transportationtomorrow
SURVEY 2022

# Analysis of the Survey Data between Fall and Spring Seasons

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MALATEST | DAVID KRIGER TRANSPORTATION POLICY AND RESEARCH | Ontario

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# Further Information

The Transportation Tomorrow Survey (TTS) is part of an ongoing data collection program by the Transportation Information Steering Committee (TISC). The survey data (2022, 2016, 2011, 2006, 2001, 1996, 1991 and 1986) are currently under the care of the Data Management Group (DMG). This group is responsible for maintaining the TTS databases and making available appropriate travel information for any urban transportation study in the area. Requests for information from the TTS, or enquiries related to the contents of this report, should be directed to the address below.

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# 1. OVERVIEW

The Transportation Tomorrow Survey (TTS) is a confidential and voluntary travel survey on how Ontarians in the Greater Golden Horseshoe (GGH) and surrounding areas use the transportation system. The data collected help local and regional governments, as well as the province and transit agencies, make transportation planning and investment decisions. The TTS collects three categories of information: household, person, and trip data. The 2022 TTS is one of the largest and most comprehensive travel surveys in North America, and the eighth in a series of surveys conducted every five years since 1986. The most recent survey was conducted by R.A. Malatest & Associates Ltd. (Malatest) on behalf of the Ministry of Transportation of Ontario and 24 partnering agencies.

The 2022 TTS was conducted across two separate data collection phases. The first phase, referred to as the Fall sample, occurred from September 13 to December 19, 2022. The second phase, referred to as the Spring sample, collected the great majority of surveys for this phase between the 3rd week of March and 3rd week of June 2023.[1] Approximately 70% of the surveys (n= 110,902) were collected as part of the Fall sample, and 30% of surveys (n= 47,760) were collected for the Spring sample. Across both phases, the TTS successfully collected data from over 186,000 households across the Greater Golden Horseshoe and surrounding areas, with a total of 158,700 surveys with trip data. For more information on the survey methodology, please refer to the report under the following cover: *TTS 2022: Design and Conduct of the Survey.*

## 1.1. Purpose

This report is intended to provide insights into the equivalency or comparability of the survey data across the two phases. The Fall 2022 and Spring 2023 samples will be compared on various key indicators to inform an understanding of the equivalency of the data. The analysis undertaken seeks to answer the question as to whether there are substantive differences between the two phases that may affect the survey results and/or the survey dataset's comparability to data collected in previous surveys, which were mainly conducted in fall conditions (with a few exceptions).

This analysis has been undertaken with two approaches: first, a bivariate analysis with descriptive statistics that show similarities or differences between the Spring and Fall samples. Second, a multivariate analysis adds further depth as it attempts to control for differences in the characteristics in the two samples to identify the extent to which the phase of the data collection

[1] The spring sample includes a small proportion of surveys collected during the winter (January 3 to March 24, 2023) and the summer (June 30 to July 29, 2023) period. Data collection was allowed to continue in the Winter for a few reasons: A large number of invitations letters had been sent out in the fall up until the end of November, and we did not want to turn away those who were interested; some follow up on partially completed surveys from the fall was undertaken; and it left the surveying processes in place and operational in case the Ministry approved a pilot testing alternative survey recruitment methods, although this did not come to pass. Data collection was also allowed to continue beyond the spring, as invitation letters were sent to hard-to-reach areas up until early June in attempts to reach the target sampling rate in these geographies.

may influence the survey results for three key statistics: average daily trips per person, average daily non-discretionary trips per person (where non-discretionary trips are trips to work or school), and average daily discretionary trips per person (trips for non-commute purposes). The two approaches complement each other.

## 1.2. TTS Dataset – Fall and Spring Samples

Figure 1 illustrates the breakdown of the valid survey completions by survey phase, including details of surveys in the Spring dataset that were collected outside of the actual spring season. Table 1 provides these counts along with the counts of surveyed household members. The inclusion of surveys outside of spring conditions is discussed further in Section 1.3.4 below. The datasets in both phases are robust and provide a good basis for comparison.

It is important to note that the comparisons of weighted survey results provided in Section 2 of this report are based on a survey dataset that has been weighted as a whole across both survey phases. I.e., the Fall and Spring subsamples have not been weighted independently to each represent the entire population of the study area. Thus, the bivariate comparisons in Section 2 illustrate internal differences between two different samples within the dataset. Given different geographic distributions in the Fall and Spring samples, it is important to understand that the results presented may not be representative of an independent Fall dataset or an independent Spring dataset, and will not represent actual trip volumes of the entire population. We do not recommend using these results to publicly report on actual fall or spring travel patterns without caveating the fact that the two samples may each have different biases when examined separately, particularly in terms of geographic distributions, or without reweighting the data to create independent datasets. The differences in geographic distributions are discussed further in Section 1.3.7 of this report.

**Figure 1: Valid survey completions by survey administration phase**

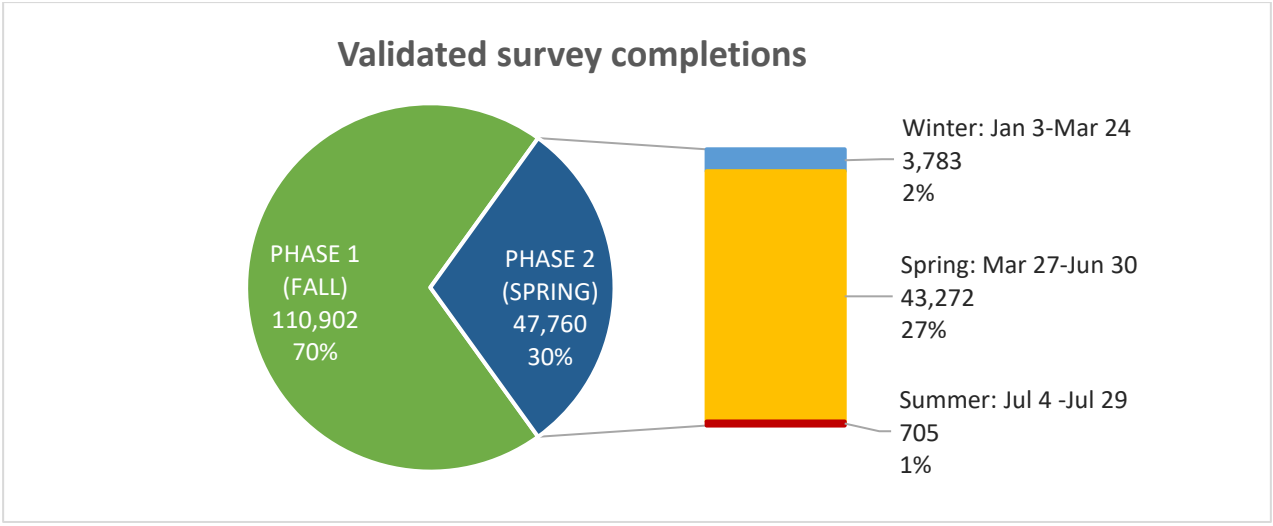


**Table 1: Survey dataset by phase**

| | Households surveyed | | Household members | | Persons 5+ years of age for whom trips were captured | |
|---|---|---|---|---|---|---|
| **Total Surveys** | **158,662** | **100.0%** | **366,172** | **100.0%** | **354,452** | **100.0%** |
| **Fall** September 13- December 19 | **110,902** | **69.9%** | **255,702** | **69.8%** | **247,171** | **69.7%** |
| **Spring** | **47,760** | **30.1%** | **110,470** | **30.2%** | **107,281** | **30.3%** |
| January 3-March 24 | 3,783 | 2.4% | 8,934 | 2.4% | 8,568 | 2.4% |
| March 27-June 30 | 43,272 | 27.3% | 100,049 | 27.3% | 97,271 | 27.4% |
| July 4 -July 29 | 705 | 0.4% | 1,487 | 0.4% | 1,442 | 0.4% |

## 1.3. Factors that May Contribute to Differences between Fall and Spring Survey Results

### 1.3.1. Similarities between Fall and Spring Seasons

Before exploring the possible factors that could contribute to differences in results, it is important to state that fall and spring were chosen as data collection periods for their similarities and stability in terms of human activity patterns. During both periods, K-12 school is in session. Post-secondary school is in session for the entire Fall phase and a portion of the Spring phase (although it ends part-way through the Spring phase). Both periods largely avoid weather extremes and extremes in hours of daylight associated with Winter and Summer. Both periods are shoulder or off-peak seasons for vacations, i.e., they avoid the Christmas / December holiday break and peak periods for leisure travel. Thus, work and school patterns will be routine for many workers and almost all students.

Fall is usually chosen for household travel surveys as a period of general stability in terms of human activities and travel behaviours, while weather patterns are still favourable for travel by all modes. The collection of data that reflect typical or average travel patterns allows for reliable analysis to inform decision making for transportation policy, plans and investments. The spring is very similar to the fall in many respects, making it the most reasonable alternative time of year during which to conduct household travel surveys.

It can be noted that traffic cordon and screenline counts, another important data source for transportation planning, typically have been conducted in the spring and summer (less so in the fall), when labour has been available. The warm-weather months are usually the time of year when peak passenger vehicle volumes can be observed at these locations (excepting, of course, unique days or periods for special events or around Christmas / December holidays). The emergence of electronic visual counting technologies allows year-round counts which, with GPS trip traces, allows an improved understanding of seasonal variations.

### 1.3.2. Holidays and School Breaks

Although the Spring sample was collected during a time with a range of weather conditions similar to the Fall sample, the analysis and comparison of the two phases have certain caveats due to

seasonal differences. For example, the Spring survey phase was characterized by longer periods of "non-typical" travel periods, including for example the 4-day Easter break (April 7-10, 2023) as well as the school mid-winter break that occurred from March 13-March 17, 2023, and the Victoria Day holiday observed on May 23, 2023. In addition, a modest number of surveys were allowed in July, after the beginning of the K-12 summer break. In comparison, for the Fall survey period, holiday periods were confined to the Thanksgiving holiday (Monday, October 10, 2022). It may be noted that some workers and/or students may have observed (or had atypical travel days on) non-statutory holidays during the Fall phase, including the one-time National Day of Mourning (Monday, September 19, 2022), the National Day for Truth and Reconciliation (September 30, 2022) and the municipal elections (October 24, 2022), which were all treated as normal travel days, and/or Remembrance Day (November 11, 2022), for which travel data were not collected. It may also be noted that a small number of surveys was completed for travel on Monday, December 19, 2022, which was the first day of the school board-designated holidays. Even though respondents were not asked to provide travel data for statutory holidays and Remembrance Day, it can be expected that the presence of a greater number of holiday days for the Spring period could influence travel patterns especially as they impact school/work-based travel.

To address these impacts, surveys that were collected for travel days during designated school break periods (both during the school year and July surveys) were reviewed to identify and remove surveys completed with families with school age children who would not have travelled to school when school was not in session.[2]

### 1.3.3. Impact of Daylight and Weather

Differences in observed travel patterns could be affected by hours of daylight (that may affect feelings of safety when travelling and/or social or recreational activity choices) and periods of sunshine (that may affect transportation mode). For example, for the period from mid-September to mid-December, Toronto experiences, on average, 10.8 hours of daylight per day and, on average, 4.5 hours of sunshine per day (i.e. after excluding rain and overcast conditions). In contrast, in the main Spring period (late March through June, representing over 90% of the Spring phase data collected), Toronto experiences, on average, 13.8 hours of daylight per day, and, on average, 7.0 hours of sunshine per day. Differences in weather also could contribute to differences between the Fall and Spring results – notably, the duration of winter driving conditions in the two seasons, which could impact travel choices.

### 1.3.4. Inclusion of a Modest Number of Surveys in Winter and Summer Conditions

The 2022 TTS allowed for the completion of some surveys between January and mid-March. The survey was left open to complete online or via call-in to the survey toll-free number for residents who were late in receiving or acting on survey invitation letters sent in late November. These surveys are included in the Spring dataset. Just over 3,700 valid surveys were completed in this time frame, representing 8% of the Spring dataset or 2% of the total survey dataset across both phases. In addition, the survey was left open in July to allow online survey completion or call-in

[2] A total of 255 such surveys were excluded from the final dataset.

survey completion for residents who were late in acting on survey invitations sent to them in late May or early June. Just over 700 valid surveys were completed in July, representing 1.5% of the Spring dataset or 0.4% of the total survey dataset across both phases. It is possible that surveys conducted outside spring conditions that were included in the Spring dataset may be more likely to capture atypical travel. However, given that they only represent 9% of Spring surveys and less than 3% of all surveys, their influence on the overall survey results is relatively minimal. Furthermore, as noted above, surveys completed during school breaks during these periods were reviewed to identify and remove surveys with school-age children. Additionally, the July surveys with non-child households were reviewed to identify and remove surveys that suggested atypical activity due to summer vacations.[3]

### 1.3.5. Other Seasonal Differences in Human Activity Patterns

Beyond the holidays and weather, there may be other seasonal differences in human activity patterns that could affect travel behaviours, especially for post-secondary students. The mid-spring (end of April) end of the post-secondary school term has already been noted. Also of note, the survey may have collected surveys from post-secondary students who had transitioned to temporary summer or co-op work. If they were not reported as students, this would have reduced the incidence of post-secondary students in the latter part of the Spring dataset. However, some of these individuals may still have identified themselves as a student, but would not have reported school trips, potentially affecting post-secondary student trip rates in the dataset across the entire study period.

It may also be noted that during the validation of the weighted survey data, it was observed that there were quite a few post-secondary students reported as attending schools outside the TTS study area. It is unclear as to whether some of these may have fit the situation just described or had virtual programs or were studying remotely (e.g., post-graduate student working on a thesis).

Finally, for the population as a whole, other there may be other season-related human activity patterns such as seasonal colds and flus and/or other patterns not considered here that could also contribute to differences between the Fall and Spring phases.

### 1.3.6. Evolving Effects of the COVID-19 Pandemic on Human Behaviour

Although the COVID-19 disruptions had largely receded by Fall 2022, evolving commuting and other travel patterns may impact comparability across phases. Specifically, a ‘new normal’ in human activity was deemed to be sufficiently well established to enable the start of the Fall phase, culminating in the World Health Organization’s declaration of the end of the pandemic emergency in early May 2023, during the Spring phase of the TTS. Even so, there may have been some shifts in work-from-home and hybrid work arrangements (and potentially further increase in work

[3] While it is normal for a percentage of the population to report one or more household members being away on vacation during usual survey conditions, or travelling to or returning from vacation on their travel day, the concern was that the incidence would be higher in late spring or early summer. After a review of the incidence of people reporting being on vacation in different survey months the decision was to not to remove any such surveys completed in June, but to remove such surveys completed in July, the removal of which then balances the higher incidence of residents on vacation in June.

commute trips) as employer workplace policies evolved. There may also have been shifts in other human activity patterns (time spent in communal or social scenarios and/or recreational activities) during the period over which the survey was conducted.

### 1.3.7. Differences in Geographical Distribution

Differences in sample composition in terms of the geographical distribution, household and demographic characteristics between the two phases should be considered. The differences relate to the approach to recruitment across the two phases. In the fall, mailouts were distributed across the survey area according to the sampling plan. During the spring, mailouts were generally targeted to low response rate geographies.

Similarly, because the low responses may be attributed to hard-to-reach groups like larger or non-English speaking households in these geographies, the household and demographic characteristics of those lower-response rate geographies targeted more heavily in the spring may lack comparability to those households surveyed in the fall. It should be noted that differences in the survey results between Spring and Fall phases that may related to differences in the geographical distribution of the survey data would cancel out when the complete dataset is combined across both phases. The complete dataset across both phases provides a better geographic representation of the study area than either phase taken alone. Accordingly, as noted, we do not recommend using these results to publicly report on actual fall or spring travel patterns without caveating the fact that the two samples may each have different biases when examined separately, particularly in terms of geographic distributions, or without reweighting the data to create independent datasets.

### 1.3.8. Differences in the Day of Week Surveyed

The TTS is a 24-hour recall travel survey that asks respondents to reply to the survey with respect to the most recent weekday (other than statutory holidays and other common non-typical weekdays). The survey does not pre-assign the day on which to complete the survey. Outbound dialling was only conducted between Tuesday and Saturday, although call-ins to complete the survey by phone were allowed on Sundays and Mondays. Given that survey respondents may complete the survey on any day of the week, respondents completing the survey on a Saturday, Sunday, or Monday would normally complete the survey with respect to travel on a Friday. To mitigate the effect of this and to reduce the chance of an over-representation of Fridays, a portion of surveys completed on Saturdays and Sundays was randomly assigned to complete the survey about their travel on the preceding Thursday. In addition, outbound dialling was reduced on Saturdays.

With the increase of cellphone-only households and with reduced availability of address-and-phone samples, online surveys represent a higher proportion of total surveys than in past cycles with the option to complete online. The travel day about which online surveys are completed largely depends on when letters are delivered, when respondents check their mailboxes (which is not always on the day of delivery, particularly for those living in apartment buildings or with community mailboxes), on when it is convenient for the survey respondent, and whether the previous weekday is a statutory or other system-wide atypical day designated as a non-survey day. It is not possible to precisely control the day of delivery for the survey invitation letters, which may

impact the balance of surveys by day of week, even with the measures to promote balance noted above. Certain statutory holidays always take place on a Monday or can take place on a Monday if the holiday lands on a weekend day, thus Mondays will naturally be undersampled in weeks with a statutory holiday.

It may be noted that Mondays and Fridays typically have lower daily trip volumes, particularly for work trips. If the balance by weekday is different in the Fall and Spring samples, it could also affect the observed trip rates in each sample. Trip rates by day are examined later in this report.

## 1.4. Survey Confidence Limits

It should be remembered that the TTS is a survey and is subject to standard sample errors common to all surveys. In this context, household-level survey results for the Fall survey had an estimated maximum sample error of ±0.41% (19 times out of 20) and the Spring survey had a maximum sample error of ±0.63% (19 times out of 20). The person-level survey results and the trip-level results associated with travel by those persons for the Fall survey had an estimated maximum sample error of ±0.27% (19 times out of 20) and the Spring survey had a maximum sample error of ±0.41% (19 times out of 20).[4]

In this context, as a general rule of thumb, differences of greater than 1.04% in the household-level results and greater than 0.68% in the person- and trip-level results are outside the bounds of the maximum margin of error for the two samples and can be considered with some confidence to be true differences between the two samples. Conversely, differences of less than 1.04% in the household-level results and 0.68% in the person- and trip-level results are within the bounds of the maximum sample errors of both surveys, but further statistical testing would be required to rule in or rule out the hypothesis that there is no difference between the two surveyed populations.[5]

[4] Theoretical sampling error at a 95% confidence level, taking into account the effects of data weighting in the final survey data file, but not taking into account that within the final survey data file there may be biases in the Spring and Fall phases that could further affect the confidence in the survey results.

[5] The reason for that further statistical testing would be required is that the maximum margins of error quoted above are maximum sampling errors for response percentages of 50%, assuming normal distributions, and can be used as a general rule of thumb to identify that results are statistically different. However, when two results lie within the confidence interval defined by the maximum margin of error, it is harder to say definitively that the reverse hypothesis (that there is not difference) is true. This is due to the fact that for higher or lower response percentages, the actual margin of sampling error can be lower than the maximum cited for the survey as a whole, which would warrant further statistical testing for the data for the specific question.

# 2. BIVARIATE ANALYSIS OF FALL AND SPRING DATA

This section of the report presents a descriptive analysis of the Fall and Spring survey data that highlights differences in the survey results for the two samples. This analysis was undertaken with weighted data.

## 2.1. Household Characteristics and Demographics Comparison

Table 2 presents some key household characteristics for the two survey phases, while Table 3 presents household distributions for selected characteristics. For most characteristics, the differences are minor:

- Overall, households in the Spring sample were slightly larger (1.9%) than those in the Fall sample. The average household size in the spring was 2.63 persons per household compared to 2.59 persons per household in the fall.
- Households had 3.2% more adults in the spring, with an average of 2.15 adults in the spring compared to an average of 2.09 adults per household in the fall.
- Households in the spring had 3.8% fewer children compared to the fall (0.48 children per household in Spring versus 0.50 children per household in fall).
- Surveys completed in the spring were proportionately less likely to be with households living in apartments (36.4% in fall, 32.8% in spring), more likely to have three or more adults without children (15.2% in fall, 18.0% in spring), and just slightly more likely to have higher incomes or refuse to answer the income question.
- The incidence of households with immigrants was generally equivalent between the two samples.

However, although this analysis confirms that there are minor differences in household characteristics when comparing the Fall and Spring samples, it may be noted that household size, dwelling type, and age were controlled for in the survey data weighting. Therefore, differences between these phases with respect to these characteristics are primarily due to differences in the geographic spread of survey completions or possibly due to varying levels of non-response bias in the two phases for residents in different categories within these variables.

It can be observed that some characteristics have stronger differences between the phases, notably the proportions of workers who work exclusively from home (11.6% lower in the spring), adult students in the household (8.8% higher in the spring) and daily trips per person (4.1% higher in the spring). It is possible that these characteristics could be seasonally affected. However, one cannot conclude this definitively without more complex analysis than simply comparing the statistics for each phase. These characteristic differences in sample composition could be just as likely to be a product of the different geographic distributions in the two samples and/or possibly different response rates for different types of household depending on the type of sample used and communications materials. In other words, differences in characteristics such as this are not necessarily a result of seasonality. They may simply be illustrating differences in the composition of the households in each sample.

One of the possible reasons for the slight changes in household demographics could be explained by the survey administration approach. Whereas in the Fall survey, there was only limited targeting of completions on the basis of region, in the Spring survey, concerted efforts were made to obtain survey completions from regions that were under-represented in the Fall survey. In addition, in areas with low response rates, the Spring survey may have relied more on address-only sample due to limitations in available address-and-phone sample.

Of note, the average number of workers per household is equivalent in both samples. The average number of workers who work exclusively from home is lower in the spring (0.22 in the fall vs. 0.19 in the spring). However, it cannot necessarily be assumed that this is due to an increased return to working at usual workplaces, as it could equally be the result of differences in the geographic distributions of the sample (and the varying proportions of workers who work from home in each geography). This is explored in more detail later in this section.

Interpretation of the differences observed between the Fall and Spring sample should also consider the balance between the two survey samples in the total survey dataset. The Spring sample is only 30% of the total weight of the data. Therefore, the impact of the differences on the averages is muted (as illustrated in the right-most column of Table 2). For example, while the Spring survey saw 0.03 more daily trips reported per person, the total survey average across both phases sees only a 0.01 difference from the Fall sample. Note also that Phase 1 and Phase 2 were combined for data weighting, so together better represent the sample universe (all residents of the TTS area).

**Table 2: Selected household and demographic characteristics by survey phase**

| Characteristic | Full sample (combined Phases 1 & 2) | Phase 1 (70% of full sample) | Phase 2 (30% of full sample) | Difference (Phase 2- Phase 1) | % Difference (Phase 2 relative to Phase 1) * | Difference between Full Sample and Phase 1 |
|---|---|---|---|---|---|---|
| Avg. household size | 2.60 | 2.59 | 2.63 | 0.05 | 1.9% | 0.01 |
| Avg. vehicles per household | 1.51 | 1.49 | 1.55 | 0.06 | 3.8% | 0.02 |
| Median age of household members | 39.6 | 39.1 | 41.1 | 2.0 | 5.1% | 0.5 |
| Avg. adults per household | 2.10 | 2.08 | 2.15 | 0.07 | 3.2% | 0.02 |
| Avg. children per household | 0.50 | 0.50 | 0.48 | -0.02 | -3.8% | 0.00 |
| Avg. children who are students | 0.37 | 0.37 | 0.36 | -0.01 | -1.9% | 0.00 |
| Avg. adult students per household | 0.19 | 0.19 | 0.21 | 0.02 | 8.8% | 0.00 |
| Avg. licensed drivers per household | 1.85 | 1.83 | 1.89 | 0.05 | 2.8% | 0.02 |
| Avg. persons with transit pass per hh. | 0.21 | 0.21 | 0.21 | 0.00 | -0.9% | 0.00 |
| Avg. workers per household | 1.38 | 1.37 | 1.38 | 0.01 | 0.8% | 0.01 |
| Avg. full-time workers per household | 1.14 | 1.14 | 1.13 | 0.00 | -0.4% | 0.00 |
| Avg. workers who work exclusively from home per household | 0.21 | 0.22 | 0.19 | -0.03 | -11.6% | 0.01 |
| Daily trips per household | 5.30 | 5.24 | 5.45 | 0.21 | 4.1% | -0.06 |
| Daily trips per person | 2.14 | 2.13 | 2.16 | 0.03 | 1.6% | 0.01 |

* % difference = difference between Phase 1 and Phase 2 values divided by Phase 1 value.
Note: these are not percentage-point (%-pt) differences. E.g., 11.6% fewer persons who work from home is a 2.0%-pt difference between 16.0% and 14.0% of all workers working from home in fall vs spring.

