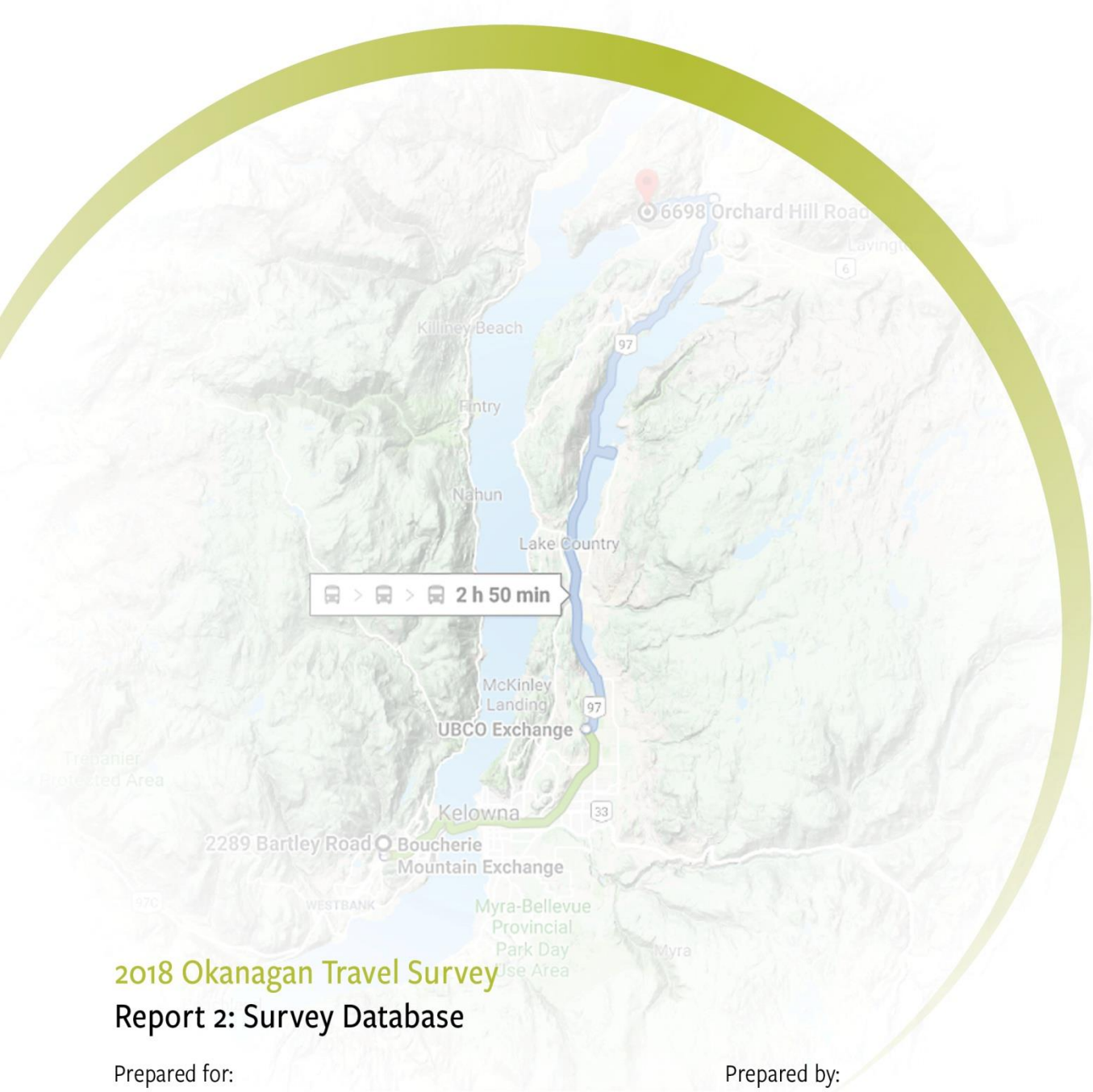
malatest

2018 Okanagan Travel Survey

Report 2: Survey Database

August 2019

smartTRIPS OKANAGAN TRAVEL SURVEY



2018 Okanagan Travel Survey

Report 2: Survey Database

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

August 2019

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Acknowledgements

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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 Introduction

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 documents the contents of the survey database developed as part of this project. Within this report, **Section 2** provides an overview of the survey geography and survey methodology relevant to the compilation and creation of the dataset, **Section** 3 outlines the database structure, and **Section** 4 provides the detailed data dictionaries for the survey data tables for households, persons, and trips.

[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 Overview

This section of this report provides an overview of the survey geography and survey methodology relevant to the compilation and creation of the dataset. For more detail on the survey methodology, data processing, and validation of the weighted data please refer to *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*.

2.1 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 1**~~**Figure 1**~~~~**Figure 1**~~.

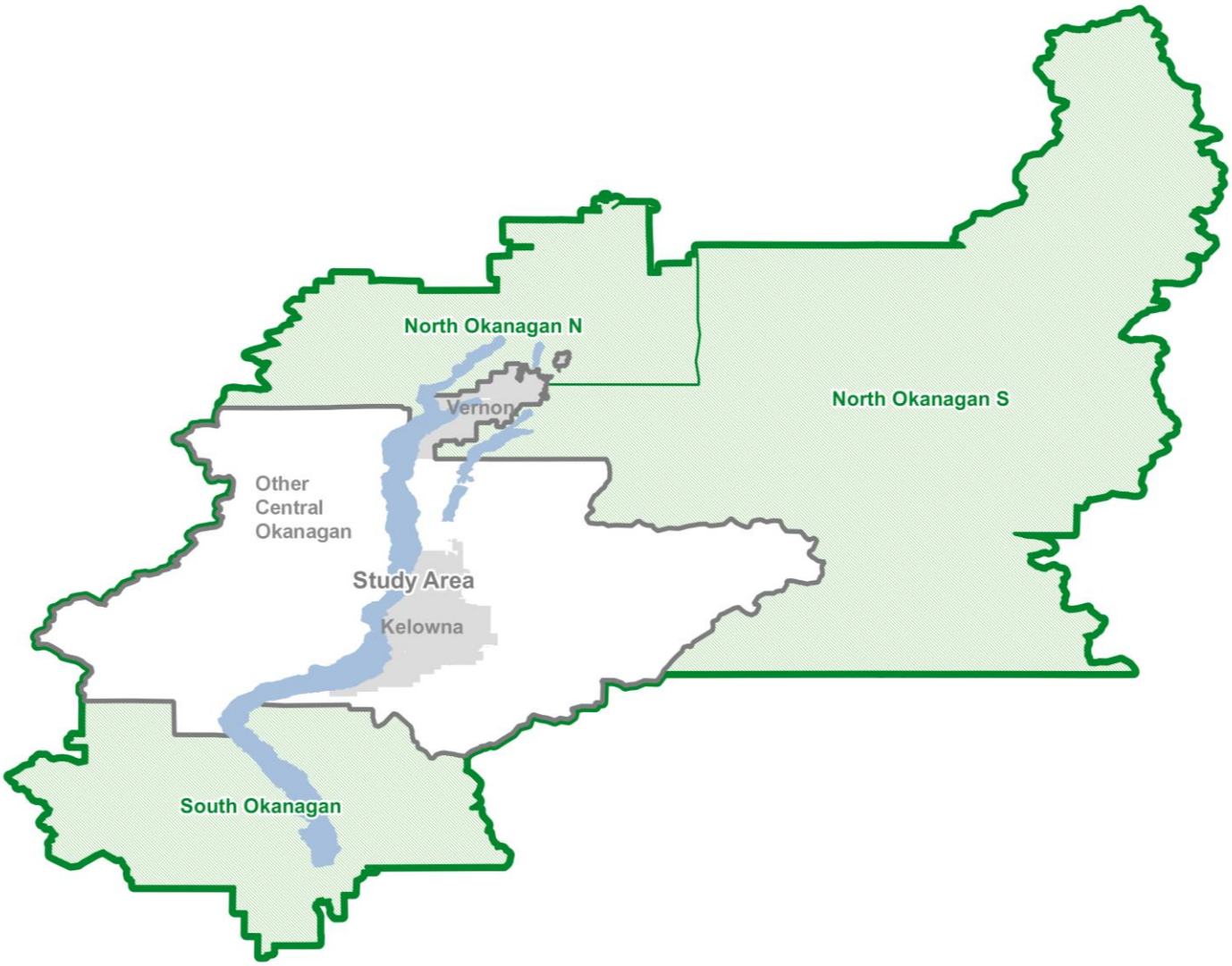
For analysis, most survey results are summarized for three sub-regions: **Vernon, Kelowna,** and **Other Central Okanagan** (comprising all other communities in the Central Okanagan, excluding Kelowna).