Shading is used to highlight high and low differences. Blue shading highlights higher values, pink shading highlights lower values. The intensity of the shading increases as it approaches the highest or lowest values.

### Table 3: Selected household characteristics by survey phase

| Characteristic | Phase 1 Fall | Phase 2 Spring | %-pt difference |
|---|---|---|---|
| **Dwelling type** | | | |
| House | 53.9% | 57.4% | 3.5% |
| Apartment | 36.4% | 32.8% | -3.6% |
| Townhouse | 9.7% | 9.8% | 0.1% |
| **Household size** | | | |
| 1 person | 25.4% | 25.0% | -0.4% |
| 2 people | 31.3% | 29.9% | -1.4% |
| 3 people | 16.8% | 17.2% | 0.4% |
| 4 people | 16.5% | 17.0% | 0.4% |
| 5 people | 7.0% | 7.8% | 0.8% |
| 6 people | 2.1% | 2.2% | 0.1% |
| 7 or more people | 0.8% | 0.9% | 0.1% |
| **Household structure** | | | |
| Single person | 25.4% | 25.0% | -0.4% |
| Two adults, no children | 30.1% | 28.9% | -1.2% |
| Three or more adults, no children | 15.2% | 18.0% | 2.7% |
| Single parent, one or more children 0-17 yrs | 2.0% | 1.8% | -0.2% |
| Two adults, one or more children 0-17 yrs | 19.6% | 18.1% | -1.6% |
| Three or more adults, one or more children 0-17 yrs | 7.6% | 8.2% | 0.6% |
| **Household members born in/outside of Canada** | | | |
| Yes, entire household born in Canada | 52.1% | 51.8% | -0.3% |
| No, at least one household member born outside Canada | 45.3% | 45.1% | -0.2% |
| Decline / don't know | 2.6% | 3.1% | 0.5% |
| **Household income** | | | |
| $0 to $14,999 | 2.6% | 2.3% | -0.2% |
| $15,000 to $39,999 | 9.4% | 9.1% | -0.3% |
| $40,000 to $59,999 | 9.8% | 9.0% | -0.8% |
| $60,000 to $79,999 | 9.9% | 9.8% | -0.1% |
| $80,000 to $99,999 | 10.1% | 9.7% | -0.4% |
| $100,000 to $124,999 | 11.4% | 11.1% | -0.3% |
| $125,000 to $149,999 | 8.0% | 7.7% | -0.3% |
| $150,000 to $199,999 | 10.1% | 10.5% | 0.4% |
| $200,000 and above | 12.2% | 12.4% | 0.2% |
| Decline / don’t know | 16.8% | 18.6% | 1.8% |

Shading is used to highlight high (blue shading) and low values (pink).

Table 4 explores whether there are differences between Phase 1 (Fall) and Phase 2 (Spring) for key household characteristics for each planning district in the study area. As with most other survey results explored in this report, the indicators examined are based on weighted data. Larger differences between Fall and Spring samples are highlighted with shading.

As shown, for planning districts with more robust sample sizes, the results are generally similar between phases in terms of average household size, the proportion of dwellings surveyed that are apartments, and the proportion of households with children. However, variance between Fall and Spring samples is more likely for planning districts that have smaller samples in one or both of the phases. As might be expected with a randomly drawn sample, variance between the two phases is larger for smaller sample sizes.

Within certain planning districts with larger samples but which still have notable differences in characteristics between phases, the apparent differences could be due to one of three reasons:

- The balance of survey completions by sampling zone within the planning district may be different in the two phases, resulting in a difference in the characteristics averaged across the planning district.
- The address-sample may have had a different composition in the Spring phase than in the Fall phase. This could have occurred in instances where the Fall address sample drew all of the available listings with a known telephone number, leaving none for inclusion in the Spring sample.
- Response rates for various kinds of households may have been different in the two phases, although this possibility is difficult to test for, as the household characteristics are not known prior to surveying. Also, no reason comes to mind as to why distinct types of households might respond that differently in the two phases, beyond random variance. The changes to the messaging and design of the Spring survey invitations do not seem to be such that one would expect distinct types of households to respond differently.

The one characteristic examined that has the appearance of having more consistent differences between Fall and Spring samples is the proportion of workers reported as working from home. This proportion is more often slightly lower in the Spring phase than it is higher, with 68% of planning districts showing a drop, albeit the drop is small in most planning districts. This suggests a possible slight drop in work from home between fall and spring, although a deeper analysis controlling for other differences in the sample would be required to conclude this more definitively (and is beyond the scope of the current analysis).

Generally speaking, within many of the study area geographies, the two samples appear to have fairly similar characteristics, although there may be differences due to random sampling, differences in the Fall/Spring balance by individual sampling zone, or other reasons such as the availability of certain types of sample in each phase. The close similarity between most large-sample geographies seems to support that hypothesis that differences in the geographic distribution between the two phases may contribute to some of the differences in household characteristics observed for the aggregate survey sample in the earlier tables in this section. As

noted above, the effect of the apparent drop in in the incidence of working exclusively from home in the Spring sample is diminished when the samples for both phases are combined.

**Table 4: Selected household characteristics by planning district by survey phase**

| PD | Name | Sample size (n households) | | Avg. household size | | | % apartments | | | % with any children | | | % of workers who work from home | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase 1 | Phase 2 | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff |
| 1 | PD 1 of Toronto | 6,311 | 2,088 | 1.7 | 1.7 | 0.0 | 95% | 93% | -2% | 9% | 10% | 1% | 19% | 19% | 0% |
| 2 | PD 2 of Toronto | 3,380 | 1,006 | 2.1 | 2.1 | 0.0 | 72% | 67% | -6% | 20% | 21% | 1% | 21% | 19% | -2% |
| 3 | PD 3 of Toronto | 2,591 | 1,578 | 2.4 | 2.4 | 0.0 | 61% | 54% | -6% | 26% | 25% | -1% | 14% | 13% | -2% |
| 4 | PD 4 of Toronto | 4,118 | 1,027 | 2.2 | 2.3 | 0.1 | 68% | 65% | -3% | 23% | 23% | 1% | 18% | 15% | -3% |
| 5 | PD 5 of Toronto | 1,517 | 598 | 2.6 | 2.3 | -0.3 | 63% | 65% | 2% | 28% | 25% | -3% | 18% | 13% | -6% |
| 6 | PD 6 of Toronto | 3,481 | 925 | 2.3 | 2.2 | -0.1 | 55% | 49% | -5% | 27% | 23% | -4% | 19% | 15% | -3% |
| 7 | PD 7 of Toronto | 1,216 | 425 | 2.0 | 2.0 | 0.0 | 71% | 70% | -1% | 19% | 15% | -4% | 18% | 14% | -4% |
| 8 | PD 8 of Toronto | 2,657 | 1,041 | 2.5 | 2.4 | 0.0 | 55% | 48% | -6% | 26% | 24% | -2% | 14% | 16% | 2% |
| 9 | PD 9 of Toronto | 629 | 493 | 3.0 | 2.9 | -0.1 | 56% | 50% | -6% | 36% | 32% | -5% | 10% | 9% | -1% |
| 10 | PD 10 of Toronto | 1,194 | 606 | 2.8 | 2.8 | 0.0 | 56% | 56% | 0% | 32% | 32% | 1% | 10% | 9% | -2% |
| 11 | PD 11 of Toronto | 2,877 | 1,057 | 2.3 | 2.3 | -0.1 | 71% | 69% | -1% | 23% | 18% | -5% | 19% | 18% | -1% |
| 12 | PD 12 of Toronto | 1,046 | 412 | 2.6 | 2.3 | -0.3 | 59% | 63% | 4% | 29% | 22% | -6% | 19% | 16% | -3% |
| 13 | PD 13 of Toronto | 2,084 | 1,420 | 2.7 | 2.7 | -0.1 | 61% | 53% | -7% | 31% | 28% | -4% | 13% | 14% | 0% |
| 14 | PD 14 of Toronto | 755 | 345 | 2.5 | 2.6 | 0.1 | 47% | 48% | 1% | 28% | 29% | 0% | 16% | 15% | -2% |
| 15 | PD 15 of Toronto | 796 | 471 | 2.9 | 2.9 | 0.0 | 31% | 33% | 2% | 31% | 29% | -2% | 17% | 14% | -3% |
| 16 | PD 16 of Toronto | 2,129 | 1,163 | 2.9 | 2.9 | 0.1 | 44% | 43% | -1% | 28% | 26% | -2% | 15% | 15% | 0% |
| 17 | Brock | 112 | 87 | 2.5 | 2.6 | 0.0 | 9% | 10% | 1% | 27% | 25% | -3% | 19% | 13% | -6% |
| 18 | Uxbridge | 249 | 114 | 2.5 | 3.0 | 0.5 | 11% | 12% | 1% | 27% | 30% | 2% | 14% | 8% | -6% |
| 19 | Scugog | 298 | 96 | 2.5 | 2.8 | 0.4 | 7% | 6% | -1% | 23% | 32% | 9% | 12% | 10% | -2% |
| 20 | Pickering | 1,028 | 499 | 2.9 | 2.8 | -0.2 | 12% | 19% | 6% | 33% | 31% | -2% | 15% | 12% | -2% |
| 21 | Ajax | 1,043 | 653 | 3.1 | 3.2 | 0.1 | 14% | 12% | -1% | 41% | 38% | -3% | 19% | 16% | -3% |
| 22 | Whitby | 1,496 | 579 | 2.9 | 2.9 | 0.0 | 13% | 16% | 3% | 39% | 38% | -1% | 17% | 14% | -3% |
| 23 | Oshawa | 1,767 | 1,060 | 2.6 | 2.6 | 0.1 | 28% | 23% | -4% | 30% | 31% | 1% | 13% | 11% | -2% |
| 24 | Clarington | 1,044 | 615 | 2.8 | 2.8 | 0.0 | 10% | 11% | 1% | 38% | 32% | -6% | 11% | 11% | 0% |
| 25 | Georgina | 488 | 297 | 2.6 | 2.6 | 0.0 | 10% | 8% | -1% | 32% | 27% | -4% | 14% | 11% | -3% |
| 26 | East Gwillimbury | 340 | 152 | 3.0 | 2.8 | -0.2 | 6% | 4% | -2% | 38% | 31% | -7% | 15% | 17% | 2% |
| 27 | Newmarket | 904 | 407 | 2.8 | 2.9 | 0.1 | 19% | 19% | 1% | 35% | 34% | -1% | 18% | 12% | -6% |
| 28 | Aurora | 733 | 208 | 2.8 | 3.0 | 0.2 | 16% | 15% | 0% | 37% | 28% | -9% | 19% | 13% | -6% |
| 29 | Richmond Hill | 2,257 | 808 | 2.8 | 2.9 | 0.0 | 25% | 22% | -2% | 34% | 32% | -2% | 18% | 17% | -1% |
| 30 | Whitchurch-Stouffville | 550 | 193 | 3.0 | 2.7 | -0.2 | 9% | 12% | 3% | 40% | 24% | -17% | 13% | 13% | 0% |
| 31 | Markham | 3,869 | 1,259 | 3.0 | 2.9 | 0.0 | 24% | 18% | -6% | 37% | 31% | -6% | 19% | 17% | -1% |
| 32 | King | 275 | 108 | 3.0 | 3.0 | 0.1 | 6% | 9% | 3% | 34% | 37% | 3% | 18% | 7% | -10% |
| 33 | Vaughan | 2,965 | 1,575 | 3.0 | 3.1 | 0.1 | 20% | 16% | -4% | 37% | 36% | -1% | 16% | 13% | -3% |
| 34 | Caledon | 707 | 372 | 3.1 | 3.2 | 0.1 | 4% | 4% | 0% | 38% | 41% | 2% | 14% | 9% | -4% |
| 35 | Brampton | 4,155 | 2,771 | 3.5 | 3.3 | -0.1 | 15% | 18% | 2% | 45% | 41% | -4% | 14% | 14% | 0% |
| 36 | Mississauga | 7,393 | 3,682 | 2.9 | 2.8 | 0.0 | 38% | 35% | -3% | 33% | 30% | -3% | 17% | 16% | -1% |
| 37 | Halton Hills | 666 | 279 | 2.8 | 3.0 | 0.2 | 12% | 12% | -1% | 36% | 35% | 0% | 13% | 13% | 0% |

| PD | Name | Sample size (n households) | | Avg. household size | | | % apartments | | | % with any children | | | % of workers who work from home | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase 1 | Phase 2 | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff |
| 38 | Milton | 1,152 | 577 | 3.2 | 3.3 | 0.1 | 10% | 12% | 1% | 51% | 48% | -3% | 19% | 16% | -3% |
| 39 | Oakville | 2,574 | 728 | 2.9 | 2.8 | -0.1 | 20% | 19% | 0% | 39% | 29% | -10% | 21% | 19% | -2% |
| 40 | Burlington | 2,542 | 754 | 2.5 | 2.5 | 0.0 | 27% | 24% | -3% | 30% | 26% | -4% | 17% | 15% | -3% |
| 41 | Flamborough PD | 567 | 226 | 2.8 | 2.8 | 0.0 | 8% | 2% | -7% | 36% | 33% | -3% | 19% | 19% | 0% |
| 42 | Dundas PD | 383 | 94 | 2.3 | 2.2 | -0.2 | 27% | 30% | 3% | 24% | 16% | -8% | 12% | 13% | 1% |
| 43 | Ancaster PD | 521 | 138 | 2.9 | 3.0 | 0.2 | 3% | 7% | 4% | 34% | 33% | -1% | 14% | 14% | 0% |
| 44 | Glanbrook PD | 356 | 178 | 2.9 | 2.9 | 0.0 | 2% | 3% | 0% | 43% | 40% | -3% | 15% | 16% | 1% |
| 45 | Stoney Creek PD | 754 | 424 | 2.7 | 2.8 | 0.2 | 15% | 12% | -2% | 34% | 32% | -2% | 13% | 13% | 0% |
| 46 | Hamilton PD | 3,839 | 2,245 | 2.4 | 2.3 | -0.1 | 38% | 38% | 0% | 26% | 23% | -3% | 13% | 12% | 0% |
| 51 | Grimsby | 400 | 108 | 2.5 | 2.3 | -0.3 | 11% | 7% | -4% | 31% | 13% | -17% | 9% | 11% | 2% |
| 52 | Lincoln | 344 | 96 | 2.6 | 2.6 | 0.0 | 8% | 9% | 1% | 28% | 27% | -1% | 16% | 10% | -6% |
| 53 | Pelham | 243 | 64 | 2.6 | 2.5 | -0.1 | 8% | 11% | 3% | 26% | 19% | -7% | 16% | 12% | -4% |
| 54 | Niagara-on-the-Lake | 284 | 59 | 2.4 | 2.0 | -0.3 | 5% | 11% | 6% | 18% | 3% | -16% | 27% | 25% | -1% |
| 55 | St. Catharines | 1,847 | 695 | 2.3 | 2.3 | 0.0 | 30% | 27% | -3% | 23% | 20% | -3% | 12% | 12% | 1% |
| 56 | Thorold | 228 | 150 | 2.5 | 2.6 | 0.1 | 19% | 11% | -8% | 28% | 29% | 1% | 10% | 9% | -2% |
| 57 | Niagara Falls | 1,077 | 489 | 2.4 | 2.4 | 0.0 | 20% | 22% | 2% | 24% | 26% | 2% | 13% | 9% | -4% |
| 58 | Welland | 639 | 327 | 2.3 | 2.4 | 0.1 | 23% | 23% | 0% | 24% | 24% | 0% | 12% | 13% | 1% |
| 59 | Port Colborne | 235 | 119 | 2.2 | 2.3 | 0.1 | 21% | 18% | -3% | 22% | 20% | -1% | 12% | 5% | -7% |
| 60 | Fort Erie | 397 | 186 | 2.3 | 2.3 | 0.0 | 13% | 11% | -2% | 23% | 19% | -4% | 16% | 24% | 8% |
| 61 | West Lincoln | 148 | 62 | 2.8 | 3.1 | 0.3 | 5% | 0% | -5% | 34% | 30% | -4% | 11% | 20% | 8% |
| 62 | Wainfleet | 98 | 29 | 2.5 | 2.9 | 0.5 | 2% | 0% | -2% | 22% | 47% | 26% | 19% | 7% | -12% |
| 63 | Waterloo | 1,692 | 499 | 2.5 | 2.4 | -0.1 | 36% | 32% | -4% | 26% | 22% | -4% | 21% | 15% | -5% |
| 64 | Kitchener | 3,163 | 1,294 | 2.5 | 2.4 | -0.1 | 34% | 34% | -1% | 30% | 27% | -3% | 17% | 14% | -3% |
| 65 | Cambridge | 1,485 | 743 | 2.6 | 2.7 | 0.2 | 25% | 20% | -6% | 30% | 34% | 4% | 15% | 13% | -1% |
| 66 | North Dumfries | 120 | 49 | 2.8 | 2.7 | -0.1 | 2% | 19% | 16% | 37% | 17% | -20% | 12% | 13% | 1% |
| 67 | Wilmot | 269 | 104 | 2.7 | 2.7 | 0.0 | 9% | 8% | -1% | 33% | 29% | -4% | 17% | 14% | -4% |
| 68 | Wellesley | 80 | 80 | 2.9 | 3.4 | 0.5 | 9% | 0% | -8% | 34% | 48% | 14% | 18% | 16% | -2% |
| 69 | Woolwich | 347 | 92 | 2.8 | 2.6 | -0.2 | 9% | 11% | 2% | 35% | 32% | -3% | 14% | 6% | -9% |
| 70 | Guelph City | 2,057 | 629 | 2.5 | 2.5 | 0.0 | 33% | 27% | -6% | 28% | 30% | 3% | 13% | 14% | 1% |
| 71 | Puslinch | 109 | 26 | 2.7 | 2.7 | -0.1 | 0% | 0% | 0% | 26% | 20% | -6% | 14% | 2% | -12% |
| 72 | Guelph/Eramosa | 184 | 37 | 2.8 | 2.8 | 0.0 | 5% | 0% | -5% | 28% | 27% | -1% | 15% | 10% | -4% |
| 73 | Centre Wellington | 451 | 95 | 2.5 | 2.7 | 0.2 | 15% | 18% | 4% | 30% | 24% | -6% | 13% | 10% | -3% |
| 79 | Erin | 147 | 75 | 2.8 | 2.8 | 0.0 | 2% | 8% | 7% | 30% | 26% | -4% | 14% | 8% | -6% |
| 80 | Orangeville | 333 | 169 | 2.6 | 2.8 | 0.2 | 17% | 18% | 2% | 34% | 31% | -3% | 13% | 7% | -7% |
| 81 | Barrie | 1,685 | 915 | 2.6 | 2.6 | 0.1 | 27% | 23% | -4% | 30% | 32% | 2% | 15% | 14% | -2% |
| 82 | Innisfil | 385 | 211 | 2.6 | 2.8 | 0.2 | 5% | 4% | -1% | 32% | 39% | 7% | 14% | 17% | 2% |
| 83 | Bradford-West Gwillimbury | 387 | 163 | 3.1 | 2.9 | -0.2 | 14% | 9% | -5% | 41% | 38% | -3% | 13% | 8% | -5% |
| 84 | New Tecumseth | 460 | 179 | 2.7 | 2.7 | 0.0 | 14% | 8% | -6% | 35% | 33% | -1% | 11% | 8% | -3% |
| 85 | Adjala-Tosorontio | 122 | 46 | 2.8 | 2.9 | 0.1 | 3% | 0% | -3% | 31% | 33% | 3% | 17% | 10% | -8% |
| 86 | Essa/CFB Borden | 199 | 130 | 2.9 | 2.8 | -0.1 | 4% | 7% | 3% | 38% | 31% | -7% | 12% | 8% | -4% |
| 87 | Clearview | 152 | 79 | 2.7 | 2.5 | -0.2 | 4% | 6% | 2% | 30% | 27% | -3% | 10% | 11% | 2% |
| 88 | Springwater | 228 | 77 | 2.8 | 3.1 | 0.3 | 5% | 6% | 1% | 36% | 36% | 0% | 19% | 14% | -5% |