For the purposes of defining trips external to the study area, a wider geographical 'Travel Area' was developed (**Figure 2**~~**Figure 2**~~~~**Figure 2**~~, 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 1. 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 2. 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 3~~Figure 3~~~~Figure 3~~** (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).

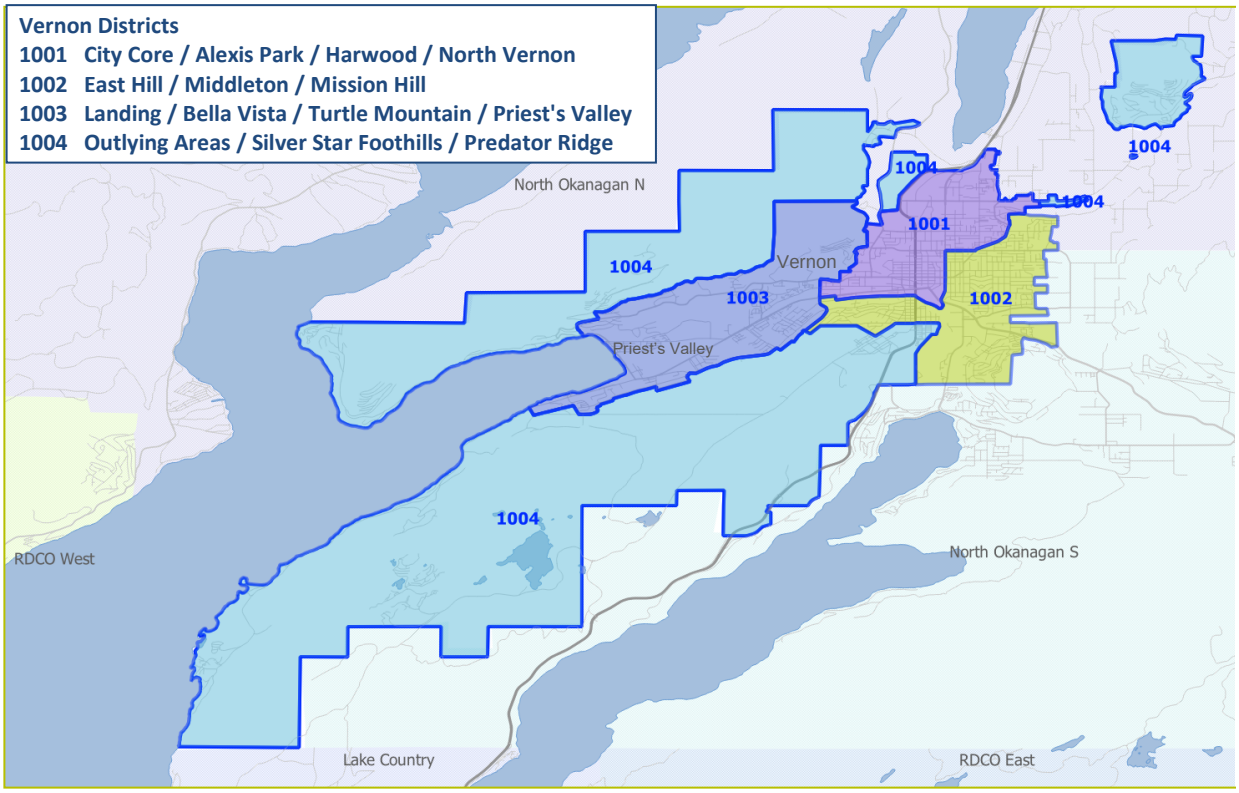
Table 1: Travel Area Geographies

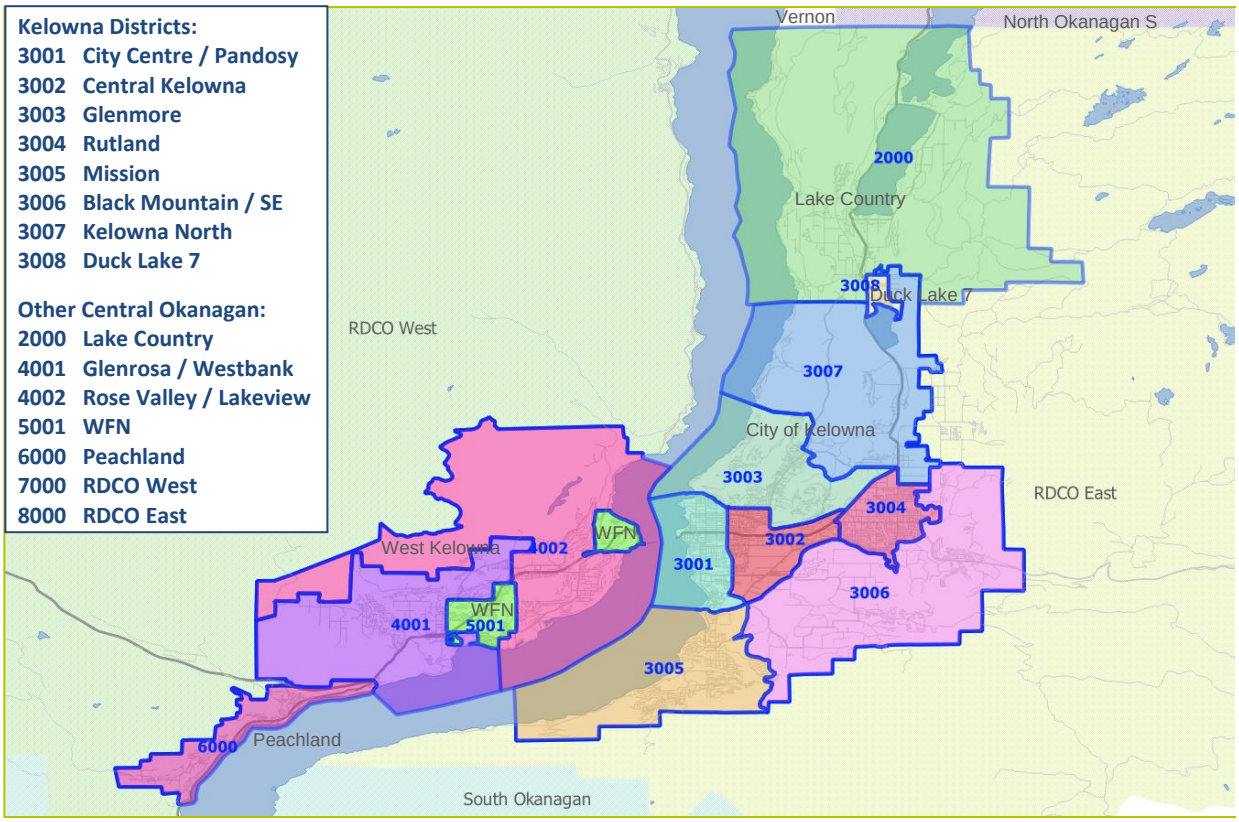
Travel Area	Census Division	Municipal Sector	Census Subdivision	District	
Study Area	Vernon (part of RD of North Okanagan)	Vernon+	City of Vernon	1001	City Core / Alexis Park / Harwood / North Vernon
				1002	East Hill / Middleton / Mission Hill
				1004	Outlying Areas
				1003	Landing / Bella Vista / 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 3. Sub-Municipal Districts





2.2 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.

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.

2.3 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.

2.4 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.

2.5 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

[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.

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.

2.6 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 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

[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.

[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

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 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* (Section 5.8). Readers are also referred to *Report 1* for discussion of data reliability (Section 5.9), estimates of sampling error for the different geographies surveyed (Section 5.10), and discussion of the comparability of the 2018 dataset with the data for the 2007 and 2013 cycles (Section 6).

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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.

3 Survey Data

3.1 Survey Instrument

The survey instrument for the 2018 OTS is a 24-hour recall survey. The key part of the survey was for respondents to provide detailed information about all trips taken by members of their household on the weekday prior to the day of the survey interview or online survey completion. Specifically, respondents were asked about trips beginning in the 24-hour period between 4:00 a.m. on the day prior to the survey and 3:59 a.m. on the day of the survey.

The 2018 OTS survey instrument consisted of three main sections that collect information at the household, person and trip level. Refer to **Appendix B** in *Report 1: Survey Design and Conduct* for the full survey instrument.

Household level

- ✓ Confirm have reached appropriate person to complete the survey. (Online: also confirm at least 16 years of age).
- ✓ Confirm phone number, email if online (removed from final data deliverable)
- ✓ Travel day surveyed (date and day of week)
- ✓ Confirm address (geocode home XY coordinates)
- ✓ Dwelling type
- ✓ Number of householders
- ✓ Number of vehicles available to householders (includes company vehicles, lease or own, motorcycles, light trucks, but not recreational vehicles like RVs, UTVs, or snowmobiles)
- ✓ Number of motor vehicles of each type (passenger car, SUV, pickup truck or van, motorcycle, other)
- ✓ Number of motor vehicles of each fuel type (if has vehicles)
- ✓ Number of working bicycles available to householders
- ✓ Household Income

Person level – for each person in the household

- ✓ Identifier (respondent's preference – first name, initial, relationship, or other identifier) for reference in survey questions (removed from data deliverable)
- ✓ Gender
- ✓ Age
- ✓ If age refused, age range within a 5-year range
- ✓ Driver's license (yes/no)
- ✓ Mobility challenged status, type(s) of mobility device used
- ✓ Student status (f/t, p/t)
- ✓ School level (elementary, high school, college, etc.)
- ✓ School name / location (geocode school XY coordinates)
- ✓ Employed (yes, no, don't know)
- ✓ Employment status (f/t, p/t, unemployed, retired)
- ✓ Workplace location (employed) (note if home) (geocode workplace XY coordinates)

- ✓ Type of occupation (if employed)
- ✓ Made any trips between 4:00 a.m. yesterday and 3:59 a.m. today

Trip level – for each trip made by each household member 5+ years of age

- ✓ Origin (Geocode origin XY coordinates)
- ✓ Destination (Geocode destination XY coordinates)
- ✓ Trip departure time
- ✓ Trip arrival time
- ✓ Trip purpose (or activity at destination location)
- ✓ Mode of travel (up to five modes)
- ✓ Clarify access and egress modes if transit was chosen without a preceding or next mode entry
- ✓ Transit route(s) (if transit taken) (route name or number)
- ✓ Number of vehicle occupants (if auto driver or auto passenger)
- ✓ Vehicle availability for trip (if not by automobile and household has vehicles)
- ✓ Additional information about trip (open-ended response)

Other questions

The survey concluded with the following questions that may be useful to transportation planners or for the conduct of future research:

- ✓ Most important transportation issue or challenge in your community (open-ended, online-respondents only, provided to client without coding or analysis)
- ✓ Willingness to participate in future research (Y/N)

Other questions

The survey instrument also included a number of questions for data validation purposes, but which were not intended for analysis. Such questions included probing for entry mistakes when someone reported as having a driver's license is reported as making a trip as an auto driver, or probing for more information if full time workers did not report travelling to work. Some validation questions were used to trigger additional data capture in the survey, while others furnished information that could be used to validate or correct issues in the data during data validation. Some of the validation questions asked in the survey are included in the final dataset, as they may be useful to users of the data in understanding the data captured.

The data dictionary in this report presents all of the variables and data definitions for each of the data elements included in the final dataset.

3.2 Database Structure

Key Data Tables

The database includes three primary data tables containing weighted household travel survey data.

Household Data pertaining to the household, such as dwelling type, household size, household income, and vehicle ownership.

Person Demographics such as age, gender, and employment status, as well as other data for each person living in the household, including geocoded school and work locations if applicable.

Trip Data pertaining to each trip taken by each person, including time, purpose, geocoded origin and destination, mode(s) of travel, and primary mode.

Lookup Tables

Included in the database is a series of Lookup tables providing labels (response categories) for the fields in the primary data tables, and some tables containing Census data used for data weighting and expansion.

Additional Data Tables

The survey dataset also includes the following data tables:

- **Verbatim open-ended comments in response to the final question on the survey,** "In your opinion, what is the most important transportation issue or challenge in your community?" A total of 3,345 respondents provided some kind of comment on this question.
- **Contact information for respondents who agreed to participate in future research**. As this table contains personal information, steps should be taken to control access to it to only those municipal staff who require access in order to invite respondents to participate in future surveys. A total of 3,261 survey respondents agreed to participate in future research.

3.3 Database Records

Outlined below is the number of survey records associated with the 2018 survey, as well as those for the previous two household travel surveys, including the adjusted totals for the revised 2013 survey dataset after corrections, deletions, and reweighting.

Table 2: Survey Records: 2007, 2013, and 2018 Surveys

Table	2007 Original	2007 Filtered to Current Study Area	2013 Original	2013 Revised	2018
Households	3,583	2,956	3,057	3,005	4,886
Persons	9,070	7,877	6,972	6,881	10,801
Trips	30,082	24,875	22,441	22,227	30,299

3.4 Concordance with Previous Datasets

As much as possible, the field names and response options in the lookup tables are the same or similar to the equivalent fields in the 2013 database, while no attempt was made to match the data formats of the 2007 dataset. As a result of matching against the previous formats, occasionally the numbering of response codes in the survey instrument differs from the response codes in the survey data. Therefore the data dictionary and response codes are to be relied on rather than the response coding numbering in the survey questionnaire.

It should be noted that in 2018 there were a number of questionnaire design changes, including the addition of questions and differences in how mode-related and transit-related information were captured. Refinements were made to the response options for questions common to both cycles and response option numbering may have changed for a few questions. The criteria used to trigger questionnaire skip patterns may differ for different cycles.

When analysing the 2007 and 2013 data, use of the lookup tables for those years is recommended, as well as reference to the survey instrument skip patterns for those years. Similarly, when analysing the 2018 data, use of the 2018 lookup tables and survey instrument is recommended. If data for 2013 and 2018 are to be combined for any fields, we recommend closely comparing the response options first to determine whether either data need to be transformed prior to merging.

Notwithstanding efforts made to ensure the survey data for different cycles had a similar basis for comparison, differences in sampling methodology, survey design[8], and/or data processing may affect the comparability of results. Readers are referred to *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct* for a more detailed discussion of the comparability of the 2018 data with the data for the 2007 and 2013 cycles (Section 6).