| PD | Name | Sample size (n households) | | Avg. household size | | | % apartments | | | % with any children | | | % of workers who work from home | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase 1 | Phase 2 | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff |
| 89 | Kawartha Lakes | 844 | 49 | 2.3 | 2.4 | 0.0 | 12% | 4% | -7% | 20% | 17% | -3% | 11% | 12% | 0% |
| 103 | Peterborough City | 1,088 | 567 | 2.3 | 2.2 | -0.1 | 30% | 36% | 6% | 26% | 18% | -8% | 12% | 12% | 1% |
| 104 | Cavan Monaghan | 143 | 26 | 2.7 | 3.0 | 0.3 | 1% | 17% | 15% | 32% | 17% | -15% | 9% | 2% | -6% |
| 106 | Otonabee-South Monaghan | 107 | 31 | 2.4 | 2.8 | 0.4 | 4% | 0% | -4% | 19% | 29% | 11% | 13% | 17% | 4% |
| 108 | Asphodel-Norwood | 36 | 29 | 2.3 | 2.8 | 0.5 | 7% | 0% | -7% | 11% | 40% | 29% | 20% | 24% | 4% |
| 109 | Douro-Dummer | 118 | 23 | 2.8 | 1.8 | -1.0 | 0% | 0% | 0% | 27% | 14% | -13% | 12% | 18% | 6% |
| 111 | Selwyn | 207 | 118 | 2.3 | 2.7 | 0.4 | 4% | 2% | -2% | 19% | 31% | 13% | 12% | 14% | 3% |
| 124 | Brant County | 443 | 168 | 2.6 | 2.9 | 0.4 | 7% | 4% | -3% | 26% | 33% | 7% | 14% | 15% | 1% |
| 127 | Collingwood | 379 | 97 | 2.1 | 2.5 | 0.4 | 25% | 23% | -1% | 18% | 22% | 3% | 21% | 29% | 8% |
| 128 | Wasaga Beach | 324 | 137 | 2.2 | 2.3 | 0.1 | 8% | 2% | -6% | 19% | 18% | -1% | 15% | 17% | 2% |
| 129 | Tiny & Christian Island | 172 | 64 | 2.4 | 2.2 | -0.2 | 1% | 5% | 4% | 22% | 9% | -13% | 14% | 11% | -3% |
| 130 | Penetanguishene | 128 | 50 | 2.3 | 2.2 | 0.0 | 27% | 18% | -9% | 19% | 13% | -6% | 13% | 7% | -7% |
| 131 | Midland | 257 | 85 | 2.2 | 2.1 | -0.1 | 25% | 23% | -2% | 23% | 16% | -7% | 16% | 18% | 2% |
| 132 | Tay | 107 | 69 | 2.4 | 2.3 | -0.1 | 7% | 0% | -7% | 25% | 13% | -11% | 6% | 16% | 10% |
| 133 | Oro-Medonte | 338 | 56 | 2.6 | 2.7 | 0.1 | 3% | 0% | -3% | 25% | 39% | 14% | 17% | 12% | -5% |
| 134 | Severn | 150 | 76 | 2.4 | 2.6 | 0.2 | 5% | 5% | 0% | 21% | 30% | 9% | 14% | 21% | 7% |
| 135 | Ramara & Chippewas of Rama First Nation | 111 | 98 | 2.3 | 2.4 | 0.0 | 2% | 0% | -2% | 12% | 26% | 14% | 15% | 24% | 8% |
| 136 | Orillia | 406 | 191 | 2.1 | 2.4 | 0.2 | 30% | 35% | 4% | 20% | 27% | 8% | 15% | 6% | -9% |
| 140 | Mulmur | 67 | 30 | 2.4 | 2.7 | 0.3 | 0% | 0% | 0% | 25% | 16% | -10% | 23% | 17% | -5% |
| 141 | Shelburne | 59 | 57 | 2.6 | 3.2 | 0.6 | 19% | 10% | -9% | 31% | 45% | 14% | 6% | 4% | -2% |
| 142 | Amaranth | 42 | 13 | 3.1 | 2.7 | -0.4 | 0% | 0% | 0% | 51% | 19% | -33% | 36% | 5% | -31% |
| 143 | Melancthon | 30 | 12 | 3.2 | 2.7 | -0.4 | 0% | 0% | 0% | 40% | 45% | 5% | 26% | 2% | -24% |
| 144 | Mono | 104 | 32 | 3.0 | 2.7 | -0.4 | 0% | 0% | 0% | 34% | 38% | 4% | 19% | 18% | -1% |
| 145 | Grand Valley | 35 | 26 | 2.9 | 2.5 | -0.5 | 15% | 0% | -15% | 47% | 21% | -26% | 21% | 18% | -3% |
| 146 | East Garafraxa | 38 | 15 | 3.1 | 2.3 | -0.8 | 0% | 0% | 0% | 31% | 0% | -31% | 32% | 53% | 21% |
| 147 | Brantford | 1,165 | 635 | 2.4 | 2.5 | 0.0 | 25% | 25% | 1% | 29% | 26% | -2% | 9% | 9% | 0% |
| 148 | Brighton | 171 | 38 | 2.3 | 2.2 | -0.1 | 7% | 3% | -4% | 22% | 0% | -22% | 7% | 35% | 29% |
| 149 | Cramahe | 70 | 30 | 2.3 | 2.7 | 0.4 | 6% | 9% | 3% | 14% | 18% | 4% | 16% | 2% | -14% |
| 150 | Hamilton Township | 134 | 55 | 2.6 | 2.4 | -0.2 | 0% | 0% | 0% | 25% | 23% | -2% | 11% | 10% | -1% |
| 151 | Port Hope | 209 | 107 | 2.3 | 2.2 | -0.1 | 17% | 19% | 2% | 19% | 16% | -3% | 14% | 23% | 9% |
| 152 | Cobourg | 262 | 135 | 2.0 | 2.4 | 0.4 | 27% | 23% | -4% | 15% | 30% | 15% | 10% | 5% | -5% |
| 153 | Alnwick/Haldimand | 105 | 43 | 2.6 | 2.6 | -0.1 | 2% | 0% | -2% | 25% | 24% | 0% | 20% | 7% | -13% |
| 154 | Alderville First Nation | 5 | 0 | 1.3 | | -1.3 | 10% | n/a | n/a | 0% | n/a | n/a | 0% | n/a | n/a |
| 155 | Trent Hills | 139 | 98 | 2.3 | 2.4 | 0.1 | 7% | 9% | 2% | 18% | 17% | -1% | 24% | 22% | -2% |
| 156 | The Blue Mountains | 124 | 34 | 2.2 | 2.0 | -0.2 | 10% | 0% | -10% | 14% | 14% | 0% | 29% | 27% | -2% |
| 157 | West Grey | 130 | 87 | 2.6 | 2.1 | -0.5 | 4% | 11% | 7% | 28% | 14% | -14% | 17% | 6% | -12% |
| 158 | Southgate | 37 | 67 | 2.5 | 2.9 | 0.5 | 0% | 6% | 6% | 18% | 32% | 14% | 43% | 5% | -38% |
| 159 | Grey Highlands | 125 | 22 | 2.5 | 2.4 | -0.1 | 0% | 24% | 24% | 20% | 16% | -4% | 29% | 10% | -19% |
| 160 | Hanover | 95 | 44 | 2.3 | 1.8 | -0.6 | 25% | 25% | 0% | 27% | 10% | -17% | 5% | 8% | 3% |
| 161 | Chatsworth | 65 | 58 | 2.5 | 2.3 | -0.3 | 5% | 0% | -5% | 34% | 23% | -11% | 16% | 16% | 0% |

| PD | Name | Sample size (n households) | | Avg. household size | | | % apartments | | | % with any children | | | % of workers who work from home | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase 1 | Phase 2 | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff | Phase 1 | Phase 2 | Diff |
| 162 | Meaford | 157 | 56 | 2.2 | 2.3 | 0.1 | 12% | 8% | -4% | 15% | 18% | 3% | 23% | 11% | -12% |
| 163 | Georgian Bluffs | 120 | 53 | 2.5 | 2.3 | -0.1 | 3% | 0% | -3% | 28% | 0% | -27% | 16% | 11% | -5% |
| 164 | Owen Sound | 253 | 170 | 2.2 | 1.9 | -0.3 | 41% | 32% | -9% | 25% | 14% | -11% | 7% | 8% | 1% |

Red text indicates sample sizes of fewer than n=200 surveys.

Shading is used to highlight high (blue shading) and low (pink) values in the difference columns.

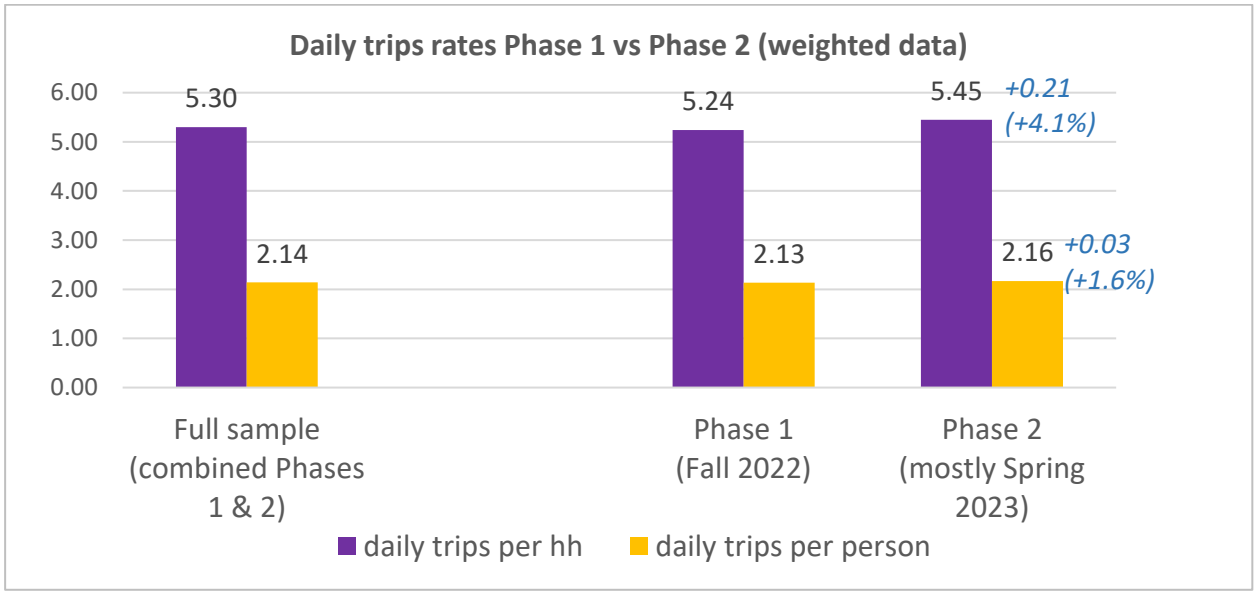
Percentages are rounded to the closest percent. The difference between percentages was computed before rounding, therefor subtraction of the rounded Phase 1 figure from the Phase 2 figure may not always match the rounded difference.

## 2.2. Trip Rate Comparison

### 2.2.1. Overall Trip Rates

There are small differences in the trip rates between the Fall and Spring samples. However, the results for the combined samples are very close to the Fall results, as the Spring sample only represents 30% of the weight of the total results. The daily trip rate per household across both phases was 5.30, and the daily trip rate per person was 2.14. When examining the comparability of the daily trip rate per household across phases, the daily trips per household were 4.1% higher in the spring, at 5.45 daily trips per household, compared to the fall, at 5.24 daily trips per household. The person trip rates were only 1.6% higher in the spring (2.16 daily trips per person) compared to the fall (2.13 trips per person).

**Figure 2: Daily rates – survey total, Fall and Spring phases**



### 2.2.2. Trip Rates by Household Characteristics

Given that the difference in the daily trips per person (+1.6% in Spring) less than the difference in daily trips per household (+4.1%), it would be easy to assume that this may be due to differences in household size between the two samples given that the Spring sample targeted geographies with larger households (see section 1.3.7). There was in fact a small difference in average household size between the two phases, at 2.59 in fall vs. 2.63 in spring, or 1.9% more persons per household (Table 5), with the Spring sample capturing proportionately slightly more households with three or more persons (such households represent 43% of the Fall sample vs. 45% of the Spring sample). However, the survey results did not reveal uniformity in household trip rates by household size between the two survey phases. One-person households had slightly lower trip rates in the spring, and households of between two and six persons had somewhat higher trip rates in the spring (Table 6). In case this result was biased by different proportions of persons eligible for trip capture in the two phases, the analysis was repeated by size of household in terms of the number of persons aged 5+ years (Table 7). This simply confirms the result more precisely: households with one person 5+ years had slightly lower trip rates in the spring, those with three persons 5+ were nearly identical in both phases, and all other households had more daily trips in the spring. It is important to note that this result does not necessarily confirm an issue with bias in trip behaviours in the Spring survey dataset when compared to Fall dataset, simply that the explanation likely lies elsewhere than household size (whether the effect is due to seasonality or due to other factors). Later sections of this report explore this further. Section 2.5 explores differences in the Fall and Spring samples in terms of the geographic distribution of surveys collected, Section 2.6 explores differences by day of week, and the multivariate analysis in Section 3 identifies statistically significant factors associated with differences in trip-making behaviour while controlling for a range of factors.

**Table 5: Average household size, Fall and Spring phases**

| | Phase 1 Fall | Phase 2 Spring | Difference | % Difference |
|---|---|---|---|---|
| Average household size | 2.59 | 2.63 | 0.05 | 1.9% |
| Average persons 5+ (trips captured) | 2.46 | 2.52 | 0.06 | 2.4% |

**Table 6: Daily trip rates by household size, Fall and Spring phases**

| Household Size | Phase 1 % of total surveys | Phase 2 % of total surveys | Phase 1 daily trips / household | Phase 2 daily trips / household | Difference | % Difference |
|---|---|---|---|---|---|---|
| 1 | 25.4% | 25.0% | 2.22 | 2.21 | -0.01 | -0.6% |
| 2 | 31.3% | 29.9% | 4.07 | 4.16 | 0.09 | 2.3% |
| 3 | 16.8% | 17.2% | 5.83 | 5.89 | 0.07 | 1.2% |
| 4 | 16.5% | 17.0% | 8.40 | 8.62 | 0.22 | 2.6% |
| 5 | 7.0% | 7.8% | 9.97 | 10.51 | 0.54 | 5.4% |
| 6 | 2.1% | 2.2% | 10.70 | 11.08 | 0.38 | 3.5% |
| 7+ * | 0.8% | 0.9% | 12.64 | 12.49 | -0.16 | -1.2% |
| Total | 100% | 100% | 5.24 | 5.45 | 0.21 | 4.1% |

* Interpret results for households with 7+ persons with caution due to smaller sample sizes.

**Table 7: Daily trip rates by number of persons aged 5+ years, Fall and Spring phases**

| Number of persons 5+ years | Phase 1 % of total surveys | Phase 2 % of total surveys | Phase 1 daily trips / household | Phase 2 daily trips / household | Difference | % Difference |
|---|---|---|---|---|---|---|
| 1 | 25.6% | 25.1% | 2.23 | 2.21 | -0.02 | -0.8% |
| 2 | 36.0% | 34.2% | 4.19 | 4.25 | 0.06 | 1.5% |
| 3 | 16.4% | 16.7% | 6.41 | 6.43 | 0.02 | 0.3% |
| 4 | 14.2% | 15.2% | 8.85 | 9.03 | 0.19 | 2.1% |
| 5 | 5.8% | 6.4% | 10.44 | 10.84 | 0.40 | 3.8% |
| 6 | 1.6% | 1.9% | 11.57 | 12.18 | 0.60 | 5.2% |
| 7+ * | 0.6% | 0.6% | 13.06 | 13.20 | 0.14 | 1.1% |
| Total | | | 5.24 | 5.45 | 0.21 | 4.1% |

* Interpret results for households with 7+ persons 5+ with caution due to smaller sample sizes.

## 2.3. Trip Purpose Comparison

### 2.3.1. Home-Based Trip Purposes

The trip data collected in the TTS were categorized by overall trip purpose, examining both the origin purpose (reason for being at origin, or if the first trip of day, home or other location) and destination purpose. Trips were classified as follows:

- Home-based work (HBW): a trip from home to work or from work to home.
- Home-based school (HBS): a trip from home to school or from school to home.
- Home-based other (HBO): a trip from home to a non-work or school destination (e.g., for shopping, a medical appointment, personal business, dining, recreation, or picking up or dropping off a passenger), or a trip returning home from such a destination.
- Non-home based (NHB): a trip between two locations away from home (i.e., home is neither origin nor destination).

Home-based work and home-based school are considered non-discretionary trips, meaning that that these are usually trips related to fundamental life activities and the individuals who take these trips have limited choice regarding whether to make the trip even if they have flexibility in terms of timing or mode. Home-based other trips are considered discretionary trips, meaning that they are made more out of choice than strict necessity, and that the individual taking the trip has more flexibility as to whether to make the trip, when to make it, where to go, and so on. Most non-home-based trips are discretionary trips, but some may be non-discretionary, such as trips between work-related locations, or continuing to work after dropping off a child at their school.[6]

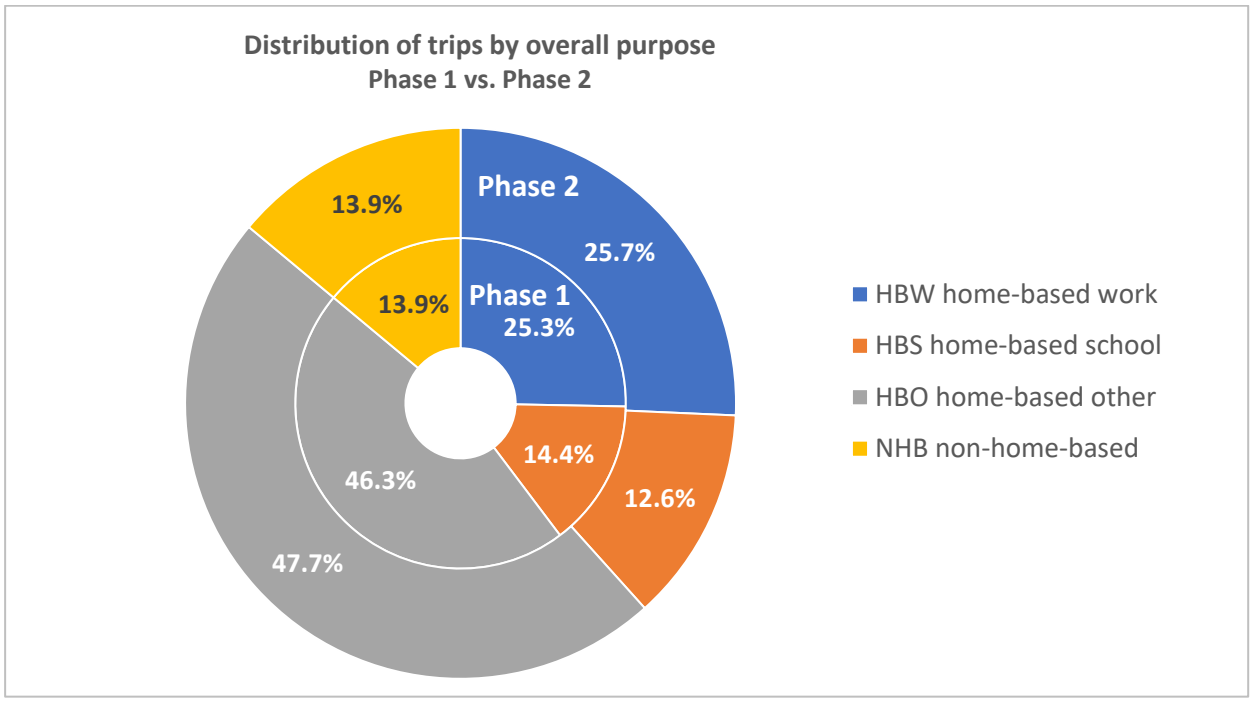
[6] Note that not all non-home-based trips to or from work or school are non-discretionary in nature. They may be discretionary when the trips are part of a sub-tour from the original commute destination, such as leaving work to run

Table 8 and Figure 3 highlight differences between the Fall and Spring samples in terms of trip purpose. While the profiles are very similar, the Spring survey cycle saw slightly higher proportions of home-based work trips (+0.4%-points) and home-based discretionary trips (+1.4%-points) but a lower proportion of home-based school trips (-1.8%-points). The difference in home-based school trips may be contributed to in part by differences in post-secondary school attendance in the Fall and Spring samples. This is explored in detail later in this section of the report.

**Table 8: Overall trip purpose, Fall and Spring phases**

| | Survey Total | Phase 1 Fall | Phase 2 Spring | %-pt Difference (Spring vs. Fall) |
|---|---|---|---|---|
| Total trips | 19,470,500 | 13,650,500 | 5,820,000 | |
| HBW home-based work | 25.4% | 25.3% | 25.7% | +0.4% |
| HBS home-based school | 13.9% | 14.4% | 12.6% | -1.8% |
| HBO home-based other | 46.7% | 46.3% | 47.7% | +1.4% |
| NHB non-home-based | 13.9% | 13.9% | 13.9% | 0.0% |

**Figure 3: Overall trip purpose, Fall and Spring phases**




a personal errand then returning to work after running that errand. For analyses that focus only on the destination purpose, such trips may end up being classified as having non-discretionary purposes, even though they may be part of what may be considered a discretionary subtour.

### 2.3.2. Trip Destination Purposes

Table 9 provides detail on the trip destination purposes in both phases, i.e., looking at only the destination purpose (whereas the preceding discussion examines overall purpose considering both ends of the trip).

Interestingly, trips with work destination purposes[7] are effectively equivalent in the two phases. The larger difference in home-based work trips in Table 8 above could be the product of slightly different commuting patterns in the Spring and Fall samples (e.g., differences in the number of trips with stops along the way) and/or different rates of sub-tours at work (leaving work and coming back again). A closer exploration of the data revealed that the incidence of workers taking at least one work trip was slightly higher in the spring (56%) than fall (54%). Given differences in the demographics and geographies in the two samples, it is difficult to speculate as to the reason for the slight increase in the spring, but the possibility that work arrangements may have continued to evolve between Fall 2022 and Spring 2023 cannot be discounted (e.g., reduction in work-from-home and hybrid work arrangements).

The greatest proportional difference is in school trips, 6.8% in spring vs. 7.8% in fall. Readers are reminded that the families with school age children surveyed after the end of the K-12 school year were removed from the Spring sample, so the inclusion of surveys in July does not explain the lower school trip count. However, one should note that the Spring cycle also extended beyond the end of the post-secondary winter term around the end of April (with adult students representing about one-third of all students in the dataset, though as noted in section 1.3.5, not all would be attending school at this time), which could be a contributing factor. The differences in school trips by K-12 and by post-secondary students are important to examine, and are explored in more detail in the following section.

There were also notable increases in the proportions of trips with social or recreational purposes in the Spring sample (visiting friends and family, +0.3%-points; recreation, sports, leisure, arts, +0.6%-points). Possible reasons for this increase may reflect differences in sample composition (including geography), seasonal behavioural differences (e.g., associated with more favourable weather conditions for outdoor activities and more hours of daylight on average in the Spring sample), and/or an increase in the general population's comfort in engaging in these activities after living with COVID-related restrictions and cautious behaviours.

Interestingly, the proportion of return-home trips is identical in the Fall and Spring samples, suggesting that the surveyed people in both samples averaged the same number of trip tours (trips that leave and return home) in both phases.

[7] Work-related trip destination purposes include: travel to usual workplace, work-related trips to attend meetings, and working on the road/itinerant work.

**Table 9: Detailed destination purpose, Fall and Spring phases**

| | Survey Total | Phase 1 Fall | Phase 2 Spring | %-pt Difference |
|---|---|---|---|---|
| Travel to Work (usual place of work) | 12.0% | 12.0% | 12.1% | 0.1% |
| Work-related trips to attend meetings, etc. | 2.6% | 2.6% | 2.6% | -0.1% |
| Working on the road / itinerant work | 1.0% | 0.9% | 1.0% | 0.0% |
| Attend school | 7.5% | 7.8% | 6.9% | -1.0% |
| Daycare pick-up/drop-off | 1.3% | 1.3% | 1.4% | 0.1% |
| Pick up a package or online purchase | 0.4% | 0.4% | 0.4% | 0.0% |
| Shopping (groceries, mall, gas station, etc.) | 9.5% | 9.5% | 9.5% | 0.0% |
| Services (bank, haircut, mechanic, etc.) | 1.8% | 1.8% | 1.8% | 0.0% |
| Health and personal care | 2.7% | 2.7% | 2.7% | 0.1% |
| Restaurant, bar, or coffee (incl. takeout) | 2.9% | 2.9% | 3.0% | 0.1% |
| Visiting friends, family | 2.6% | 2.5% | 2.7% | 0.3% |
| Recreation, sports, leisure, arts | 4.8% | 4.6% | 5.3% | 0.6% |
| Worship or religious activity | 0.4% | 0.4% | 0.5% | 0.1% |
| Pick up a passenger | 2.8% | 2.9% | 2.7% | -0.2% |
| Drop off a passenger | 3.8% | 3.8% | 3.6% | -0.2% |
| Other, specify | 0.6% | 0.6% | 0.6% | 0.1% |
| Voting in the municipal election | 0.1% | 0.1% | 0.0% | -0.1% |
| Return Home | 43.1% | 43.2% | 43.1% | 0.0% |

Percentages are rounded to the closest 0.1%. Shading is used to highlight high (blue shading) and low (pink) values. The percentage-point differences were computed before rounding of the percentages for display in the table. Therefore the difference between the rounded figures may not always exactly match the percentage-point difference.

### 2.3.3. Exploration of K-12 and Post-Secondary School Trips

To investigate the difference in school trip purposes, the data were explored further by school level. The list of schools was first reviewed to identify which schools were K-12 schools and which ones were post-secondary. Each student was then classified as attending a K-12 school, a home-schooled K-12 student, a full-time post-secondary student or other adult student, or a part-time post-secondary student or other adult student. As some adults may attend adult basic education or high school equivalency at a K-12 school, and as there may have been very occasional school identification issues, age was also used to assist in the categorization of students into these classifications.

The proportion of students identified as attending K12 school is the same in both phases (14.5%), while the proportion of students identified as attending post-secondary education is also the same

(7.2%), with very minor differences (±0.1%-pt) in the proportion who are full-time or part-time (Table 10).[8]

**Table 10: Students identified in the weighted samples**

| | Phase 1 Fall | Phase 2 Spring |
|---|---|---|
| Non-students | 78.3% | 78.3% |
| K-12 student excluding home-schooled | 12.4% | 12.3% |
| K-12 student home schooled | 2.1% | 2.2% |
| Full-time post-secondary student | 5.5% | 5.4% |
| Part-time post-secondary student | 1.7% | 1.8% |

Table 11 shows the proportion of each type of student reporting a trip to school. Sample sizes were robust for all student types in both Spring and Fall surveys. The following observations can be made:

- School attendance for K-12 school was almost identical in the Spring and Fall phases of the survey. Removal of surveys completed with families on days during which school was on break would have helped ensure this equivalency.
- School attendance for full-time post-secondary students was less than half in Spring compared to Fall and for part-time students was about seven-tenths in Spring compared to Fall. This certainly the reason for the difference in the proportion of trips with school purposes observed in the table above.