3.5 Possible Sources of Error in the Data

The survey data may be subject to sources of error, including sampling error (variability due to random sampling), measurement error, respondent error, processing errors, and/or non-response bias not corrected for in the data weighting.

While every effort has been made to provide a clean and validated survey dataset, it may be noted that very occasional entry mistakes or respondent reporting errors may not have been detectable by the built-in data validation controls, the battery of post-survey data validation tests, or manual review of individual survey cases. It is not unusual for such large and complex datasets to have some 'noise' in the data, which, while having negligible impact in the analysis of the overall aggregated results, may show up in the analysis when small subsamples of the data are analysed.

Readers are referred to *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct* for a more detailed discussion of possible sources of error.

[8] For example, the 2018 survey employed a 24-hour recall approach, whereas the 2013 survey employed a trip-diary approach where household were recruited to participate and assigned a future travel date.

3.6 Data Confidentiality

Survey respondents were assured that their data would remain confidential and reported only in aggregate form. The survey database includes the confidential survey responses of households who participated in the study. While the data have been stripped of names and contact information used in the conduct of the survey, the data tables include personal location information including home addresses, work locations, school locations, trip origins, and trip destinations that could be used to identify individuals. This information includes both fields with the location addresses (HomeGeocodedText, WGeocodedTxtAddress, SGecodedTxt, OriginGeocodedTxt, DestGeocodedTxt) and associated fields with the UTM X-Y coordinates and latitudes/longitudes. The database should only be shared with client staff, partners or contractors who are authorized to view confidential survey responses.

If the data tables are to be shared more broadly with others, all data tables should first be 'anonymized' by removing information that could be used to identify survey respondents. If location coordinates are to be used, both the UTM X-Y and latitude/longitude coordinates should either be removed or offset in random direction by a reasonable distance so that individual households and workplaces cannot be identified and checked to verify the offsets do not still allow larger residential properties to be identified in the data. All open-ended text responses should also be reviewed to ensure that individuals cannot be identified from the responses and removed as appropriate.

The survey asked respondents if they would consent to be contacted in the future for other transportation related research. The contact information furnished by respondents who agreed to participate in future research is not part of the final survey database, but is maintained in a separate list that should be protected per privacy laws and used only for the stated purpose for which it was collected.

4 Data Dictionary

4.1 Household Table

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
ID_HH	Text	Unique ID for Household	8-10 character alphanumeric ID
SampleType	Long Integer	Type of contact sample list	1 Address and phone 2 Address only 7 Volunteered to be added to sample
AtLeast16YrsOld	Long Integer	Confirmation that the main survey respondent was at least 16 years of age	1 Yes
ReceivedLetter	Long Integer	Indicator for whether respondent recalled receiving the survey notification brochure mailed out prior to the survey	LookupReceivedLetter 1 Yes 2 No 3 Yes, completed online directly after receiving brochure (not asked question)
HomeLat	Double	Latitude of household (decimal degrees)	
HomeLong	Double	Longitude of household (decimal degrees)	
HomeX	Double	Household UTM X Co-ordinate (Easting) (UTM Zone 11N)	
HomeY	Double	Household UTM Y Co-ordinate (Northing) (UTM Zone 11N)	
HomeCSD	Long Integer	Census Subdivision (CSD) of Home	Statistics Canada 2016 Census geographies
HomeDA	Long Integer	Dissemination Area (DA) of Home	Statistics Canada 2016 Census geographies
HomeZone	Long Integer	Geographic zones used for data analysis, aligning with municipal boundaries and neighbourhood boundaries within Vernon and Kelowna. See also Table 1: Travel Area Geographies earlier in this report.	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 West Bank First Nation 6000 Peachland

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
			7000 Central Okanagan J 8000 Central Okanagan External to study area (not applicable at household level): 10001 North Okanagan – South 10002 North Okanagan – North 11000 Okanagan South 99999 External
HomeExpZone	Long Integer	Geographic zones used for data weighting and expansion that align with aggregations of Statistics Caanda standard Dissemination Area (DA) geographies. While most zones are identical to the analysis zones above, within Vernon and Kelowna, there were some slight differences between the DA boundaries and municipalities' neighbourhood boundaries.	Same zone numbering as above, with same descriptions, although slightly differing boundaries for certain zones.
HomeSampleZone	Long Integer	Sampling Zones used to set and monitor geographic survey completion targets, based on Census Aggregated Dissemination Areas, with some adjustments	SZone Description ADA 101 Kelowna Fringe (Ellison - South East) 59350003 (5) 102 Glenmore - Wilden - McKinley 59350004 103 Dilworth - University 59350006 104 Downtown - North Central 59350010 105 Old Glenmore 59350011 106 Rutland North 59350014 107 South Central 59350015 108 Capri - Guisachan 59350016 109 Springfield/Spall 59350018 110 Rutland Centre 59350019 111 Rutland South 59350020 112 Lower Mission 59350021 113 Black Mountain - South East 59350022 114 Upper Mission 59350023 115 Duck Lake (1) 59350005 200 Lake Country 59350002 300 Peachland 59350017 400 Central Okanagan East 59350003 (5) 500 Central Okanagan West (J) 59350001 (6) 601 West Kelowna Fringe 59350001 (6) 602 West Kelowna N 59350007 603 West Kelowna W 59350008 (7) 604 West Kelowna S 59350012 605 West Kelowna Memorial Park 59350601 701 Westbank FN 1 (2) 59350013 702 Westbank FN 2 (2) 59350009 801 Vernon Silver Star 1 59370009 802 Vernon Silver Star 2 59370011 803 Vernon Inner W 59370010 804 Vernon Inner E 59370012 805 Vernon West 59370008 806 Vernon South West 59370014 807 Priest's Valley (3) 59370013 Notes:

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
			(1) Duck Lake 7 - Okanagan Indian Band. Census Subdivision (CSD) sits between Lake Country and Kelowna. Grouped with Kelowna sub-area for analysis. (2) Tsinstikeptum 9, 10 - Westbank First Nation. Both CSDs sit within the West Kelowna boundaries. (3) Priest's Valley 6 - Okanagan Indian Band. Grouped with Vernon sub-area for analysis. (5), (6) ADAs that are split across the boundaries of the sampling districts. Population and household counts have been estimated by aggregating Dissemination Areas (DAs) on either side of the split (7) A small part of ADA 59350008 in West Kelowna extends into Central Okanagan West, however, it only accounts for 100 population.
UnitNum	Text	Household unit number if applicable	
HGeocodedTxt	Text	Household street address	
HGeocodedMeth	Long Integer	Indicates how the location was captured	1 AutoComplete 2 GeoCoder 3 DoubleClick 4 Drag&Drop 7 School selected from list 8 Manually changed by coder
HGeocodedAcc	Long Integer	Indication of the accuracy of the geocoding of the household location	1 Full Address 2 Intersection 3 Landmark 4 Postal Code 5 Neighbourhood 6 Address Range 7 Street Name 8 FSA 9 Town/municipality 11 Street Address (Google) 12 Intersection (Google) 13 POI (Google) 14 Postal Code (Google) 15 Neighborhood (Google) 16 Route/Street Name (Google) 17 Locality (Google) 18 Transit Station 19 Unclear Google Accuracy 90 Geocoding method not recorded 91 Flagged as Unk/UC but has coordinates 98 Outside Study Area 99 Location Unknown / Uncodable