While differences in the geographic distributions and demographics of the survey samples may also contribute to some of the differences in the samples, given the magnitude of the difference in school attendance for post-secondary students, it is reasonable to conclude that the Spring survey data are biased in terms of the representation of post-secondary students' trips to school. I.e., the Spring sample under-represents travel to post-secondary school, particularly for full-time students. Of note, the Spring and Fall phases had identical proportions of post-secondary/other adult students (7.2% of the weighted sample). It appears that the Spring phase surveyed individuals who identified as post-secondary students, but who may not have currently been attending, as evidenced by the dramatically lower incidence of school trips. The survey has built-in probes to ask

[8] This is consistent with initial testing during the data validation phase that found that, proportionally, there was the same incidence of post-secondary students in the two survey data collection phases, which supported initial positive assumptions about the equivalency of the two samples. During the data validation phase, a review was also undertaken to examine students who did not take school trips to confirm that the reasons they did not take trips appeared to be valid, which confirmed that the reasons given appeared to be valid, which they generally appeared to be, or which were addressed when they did not appear to be. However, the possibility that the respondents would have been reported as post-secondary students when in fact they were not attending classes was not considered at that time.

the reasons students did not report trips and to ask them to add their trips to school if they did in fact attend. During survey validation, review of the answers did not highlight any issues that would suggest trips were under-reported. However, the question responses did not include a category for "school was not in session" which may have actually been the case for a number of household members identified as post-secondary students.

Given that the Spring survey represents only 30% of total survey completions, the impact on the overall sample is less dramatic, but still significant. The incidence of school attendance in the combined sample is 39.9% for full-time post-secondary students, which is lower than the Fall measurement by 7.5%-pts. For part-time post-secondary students, the incidence of travel to school is 12.3% in the full sample, less than the Fall measurement by only 1.2%-pts.

**Table 11: Proportion of students reporting a trip to school, Fall and Spring phases**

| | Sample size (n person records) | | % reporting trip to school | | |
|---|---|---|---|---|---|
| | Phase 1 Fall | Phase 2 Spring | Survey Total | Phase 1 Fall | Phase 2 Spring |
| K-12 student, excluding home-schooled | 26,449 | 10,967 | 88.8% | 88.9% | 88.5% |
| Full-time post-secondary/other adult student | 8,903 | 3,809 | 39.9% | 47.4% | 21.8% |
| Part-time post-secondary/other adult student | 3,406 | 1,453 | 12.3% | 13.5% | 9.4% |

Excludes home-schooled K-12 students (who did not report any trips to school).

Table 12 examines trips to school as a percentage of total daily trips. In the context of the total dataset, trips with a destination of school made by post-secondary students (full- and part-time combined) constituted 1.43% of total trips by all persons 5+ years in the Fall sample (1.31% school trips by full-time post-secondary students + 0.12% by part-time students). In the spring sample, the share of total trips is less, at 0.67% (0.59% by full-time post-secondary students + 0.08% by part-time post-secondary students). When the Spring and Fall samples are combined, 1.20% of trips in the full sample were post-secondary trips, a modest difference from the Fall average, or -0.23 %-pts, which is a small portion of total trips.

Note that the difference in the overall share represented by trips to school made by K-12 students was only slightly different in the combined sample compared to the Fall sample alone, at 6.34% in the full sample compared to 6.41% in the Fall sample, a difference of only -0.07 %-pts.

**Table 12: Breakdown of trips with school destination purpose (% of total daily trips)**

| | Survey Total | Phase 1 Fall | Phase 2 Spring | %-pt Difference | |
|---|---|---|---|---|---|
| | | | | Spring vs. Fall | Survey Total vs. Fall |
| Trip to school by K-12 Student excluding home-schooled | 6.34% | 6.41% | 6.20% | -0.21% | -0.07% |
| Trip to school by full-time post-secondary student | 1.09% | 1.31% | 0.59% | -0.72% | -0.22% |
| Trip to school by part-time post-secondary student | 0.11% | 0.12% | 0.08% | -0.04% | -0.01% |
| **Total trips to school** | **7.54%** | **7.83%** | **6.87%** | **-0.96%** | **-0.29%** |

Excludes home-schooled K-12 students (who did not report any trips to school).

Table 13 details the average daily trip rates for students in the Fall and Spring samples. As shown, full-time post-secondary students in the Spring phase reported 1.63 trips/day on average compared to 1.77 in the Fall phase (0.14 fewer trips/day in Spring). This result suggests that the lower spring school attendance for survey participants identified as full-time post-secondary students is 'made up for' in part (but not fully) by trips for other trip purposes. When the samples are combined, there is less difference between the overall survey average and the Fall sample, i.e., a difference of only 0.04 trips/day. Note also that there is little difference between the overall survey total and the Fall average trip rates for K-12 students (a difference of only 0.03 trips/day).

**Table 13: Trip Rates for students, Fall and Spring phases**

| | Survey Total | Phase 1 Fall | Phase 2 Spring | Difference | |
|---|---|---|---|---|---|
| | | | | Spring vs. Fall | Survey Total vs. Fall |
| Non-student | 2.14 | 2.13 | 2.16 | +0.03 | +0.01 |
| K-12 student, excluding home-schooled | 2.34 | 2.31 | 2.41 | +0.10 | +0.03 |
| K-12 student, home-schooled* | 0.92 | 0.80 | 1.19 | +0.40 | +0.12 |
| Full-time post-secondary/other adult student | 1.73 | 1.77 | 1.63 | -0.14 | -0.04 |
| Part-time post-secondary/other adult student | 2.14 | 2.11 | 2.21 | +0.10 | +0.03 |

Interpret results for home-schooled K12 students with caution due to small samples sizes, particularly in the Spring phase (n=213).

To sum up, for K-12 students, there is little difference between the Fall and Spring samples in terms of school attendance or total daily trip rates. However, there are differences for post-secondary students and their travel. The Spring sample appears to include some individuals identified as post-secondary students who were not currently attending classes when surveyed. The impact of this appears to be under-representation of trips to school by full-time post-secondary students, although given that the Spring sample represents only 30% of total trips, the impact on the total combined sample is modest. There is some substitution with trips for other

purposes, so the impact on overall trip rates and expanded trip volumes is less pronounced than the impact on origins/destinations and trip purpose. In the context of total trips, the apparent bias in post-secondary trips is relatively small.

The observation that post-secondary travel may be modestly under-represented in the full sample (and more distinctly so in the Spring sub-sample) may be an important consideration for modelling purposes and certain other kinds of analysis with the 2022 TTS dataset. Nevertheless, given the small impact on the full dataset, for most analyses it may be sufficient for this bias to simply be a caveat associated with the dataset, as the magnitude of the impact is not likely to significantly affect most interpretations of the survey results.

This may also be an important consideration for future surveys if Spring survey cycles are to be considered. Given that the winter post-secondary school term usually ends at the end of April, data collected in May and June may not reflect post-secondary students' usual travel patterns while attending school. The period in the spring during which weather conditions and hours of daylight are similar to fall, K-12 school March breaks are over, post-secondary school is still in session, would provide a tight window for data collection (late March to end of April). If surveys are conducted after the end of April, supplemental questions may be required during this period to confirm active post-secondary attendance to provide a basis for treating the data and/or differentially weighting surveys and/or excluding certain surveys to provide a representation of post-secondary travel that is closer to the fall.

### 2.3.4. K-12 School Attendance in 2022 Compared to Previous Survey Cycles

Returning to the question of K-12 school non-attendance in 2022, as noted above, overall, 89% of K-12 students with a school outside the home reported a trip to school in both fall and spring. Fully 11% non-attendance may seem high; however, multiple sources across Canada have noted that school attendance was lower in the 2022-23 school year compared to pre-pandemic school attendance,[9] although comprehensive statistics do not appear to be available for all Ontario school districts. In the Hamilton Wentworth District, student absenteeism amongst high school students rose from 3%-4% in 2020 to between 8%-14% in November 2022, with the figures for elementary students being even more dramatic, increasing from 5%-10% in 2020 to 13%-20% in 2022.[10]

Reasons for the observed increase in absenteeism may not be entirely clear, but could be related to increased incidence of illness (e.g., continued COVID transmission and/or decreased immunity to colds and flu due to isolation during the pandemic), greater sensitivity to preventing transmission of illness (staying home when functional but still sick), and/or changes in attitudes towards the importance of school attendance (e.g., families taking vacation days during school periods).

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[9] Bennet, Paul W. "Post-Pandemic Student Absenteeism: Where's the Canadian Data?" *Educhatter*, 13 Jan. 2024, educhatter.wordpress.com/2024/01/13/post-pandemic-student-absenteeism-wheres-the-canadian-data/.

[10] Hewitt, Fallon. "As Many as One-Fifth of Hamilton Public Students Absent Due to Illness on a Single Day Last Month." *The Hamilton Spectator*, 10 Nov. 2022, www.thespec.com/news/hamilton-region/as-many-as-one-fifth-of-hamilton-public-students-absent-due-to-illness-on-a/article_e62bb79f-e699-5f0e-8038-570bb358d0c4.html (last accessed April 28, 2025).

Note that comparisons of school attendance with previous cycles require filtering the 2022 data to students 11 years of age or older, as previous cycles did not collect trip data for children 5 to 10 years of age. In the 2016 cycle, approximately 92% of children aged 11 to 17 reported trips to school, for an 8% non-attendance rate.[11] Filtering the 2022 TTS data to just K-12 students 11 to 17 years of age results in 89% attendance / 11% non-attendance in both fall and spring, the same as the statistic across all students 5+ years of age for both phases.

Given the external sources that confirm changes in school attendance since the COVID-19 pandemic, and the consistency between Spring and Fall periods in the survey data, the differences in school trip rates for K-12 students in the 2022 TTS compared to previous TTS years can be considered a generally accurate reflection of a shift in behaviour rather than an artefact of differences in methodology such as the inclusion of a Spring data collection period.

## 2.4. Mode Share Comparison

There are some small differences in mode shares across the two phases, as detailed in Table 14 and Figure 4 on the following page. When results from both phases are averaged together, the results from the full sample have small differences from the Fall sample. Given differences in weather and school schedules, one cannot rule out the potential impact of these factors on the mode shares, although it may be difficult to separate these factors out from other contributing factors such as differences in geography and demographics.

The Spring phase saw higher auto mode shares. Specifically, auto driver trips were 1.1 percentage points higher in the spring, with 59.0% of trips in the Spring sample by auto driver mode, compared to 57.9% in the Fall sample. A similar pattern was observed for auto passenger trips as 17.2% of trips in the Spring sample were by auto passenger mode compared to 16.2% in the Fall sample, representing an increase of one percentage point. The slight increase in the auto shares is also consistent with historically higher auto use in the warmer weather months, although these differences may also be explained, at least in part, by the normal variance associated with the surveys.

There were slightly higher bike shares in the Spring sample (1.9%) compared to the fall (1.6%) – consistent, again, with the warmer weather but also with the normal variance associated with the surveys. This represents an increase of 0.3 percentage points. However, lower transit and walk shares were observed in the Spring sample compared to the Fall sample (7.9% transit share in the fall versus 7.2% in the spring; 12.9% walk share in the fall versus 10.9% in the spring). While the reduced transit share is consistent with the shift to autos and bicycles, the reduced walk share is not obviously explained - normal variance associated with the surveys may again be the key factor.

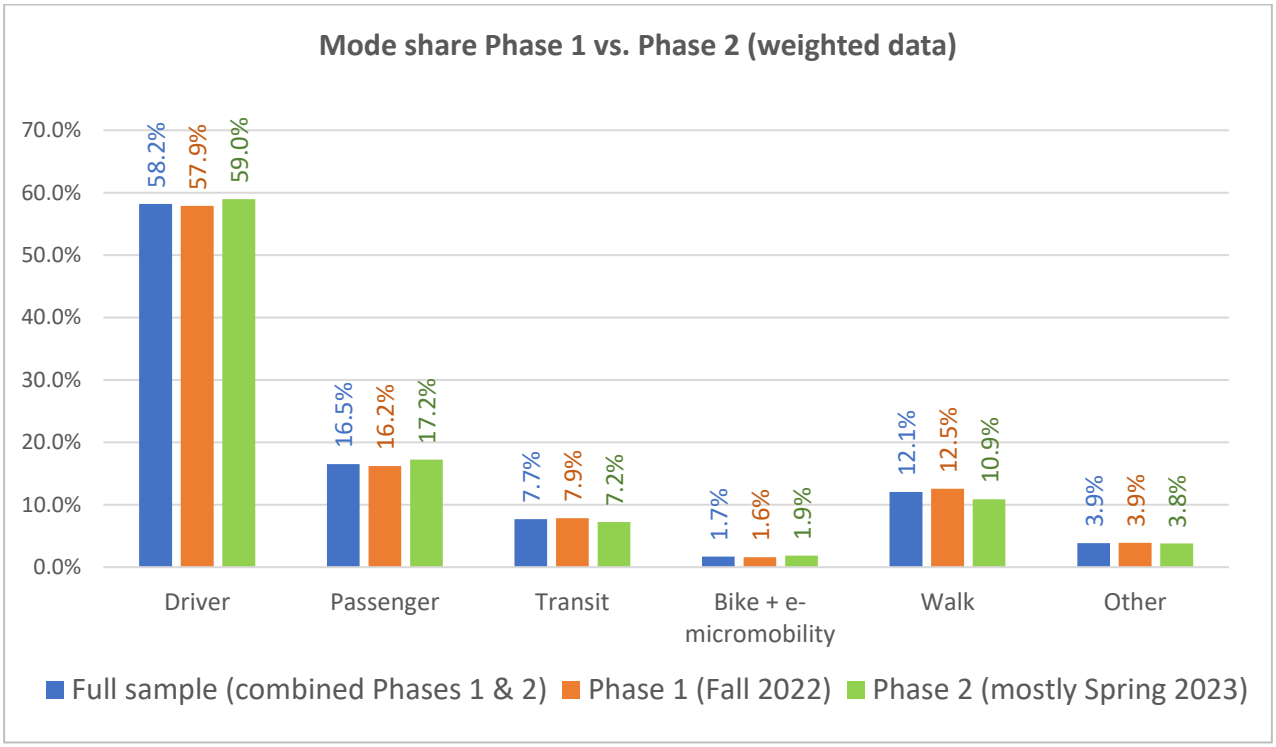
Overall, more research on seasonal modal use would be required to confirm these results (e.g., by comparing available fall and spring screenline or intersection counts and comparing fall and spring transit ridership figures), as well as on the impact of the different geographies sampled in the two phases.

[11] Note that this filtering is purely by age and does not include filtering of the school type.

**Table 14: Proportion of trips by mode – Fall and Spring phases**

| Mode | Survey Total | % Fall 2022 | % Spring 2023 | Difference Spring vs. Fall |
|---|---|---|---|---|
| Driver | 58.2% | 57.9% | 59.0% | +1.1% |
| Passenger | 16.5% | 16.2% | 17.2% | +1.0% |
| Transit | 7.7% | 7.9% | 7.2% | -0.5% |
| Bicycle + e-micromobility | 1.7% | 1.6% | 1.9% | +0.3% |
| Walk | 12.1% | 12.5% | 10.9% | -1.6% |
| Other | 3.9% | 3.9% | 3.8% | -0.1% |

**Figure 4: Mode shares, Fall and Spring phases**




## 2.5. Geographic Distribution by Phase

Figure 5 illustrates the differences in *overall geographic distribution by TTS region* in each of the survey data collection phases, while Figure 6 illustrates differences in *the balance of surveys by phase* within each TTS region. Figure 7 and Figure 8 illustrate the differences by Planning District within the City of Toronto, the largest municipality within the study area.

As indicated, there is considerable variation in the proportion of survey samples by geography, which supports the theory that a good portion of the difference between Fall and Spring survey results may be due to geographical differences.

**Figure 5: Illustration of Fall/Spring differences in geographic distribution by Region**

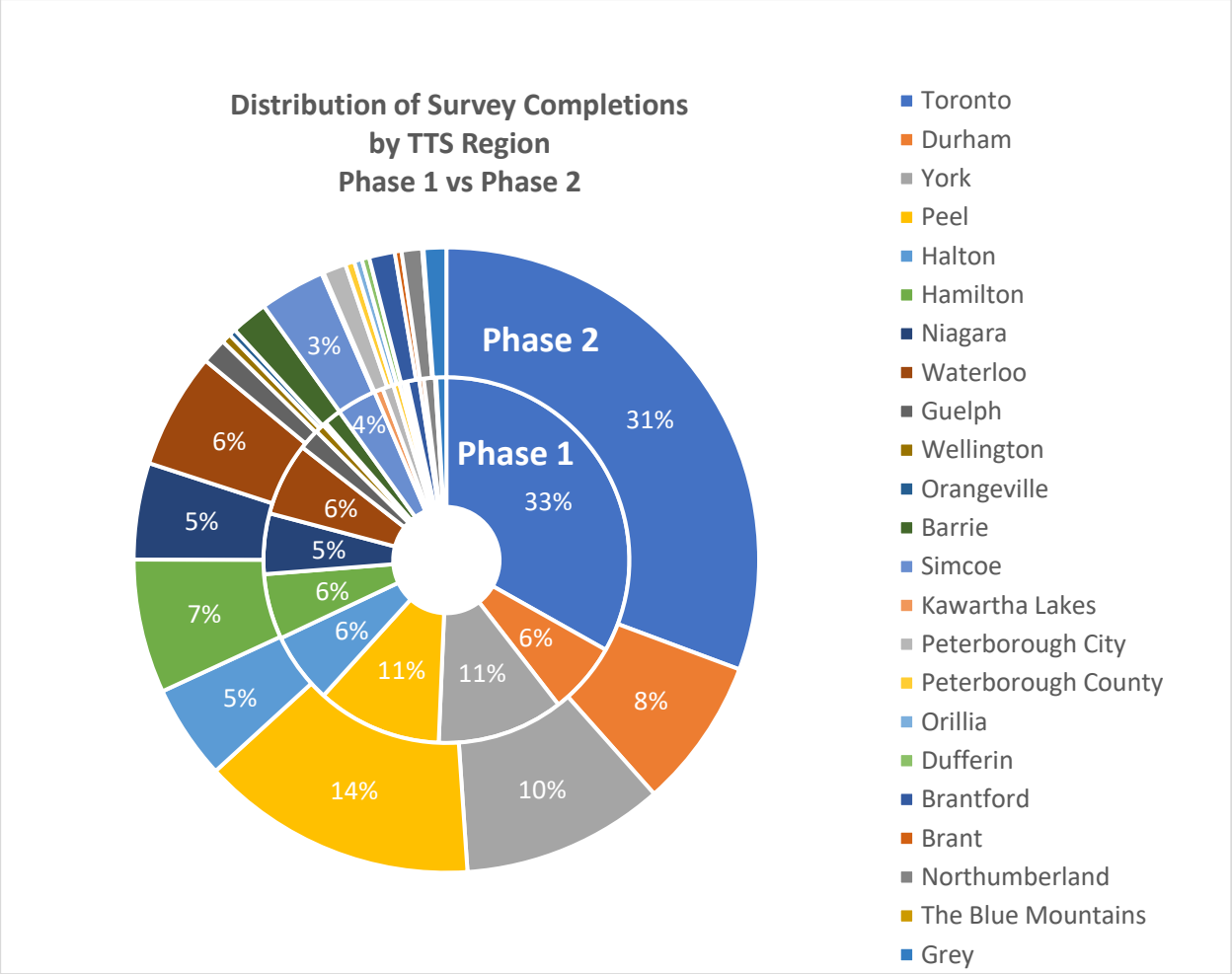


**Figure 6: Balance of Fall and Spring surveys within each Region**

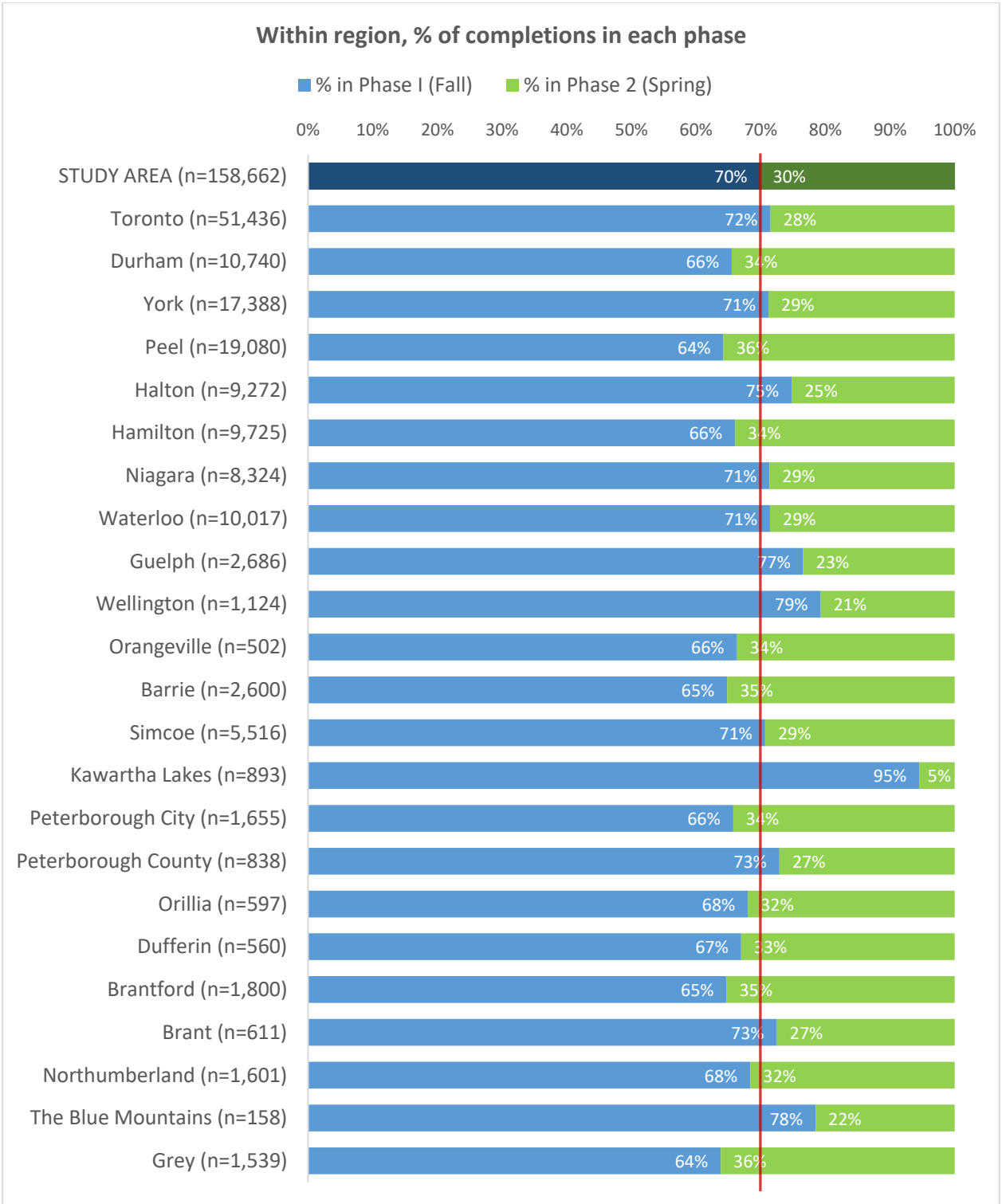


**Figure 7: Illustration of Fall/Spring differences in geographic distribution by Toronto Planning District**

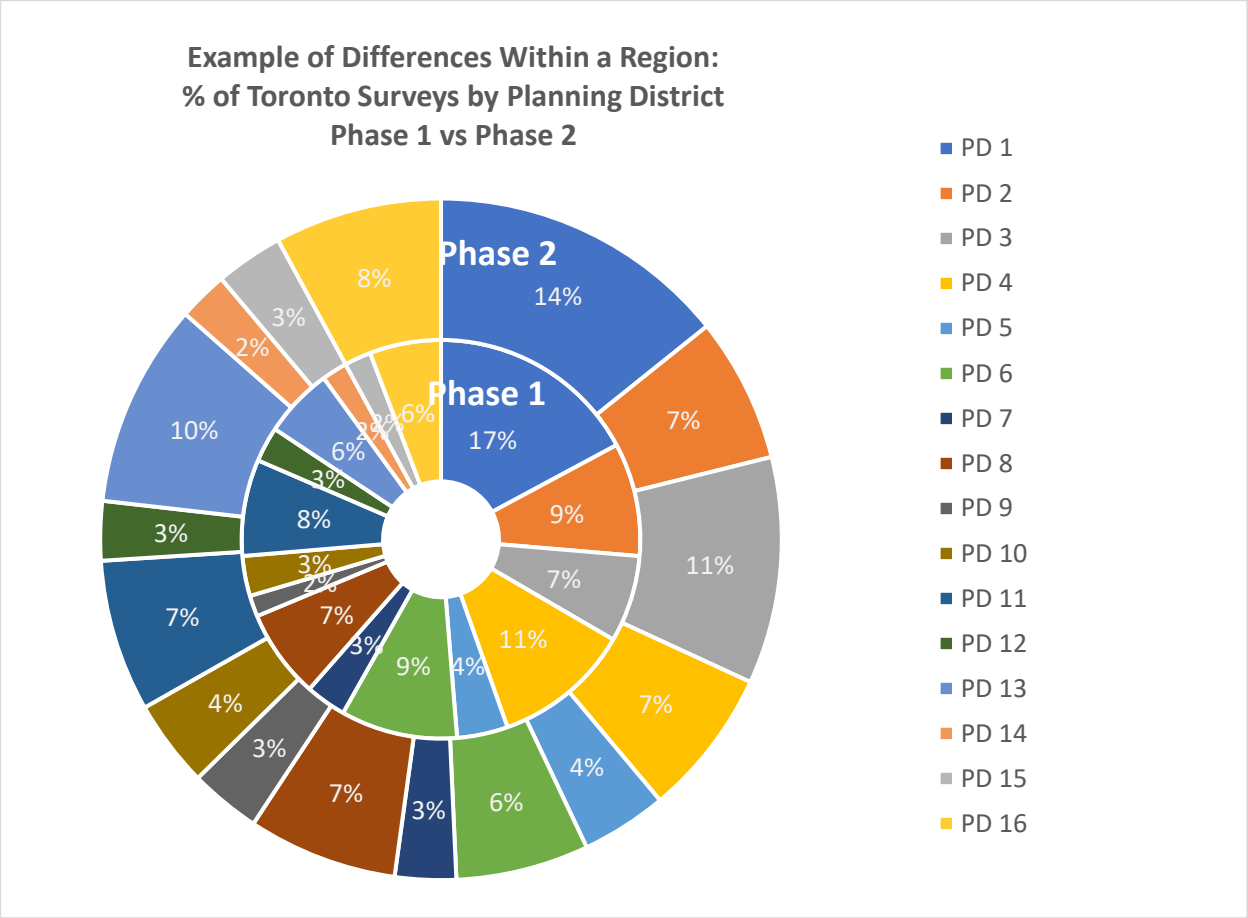
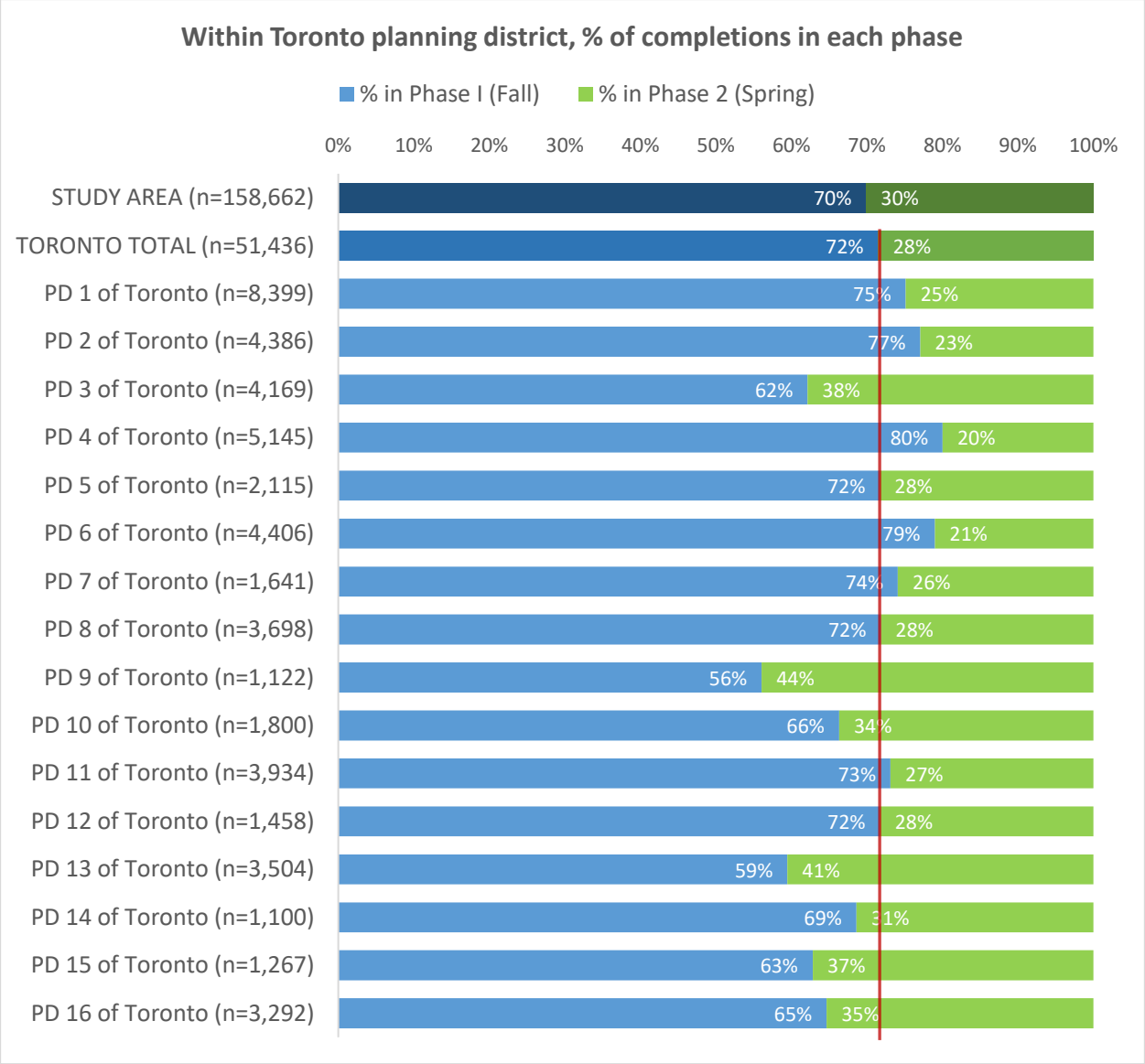


**Figure 8: Balance of Fall and Spring surveys within each Toronto Planning District**




Within each municipality and planning district, the geographies were further stratified into sampling zones.[12] Sampling zones with particularly low response rates in the fall received considerably more survey invitations in the spring and are more likely to have more survey completions in the Spring phase, while those with high response rates received less attention in the spring. The aggregation to region and to planning district in the charts below masks the fact that each of these geographies had a mix of higher- and lower-response rate sampling zones. I.e.,

[12] The sampling zones were geographies for which survey targets were set. In the 2022 TTS, the sampling zones were based on the 2016 expansion zones (which were typically aggregations of Statistics Canada Aggregated Dissemination Areas), adding in new sampling zones for the geographies surveyed for the first time in 2022 TTS.

the unequal distribution by geography at the sampling zone level can be even more pronounced than illustrated here. Figure 9 and Figure 10 below illustrates this for the sampling districts within Planning District 13, one of the low-response rate geographies in the study area. For example, zone 3 had 83% of its survey completions obtained in the Fall phase and 17% in the Spring phase. At the other extreme, zone 12 had only 49% of its survey completions obtained in the Fall phase and 51% in the Spring phase. The reasons for these imbalances between Fall and Spring surveys were in part the product of differences in response rates and the allocation of additional resources in the spring to make up for shortfalls in the fall, in part due to the availability of phone sample in certain areas with low incidence of listed land-lines, and in part the availability of address sample in those areas which had the lowest response rates. The need to limit survey efforts in areas that had already consumed more than their expected share of survey resources (after the allocation of extra resources to low-response areas) may also have factored into imbalances in the geographic distribution.

**Figure 9: Example of Fall/Spring differences in geographic distribution by Sampling Zone (SZ) within Toronto Planning District 13**

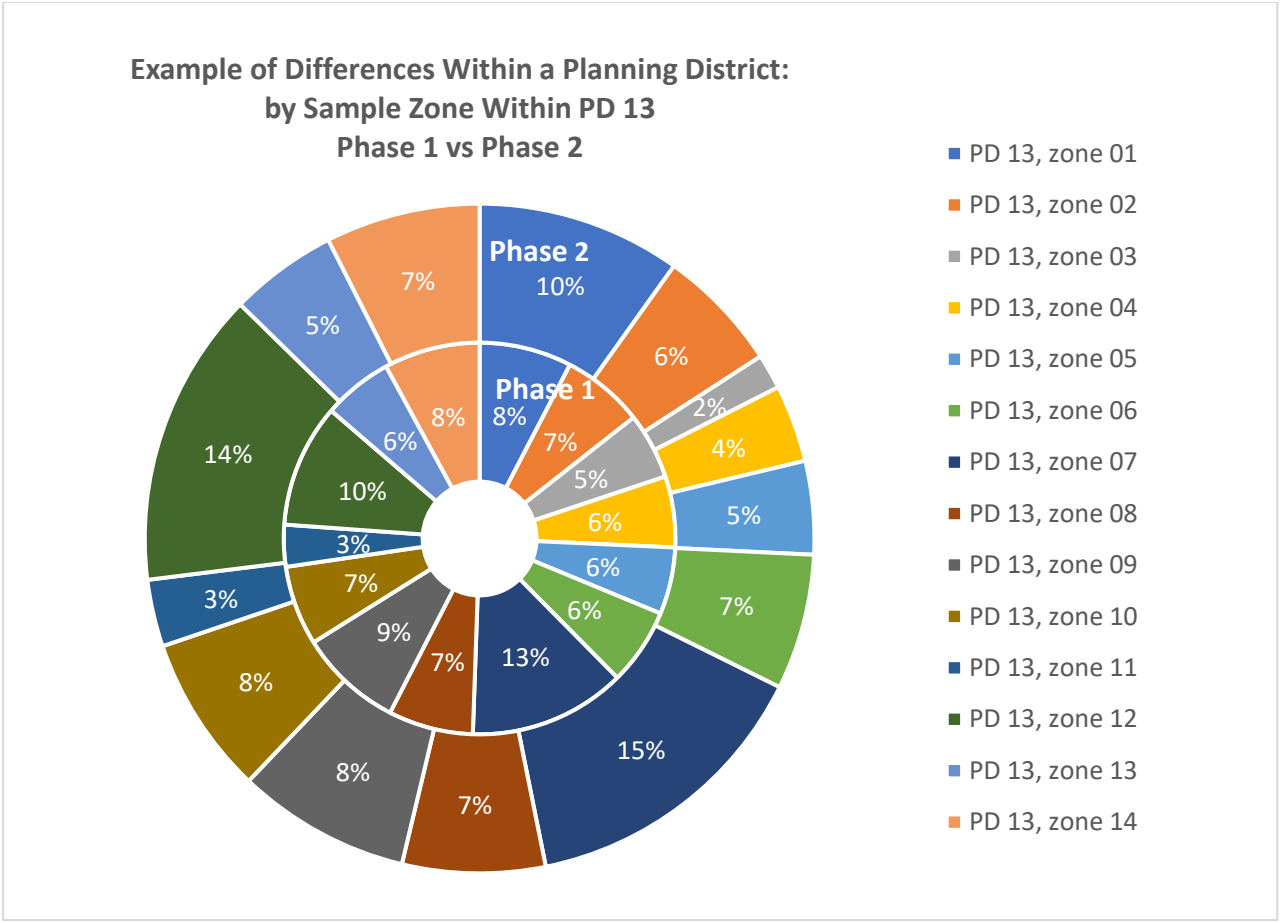


**Figure 10: Balance of Fall and Spring surveys within each Sampling Zone (SZ) in Toronto Planning District 13**

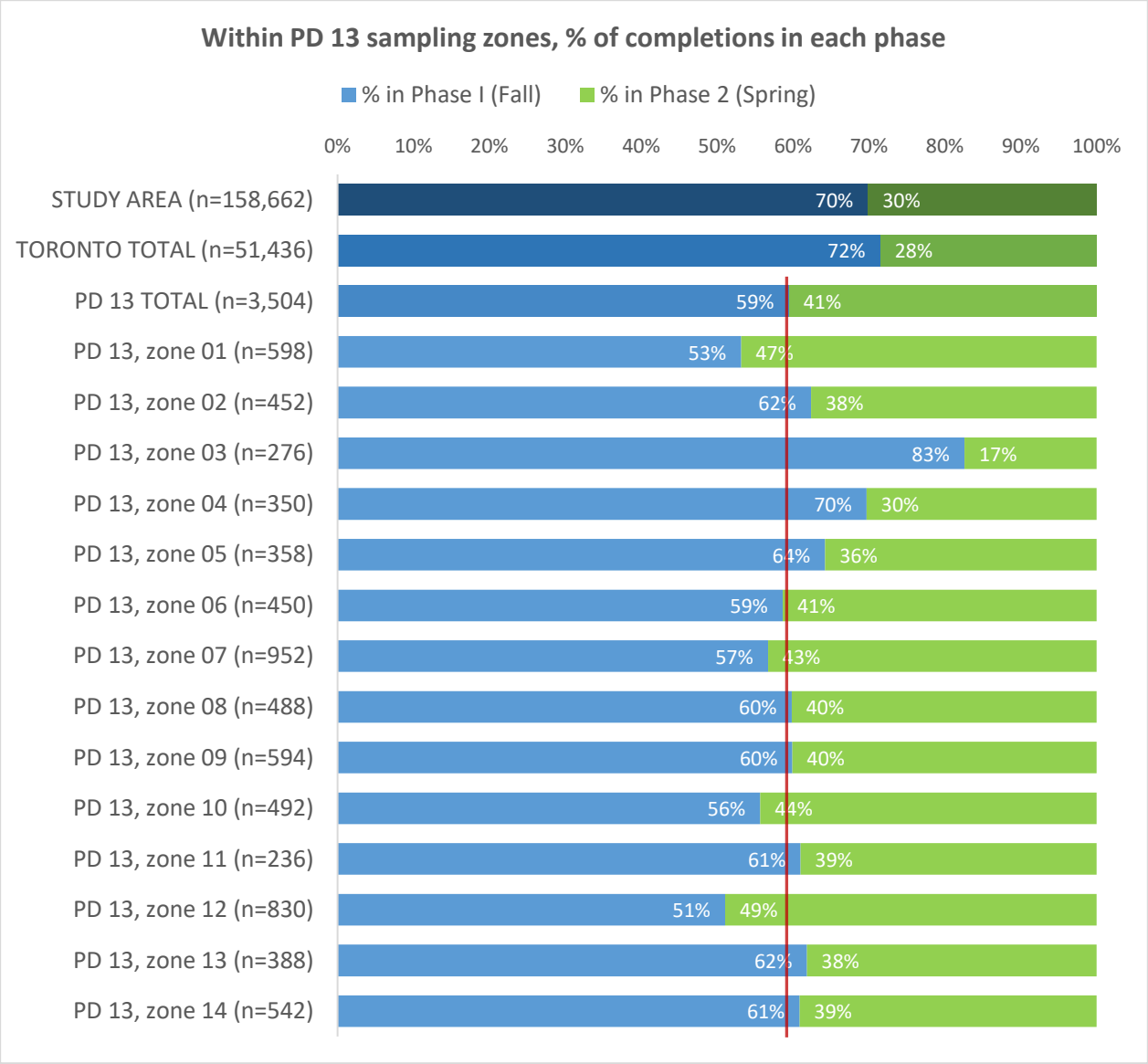



Table 15, following, lists the number of survey completions by phase for the regions and planning districts in the survey. The average daily trip rate for persons 5+ years and the transit mode share have been included in the table to illustrate the variance in key survey statistics by geography. The survey statistics are for the full sample, and are not split out by phase, as the focus here is understanding whether imbalances by geography would affect the Fall vs. Spring averages acrost the entire sample. Given the variance in key statistics by geography, particularly for the smaller planning district geographies, it is likely that the spring/fall distribution by geography would have some impact on the overall averages across aggregated geographies. A deeper dive into the data confirms this: dividing the planning districts into those with more than the survey average of 30%

Spring surveys and planning districts with less than 30% Spring surveys revealed that the planning districts with above-average proportions of their sample in the Spring had lower trip rates (2.07 on average across these planning districts) and lower transit mode shares (6.8%), as compared to planning districts with below-average proportions in the Spring (2.22 trip rate, and 8.6% transit share). Note that the set of planning districts with more than 30% Spring survey completions accounts for 49% of total survey completions, but only 44% of the Fall sample and fully 58% of the Spring sample. This supports the hypothesis that differences in the geographic distribution in each phase's sample could contribute to differences in the overall average results for the Spring sample compared to the Fall sample. I.e., the differences in geographic distribution may confound bivariate analysis that seeks to determine whether the survey averages are influenced by seasonality. It was not within scope for this analysis to reweight the Spring and Fall datasets to account for differences in geographic distribution.

**Table 15: Surveys by phase by region and by planning district, with example key statistics for the combined sample**

| Reg or PD | Region or PD Name | Phase 1 Fall Surveys | % of Phase 1 Surveys | Phase 2 Spring Surveys | % of Phase 2 Surveys | Total Surveys | % in Phase 2 | Avg. Daily Trip Rate | Transit Mode Share |
|---|---|---|---|---|---|---|---|---|---|
| | **STUDY AREA** | **110,902** | **100.0%** | **47,760** | **100.0%** | **158,662** | **30%** | **2.14** | **7.7%** |
| | **TTS Regions** | | | | | | | | |
| 1 | Toronto | 36,781 | 33.2% | 14,655 | 30.7% | 51,436 | 28% | 2.09 | 18.3% |
| 2 | Durham | 7,037 | 6.3% | 3,703 | 7.8% | 10,740 | 34% | 2.20 | 3.5% |
| 3 | York | 12,381 | 11.2% | 5,007 | 10.5% | 17,388 | 29% | 2.06 | 4.2% |
| 4 | Peel | 12,255 | 11.1% | 6,825 | 14.3% | 19,080 | 36% | 1.93 | 5.9% |
| 5 | Halton | 6,934 | 6.3% | 2,338 | 4.9% | 9,272 | 25% | 2.28 | 2.5% |
| 6 | Hamilton | 6,420 | 5.8% | 3,305 | 6.9% | 9,725 | 34% | 2.32 | 5.1% |
| 11 | Niagara | 5,940 | 5.4% | 2,384 | 5.0% | 8,324 | 29% | 2.29 | 1.7% |
| 12 | Waterloo | 7,156 | 6.5% | 2,861 | 6.0% | 10,017 | 29% | 2.35 | 3.7% |
| 13 | Guelph | 2,057 | 1.9% | 629 | 1.3% | 2,686 | 23% | 2.41 | 3.1% |
| 14 | Wellington | 891 | 0.8% | 233 | 0.5% | 1,124 | 21% | 2.36 | 0.2% |
| 15 | Orangeville | 333 | 0.3% | 169 | 0.4% | 502 | 34% | 2.23 | 1.1% |
| 16 | Barrie | 1,685 | 1.5% | 915 | 1.9% | 2,600 | 35% | 2.26 | 1.4% |
| 17 | Simcoe | 3,899 | 3.5% | 1,617 | 3.4% | 5,516 | 29% | 2.19 | 0.7% |
| 18 | Kawartha Lakes | 844 | 0.8% | 49 | 0.1% | 893 | 5% | 2.12 | 0.4% |
| 19 | Peterborough City | 1,088 | 1.0% | 567 | 1.2% | 1,655 | 34% | 2.30 | 3.0% |
| 20 | Peterborough County | 611 | 0.6% | 227 | 0.5% | 838 | 27% | 2.27 | 0.1% |
| 21 | Orillia | 406 | 0.4% | 191 | 0.4% | 597 | 32% | 2.25 | 2.3% |
| 22 | Dufferin | 375 | 0.3% | 185 | 0.4% | 560 | 33% | 2.06 | 0.4% |
| 23 | Brantford | 1,165 | 1.1% | 635 | 1.3% | 1,800 | 35% | 2.32 | 1.8% |
| 24 | Brant | 443 | 0.4% | 168 | 0.4% | 611 | 27% | 2.26 | 0.4% |
| 25 | Northumberland | 1,095 | 1.0% | 506 | 1.1% | 1,601 | 32% | 2.12 | 1.6% |
| 26 | The Blue Mountains | 124 | 0.1% | 34 | 0.1% | 158 | 22% | 2.05 | 0.4% |
| 27 | Grey | 982 | 0.9% | 557 | 1.2% | 1,539 | 36% | 2.16 | 0.6% |
| | **Planning Districts** | | | | | | | | |

| Reg or PD | Region or PD Name | Phase 1 Fall Surveys | % of Phase 1 Surveys | Phase 2 Spring Surveys | % of Phase 2 Surveys | Total Surveys | % in Phase 2 | Avg. Daily Trip Rate | Transit Mode Share |
|---|---|---|---|---|---|---|---|---|---|
| 1 | PD 1 of Toronto | 6,311 | 5.69% | 2,088 | 4.37% | 8,399 | 25% | 2.26 | 20.1% |
| 2 | PD 2 of Toronto | 3,380 | 3.05% | 1,006 | 2.11% | 4,386 | 23% | 2.33 | 21.1% |
| 3 | PD 3 of Toronto | 2,591 | 2.34% | 1,578 | 3.30% | 4,169 | 38% | 2.05 | 22.5% |
| 4 | PD 4 of Toronto | 4,118 | 3.71% | 1,027 | 2.15% | 5,145 | 20% | 2.26 | 19.4% |
| 5 | PD 5 of Toronto | 1,517 | 1.37% | 598 | 1.25% | 2,115 | 28% | 2.19 | 14.4% |
| 6 | PD 6 of Toronto | 3,481 | 3.14% | 925 | 1.94% | 4,406 | 21% | 2.34 | 20.5% |
| 7 | PD 7 of Toronto | 1,216 | 1.10% | 425 | 0.89% | 1,641 | 26% | 2.28 | 13.7% |
| 8 | PD 8 of Toronto | 2,657 | 2.40% | 1,041 | 2.18% | 3,698 | 28% | 2.23 | 13.1% |
| 9 | PD 9 of Toronto | 629 | 0.57% | 493 | 1.03% | 1,122 | 44% | 1.77 | 16.8% |
| 10 | PD 10 of Toronto | 1,194 | 1.08% | 606 | 1.27% | 1,800 | 34% | 1.75 | 21.9% |
| 11 | PD 11 of Toronto | 2,877 | 2.59% | 1,057 | 2.21% | 3,934 | 27% | 1.99 | 19.1% |
| 12 | PD 12 of Toronto | 1,046 | 0.94% | 412 | 0.86% | 1,458 | 28% | 1.96 | 16.0% |
| 13 | PD 13 of Toronto | 2,084 | 1.88% | 1,420 | 2.97% | 3,504 | 41% | 1.80 | 20.1% |
| 14 | PD 14 of Toronto | 755 | 0.68% | 345 | 0.72% | 1,100 | 31% | 2.06 | 16.0% |
| 15 | PD 15 of Toronto | 796 | 0.72% | 471 | 0.99% | 1,267 | 37% | 1.98 | 13.4% |
| 16 | PD 16 of Toronto | 2,129 | 1.92% | 1,163 | 2.44% | 3,292 | 35% | 1.86 | 12.3% |
| 17 | Brock | 112 | 0.10% | 87 | 0.18% | 199 | 44% | 2.39 | 0.0% |
| 18 | Uxbridge | 249 | 0.22% | 114 | 0.24% | 363 | 31% | 2.32 | 0.5% |
| 19 | Scugog | 298 | 0.27% | 96 | 0.20% | 394 | 24% | 2.31 | 0.5% |
| 20 | Pickering | 1,028 | 0.93% | 499 | 1.04% | 1,527 | 33% | 2.16 | 4.3% |
| 21 | Ajax | 1,043 | 0.94% | 653 | 1.37% | 1,696 | 39% | 2.07 | 5.0% |
| 22 | Whitby | 1,496 | 1.35% | 579 | 1.21% | 2,075 | 28% | 2.28 | 4.0% |
| 23 | Oshawa | 1,767 | 1.59% | 1,060 | 2.22% | 2,827 | 37% | 2.17 | 4.0% |
| 24 | Clarington | 1,044 | 0.94% | 615 | 1.29% | 1,659 | 37% | 2.29 | 1.5% |
| 25 | Georgina | 488 | 0.44% | 297 | 0.62% | 785 | 38% | 2.18 | 0.9% |
| 26 | East Gwillimbury | 340 | 0.31% | 152 | 0.32% | 492 | 31% | 2.20 | 0.9% |
| 27 | Newmarket | 904 | 0.82% | 407 | 0.85% | 1,311 | 31% | 2.24 | 2.5% |
| 28 | Aurora | 733 | 0.66% | 208 | 0.44% | 941 | 22% | 2.16 | 3.1% |
| 29 | Richmond Hill | 2,257 | 2.04% | 808 | 1.69% | 3,065 | 26% | 1.95 | 4.7% |
| 30 | Whitchurch-Stouffville | 550 | 0.50% | 193 | 0.40% | 743 | 26% | 2.21 | 2.5% |
| 31 | Markham | 3,869 | 3.49% | 1,259 | 2.64% | 5,128 | 25% | 1.95 | 4.7% |
| 32 | King | 275 | 0.25% | 108 | 0.23% | 383 | 28% | 2.30 | 1.8% |
| 33 | Vaughan | 2,965 | 2.67% | 1,575 | 3.30% | 4,540 | 35% | 2.09 | 5.5% |
| 34 | Caledon | 707 | 0.64% | 372 | 0.78% | 1,079 | 34% | 2.03 | 1.0% |
| 35 | Brampton | 4,155 | 3.75% | 2,771 | 5.80% | 6,926 | 40% | 1.85 | 5.3% |
| 36 | Mississauga | 7,393 | 6.67% | 3,682 | 7.71% | 11,075 | 33% | 1.99 | 7.0% |
| 37 | Halton Hills | 666 | 0.60% | 279 | 0.58% | 945 | 30% | 2.30 | 1.1% |
| 38 | Milton | 1,152 | 1.04% | 577 | 1.21% | 1,729 | 33% | 2.21 | 2.3% |
| 39 | Oakville | 2,574 | 2.32% | 728 | 1.52% | 3,302 | 22% | 2.22 | 3.4% |
| 40 | Burlington | 2,542 | 2.29% | 754 | 1.58% | 3,296 | 23% | 2.40 | 2.1% |
| 41 | Flamborough PD | 567 | 0.51% | 226 | 0.47% | 793 | 28% | 2.37 | 0.9% |
| 42 | Dundas PD | 383 | 0.35% | 94 | 0.20% | 477 | 20% | 2.35 | 3.9% |
| 43 | Ancaster PD | 521 | 0.47% | 138 | 0.29% | 659 | 21% | 2.24 | 2.3% |