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
DwellType	Long Integer	Type of Dwelling	1 Single-detached house 2 Apartment or condominium 3 Row house or townhouse 4 Semi-detached house (side-by-side, duplex) 5 Mobile home 6 Secondary suite 8 Other
DwellingTypeOther	Text	Open-ended field capturing other type of dwelling. May have been recoded to DwellingType	
PplNum	Long Integer	Number of persons normally living in household (in cases of split custody, children were included only if they were present in the household for the Travel Day)	Range: 1-10
HHIncome	Long Integer	Total household income before taxes	1 $0 to less than $30,000 2 $30,000 to less than $50,000 3 $50,000 to less than $80,000 4 $80,000 to less than $125,000 5 $125,000 or more 99 Decline / don't know
VehNum	Long Integer	Number of vehicles available to the household (includes company vehicles; excludes unlicensed vehicles)	0 - 9
KnowVehType	Long Integer	Indicates whether the vehicle type(s) is/are known	Blank Not applicable 1 Vehicle types known
NumVehPass	Long Integer	Number of passenger vehicles in the household	Blank Not applicable (no vehicles) 0-9
NumVehSUV	Long Integer	Number of SUVs	Blank Not applicable (no vehicles) 0-9
NumVehPUVan	Long Integer	Number of pickups and vans	Blank Not applicable (no vehicles) 0-9
NumVehMC	Long Integer	Number of motorcycles	Blank Not applicable (no vehicles) 0-9
NumVehOther	Long Integer	Number of other vehicle types (freight trucks, etc.)	Blank Not applicable (no vehicles) 0-9
AltFuelVeh	Long Integer	Indicates whether any of the household vehicles have an alternative fuel type	Blank not applicable 1 Yes 2 No
NumVehPetrol	Long Integer	Number of vehicles in household fueled by regular gas (assumed, i.e., subtract from total vehicles the number indicated as an alternative fuel type)	Blank Not applicable (no vehicles) 0-9
NumVehHybrid	Long Integer	Number of hybrid vehicles in household	Blank Not applicable (no vehicles) 0-9
NumVehElec	Long Integer	Number of electric vehicles in household	Blank Not applicable (no vehicles)

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation	
			0-9	
NumVehDiesel	Long Integer	Number of diesel vehicles in household	Blank 0-9	Not applicable (no vehicles)
NumVehBioD	Long Integer	Number of biodiesel vehicles in household	Blank 0-9	Not applicable (no vehicles)
NumVehUnk	Long Integer	Number of vehicles in household for which alternative fuel type is unknown	Blank 0-9	Not applicable (no vehicles)
BikeNum		Total number of bicycles in the household	-999 0-12	Unknown
NumBikesAdult	Long Integer	Number of adult bicycles owned by household	0-12	
NumBikesAdultE	Long Integer	Number of adult E-bikes (electric assist bicycles) owned by household	0-12	
NumBikesChild	Long Integer	Number of working children's bicycles owned by household that have been used in the past year	0-12	
TravelDate	Text	Date for which household trips are reported Note: very few surveys were allowed after December 17, and only after careful review for reasonable daily travel patterns	Range: 2018-10-24 to 2018-12-21	
TravelDayOfWk	Long Integer	Day of week for which household trips are reported	1 2 3 4 5	Monday Tuesday Wednesday Thursday Friday
Persons5Plus	Long Integer	Number of persons in household 5 years of age or older	0-9	
PersonsTravel	Long Integer	Number of persons 5 years of age or older in household who tosok trips on their travel day	0-9	
PersonsNotTravel	Long Integer	Number of persons 5 years of age or older in household who did not take trips on their travel day	0-9	
NumTrips		Number of trips by persons in the Household	0-99	
NumLicence		Number of people in the household with driver's licences	0-9	
NumEmpFT		Number of people in household employed full-time	0-9	
NumEmpPT		Number of people in household employed part-time	0-9	
NumStudent		Number of students in household	0-9	

Household Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
HouseholdWeightNormalized	Double	Unexpanded household weight normalized so that the sum of weights equals the total number of survey completions. May be useful for statistical testing.	0.1 – 4.0
DistrictBaseWeight	Double	Initial base expansion weight for the district before adjustment of the weighting against household and demographic controls for the district	8.5 – 24.5
HhWeightRelativeToBase	Double	Household weighting factor divided by base weight for the district of the household. Provides a measure of the dispersion of data weights within each district.	0.24 – 3.64
EXPFACT	Double	Final data expansion weight after the iterative proportional fitting data weighting process. The household factor is applied to all person records and trip records associated with the household. **This weighting factor should be used for all weighted analyses**	2.18 – 82.8

4.2 Person Table

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
PersonID	Text	Unique ID for Person	Composed of [HouseholdID]-P[2-digit person number]
ID_HH	Text	Unique ID for Household. Used to link to Household table	
PPnum	Long Integer	Number of person within household	0-9
Gender	Long Integer	Gender of person for weighting and analysis purposes, recoding Other and Decline to either Male or Female	1 Male 2 Female
GenderOrig	Long Integer	Original gender of person	1 Male 2 Female 3 Other 99 Decline / don't know
Age	Long Integer	Age of person Includes some imputed values when specific age was unknown: If an age range was given, the age was imputed between the bounds of the age range (see AgeGroupOriginal); If the age range question was refused, the age was imputed randomly, with some bounds applied depending on other information in the survey case.	0-97 individual ages 98 98 years and above
AgeOrig	Long Integer	Reported age of person on survey before any final imputations	0-97 individual ages 98 98 years and above 99 refused to give specific age (ask age range)
AgeGroup	Long Integer	Reported age group of persons on survey before any final imputations	1 0-4 2 5-14 3 15-24 4 25-34 5 35-44 6 45-54 7 55-64 8 65+ 99 Unknown (impute as best as possible given other information)

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
AgeRange	Long Integer	Age range, in standardized 5-year groupings (after imputation of any missing ages)	LookupAgeRange 1 0 - 4 years 2 5 - 9 years 3 10 - 14 years 4 15 - 19 years 5 20 - 24 years 6 25 - 29 years 7 30 - 34 years 8 35 - 39 years 9 40 - 44 years 10 45 - 49 years 11 50 - 54 years 12 55- 59 years 13 60 - 64 years 14 65 - 69 years 15 70 - 74 years 16 75 - 79 years 17 80 - 84 years 18 85 - 89 years 19 90 - 94 years 20 over 95 years of age
MobilityChallenges	Long Integer	Indicates whether person has a physical disability or condition that limits their mobility	1 Yes 2 No 99 Don't Know
svMobChallPrimary	Long Integer	Primary type of assistance used to address mobility challenge If multiple responses to svMobAid_WC through svMobAidDK, a primary device was selected (e.g., if both wheelchair and walker, wheelchair was selected as the most likely primary device).	Blank Not applicable 1 Wheelchair 2 Scooter 3 Cane 4 Walker 5 Crutches 6 Mobility challenge, but do not use any of these devices to aid mobility 99 Unknown if have mobility challenge or not
svMobAid_WC	Long Integer	Use wheelchair	1 Yes 2 No
svMobAid_Scoot	Long Integer	Use scooter	1 Yes 2 No
svMobAid_Walk	Long Integer	Use walker	1 Yes 2 No
svMobAid_Cane	Long Integer	Use cane	1 Yes 2 No
svMobAid_Crutch	Long Integer	Use Crutch	1 Yes 2 No
svMobChallNoAid	Long Integer	Has mobility challenge, but does not use any of the listed devices to aid mobility	1 Yes 2 No
svMobAidDK	Long Integer	Unknown if have mobility challenge or not	1 Yes 2 No
svDvrLic	Long Integer	Has driver's license	Blank Not applicable (too young) 1 Yes 2 No