| Reg or PD | Region or PD Name | Phase 1 Fall Surveys | % of Phase 1 Surveys | Phase 2 Spring Surveys | % of Phase 2 Surveys | Total Surveys | % in Phase 2 | Avg. Daily Trip Rate | Transit Mode Share |
|---|---|---|---|---|---|---|---|---|---|
| 44 | Glanbrook PD | 356 | 0.32% | 178 | 0.37% | 534 | 33% | 2.30 | 1.2% |
| 45 | Stoney Creek PD | 754 | 0.68% | 424 | 0.89% | 1,178 | 36% | 2.32 | 1.6% |
| 46 | Hamilton PD | 3,839 | 3.46% | 2,245 | 4.70% | 6,084 | 37% | 2.32 | 7.3% |
| 51 | Grimsby | 400 | 0.36% | 108 | 0.23% | 508 | 21% | 2.26 | 0.5% |
| 52 | Lincoln | 344 | 0.31% | 96 | 0.20% | 440 | 22% | 2.36 | 0.9% |
| 53 | Pelham | 243 | 0.22% | 64 | 0.13% | 307 | 21% | 2.46 | 0.2% |
| 54 | Niagara-on-the-Lake | 284 | 0.26% | 59 | 0.12% | 343 | 17% | 2.22 | 0.1% |
| 55 | St. Catharines | 1,847 | 1.67% | 695 | 1.46% | 2,542 | 27% | 2.36 | 2.7% |
| 56 | Thorold | 228 | 0.21% | 150 | 0.31% | 378 | 40% | 2.30 | 3.5% |
| 57 | Niagara Falls | 1,077 | 0.97% | 489 | 1.02% | 1,566 | 31% | 2.24 | 1.8% |
| 58 | Welland | 639 | 0.58% | 327 | 0.68% | 966 | 34% | 2.31 | 1.6% |
| 59 | Port Colborne | 235 | 0.21% | 119 | 0.25% | 354 | 34% | 2.23 | 0.1% |
| 60 | Fort Erie | 397 | 0.36% | 186 | 0.39% | 583 | 32% | 2.07 | 1.1% |
| 61 | West Lincoln | 148 | 0.13% | 62 | 0.13% | 210 | 30% | 2.18 | 1.0% |
| 62 | Wainfleet | 98 | 0.09% | 29 | 0.06% | 127 | 23% | 2.39 | 0.1% |
| 63 | Waterloo | 1,692 | 1.53% | 499 | 1.04% | 2,191 | 23% | 2.38 | 5.3% |
| 64 | Kitchener | 3,163 | 2.85% | 1,294 | 2.71% | 4,457 | 29% | 2.37 | 4.6% |
| 65 | Cambridge | 1,485 | 1.34% | 743 | 1.56% | 2,228 | 33% | 2.29 | 2.5% |
| 66 | North Dumfries | 120 | 0.11% | 49 | 0.10% | 169 | 29% | 2.32 | 0.0% |
| 67 | Wilmot | 269 | 0.24% | 104 | 0.22% | 373 | 28% | 2.36 | 0.3% |
| 68 | Wellesley | 80 | 0.07% | 80 | 0.17% | 160 | 50% | 2.24 | 0.1% |
| 69 | Woolwich | 347 | 0.31% | 92 | 0.19% | 439 | 21% | 2.49 | 0.5% |
| 70 | Guelph City | 2,057 | 1.85% | 629 | 1.32% | 2,686 | 23% | 2.41 | 3.1% |
| 71 | Puslinch | 109 | 0.10% | 26 | 0.05% | 135 | 19% | 2.38 | 0.1% |
| 72 | Guelph/Eramosa | 184 | 0.17% | 37 | 0.08% | 221 | 17% | 2.33 | 0.1% |
| 73 | Centre Wellington | 451 | 0.41% | 95 | 0.20% | 546 | 17% | 2.37 | 0.2% |
| 79 | Erin | 147 | 0.13% | 75 | 0.16% | 222 | 34% | 2.34 | 0.6% |
| 80 | Orangeville | 333 | 0.30% | 169 | 0.35% | 502 | 34% | 2.23 | 1.1% |
| 81 | Barrie | 1,685 | 1.52% | 915 | 1.92% | 2,600 | 35% | 2.26 | 1.4% |
| 82 | Innisfil | 385 | 0.35% | 211 | 0.44% | 596 | 35% | 2.12 | 0.3% |
| 83 | Bradford-West Gwillimbury | 387 | 0.35% | 163 | 0.34% | 550 | 30% | 2.32 | 1.1% |
| 84 | New Tecumseth | 460 | 0.41% | 179 | 0.37% | 639 | 28% | 2.27 | 0.8% |
| 85 | Adjala-Tosorontio | 122 | 0.11% | 46 | 0.10% | 168 | 27% | 2.10 | 0.0% |
| 86 | Essa/CFB Borden | 199 | 0.18% | 130 | 0.27% | 329 | 40% | 2.21 | 0.5% |
| 87 | Clearview | 152 | 0.14% | 79 | 0.17% | 231 | 34% | 2.13 | 0.4% |
| 88 | Springwater | 228 | 0.21% | 77 | 0.16% | 305 | 25% | 2.24 | 1.0% |
| 89 | Kawartha Lakes | 844 | 0.76% | 49 | 0.10% | 893 | 5% | 2.12 | 0.4% |
| 103 | Peterborough City | 1,088 | 0.98% | 567 | 1.19% | 1,655 | 34% | 2.30 | 3.0% |
| 104 | Cavan Monaghan | 143 | 0.13% | 26 | 0.05% | 169 | 15% | 2.21 | 0.1% |
| 106 | Otonabee-South Monaghan | 107 | 0.10% | 31 | 0.06% | 138 | 22% | 2.36 | 0.2% |
| 108 | Asphodel-Norwood | 36 | 0.03% | 29 | 0.06% | 65 | 45% | 1.99 | 0.0% |
| 109 | Douro-Dummer | 118 | 0.11% | 23 | 0.05% | 141 | 16% | 2.32 | 0.1% |
| 111 | Selwyn | 207 | 0.19% | 118 | 0.25% | 325 | 36% | 2.30 | 0.0% |

| Reg or PD | Region or PD Name | Phase 1 Fall Surveys | % of Phase 1 Surveys | Phase 2 Spring Surveys | % of Phase 2 Surveys | Total Surveys | % in Phase 2 | Avg. Daily Trip Rate | Transit Mode Share |
|---|---|---|---|---|---|---|---|---|---|
| 124 | Brant County | 443 | 0.40% | 168 | 0.35% | 611 | 27% | 2.26 | 0.4% |
| 127 | Collingwood | 379 | 0.34% | 97 | 0.20% | 476 | 20% | 2.32 | 0.8% |
| 128 | Wasaga Beach | 324 | 0.29% | 137 | 0.29% | 461 | 30% | 2.00 | 1.9% |
| 129 | Tiny & Christian Island | 172 | 0.16% | 64 | 0.13% | 236 | 27% | 1.90 | 0.0% |
| 130 | Penetanguishene | 128 | 0.12% | 50 | 0.10% | 178 | 28% | 2.15 | 1.0% |
| 131 | Midland | 257 | 0.23% | 85 | 0.18% | 342 | 25% | 2.37 | 0.8% |
| 132 | Tay | 107 | 0.10% | 69 | 0.14% | 176 | 39% | 2.05 | 0.6% |
| 133 | Oro-Medonte | 338 | 0.30% | 56 | 0.12% | 394 | 14% | 2.12 | 0.2% |
| 134 | Severn | 150 | 0.14% | 76 | 0.16% | 226 | 34% | 2.27 | 0.2% |
| 135 | Ramara & Chippewas of Rama FN | 111 | 0.10% | 98 | 0.21% | 209 | 47% | 2.04 | 0.2% |
| 136 | Orillia | 406 | 0.37% | 191 | 0.40% | 597 | 32% | 2.25 | 2.3% |
| 140 | Mulmur | 67 | 0.06% | 30 | 0.06% | 97 | 31% | 2.23 | 0.4% |
| 141 | Shelburne | 59 | 0.05% | 57 | 0.12% | 116 | 49% | 2.28 | 0.0% |
| 142 | Amaranth | 42 | 0.04% | 13 | 0.03% | 55 | 24% | 2.06 | 0.0% |
| 143 | Melancthon | 30 | 0.03% | 12 | 0.03% | 42 | 29% | 1.92 | 0.1% |
| 144 | Mono | 104 | 0.09% | 32 | 0.07% | 136 | 24% | 1.91 | 1.5% |
| 145 | Grand Valley | 35 | 0.03% | 26 | 0.05% | 61 | 43% | 1.70 | 0.0% |
| 146 | East Garafraxa | 38 | 0.03% | 15 | 0.03% | 53 | 28% | 2.32 | 0.1% |
| 147 | Brantford | 1,165 | 1.05% | 635 | 1.33% | 1,800 | 35% | 2.32 | 1.8% |
| 148 | Brighton | 171 | 0.15% | 38 | 0.08% | 209 | 18% | 1.87 | 1.6% |
| 149 | Cramahe | 70 | 0.06% | 30 | 0.06% | 100 | 30% | 1.89 | 0.0% |
| 150 | Hamilton Township | 134 | 0.12% | 55 | 0.12% | 189 | 29% | 2.10 | 0.6% |
| 151 | Port Hope | 209 | 0.19% | 107 | 0.22% | 316 | 34% | 2.21 | 1.7% |
| 152 | Cobourg | 262 | 0.24% | 135 | 0.28% | 397 | 34% | 2.32 | 3.6% |
| 153 | Alnwick/Haldimand | 105 | 0.09% | 43 | 0.09% | 148 | 29% | 2.05 | 0.4% |
| 154 | Alderville First Nation | 5 | 0.00% | 0 | 0.00% | 5 | 0% | 2.38 | 0.0% |
| 155 | Trent Hills | 139 | 0.13% | 98 | 0.21% | 237 | 41% | 2.08 | 0.5% |
| 156 | The Blue Mountains | 124 | 0.11% | 34 | 0.07% | 158 | 22% | 2.05 | 0.4% |
| 157 | West Grey | 130 | 0.12% | 87 | 0.18% | 217 | 40% | 2.17 | 0.0% |
| 158 | Southgate | 37 | 0.03% | 67 | 0.14% | 104 | 64% | 1.95 | 0.1% |
| 159 | Grey Highlands | 125 | 0.11% | 22 | 0.05% | 147 | 15% | 2.28 | 0.0% |
| 160 | Hanover | 95 | 0.09% | 44 | 0.09% | 139 | 32% | 1.98 | 0.0% |
| 161 | Chatsworth | 65 | 0.06% | 58 | 0.12% | 123 | 47% | 2.04 | 0.0% |
| 162 | Meaford | 157 | 0.14% | 56 | 0.12% | 213 | 26% | 2.10 | 0.0% |
| 163 | Georgian Bluffs | 120 | 0.11% | 53 | 0.11% | 173 | 31% | 2.16 | 0.2% |
| 164 | Owen Sound | 253 | 0.23% | 170 | 0.36% | 423 | 40% | 2.31 | 2.3% |

Shading is used to highlight high (blue shading) and low values (pink) in each column.

Table 16, following, lists the two key statistics detailed in Table 15 above (trip rates and transit mode share), this time broken out by phase. The average daily trip rate has some variance by phase within geographies, but is often more consistent for geographies with larger sample sizes. Transit mode shares show similar patterns in terms of variance between phases. The differences between phases do not seem to exhibit uniform bias for all geographies. For example, about half of the planning districts have lower transit mode shares in the spring compared to the fall, one-third have higher transit mode shares in the spring compared to the fall, and the remainder have the equivalent transit shares (within a tenth of a percentage-point) in both phases. As there are differences in the sample distributions for the sampling zones within each of the planning districts, and there may be differences in the distributions of the person and household characteristics of the samples in each sampling zone between phases, it is difficult to draw conclusions as to whether or not the variances by phase are entirely meaningful. The multivariate analysis sheds further light on the effect of survey phase on trip rates, with limited geography-related controls, however, it was not within scope to build an additional multivariate model to examine the extent to which individual mode shares may be influenced by seasonality. Even if there may be some seasonal effects that produced somewhat lower transit mode shares in the Spring sample, users of the data are reminded that given the Fall sample's larger weight, if a true bias exists, it would result in only a relatively small bias in the transit mode share for the combined sample.

Table 16: Example key statistics by phase by region and by planning district

| Reg or PD | Name | Phase 1 Fall Surveys | Phase 2 Spring Surveys | Avg. Daily Trips per Person | | | | Transit Mode Share | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Survey Total | Phase 1 | Phase 2 | Diff. Spring vs. Fall | Survey Total | Phase 1 | Phase 2 | %-pt Diff. Spring vs. Fall |
| | **STUDY AREA** | **110,902** | **47,760** | **2.14** | **2.13** | **2.16** | **0.03** | **7.7%** | **7.9%** | **7.2%** | **-0.6%** |
| | **TTS Regions** | | | | | | | | | | |
| 1 | Toronto | 36,781 | 14,655 | 2.09 | 2.09 | 2.09 | 0.00 | 18.3% | 18.6% | 17.5% | -1.1% |
| 2 | Durham | 7,037 | 3,703 | 2.20 | 2.19 | 2.23 | 0.05 | 3.5% | 3.5% | 3.5% | 0.0% |
| 3 | York | 12,381 | 5,007 | 2.06 | 2.04 | 2.10 | 0.06 | 4.2% | 4.2% | 4.1% | -0.1% |
| 4 | Peel | 12,255 | 6,825 | 1.93 | 1.90 | 1.97 | 0.07 | 5.9% | 6.0% | 5.8% | -0.2% |
| 5 | Halton | 6,934 | 2,338 | 2.28 | 2.28 | 2.28 | -0.01 | 2.5% | 2.4% | 2.7% | 0.2% |
| 6 | Hamilton | 6,420 | 3,305 | 2.32 | 2.32 | 2.31 | -0.02 | 5.1% | 5.0% | 5.2% | 0.2% |
| 11 | Niagara | 5,940 | 2,384 | 2.29 | 2.28 | 2.31 | 0.04 | 1.7% | 1.7% | 1.6% | -0.1% |
| 12 | Waterloo | 7,156 | 2,861 | 2.35 | 2.32 | 2.46 | 0.14 | 3.7% | 4.2% | 2.6% | -1.6% |
| 13 | Guelph | 2,057 | 629 | 2.41 | 2.41 | 2.42 | 0.01 | 3.1% | 3.2% | 2.7% | -0.6% |
| 14 | Wellington | 891 | 233 | 2.36 | 2.28 | 2.63 | 0.35 | 0.2% | 0.3% | 0.1% | -0.2% |
| 15 | Orangeville | 333 | 169 | 2.23 | 2.13 | 2.41 | 0.28 | 1.1% | 1.1% | 1.0% | -0.1% |
| 16 | Barrie | 1,685 | 915 | 2.26 | 2.25 | 2.28 | 0.03 | 1.4% | 1.4% | 1.5% | 0.1% |
| 17 | Simcoe | 3,899 | 1,617 | 2.19 | 2.16 | 2.24 | 0.08 | 0.7% | 0.8% | 0.5% | -0.3% |
| 18 | Kawartha Lakes | 844 | 49 | 2.12 | 2.13 | 2.00 | -0.13 | 0.4% | 0.4% | 0.0% | -0.4% |
| 19 | Peterborough City | 1,088 | 567 | 2.30 | 2.35 | 2.20 | -0.15 | 3.0% | 3.3% | 2.6% | -0.7% |
| 20 | Peterborough County | 611 | 227 | 2.27 | 2.25 | 2.31 | 0.06 | 0.1% | 0.1% | 0.0% | -0.1% |
| 21 | Orillia | 406 | 191 | 2.25 | 2.13 | 2.45 | 0.32 | 2.3% | 2.2% | 2.3% | 0.1% |
| 22 | Dufferin | 375 | 185 | 2.06 | 1.99 | 2.20 | 0.21 | 0.4% | 0.6% | 0.1% | -0.5% |

| Reg or PD | Name | Phase 1 Fall Surveys | Phase 2 Spring Surveys | Avg. Daily Trips per Person | | | | Transit Mode Share | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Survey Total | Phase 1 | Phase 2 | Diff. Spring vs. Fall | Survey Total | Phase 1 | Phase 2 | %-pt Diff. Spring vs. Fall |
| 23 | Brantford | 1,165 | 635 | 2.32 | 2.28 | 2.40 | 0.12 | 1.8% | 1.6% | 2.0% | 0.4% |
| 24 | Brant | 443 | 168 | 2.26 | 2.30 | 2.20 | -0.10 | 0.4% | 0.6% | 0.0% | -0.6% |
| 25 | Northumberland | 1,095 | 506 | 2.12 | 2.01 | 2.34 | 0.33 | 1.6% | 1.0% | 2.6% | 1.6% |
| 26 | The Blue Mountains | 124 | 34 | 2.05 | 1.99 | 2.30 | 0.31 | 0.4% | 0.5% | 0.0% | -0.5% |
| 27 | Grey | 982 | 557 | 2.16 | 2.16 | 2.15 | -0.02 | 0.6% | 0.6% | 0.7% | 0.1% |
| | **TTS Planning Districts** | | | | | | | | | | |
| 1 | PD 1 of Toronto | 6,311 | 2,088 | 2.26 | 2.26 | 2.26 | 0.00 | 20.1% | 19.8% | 21.1% | 1.3% |
| 2 | PD 2 of Toronto | 3,380 | 1,006 | 2.33 | 2.29 | 2.47 | 0.18 | 21.1% | 21.6% | 19.5% | -2.1% |
| 3 | PD 3 of Toronto | 2,591 | 1,578 | 2.05 | 2.05 | 2.04 | -0.01 | 22.5% | 22.9% | 21.7% | -1.2% |
| 4 | PD 4 of Toronto | 4,118 | 1,027 | 2.26 | 2.24 | 2.37 | 0.13 | 19.4% | 19.8% | 18.2% | -1.6% |
| 5 | PD 5 of Toronto | 1,517 | 598 | 2.19 | 2.17 | 2.26 | 0.10 | 14.4% | 13.9% | 15.7% | 1.7% |
| 6 | PD 6 of Toronto | 3,481 | 925 | 2.34 | 2.32 | 2.42 | 0.09 | 20.5% | 20.7% | 19.9% | -0.8% |
| 7 | PD 7 of Toronto | 1,216 | 425 | 2.28 | 2.29 | 2.27 | -0.02 | 13.7% | 14.4% | 11.6% | -2.8% |
| 8 | PD 8 of Toronto | 2,657 | 1,041 | 2.23 | 2.19 | 2.35 | 0.16 | 13.1% | 13.7% | 11.5% | -2.3% |
| 9 | PD 9 of Toronto | 629 | 493 | 1.77 | 1.83 | 1.68 | -0.15 | 16.8% | 15.5% | 18.9% | 3.3% |
| 10 | PD 10 of Toronto | 1,194 | 606 | 1.75 | 1.75 | 1.74 | -0.01 | 21.9% | 22.1% | 21.4% | -0.7% |
| 11 | PD 11 of Toronto | 2,877 | 1,057 | 1.99 | 1.98 | 2.02 | 0.04 | 19.1% | 19.5% | 17.7% | -1.8% |
| 12 | PD 12 of Toronto | 1,046 | 412 | 1.96 | 1.94 | 2.01 | 0.07 | 16.0% | 16.1% | 15.9% | -0.2% |
| 13 | PD 13 of Toronto | 2,084 | 1,420 | 1.80 | 1.76 | 1.88 | 0.12 | 20.1% | 20.8% | 18.9% | -1.9% |
| 14 | PD 14 of Toronto | 755 | 345 | 2.06 | 2.08 | 2.03 | -0.05 | 16.0% | 15.6% | 16.9% | 1.3% |
| 15 | PD 15 of Toronto | 796 | 471 | 1.98 | 1.91 | 2.08 | 0.17 | 13.4% | 15.1% | 11.0% | -4.1% |
| 16 | PD 16 of Toronto | 2,129 | 1,163 | 1.86 | 1.83 | 1.91 | 0.07 | 12.3% | 12.4% | 12.0% | -0.3% |
| 17 | Brock | 112 | 87 | 2.39 | 2.71 | 1.98 | -0.73 | 0.0% | 0.0% | 0.1% | 0.1% |
| 18 | Uxbridge | 249 | 114 | 2.32 | 2.28 | 2.39 | 0.11 | 0.5% | 0.4% | 0.5% | 0.0% |
| 19 | Scugog | 298 | 96 | 2.31 | 2.25 | 2.44 | 0.19 | 0.5% | 0.6% | 0.2% | -0.4% |
| 20 | Pickering | 1,028 | 499 | 2.16 | 2.12 | 2.25 | 0.12 | 4.3% | 4.0% | 5.1% | 1.1% |
| 21 | Ajax | 1,043 | 653 | 2.07 | 2.03 | 2.12 | 0.09 | 5.0% | 5.6% | 4.2% | -1.3% |
| 22 | Whitby | 1,496 | 579 | 2.28 | 2.27 | 2.31 | 0.04 | 4.0% | 4.0% | 4.0% | 0.1% |
| 23 | Oshawa | 1,767 | 1,060 | 2.17 | 2.12 | 2.25 | 0.13 | 4.0% | 3.7% | 4.4% | 0.7% |
| 24 | Clarington | 1,044 | 615 | 2.29 | 2.33 | 2.23 | -0.10 | 1.5% | 1.7% | 1.1% | -0.6% |
| 25 | Georgina | 488 | 297 | 2.18 | 2.14 | 2.24 | 0.11 | 0.9% | 0.9% | 0.9% | 0.0% |
| 26 | East Gwillimbury | 340 | 152 | 2.20 | 2.26 | 2.06 | -0.19 | 0.9% | 0.9% | 1.2% | 0.3% |
| 27 | Newmarket | 904 | 407 | 2.24 | 2.21 | 2.30 | 0.10 | 2.5% | 2.5% | 2.5% | 0.1% |
| 28 | Aurora | 733 | 208 | 2.16 | 2.11 | 2.34 | 0.23 | 3.1% | 2.4% | 5.0% | 2.5% |
| 29 | Richmond Hill | 2,257 | 808 | 1.95 | 1.92 | 2.04 | 0.12 | 4.7% | 4.8% | 4.4% | -0.4% |
| 30 | Whitchurch-Stouffville | 550 | 193 | 2.21 | 2.19 | 2.25 | 0.06 | 2.5% | 2.4% | 2.6% | 0.2% |
| 31 | Markham | 3,869 | 1,259 | 1.95 | 1.95 | 1.93 | -0.02 | 4.7% | 4.6% | 5.2% | 0.6% |
| 32 | King | 275 | 108 | 2.30 | 2.32 | 2.25 | -0.07 | 1.8% | 2.6% | 0.1% | -2.5% |
| 33 | Vaughan | 2,965 | 1,575 | 2.09 | 2.07 | 2.12 | 0.05 | 5.5% | 5.9% | 4.8% | -1.1% |
| 34 | Caledon | 707 | 372 | 2.03 | 1.94 | 2.19 | 0.25 | 1.0% | 0.8% | 1.2% | 0.4% |
| 35 | Brampton | 4,155 | 2,771 | 1.85 | 1.81 | 1.91 | 0.10 | 5.3% | 5.4% | 5.2% | -0.3% |
| 36 | Mississauga | 7,393 | 3,682 | 1.99 | 1.98 | 2.00 | 0.03 | 7.0% | 7.0% | 7.0% | 0.1% |
| 37 | Halton Hills | 666 | 279 | 2.30 | 2.32 | 2.24 | -0.08 | 1.1% | 1.4% | 0.4% | -1.0% |
| 38 | Milton | 1,152 | 577 | 2.21 | 2.20 | 2.24 | 0.04 | 2.3% | 2.4% | 2.2% | -0.2% |

| Reg or PD | Name | Phase 1 Fall Surveys | Phase 2 Spring Surveys | Avg. Daily Trips per Person | | | | Transit Mode Share | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Survey Total | Phase 1 | Phase 2 | Diff. Spring vs. Fall | Survey Total | Phase 1 | Phase 2 | %-pt Diff. Spring vs. Fall |
| 39 | Oakville | 2,574 | 728 | 2.22 | 2.20 | 2.30 | 0.10 | 3.4% | 3.3% | 3.8% | 0.6% |
| 40 | Burlington | 2,542 | 754 | 2.40 | 2.42 | 2.32 | -0.11 | 2.1% | 1.9% | 3.1% | 1.2% |
| 41 | Flamborough PD | 567 | 226 | 2.37 | 2.32 | 2.52 | 0.21 | 0.9% | 0.9% | 0.7% | -0.2% |
| 42 | Dundas PD | 383 | 94 | 2.35 | 2.37 | 2.24 | -0.14 | 3.9% | 4.0% | 3.5% | -0.5% |
| 43 | Ancaster PD | 521 | 138 | 2.24 | 2.26 | 2.17 | -0.09 | 2.3% | 2.5% | 1.7% | -0.8% |
| 44 | Glanbrook PD | 356 | 178 | 2.30 | 2.35 | 2.20 | -0.15 | 1.2% | 0.5% | 2.6% | 2.1% |
| 45 | Stoney Creek PD | 754 | 424 | 2.32 | 2.40 | 2.18 | -0.22 | 1.6% | 2.0% | 1.0% | -0.9% |
| 46 | Hamilton PD | 3,839 | 2,245 | 2.32 | 2.31 | 2.34 | 0.03 | 7.3% | 7.3% | 7.2% | -0.1% |
| 51 | Grimsby | 400 | 108 | 2.26 | 2.21 | 2.55 | 0.34 | 0.5% | 0.6% | 0.1% | -0.5% |
| 52 | Lincoln | 344 | 96 | 2.36 | 2.39 | 2.23 | -0.17 | 0.9% | 0.5% | 2.3% | 1.8% |
| 53 | Pelham | 243 | 64 | 2.46 | 2.48 | 2.39 | -0.09 | 0.2% | 0.2% | 0.3% | 0.0% |
| 54 | Niagara-on-the-Lake | 284 | 59 | 2.22 | 2.26 | 2.00 | -0.26 | 0.1% | 0.0% | 0.4% | 0.4% |
| 55 | St. Catharines | 1,847 | 695 | 2.36 | 2.34 | 2.43 | 0.09 | 2.7% | 2.8% | 2.5% | -0.2% |
| 56 | Thorold | 228 | 150 | 2.30 | 2.42 | 2.06 | -0.36 | 3.5% | 4.5% | 1.1% | -3.4% |
| 57 | Niagara Falls | 1,077 | 489 | 2.24 | 2.21 | 2.31 | 0.10 | 1.8% | 2.2% | 0.9% | -1.3% |
| 58 | Welland | 639 | 327 | 2.31 | 2.31 | 2.31 | 0.00 | 1.6% | 1.5% | 1.6% | 0.0% |
| 59 | Port Colborne | 235 | 119 | 2.23 | 2.20 | 2.31 | 0.12 | 0.1% | 0.1% | 0.2% | 0.2% |
| 60 | Fort Erie | 397 | 186 | 2.07 | 1.99 | 2.22 | 0.23 | 1.1% | 0.5% | 2.3% | 1.9% |
| 61 | West Lincoln | 148 | 62 | 2.18 | 2.13 | 2.30 | 0.17 | 1.0% | 0.1% | 2.8% | 2.7% |
| 62 | Wainfleet | 98 | 29 | 2.39 | 2.47 | 2.13 | -0.34 | 0.1% | 0.0% | 0.5% | 0.5% |
| 63 | Waterloo | 1,692 | 499 | 2.38 | 2.34 | 2.55 | 0.21 | 5.3% | 6.0% | 2.5% | -3.6% |
| 64 | Kitchener | 3,163 | 1,294 | 2.37 | 2.33 | 2.49 | 0.16 | 4.6% | 4.8% | 3.8% | -1.0% |
| 65 | Cambridge | 1,485 | 743 | 2.29 | 2.25 | 2.35 | 0.10 | 2.5% | 2.9% | 1.6% | -1.3% |
| 66 | North Dumfries | 120 | 49 | 2.32 | 2.27 | 2.46 | 0.19 | 0.0% | 0.1% | 0.0% | -0.1% |
| 67 | Wilmot | 269 | 104 | 2.36 | 2.33 | 2.44 | 0.11 | 0.3% | 0.4% | 0.0% | -0.4% |
| 68 | Wellesley | 80 | 80 | 2.24 | 2.07 | 2.39 | 0.32 | 0.1% | 0.0% | 0.1% | 0.1% |
| 69 | Woolwich | 347 | 92 | 2.49 | 2.45 | 2.75 | 0.30 | 0.5% | 0.6% | 0.4% | -0.2% |
| 70 | Guelph City | 2,057 | 629 | 2.41 | 2.41 | 2.42 | 0.01 | 3.1% | 3.2% | 2.7% | -0.6% |
| 71 | Puslinch | 109 | 26 | 2.38 | 2.32 | 2.65 | 0.32 | 0.1% | 0.0% | 0.3% | 0.3% |
| 72 | Guelph/Eramosa | 184 | 37 | 2.33 | 2.26 | 2.75 | 0.48 | 0.1% | 0.1% | 0.0% | -0.1% |
| 73 | Centre Wellington | 451 | 95 | 2.37 | 2.30 | 2.65 | 0.35 | 0.2% | 0.3% | 0.0% | -0.3% |
| 79 | Erin | 147 | 75 | 2.34 | 2.21 | 2.55 | 0.33 | 0.6% | 1.0% | 0.1% | -0.9% |
| 80 | Orangeville | 333 | 169 | 2.23 | 2.13 | 2.41 | 0.28 | 1.1% | 1.1% | 1.0% | -0.1% |
| 81 | Barrie | 1,685 | 915 | 2.26 | 2.25 | 2.28 | 0.03 | 1.4% | 1.4% | 1.5% | 0.1% |
| 82 | Innisfil | 385 | 211 | 2.12 | 2.14 | 2.08 | -0.06 | 0.3% | 0.3% | 0.5% | 0.2% |
| 83 | Bradford-West Gwillimbury | 387 | 163 | 2.32 | 2.28 | 2.43 | 0.15 | 1.1% | 1.4% | 0.5% | -0.8% |
| 84 | New Tecumseth | 460 | 179 | 2.27 | 2.27 | 2.27 | 0.00 | 0.8% | 1.0% | 0.3% | -0.7% |
| 85 | Adjala-Tosorontio | 122 | 46 | 2.10 | 2.18 | 1.73 | -0.44 | 0.0% | 0.0% | 0.0% | 0.0% |
| 86 | Essa/CFB Borden | 199 | 130 | 2.21 | 2.22 | 2.21 | 0.00 | 0.5% | 0.5% | 0.5% | 0.0% |
| 87 | Clearview | 152 | 79 | 2.13 | 1.99 | 2.44 | 0.45 | 0.4% | 0.7% | 0.0% | -0.7% |
| 88 | Springwater | 228 | 77 | 2.24 | 2.24 | 2.25 | 0.01 | 1.0% | 0.7% | 1.9% | 1.2% |
| 89 | Kawartha Lakes | 844 | 49 | 2.12 | 2.13 | 2.00 | -0.13 | 0.4% | 0.4% | 0.0% | -0.4% |
| 103 | Peterborough City | 1,088 | 567 | 2.30 | 2.35 | 2.20 | -0.15 | 3.0% | 3.3% | 2.6% | -0.7% |
| 104 | Cavan Monaghan | 143 | 26 | 2.21 | 2.24 | 2.07 | -0.17 | 0.1% | 0.1% | 0.0% | -0.1% |

| Reg or PD | Name | Phase 1 Fall Surveys | Phase 2 Spring Surveys | Avg. Daily Trips per Person | | | | Transit Mode Share | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Survey Total | Phase 1 | Phase 2 | Diff. Spring vs. Fall | Survey Total | Phase 1 | Phase 2 | %-pt Diff. Spring vs. Fall |
| 106 | Otonabee-South Monaghan | 107 | 31 | 2.36 | 2.24 | 2.60 | 0.35 | 0.2% | 0.3% | 0.0% | -0.3% |
| 108 | Asphodel-Norwood | 36 | 29 | 1.99 | 2.04 | 1.93 | -0.11 | 0.0% | 0.0% | 0.0% | 0.0% |
| 109 | Douro-Dummer | 118 | 23 | 2.32 | 2.20 | 3.12 | 0.92 | 0.1% | 0.1% | 0.0% | -0.1% |
| 111 | Selwyn | 207 | 118 | 2.30 | 2.33 | 2.27 | -0.06 | 0.0% | 0.1% | 0.0% | -0.1% |
| 124 | Brant County | 443 | 168 | 2.26 | 2.30 | 2.20 | -0.10 | 0.4% | 0.6% | 0.0% | -0.6% |
| 127 | Collingwood | 379 | 97 | 2.32 | 2.26 | 2.51 | 0.25 | 0.8% | 1.0% | 0.3% | -0.7% |
| 128 | Wasaga Beach | 324 | 137 | 2.00 | 1.90 | 2.23 | 0.33 | 1.9% | 2.6% | 0.6% | -2.0% |
| 129 | Tiny & Christian Island | 172 | 64 | 1.90 | 1.96 | 1.73 | -0.22 | 0.0% | 0.0% | 0.0% | 0.0% |
| 130 | Penetanguishene | 128 | 50 | 2.15 | 2.12 | 2.20 | 0.08 | 1.0% | 0.3% | 2.6% | 2.3% |
| 131 | Midland | 257 | 85 | 2.37 | 2.40 | 2.22 | -0.18 | 0.8% | 1.0% | 0.0% | -1.0% |
| 132 | Tay | 107 | 69 | 2.05 | 2.02 | 2.10 | 0.08 | 0.6% | 1.0% | 0.0% | -1.0% |
| 133 | Oro-Medonte | 338 | 56 | 2.12 | 2.08 | 2.35 | 0.27 | 0.2% | 0.2% | 0.2% | 0.0% |
| 134 | Severn | 150 | 76 | 2.27 | 2.21 | 2.38 | 0.17 | 0.2% | 0.1% | 0.4% | 0.3% |
| 135 | Ramara & Chippewas of Rama FN | 111 | 98 | 2.04 | 1.72 | 2.37 | 0.65 | 0.2% | 0.1% | 0.3% | 0.2% |
| 136 | Orillia | 406 | 191 | 2.25 | 2.13 | 2.45 | 0.32 | 2.3% | 2.2% | 2.3% | 0.1% |
| 140 | Mulmur | 67 | 30 | 2.23 | 2.11 | 2.40 | 0.29 | 0.4% | 0.3% | 0.6% | 0.2% |
| 141 | Shelburne | 59 | 57 | 2.28 | 2.11 | 2.43 | 0.33 | 0.0% | 0.0% | 0.0% | 0.0% |
| 142 | Amaranth | 42 | 13 | 2.06 | 1.80 | 2.81 | 1.01 | 0.0% | 0.0% | 0.0% | 0.0% |
| 143 | Melancthon | 30 | 12 | 1.92 | 2.05 | 1.39 | -0.66 | 0.1% | 0.0% | 0.8% | 0.8% |
| 144 | Mono | 104 | 32 | 1.91 | 1.88 | 2.00 | 0.11 | 1.5% | 1.9% | 0.0% | -1.9% |
| 145 | Grand Valley | 35 | 26 | 1.70 | 1.79 | 1.59 | -0.19 | 0.0% | 0.0% | 0.0% | 0.0% |
| 146 | East Garafraxa | 38 | 15 | 2.32 | 2.41 | 1.73 | -0.67 | 0.1% | 0.1% | 0.0% | -0.1% |
| 147 | Brantford | 1,165 | 635 | 2.32 | 2.28 | 2.40 | 0.12 | 1.8% | 1.6% | 2.0% | 0.4% |
| 148 | Brighton | 171 | 38 | 1.87 | 1.87 | 1.88 | 0.01 | 1.6% | 0.6% | 7.2% | 6.6% |
| 149 | Cramahe | 70 | 30 | 1.89 | 1.66 | 2.35 | 0.70 | 0.0% | 0.0% | 0.0% | 0.0% |
| 150 | Hamilton Township | 134 | 55 | 2.10 | 2.09 | 2.12 | 0.03 | 0.6% | 0.8% | 0.0% | -0.8% |
| 151 | Port Hope | 209 | 107 | 2.21 | 2.08 | 2.47 | 0.39 | 1.7% | 2.0% | 1.2% | -0.8% |
| 152 | Cobourg | 262 | 135 | 2.32 | 2.09 | 2.62 | 0.53 | 3.6% | 1.8% | 5.4% | 3.6% |
| 153 | Alnwick/Haldimand | 105 | 43 | 2.05 | 2.00 | 2.20 | 0.21 | 0.4% | 0.3% | 0.6% | 0.2% |
| 154 | Alderville First Nation | 5 | 0 | 2.11 | 2.38 | 2.09 | -0.29 | 1.1% | 0.0% | 1.2% | 1.2% |
| 155 | Trent Hills | 139 | 98 | 2.12 | 2.08 | 2.30 | 0.22 | 0.0% | 0.0% | 0.0% | 0.0% |
| 156 | The Blue Mountains | 124 | 34 | 2.12 | 1.99 | 2.36 | 0.38 | 0.3% | 0.5% | 0.0% | -0.5% |
| 157 | West Grey | 130 | 87 | 2.04 | 2.07 | 2.01 | -0.05 | 0.1% | 0.0% | 0.2% | 0.1% |
| 158 | Southgate | 37 | 67 | 2.09 | 1.75 | 2.47 | 0.71 | 0.0% | 0.0% | 0.0% | 0.0% |
| 159 | Grey Highlands | 125 | 22 | 2.20 | 2.24 | 2.00 | -0.24 | 0.0% | 0.0% | 0.0% | 0.0% |
| 160 | Hanover | 95 | 44 | 1.92 | 1.97 | 1.80 | -0.17 | 0.0% | 0.0% | 0.0% | 0.0% |
| 161 | Chatsworth | 65 | 58 | 2.20 | 2.17 | 2.25 | 0.08 | 0.0% | 0.0% | 0.0% | 0.0% |
| 162 | Meaford | 157 | 56 | 1.99 | 2.04 | 1.83 | -0.21 | 0.0% | 0.0% | 0.0% | 0.0% |
| 163 | Georgian Bluffs | 120 | 53 | 2.28 | 2.27 | 2.29 | 0.02 | 1.3% | 0.2% | 2.7% | 2.5% |

Red text indicates smaller sample sizes (n<200 surveys). Shading is used to highlight high (blue shading) and low values (pink) in each column.

## 2.6. Day of Week of Surveyed Travel Day

As trip rates by day of week may vary, the balance of trips by day of week could potentially influence differences in travel patterns observed in the Fall and Spring survey samples. Table 17 and Figure 11 illustrate the distribution of surveys by day of week. There were higher proportions of surveys on Thursdays and on Fridays in both samples. Readers are referred to Section 1.3.8 for a discussion of reasons why the survey samples are biased towards the end of the week. It may be noted that the shortfalls on Monday tend to balance out the over-representation on Fridays, and that these two weekdays are likely to have lower trip rates. Taken together, these two days represent 39% of the sample – just slightly below the 40% proportion if the samples were entirely equally distributed by day of week. Similarly, when taken together, Tuesday, Wednesday, and Thursday represent 61% of the sample, or average to just over 20% per day for these higher-trip-rate days. While the profile by day of week is very similar in fall and spring, there are some slight differences, with Monday and Friday surveys (41.4%) representing proportionately more of the Spring surveys compared to the proportion in the Fall surveys (38.1%).

**Table 17: Proportion of surveys by day of week, Fall and Spring phases**

| Survey Day of Week | Survey Total | Phase 1 Fall | Phase 2 Spring | %-pt difference Phase 2 - Phase 1 |
|---|---|---|---|---|
| Monday | 14.0% | 13.5% | 15.3% | 1.8% |
| Tuesday | 17.2% | 17.2% | 17.1% | -0.2% |
| Wednesday | 17.2% | 18.2% | 15.0% | -3.1% |
| Thursday | 26.5% | 26.6% | 26.5% | -0.1% |
| Friday | 25.1% | 24.6% | 26.1% | 1.5% |

Shading is used to highlight high (blue shading) and low values (pink).

**Figure 11: Proportion of surveys by day of week**

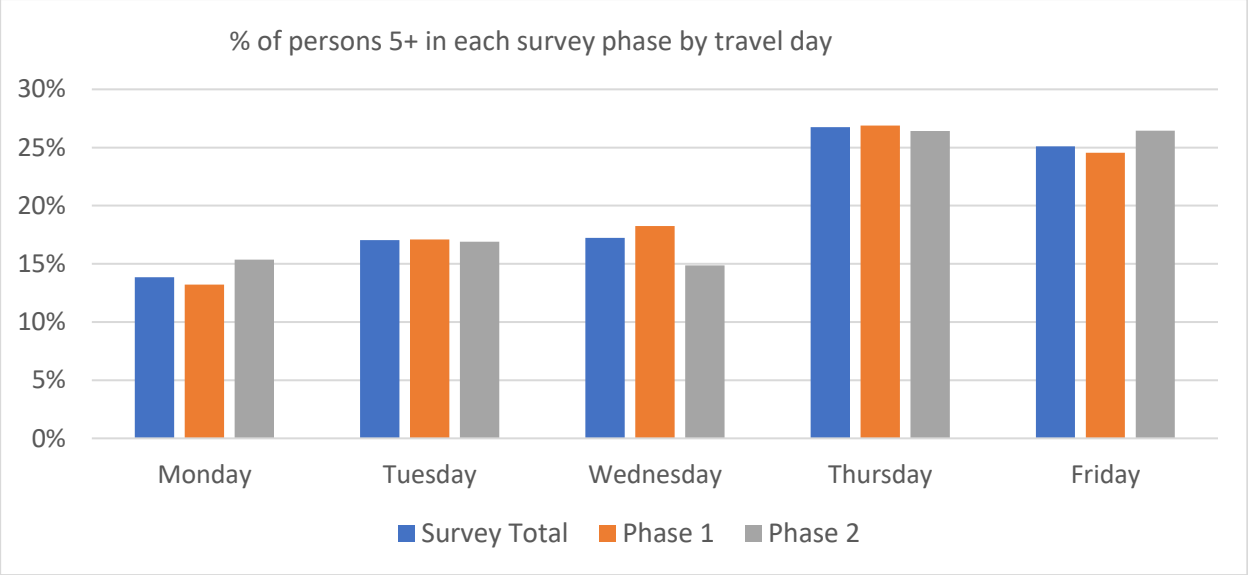


Table 18 breaks down by day of week of the number of people 5+ years of age and the daily trip rates for each day in each of the survey phases. In both Fall and Spring samples, people with travel days on Mondays and Fridays reported lower daily trips on average. The average daily trip rates have the same general profile by day of week in both phases. However, the Spring phase shows slightly higher trip rates compared to the Fall phase on all days of the week (although it is only different by 0.01 trips/day on Mondays and Fridays).

Table 19 provides the weekday breakdown for workers in each sample, and the proportion of workers on each day who reported at least one work trip. In both the Fall and Spring samples, workers with travel days on Mondays and Fridays were less likely to report trips to work compared with the other three weekdays. In the Spring phase, the proportion was higher on all days of the week.

**Table 18: Proportion of persons 5+ and daily trip rates by day of week, Fall and Spring phases**

| | % of persons 5+ | | | Avg. daily trips / person | | | | |
|---|---|---|---|---|---|---|---|---|
| Travel Day | Survey Total | Phase 1 | Phase 2 | Survey Total | Phase 1 | Phase 2 | Diff. Phase 2 vs Phase 1 | % Diff. |
| Monday | 14% | 13% | 15% | 2.06 | 2.06 | 2.07 | 0.01 | 0.5% |
| Tuesday | 17% | 17% | 17% | 2.17 | 2.14 | 2.25 | 0.11 | 5.2% |
| Wednesday | 17% | 18% | 15% | 2.21 | 2.20 | 2.24 | 0.03 | 1.5% |
| Thursday | 27% | 27% | 26% | 2.16 | 2.15 | 2.19 | 0.04 | 1.7% |
| Friday | 25% | 25% | 26% | 2.09 | 2.09 | 2.10 | 0.01 | 0.6% |
| Subtotal Mon, Fri | 39% | 38% | 42% | 2.08 | 2.08 | 2.09 | 0.01 | 0.6% |
| Subtotal Tues-Thurs | 61% | 62% | 58% | 2.18 | 2.16 | 2.22 | 0.06 | 2.6% |
| Total | 100% | 100% | 100% | 2.14 | 2.13 | 2.16 | 0.03 | 1.4% |

Shading is used to highlight high (blue shading) and low values (pink).