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation	
			99	Don't Know
svWkFT	Long Integer	Works full-time	1 2	Yes No
svWkPT	Long Integer	Works part-time	1 2	Yes No
svSchFT	Long Integer	Student full-time	1 2	Yes No
svSchPT	Long Integer	Student part-time	1 2	Yes No
svRetire	Long Integer	Retired	1 2	Yes No
svWkNO	Long Integer	Unemployed	1 2	Yes No
svStOth	Long Integer	Other status	1 2	Yes No
svStOthTxt	Text	Open-ended field capturing other type of occupational status		
OccStatus	Long Integer	Single code to indicate overall occupation status of person. Derived from multiple responses to question recording work, student, and other statuses.	1 2 10 11 12 20 21 22 30 40 50 77	Work Full-Time Work Part-Time Student Full-Time Work Full-Time / Student Full-Time Work Part-Time / Student Full-Time Student Part-Time Work Full-Time / Student Part-Time Work Part-Time / Student Part-Time Retired Unemployed Other Not applicable (0-4 years)
Occupation	Long Integer	Type of occupation/industry Based on 10 major groups in the National Occupational Classification (NOC) system	1 2 3 4 5 6 7 8 9 10 11 77 80 99	Management Occupations Business, Finance & Administration Occupations Natural & Applied Sciences Occupations Health Services Occupations Post Secondary Education, Law & Social, Community & Government Services, and Law Performing & Facilitating Art, Culture, Recreation & Sports Sales & Service Provision Trades, Transport & Equipment Operators Natural Resources, Agriculture & Related Production Manufacturing & Utilities Secondary and Elementary School Teachers Commercial driver (such as a courier, taxi, or bus driver) Other Don't Know
OccupationOther	Text	Open-ended field capturing other type of occupation. May have been recoded to Occupation.		

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
WorkPlace	Long Integer	Type of work location	1 Work from home 3 No fixed workplace address / No usual place of work 6 Work away from home 99 Unknown
WorkLat	Double	Latitude of work location (decimal degrees)	
WorkLong	Double	Longitude of work location(decimal degrees)	
WorkX	Double	Work UTM X Co-ordinate (Easting) (UTM Zone 11N)	
WorkY	Double	Work UTM Y Co-ordinate (Northing) (UTM Zone 11N)	
WGeocodedTxt	Text	Work street address	
WGeocodedMeth	Long Integer	How work location was captured	1 AutoComplete 2 GeoCoder 3 DoubleClick 4 Drag&Drop 7 School selected from list 8 Manually changed by coder
WGeocodedAcc	Long Integer	Indication of the accuracy of the geocoding of the work location	1 Full Address 2 Intersection 3 Landmark 4 Postal Code 5 Neighbourhood 6 Address Range 7 Street Name 8 FSA 9 Town/municipality 11 Street Address (Google) 12 Intersection (Google) 13 POI (Google) 14 Postal Code (Google) 15 Neighborhood (Google) 16 Route/Street Name (Google) 17 Locality (Google) 18 Transit Station 19 Unclear Google Accuracy 90 Geocoding method not recorded 91 Flagged as Unk/UC but has coordinates 98 Outside Study Area 99 Location Unknown / Uncodable
WorkCSD	Long Integer	Census Subdivision of workplace	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
WorkDA	Long Integer	Census Dissemination Area of workplace	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
WorkExpZone	Long Integer	Expansion Zone of work location Some boundaries differ from analysis zone. Use WorkZone for analysis.	See Table 1: Travel Area Geographies
WorkZone	Long Integer	Analysis zone of work location	See Table 1: Travel Area Geographies Also: 33333 = no fixed workplace address 88888 = unknown 99999 = entirely external to travel area

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
SchoolType	Long Integer	School level / type	1 Elementary school 2 Middle school (Grade 7 to 9) 3 High school (Grade 10 to 12) 4 Secondary school (usually grade 8 to 12) 5 College or university 6 Alternate, adult basic education, or other 7 Online / distance learning
SchoolTypeOther	Text	Others school type specified by respondent. May have been used to recode to a valid value in SchoolType.	
svSch1Typ	Long Integer	School type collapsed to 2013 categories, for database comparison purposes	1 Grade School 2 College or university 3 Alternate, adult basic education, or other 5 Online / distance learning
SchoolLocation	Long Integer	Type of school location	1 School Name: 2 No fixed school address / no usual place of schooling 8 Home Schooled (does not attend a school outside of home)
SchoolName	Text	Name of school	
SchoolCode	Long Integer	Numeric code assigned to school	In database, see LookupSchoolCode (list of 114 schools)
SchoolLat	Double	Latitude of school (decimal degrees)	
SchoolLong	Double	Longitude of school (decimal degrees)	
SchoolX	Double	School UTM X Co-ordinate (Easting) (UTM Zone 11N)	
SchoolY	Double	School UTM Y Co-ordinate (Northing) (UTM Zone 11N)	
SGeocodedTxt	Text	School address	
SGeocodedMeth	Long Integer	How school location was captured	1 AutoComplete 2 GeoCoder 3 DoubleClick 4 Drag&Drop 7 School selected from list 8 Manually changed by coder
SGeocodedAcc	Long Integer	Indication of the accuracy of the geocoding of the school location	1 Full Address 2 Intersection 3 Landmark 4 Postal Code 5 Neighbourhood 6 Address Range 7 Street Name 8 FSA 9 Town/municipality 11 Street Address (Google) 12 Intersection (Google) 13 POI (Google) 14 Postal Code (Google) 15 Neighborhood (Google)

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
			16 Route/Street Name (Google) 17 Locality (Google) 18 Transit Station 19 Unclear Google Accuracy 90 Geocoding method not recorded 91 Flagged as Unk/UC but has coordinates 98 Outside Study Area 99 Location Unknown / Uncodable
SchoolCSD	Long Integer	Census Subdivision of school	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
SchoolDA	Long Integer	Census Dissemination Area of school location	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
SchoolExpZone	Long Integer	Expansion Zone of school location Some boundaries differ from analysis zone. Use SchoolZone for analysis.	See Table 1: Travel Area Geographies
SchoolZone	Long Integer	Analysis zone of school location	See Table 1: Travel Area Geographies also: 22222 = no fixed school address 88888 = unknown 99999 = entirely external to travel area
TookTrips	Long Integer	Indicator for whether person took any trips on the travel day.	1 Yes 2 No 99 Don't Know
WhyFirstTripStart	Long Integer	Why person's first trip did not start from home	Blank Not applicable 1 Working a night shift (past 4 am, the start of the travel day) 2 Staying overnight at another household (friend's, relative's, parent's, etc.) 3 Away from home on business travel 4 Away from home on vacation (or other personal travel) 5 Another reason 9 Decline to answer
WhyFirstTripStartOther	Text	Verbatim response as to other reason for first trip origin being somewhere other than home	
WhyNoTrips	Long Integer	Why person did not leave home or make any trips on their travel day.	Blank Not applicable 1 Out of town for entire day 2 Sick/ill or care for other sick/ill household member 3 Not scheduled for school classes or activities 4 Not scheduled for work or on extended leave from work (paternity/maternity, short-term disability) 5 Worked from home, and did not leave home for any reason 6 No need to leave home 7 Could not leave home, no transportation available 77 Other 79 I did leave home to go to work or school (including walking trips to work or school) or to make at least one other kind of trip

Person Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
WhyNoTripsOther	Text	Verbatim response as to other reason for not having any trips	
DidNotReturnHome	Long Integer	Confirmation that the person did not return home. Asked if last trip did not have home as a destination.	Blank Not applicable 1 Did not return home 2 No (returned home, more trips to record)
WhyNoReturnHome	Long Integer	Why person did not return home before the end of the day. Asked if last trip did not have home as a destination.	Blank Not applicable 1 Worked a night shift past 4 am 2 Stayed overnight at another household 3 Away from home on business travel 4 Away from home for vacation travel
WhyNoReturnHomeOther	Text	Verbatim response as to reason did not return home	
WhyNoWork	Long Integer	Why employed person did not make a work trip. Asked if did not report a trip with destination of work or trip purpose of work or of work-related	Blank Not applicable 1 Yes, worked from home (telecommuted) 2 No, away on business / working on the road 3 No, did not work 4 No, actually [I/PERSON] worked and did take work-related trips 5 Other, specify 9 Unknown
WhyNoWorkOther	Text	Verbatim response as to other reason for not making a work trip on travel day	
WhyNoSchool	Long Integer	Why student did not make a school trip. Asked if did not report a trip with destination of school or purpose of school	Blank Not applicable 1 Yes, did go to school 2 Attended school from home (home schooled, distance learning) 3 No, did not have any scheduled classes, stayed home sick, or did not attend school for another reason 4 No, away on a field trip or other travel 5 Other
WhyNoSchoolOther	Text	Verbatim response as to other reason for not going to school on travel day	
EXPFACT	Double	Weighting factor for person	Person's data expansion factor. All persons within the same household carry the same expansion factor as the household.

4.3 Trip Table

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
TripID	Text	Unique ID for Trip	Composed of [HouseholdID]-P[2-digit person number]-T[2-digit trip number]
PersonID	Text	Unique ID for Person – used to link to Person table	Composed of [HouseholdID]-P[2-digit person number]
Ppnum	Long Integer	Person number within household	1-9
ID_HH	Text	Unique ID for Household – used to link to Household table	
PrevTripID	Double	TripID of next trip taken by person	
NextTripID	Double	TripID of previous trip taken by person	
TripNum	Long Integer	Number of trip for person	1-21
LastTrip	Long Integer	Indicator for person's last trip of the travel day	1 = Last Trip
TripPurpose	Long Integer		10 Travel to Work (usual place of work) 11 Work-related trips to attend meetings,… 12 Working on the road / itinerant.. 20 Post-Secondary School 30 Attend School (K-12) 41 Restaurant (whether eat-in or take-out) 42 Recreation (gym, swimming, etc.) 43 Social outing / meet friends 44 Shopping 45 Personal business 80 Return Home 91 Pick up a passenger 92 Drop off a passenger 888 Other
TripPurposeDesc	Text	Text description of the response category associated with TripPurpose	
TripPurposeOther	Text	Open-ended field capturing other type of trip purpose. May have been recoded to Purpose	
2013PurposeID	Long Integer	Trip purposes collapsed to the 2013 trip purposes, for use in comparisons	1 To Work / Work meeting 3 To a Restaurant 4 For Recreation (gym, swimming, etc.) 5 For a Social outing / Meeting friends 6 For Shopping 7 For Personal business (bank, doctor, errands, etc.) 8 To Home 9 To drive or pick-up someone 10 Other 11 To grade school 12 To post secondary school
2013Purpose	Text	Text description of the response category associated with PurposeID	

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
TripStart	Long Integer	Time at which left trip origin.	Uses a modified 24hour clock going from 4am on the travel day (400) to 3:59am the following day (2759). In cases where only the hour was known, 99 was used for the minutes (e.g. a trip sometime between 5pm and 6pm would be recorded as 1799)
HBPurpose	Long Integer	Home-Based trip purposes, determined by looking at both origin activity and destination activity	1 HBW Home-Based Work 2 HBS Home-Based School 3 HBO Home-Based Other 4 NHB Non Home-Based
HBPurposeDesc	Text	Text description of the response category associated with HBPurpose	
HBPurpDetailed	Long Integer	More detailed version of home-based trip purpose, breaking down HBO trips into further categories.	1 HBW Home-Based Work 2 HBS Home-Based School 3 HBPass Home-Based Serve Passenger (pick-up or drop-off) 5 HBShop Home-Based Shopping 6 HBRecSoc Home-Based Recreational/Social 7 HBPers Home-Based Personal Business 9 NHB Non Home-Based
HBPurpDetailedDesc	Text	Text description of the response category associated with HBPurpDetailed	
FlagFirstWorkTrip	Long Integer	Flags whether or not the trip is the first work trip (to usual work or work-related)	1 First Work Trip
TripEnd	Long Integer	Time at which arrived at trip destination.	Uses a modified 24hour clock going from 4am on the travel day (400) to 3:59am the following day (2759). In cases where only the hour was known, 99 was used for the minutes (e.g. a trip sometime between 5pm and 6pm would be recorded as 1799)
Tripdur	Long Integer	Estimated duration of trip based on the difference between TripStart and TripEnd. Important note: Survey respondents often round times of day to the closest hour, half-hour, or fifteen minutes or have poor recollection of when they actually left or arrived. The information in this field may not be reliable.	1-1455 minutes
Period	Long Integer	The period of the day in which trip started, divided into two three-hour peak periods and three six-hour off-peak periods.	0 Night (0000-0559, six hours) * 1 AM Peak (0600-0859, three hours) 2 Midday (inter-peak) (0900-1500, six hours) 3 PM Peak (1500-1759, three hours) 4 Evening (1800-1159, six hours) *in modified 24-hour clock format used for the Depart time, the Night period comprises all trips with values of 2400 to 2759

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
Mode1 Mode2 Mode3 Mode4 Mode5	Long Integer Fields	First, second, third, fourth, and fifth modes of travel, as applicable 2013 mode numbering is used, with three additional categories at the end for modes not listed in 2013	1 Auto driver 2 Auto passenger 3 Public transit 4 Walked (incl. jogging, etc) 5 Bicycle 6 Taxi 7 School Bus (e.g., yellow bus) 8 Other 81 HandyDart or Health Connections 82 Motorcycle or scooter 83 Intercity coach bus
Mode1Other Mode2Other Mode3Other Mode4Other Mode5Other	Text Fields	Open-ended fields capturing other mode of first, second, third, fourth, or fifth mode of travel, if not on list of modes	
PrimaryMode	Long Integer	Primary travel mode of trip. Determined based on the following hierarchy: Transit bus –> school bus –> other bus –>Handy Dart –> auto driver –> auto passenger –> taxi –> motorcycle/scooter –> bicycle –> walked entire way	1 Auto driver 2 Auto passenger 3 Public transit 4 Walked (incl. jogging, etc) 5 Bicycle 6 Taxi 7 School Bus (e.g., yellow bus) 8 Other 81 HandyDart or Health Connections 82 Motorcycle or scooter 83 Intercity coach bus
ModeSummary	Text	Summary of all travel modes used in trip for easy reference, using 2013 categories.	Format is "-[Mode1]-[Mode2]-[Mode3]-[Mode4]-[Mode5]-"
ModeSummaryText	Text	Summary of all travel modes used in trip using category description from lookup table.	Format is "-[Mode1 description]-[Mode2 description]-[Mode3 description]-[Mode4 description]-[Mode5 description]-"
Route1 Route2 Route3 Route4 Route5	Long Integer fields	First bus route used on trip Second bus route used on trip Third bus route used on trip Fourth bus route used on trip Fifth bus route used on trip	1 1 Lakeshore 2 2 North End Shuttle 3 3 Dilworth Mt. 4 4 Pandosy / UBCO Express 5 5 Gordon 6 6 Glenmore / UBCO Express 8 8 University / OK College 9 9 Shopper Shuttle 10 10 North Rutland 11 11 Rutland 12 12 McCulloch 13 13 Quail Ridge 14 14 Black Mountain 15 15 Crawford 16 16 Kettle Valley 17 17 South Ridge 18 18 Glenmore/Downtown

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
			19 19 Glenmore/Orchard Park 20 20 Lakeview 21 21 Glenrosa 22 22 Peachland 23 23 Lake Country 24 24 Shannon Lake 25 25 East Boundary 28 28 Smith Creek 29 29 Bear Creek 32 32 The Lakes 97 97 Okanagan 99 Unknown or no further routes taken 901 1 Coldstream (Vernon) 902 2 Pleasant Valley (Vernon) 903 3 Alexis Park (Vernon) 904 4 East Hill (Vernon) 905 5 South Vernon (Vernon) 906 6 College (Vernon) 907 7 Okanagan Landing (Vernon) 908 8 Bella Vista (Vernon) 909 9 North End (Vernon) 960 60 Enderby (Vernon) 961 61 Lumby (Vernon) 990 90 UBCO Connector (Vernon)
Boardings	Long Integer	Number of bus routes taken (if transit trip)	1-5
TotalVehOccs	Long Integer	Number of people in the vehicle (including person for whom trip is recorded) Only asked for trips with at least one mode being auto driver or auto passenger	Blank Not applicable (mode not auto driver or passenger) 1 One 2 Two 3 Three 4 Four 5 Five 6 Six 7 Seven 8 Eight 9 Nine 10 Ten or more
sVehPpl	Long Integer	Number of vehicle passengers excluding the person for whom the trip is recorded. This is a 2013 data convention retained only for consistency with the previous data file. Only asked for trips with at least one mode being auto driver or auto passenger	Blank Not applicable (mode not auto driver or passenger) 0 No passengers, only driver 1 Driver + 1 Passenger 2 Driver + 2 Passengers 3 Driver + 3 Passengers 4 Driver + 4 Passengers 5 Driver + 5 Passengers 6 Driver + 6 Passengers
svSustVehQ	Long Integer	Was a vehicle available for this trip (but you chose not to drive it)? Asked if trip mode not driver or passenger and Origin=Home and household had vehicles.	Blank Not asked 1 Yes 2 No 3 N/A 99 Unknown

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation	
Origin			1	Previously entered destination
			2	Previously entered destination
			3	Previously entered destination
			4	Previously entered destination
			5	Previously entered destination
			6	Previously entered destination
			7	Previously entered destination
			9	Previously entered destination
			1001	Home
			1002	Main work location
			1003	Main school location
			1006	Other location
			1021	Work address of P01
			1022	Work address of P02
			1023	Work address of P03
			1024	Work address of P04
			1025	Work address of P05
			1031	School address of P01
			1032	School address of P02
			1033	School address of P03
			1034	School address of P04
			1035	School address of P05
			1036	School address of P06
			1037	School address of P07
OriginLat	Double	Latitude of origin (decimal degrees)		
OriginLon	Double	Longitude of origin (decimal degrees)		
OriginX	Double	Origin UTM X Co-ordinate (Easting) (UTM Zone 11N)		
OriginY	Double	Origin UTM Y Co-ordinate (Northing) (UTM Zone 11N)		
OGeocodedMeth	Long Integer	Method used to capture the origin location	1	AutoComplete
			2	GeoCoder
			3	DoubleClick
			4	Drag&Drop
			7	School selected from list
			8	Manually changed by coder
OGeocodedAcc	Long Integer	Indication of the accuracy of the geocoding of the origin location	1	Full Address
			2	Intersection
			3	Landmark
			4	Postal Code
			5	Neighbourhood
			6	Address Range
			7	Street Name
			8	FSA
			9	Town/municipality
			11	Street Address (Google)
			12	Intersection (Google)
			13	POI (Google)
			14	Postal Code (Google)
			15	Neighborhood (Google)
			16	Route/Street Name (Google)

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
			17 Locality (Google) 18 Transit Station 19 Unclear Google Accuracy 90 Geocoding method not recorded 91 Flagged as Unk/UC but has coordinates 98 Outside Study Area 99 Location Unknown / Uncodable
OGeocodedTxt	Text	Street address or other location description of origin	
OriginCSD	Long Integer	Census Subdivision of origin	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
OriginDA	Long Integer	Census Dissemination Area of origin	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
OriginExpZone	Long Integer	Expansion Zone of origin location Some boundaries differ from analysis zone. Use OriginZone for analysis.	See Table 1: Travel Area Geographies
OriginZone	Long Integer	Analysis zone of origin	See Table 1: Travel Area Geographies Also 99999 = External to travel area
Destination	Long Integer	Description of the type of location for the trip destination	1 Previously entered destination 2 Previously entered destination 3 Previously entered destination 4 Previously entered destination 5 Previously entered destination 6 Previously entered destination 7 Previously entered destination 9 Previously entered destination 1001 Home 1002 Main work location 1003 Main school location 1006 Other location 1021 Work address of P01 1022 Work address of P02 1023 Work address of P03 1024 Work address of P04 1025 Work address of P05 1031 School address of P01 1032 School address of P02 1033 School address of P03 1034 School address of P04 1035 School address of P05 1036 School address of P06 1037 School address of P07
DestLat	Double	Latitude of destination (decimal degrees)	
DestLon	Double	Longitude of destination (decimal degrees)	
DestX	Double	Destination UTM X Co-ordinate (Easting) (UTM Zone 11N)	
DestY	Double	Destination UTM Y Co-ordinate (Northing) (UTM Zone 11N)	

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
DGeocodedMeth	Long Integer	Method used to capture the destination location	1 AutoComplete 2 GeoCoder 3 DoubleClick 4 Drag&Drop 7 School selected from list 8 Manually changed by coder
DGeocodedAcc	Long Integer	Indication of the accuracy of the geocoding of the destination location	1 Full Address 2 Intersection 3 Landmark 4 Postal Code 5 Neighbourhood 6 Address Range 7 Street Name 8 FSA 9 Town/municipality 11 Street Address (Google) 12 Intersection (Google) 13 POI (Google) 14 Postal Code (Google) 15 Neighborhood (Google) 16 Route/Street Name (Google) 17 Locality (Google) 18 Transit Station 19 Unclear Google Accuracy 90 Geocoding method not recorded 91 Flagged as Unk/UC but has coordinates 98 Outside Study Area 99 Location Unknown / Uncodable
DGeocodedTxt	Text	Street address or other location description of destination	
DestCSD	Long Integer	Census Subdivision of destination	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
DestDA	Long Integer	Census Dissemination Area of destination	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
DestExpZone		Expansion Zone of destination location Some boundaries differ from analysis zone. Use DestZone for analysis.	See Table 1: Travel Area Geographies
DestZone	Long Integer	Analysis zone of destination	See Table 1: Travel Area Geographies Also 99999 = External to travel area
ODBreak	Long Integer	Flags if there is a break between trips during which there may be out of scope commercial trips.	1 Origin of this trip does not match destination of previous trip
DistODEuclid	Double	Straight-line (Euclidean) distance in metres between trip origin and destination	Meters

Trip Table

Field	Field Type	Description	Lookup Table / Value Labels / Explanation
DistODGoogleApi	Double	Distance in metres travelled between trip origin and destination via Google's suggested route (usually the most efficient route for the time of day of travel). Calculated for driving (auto driver, auto passenger, motorcycle), transit, cycling, and walking trips. A result may not have been returned in all cases. The result may not be accurate for multi-mode trips that used both driving and transit.	Meters
DurODGoogleApi	Double	The duration of time from Origin to Destination using the Google non-Euclidian indirect geometry. Computed for driving (auto driver, auto passenger, motorcycle), cycling, and walking trips. Not calculated for transit trips.	Minutes
HomeCSD	Long Integer	Census Subdivision of home location, included for easy reference	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
HomeDA	Long Integer	Census Dissemination Area of home location, included for easy reference	Statistics Canada 2016 Census Geographies 9999999 = unknown or not applicable
HomeZone	Long Integer	Analysis zone of home location, included for easy reference	See Table 1: Travel Area Geographies
EXPFACT	Double	Weighting factor for trip	Trip's data expansion factor. All trips for all persons within the same household carry the same expansion factor as the household.