**Table 19: Proportion of workers and proportion of those workers who had at least one work trip by day of week, Fall and Spring phases**

| Travel Day | % of workers | | | % of workers with at least one work trip | | | |
|---|---|---|---|---|---|---|---|
| | Survey Total | Phase 1 | Phase 2 | Survey Total | Phase 1 | Phase 2 | %-Point Difference Phase 2 vs Phase 1 |
| Monday | 14% | 13% | 15% | 52.3% | 50.9% | 55.2% | 4.2% |
| Tuesday | 17% | 17% | 17% | 56.4% | 55.3% | 59.1% | 3.9% |
| Wednesday | 17% | 18% | 15% | 56.8% | 56.3% | 58.2% | 1.9% |
| Thursday | 27% | 27% | 28% | 56.9% | 56.1% | 58.8% | 2.7% |
| Friday | 26% | 25% | 25% | 51.1% | 50.9% | 51.6% | 0.7% |
| Subtotal Mon, Fri | 40% | 39% | 40% | 51.5% | 50.9% | 52.9% | 2.0% |
| Subtotal Tues-Thurs | 60% | 61% | 60% | 56.7% | 56.0% | 58.8% | 2.8% |
| Total | 100% | 100% | 100% | 54.7% | 54.0% | 56.3% | 2.3% |

Shading is used to highlight high (blue shading) and low values (pink).

## 2.7. Summary

To sum up, these results establish that:

- there are slight differences between the Fall and Spring surveys in terms of the distribution of surveys, persons 5+, and workers by day of week;
- in most planning districts, the share of workers who work from home appears to have shifted slightly between Fall and Spring;
- there are modest differences in overall trip rates by day of week;
- the trip rates and work commutes for Spring surveys are slightly higher than what was observed in the Fall sample; and
- the differences between fall and spring trips to school appear to be related to household members identified as post-secondary students being less likely to report attending school in the Spring survey; and
- it is possible that the slight differences in the balance of trips by day of week could slightly influence differences in trip rates and/or other travel patterns between the two survey phases.

Given the differences in composition of the two samples, discussed in the preceding sections, it would be difficult to draw the conclusion that the results above necessarily means that travel behaviours in the Spring period differ substantively from those in the Fall period, without controlling for other factors. The one difference that stands out as meaningful is the lower school attendance rate for post-secondary students in the Spring sample, although its impact is diluted by the fact the Spring sample only accounts for 30% of the total sample. The apparent drop in the share of workers who work from home is also interesting. While caution should be exercised when interpreting this result given the variety of small differences between the Spring and Fall samples,

this trend has a consistency across geographies and is in keeping with work arrangements still gradually evolving even well after the lifting of pandemic-related restrictions.

Given the complex nature of the Spring and Fall samples, and the differences in the characteristics of the persons and households surveyed in each phase, multivariate analysis is necessary to explore whether the other observed differences in observed travel behaviours can be attributed to something in addition to the differences in the person and household characteristics.

# 3. MULTIVARIATE ANALYSIS OF FALL AND SPRING DATA

This section of the report presents a multivariate analysis that was used to explore whether the difference in trip rates for Fall and Spring surveys is a product of seasonality or simply the product of differences in the composition of the two survey samples. A binomial regression model with a logarithm link was identified to be the most appropriate model for the nature of the dataset. A comprehensive variety of controls was tested for inclusion in the model and included the survey phase, household characteristics, demographic characteristics, and the type of geography the household was situated in (including type of population centre and population density). As the variables included in the testing included core variables used in the data weighting (dwelling type, household size, age, and gender), it was possible to conduct the analysis with unweighted data. The impact of survey phase on the overall average daily trip rate was tested, as well as the impact on discretionary and non-discretionary trips.

## 3.1. Approach

Malatest took steps to model the person trip rates to identify factors that are significantly affecting the number of trips a person reported in the survey. In addition to the number of reported person trips, the reported number of discretionary and non-discretionary trips were also explored. The main task was to determine the extent to which the following variables were influenced by the survey timing (Fall or Spring phase) while controlling for other factors.

- total number of reported trips per person
- number of reported nondiscretionary trips per person
- number of reported discretionary trips per person

For the purpose of this analysis, non-discretionary trips are trips to work or to school or returning from work or school where this could be identified (home-based work, home-based school, and non-home-based trips with a work or school destination).[13]

Discretionary trips comprise all other trip purposes. It may be noted that the discretionary trips include escort-passenger trips, which may include serving passengers with non-discretionary trip purposes (i.e., dropping children off or picking them up from school or daycare).

The analysis was undertaken using unweighted data. The model included most of the variables used as weighting controls (with the exception of specific sub-planning-district-level expansion

[13] Note that not all non-home-based trips to or from work or school are non-discretionary in nature. They may be discretionary when the trips are part of a sub-tour from the original commute destination, such as leaving work to run a personal errand then returning to work after running that errand. For analyses that focus only on the destination purpose, such trips may end up being classified as having non-discretionary purposes, even though they may be part of what may be considered a discretionary sub-tour.

zone geographies), so weighting the data was not strictly necessary to determine whether the model variables have an impact on trip rates.

## 3.2. Variables to Assess or Control For

Given the complexity of the collected survey data, a good number of measures can be used to assess their impact on reported trips per person. These variables could be person-level, like age, gender, etc. or household-level, like number of vehicles, household size, etc. The variables could also be of categorical or numeric type. Variables like completion method, dwelling type, etc. are categorical while household size, number of employed persons in a household, etc. are numeric variables.

It is worth noting that in a statistical model, the effect of categorical variables are assessed differently compared to numeric variables. It is common to compare the categories in a categorical variable using ratios. For example, those completing the survey on a PC might be X times more likely to report a trip compared to those completing on a mobile phone.

Table 20 below lists the variables that are included in the model. The variables without any significant effect or difference with the baseline will not appear in the model output.

Note that it would have been difficult to control for differences in geographical distribution by sampling zone or planning district between the Fall and Spring samples, given the enormity of the study area and the number of distinct municipalities and sub-municipal areas within the study area. Therefore, three variables were developed to attempt to better control for geographic differences: a simple variable identifying whether the household was within or outside the Greater Toronto and Hamilton Area (GTHA), a composite variable combining the Statistics Canada population centre type and population centre size classification at the Dissemination Block level (which allows a differentiation between urban and rural areas), and an urban density classification based on population per square kilometre at the Dissemination Area level.[14] This is predicated on the assumption that work locations, workplace arrangements, school locations, commuting patterns, and patterns of travel are likely to be similar for people living in areas with similar urban or rural characteristics. For example, people living in a high-density portion of an urban core of a medium-sized city may have similar access to transportation options, proximity to services and amenities, proximity to work, work arrangements, and even lifestyle, whether they are in the Kitchener downtown core, Oshawa downtown core, or the downtown core of another similarly-sized municipality, whereas those in more suburban areas may be more closely aligned with other suburban areas elsewhere in the study area.

[14] Dissemination Blocks and Dissemination Areas are standard geographical units used by Statistics Canada for dissemination information collected by the federal Census. Dissemination Blocks are the smallest geographic areas for which population and dwelling counts are disseminated. Dissemination Areas are aggregations of Dissemination Blocks and are the smallest geographical areas for which detailed Census Profile information are released; they have typical population ranges of between 400 and 700 persons. For more information on these and other Statistics Canada geographies see *Standard Geographical Classification (SGC) 2021 - Volume I, The Classification* (https://www150.statcan.gc.ca/n1/pub/12-571-x/12-571-x2021001-eng.pdf).

In a preliminary version of the model that was tested, survey month was included (and showed slightly higher trip rates in October, November, and December and lower trip rates in May), but then was removed in the final version. In the preliminary version of the model, inclusion of month tended to confound the interpretation of the results, given that the influence of phase and month would be multiplicative.

Appendix A provides a full listing of variables assessed, including the individual binary baseline/indicator variables developed for the model from the categorical variables listed below.

**Table 20: Summary of variables assessed in the model**

| Variable Name | |
|---|---|
| trip_period | Survey Phase – Fall or Spring |
| surveymethod | Telephone vs. Online via PC device vs. Online vs. Smartphone device |
| sampletype | Address-and-phone or address-only |
| region_gtha | Inside or outside of the GTHA |
| popctrgrp | Statistics Canada population centre type (core, secondary core, population centre outside the Census Metropolitan Area (CMA), fringe of CMA/CA (Census Agglomeration), rural inside CMA/CA, rural outside CMA/CA) combined with the population centre classification (large, medium, small) of the Dissemination Block of the household combined. |
| densitysqkmgp | Based on the density of the Statistics Canada Dissemination Area, grouped into rural (<400 population per sq. km.), low (400 to 1,500), medium (1,500 to 5,000), high (5,000 to 15,000), and very high (>15,000) |
| dwell_type | Dwelling type |
| incomegrp | Household income range |
| novehicles | Indicates whether the household has no vehicles or at least one vehicle |
| hhhaschildren | Indicates whether the household has children or no children |
| hh0workers | Indicates whether the household has no workers or has workers |
| primaryrespondent | Indicates whether the person and trip records for the given household member were filled out by the primary survey respondent or were filled out on behalf of the household member by the primary respondent. |
| agegrp | Age range |
| gender | Gender, men+ or women+ (randomly assigning a portion of non-binary, other, and refused responses to men+ or women+ categories) |
| licence | Has a driver's licence or not |
| transitpass | Has a transit pass or not |
| immigrant | Born in Canada, or if not, year range of immigration |
| ethnicity | Ethnic origin or cultural background |
| workerb | Worker or non-worker |
| workfromhome | Works exclusively from home (as opposed to a usual workplace or no fixed workplace) |

| Variable Name | |
|---|---|
| occtypegrp | Occupation type. Three groups aggregating individual categories on the survey into, generally: management, business, administration, professional, and technical occupations; sales and service occupations; and trades, transportation, manufacturing, agricultural, and natural resource occupations. |
| studentK12school | Student in the K12 system |
| studentK12homeschool | Home schooled student |
| studentPSEft | Full-time post-secondary student |
| studentPSEpt | Part-time post-secondary student |
| trip_day | Trip day of the week (Monday through Friday) |

## 3.3. Statistical Model

For statistical modelling, a few models were evaluated for suitability. A linear regression model was not chosen because the normality assumption failed. A Poisson regression model was not chosen because of overdispersion, i.e., conditional means were not equal to conditional variances. This is why a negative binomial model with a logarithm link was chosen.

The mathematical form of the model is:

$$\ln(NpersTrips) = Intercept + b_i I(variable_i)$$

Where $i$=1 to 70 from the above table and $I(variable_i)$ is the indicator function portraying the i$^{th}$ variable.

$$NpersTrips = e^{Intercept + b_i I(variable_i)}$$

The model intercept and coefficients along with the 95% confidence interval are provided in Appendix B for total trips, discretionary trips and nondiscretionary trips.

The incident rate ratio or the exponentiated model coefficients along with the 95% confidence interval are provided in Appendix C for total trips, discretionary trips, and nondiscretionary trips.

## 3.4. Analysis Results

The regression analysis determined that the phase during which the survey data was collected appears to have only a very modest impact on the daily trip rate. While the phase tested as statistically significant, the impact on trip rates is only very modest and associated primarily with discretionary trips. Other factors controlled for in the model have a much larger influence on trip rates. The analysis yielded the following results with respect to the influence of survey phase:

- The log odds of reporting more trips for those completing the survey in the Fall phase is 0.96 times that for those completing the survey in the Spring phase. The inverse is that there is a log odds of 1.04 that the Spring phase has a higher overall trip rate, when controlling for other factors.

- The odds of reporting more discretionary trips in the Fall phase is 0.94 times that for those completing the survey in the Spring phase. The inverse is that there is a log odds of 1.07 that the Spring phase has a higher per-person discretionary trip rate, when controlling for other factors.
- The model did not find a statistically significant difference in terms of non-discretionary trip rates for persons surveyed in the two phases (i.e., the variable was dropped from this model). This suggests that commuting patterns were not significantly different on the basis of survey phase, when controlling for other factors.

Overall, the results of the multivariate analysis suggest that there is little difference between Spring and Fall phases when controlling for other factors, with respondents in the Spring phase slightly more likely to report discretionary trips, but no difference in non-discretionary (commute and work-related) trips. I.e., the observed differences in the Fall and Spring samples may have more to do with differences in the composition of the two samples than with the season.

Note that while geography-related variables were introduced into the model it would be impossible to fully control for differences in geographic distribution between the Fall and Spring sample within the cells created by the geographic stratification used in the model (GTHA vs. non-GTHA, type of population centre, and density), which could influence the differences observed between Fall and Spring trip rates.

It is also important to note that many variables show up as statistically significant in the model due to the large number of person records (n=356,580), which reduces variability, even if their impact may be slight or modest. Quite a few variables show up as having a more notable impact on the number of reported trips.

Selected variables are listed below with their odds ratios (Table 21). Looking at variables with more consequential odds ratios, e.g., more than 1.10 or less than 0.90, the following observations can be made:

- Factors with the greatest influence on *higher overall trip rates* include being a K-12 student or a worker; having a driver's licence; being the primary survey respondent; having a Jewish, American, Oceanic, European, or Indigenous ethnic origin or cultural background; having children in the household; and having no workers at all in the household.
- Factors with the greatest influence on *lower overall trip rates* include being over the age of 80 or between 18 and 24, working from home, being a home-schooled K-12 student, and having a household income of less than $40,000 per year.
- Factors with the greatest influence on *higher discretionary trip rates* include having a driver's licence; being the primary survey respondent;[15] having children in the household; being older than 25 years of age (with highest likelihood for those between 35 and 74);

[15] Primary survey respondents may be more likely to report discretionary trips for themselves than for other household members they are also reporting on (proxy respondents). The survey respondent may not always know about all discretionary trips made by other household members (e.g., leaving the office during the day to grab lunch).

working from home; having a Jewish, American, Oceanic, European, or Indigenous ethnic origin or cultural background; and having no workers in the household.

- Factors with the greatest influence on *lower discretionary trip rates* include being a worker, K-12 student or full-time post-secondary student; being in a trades, transport, manufacturing, natural resources, or agriculture occupation; having a household income of less than $40,000 per year; being an immigrant; having a South Asian, Southeast Asian, or African ethnic origin or cultural background; living in a rural area outside a Census Metropolitan Area or Census Agglomeration; and having a transit pass.
- Factors with a massive influence on *higher non-discretionary (commute and work-related) trip rates* quite obviously include being a worker, K-12 student, or full-time post-secondary student. To a lesser extent, the following factors are also associated with higher incidence of non-discretionary trips: being a part-time post-secondary student; being in a trades, transport, manufacturing, natural resources, or agriculture occupation; and having a travel day of Tuesday, Wednesday, or Thursday. Of note, fewer variables were found to have a statistically significant relationship to the incidence of discretionary trips than in the other models.
- Factors with a massive influence on *lower non-discretionary (commute and work-related) trip rates* include working from home, not having any workers in the household, and being over the age of 65. It may be noted that other age ranges associated with lower odds of non-discretionary trips include all age ranges between 11 to 64. This should be interpreted in the context of the massive odds associated with higher non-discretionary trips for being a worker or student, with the odds for any given person being multiplicative across all factors for that person. Other factors associated with lower odds of non-discretionary trips include being home-schooled and employment in sales and service occupations (which may be more likely to be part-time and/or have weekend work with days off on weekdays).

The weak impact of survey phase on non-discretionary trip rates when controlling for other factors, and lack of impact on non-discretionary trips, coupled with the strong results for a number of other controls that have an influence on trip raters, support the idea that for the most part, observed differences in the Fall and Spring samples are not inherently because of seasonality (although seasonality may have a weak impact). Given that there are differences in composition in the Fall and Spring samples for certain of the variables that have more of an impact on trip rates and given the differences in balance of Fall and Spring samples by geography, one may conclude that the differences between Fall and Spring samples are not large enough to be a concern when analysing the data as a whole.

The only exception is the incidence of school attendance observed in the bivariate analysis in Section 2.3.3. Trips to school by full-time post-secondary students only represent a small portion of total trips. Therefore, in the multivariate analysis, this does not manifest in a statistically significant difference in non-discretionary trips as a whole. This may be because many post-secondary students on summer break would also be working and thus have non-discretionary trips to and from work to substitute for the school trips not taken. It was not within scope to build another multivariate model to test the incidence of just post-secondary school trips relative to Spring and

Fall phases. However, even if the findings in the bivariate analysis on the bias in post-secondary students' reduced school attendance in the Spring sample are affected by other factors that vary between the phases (such as geography and other characteristics), the strength of the differences in post-secondary attendance observed in the bivariate analysis is enough for the findings to stand as a caveat to the 2022 dataset.

**Table 21: Selected odds ratios (for statistically significant variables in the model)**

| Variable | Total trips model | Discretionary trips model | Non-discretionary (i.e. commute and work-related) trips |
|---|---|---|---|
| **Odds ratio for model intercept** | **1.15** | **0.64** | **0.52** |
| **Survey phase:** | | | |
| **Fall phase** | **0.96** | **0.94** | **not significant** |
| **Higher odds for total trips (log odds >1.05):** | | | |
| K-12 student | 1.70 | 0.76 | 3.43 |
| Has driver's licence | 1.40 | 1.65 | 0.88 |
| Is the primary survey respondent | 1.34 | 1.54 | 0.98 |
| Worker | 1.25 | 0.65 | 4.73 |
| Children in household | 1.25 | 1.45 | 0.96 |
| No workers in household | 1.15 | 1.18 | 0.18 |
| Mixed mode survey (partial online / partial by phone) | 1.09 | 1.10 | not significant |
| Full-time post-secondary student | 1.09 | 0.71 | 1.87 |
| Part-time post-secondary student | 1.07 | not significant | 1.18 |
| Jewish, American, Oceanian, European, or Indigenous ethnic origin or cultural background | 1.07 to 1.24 | 1.14 to 1.46 | not significant |
| Wednesday travel day | 1.05 | not significant | 1.13 |
| Tuesday travel day | 1.05 | not significant | 1.12 |
| **Higher or lower odds for discretionary or non-discretionary trips (log odds >1.05 or <0.95) but minimal effect on total trips (log odds between 0.96 and 1.04):** | | | |
| Age 35-54 | 1.04 | 1.49 | 0.54 |
| V. high density (>15K pop/sq km) | 1.04 | 1.09 | not significant |
| Low density (400 to 1500/sq km) | 1.04 | 1.06 | not significant |
| High density (5K to 15K/sq km) | 1.04 | 1.06 | not significant |

| Variable | Total trips model | Discretionary trips model | Non-discretionary (i.e. commute and work-related) trips |
|---|---|---|---|
| Occupation in trades, transport, manufacturing, natural resources, agriculture, etc. | 1.04 | 0.77 | 1.25 |
| Thursday | 1.03 | 0.98 | 1.11 |
| Sales or service occupation | 1.03 | not significant | 0.83 |
| Age 55-64 | 1.02 | 1.44 | 0.53 |
| Age 65-74 | not significant | 1.48 | 0.37 |
| Female | 1.01 | 1.03 | 0.93 |
| Address and phone sample | 0.97 | 0.94 | not significant |
| GTHA | 0.97 | 0.95 | 0.98 |
| Urban fringe or other population centre outside a CMA/CA | 0.97 | 0.94 | not significant |
| Household income $40K-$80K | 0.97 | 0.93 | 1.05 |
| Has transit pass | 0.97 | 0.89 | not significant |
| **Lower odds for total trips (log odds<0.95):** | | | |
| Age 25-34 | 0.95 | 1.29 | 0.52 |
| Completed by mobile phone | 0.95 | 0.93 | not significant |
| No household vehicles | 0.94 | not significant | 0.91 |
| Age 11-17 | 0.93 | 0.91 | 0.79 |
| Immigrated 3+ years ago (3-5 years, 5-10 years, 10-15 years, 15+ years) | 0.91 to 0.92 | 0.85 to 0.92 | not significant exc. 3 to 5 years ago, 0.97 |
| Rural outside a CMA/CA | 0.92 | 0.89 | 0.96 |
| South Asian, East Asian, Southeast Asian, or African ethnic origin or cultural background | 0.90 to 0.95 | 0.85 to 0.89 | not significant exc. South Asian, East Asian, 0.97-0.99 |
| Household income < $40K/year | 0.87 | 0.83 | 1.09 |
| Home schooled K12 student | 0.87 | not significant | 0.66 |
| Age 18-24 | 0.86 | not significant | 0.54 |
| Work from home | 0.76 | 1.38 | 0.14 |
| Age 80 or older | 0.76 | 1.13 | 0.10 |
| **Statistically significant but not consequential in any model (log odds between 0.96 and 1.04)** | | | |
| Medium density (1.5K to 5K/sq km) | 1.03 | 1.04 | not significant |
| Caribbean, Middle Eastern/North African (MENA), or Latin ethnic origin or cultural background | not significant exc. Latin, 1.02 | not significant exc. MENA, Latin 0.96-1.02 | not significant exc. Caribbean, MENA, 0.97-1.04 |
| Income between $80K and $125K/year | 1.01 | not significant | 1.03 |
| Townhouse | 0.99 | not significant | not significant |

| Variable | Total trips model | Discretionary trips model | Non-discretionary (i.e. commute and work-related) trips |
|---|---|---|---|
| Small or medium urban core | 0.98 | 0.96 | not significant |
| Phone survey | 0.97 | 0.97 | not significant |

See Appendix A for the list of baseline variables.

Note that the odds ratio is a convenient way of expressing the impact of different variables in the model on the observed characteristic. It is important to understand that since this is a logarithmic model, the odds ratio cannot be applied directly, in a linear fashion, to the trip rate. I.e., the odds ratio is not a multiplication factor that can be applied directly to the average trip rate.

Note also that the model only examined trip making overall, and for discretionary and non-discretionary purposes. It did not investigate the impact of seasonality on mode choice, which may bear further investigation.

# 4. CONCLUSIONS

The analysis of the sample characteristics and the travel patterns suggests that there are minor differences between the two samples for most of the key variables of interest. The results for the combined samples are very close to the results for the Fall sample, as the Spring sample only represents 30% of the weight of the total results. Overall, it is reasonable to combine Fall and Spring for analysis, with the only meaningful seasonal bias identified being some under-reporting of trips to post-secondary school in the Spring sample. This bias in the Spring sample has only a modest impact on the full dataset (Fall and Spring combined) and can serve as a caveat the combined dataset.

Some of the differences between survey results may be partially explained as being a function of the variance of the survey itself (maximum error of +/- 0.75% for overall results, 19 times out of 20). Other factors may have contributed to some of the observed differences such as different geographic distributions and resulting differences in household/demographic characteristics.

The multivariate analysis confirms that while the survey phase has an impact on total trips and discretionary trips, this impact is minimal, and there is no impact on non-discretionary trips. Commute trips tend to be longer and more likely to be by motorized modes, whether automobile or transit, and are thus quite important for transportation modelling, so the finding that collecting data in the Spring did not introduce bias into non-discretionary trip rates, when controlling for other factors, is a positive one.

It would be difficult to determine with certainty the causes for the confirmed slight impact of the Spring phase on trip rates. Potential causes include differences in the hours of daylight, weather, the continued evolution of human activity patterns post-COVID, and/or other factors such as the limited ability in the multivariate analysis to control for the notable differences in geographical distribution between the two samples.

In this analysis, one issue that has been identified is the difference in trips to attend school, particularly for full-time post-secondary students, with some household members being reported as post-secondary students even when they are not attending classes. For full-time post-secondary students, the incidence of school attendance in the combined Fall and Spring sample is 39.9%, which is lower than the Fall measurement of 47.4%. For part-time post-secondary students, the incidence of travel to school is 12.3% in the combined sample, compared to 13.5% in the Fall measurement, a less dramatic difference. In the context of the total dataset, trips with a destination of school made by post-secondary students constituted 1.4% of total trips by all persons 5+ years in the Fall sample and 0.7% in the Spring sample, which, when combined, translates to 1.2% of trips in the overall sample, a modest difference from the Fall average. One can expect similar differences in the proportion of total trips with post-secondary school as their origin.[16] The under-representation of post-secondary school attendance is the one meaningful

[16] The figures noted are based on post-secondary students' trips with a destination purpose of school, therefore, one can expect an equal number of trips leaving school as well.

seasonal bias with an appreciable impact on trip characteristics that was found in the survey results, albeit with a small impact relative to total trips. This observation may be an important consideration for modelling purposes and other kinds of analysis with the 2022 TTS dataset. Nevertheless, given the relatively small impact on the full dataset, for most analyses it may be sufficient for this bias to simply be a caveat associated with the dataset, as the magnitude of the impact is not likely to significantly affect most interpretations of the survey results. The bias in post-secondary school attendance in the Spring data may also be an important consideration for future surveys in which Spring survey cycles are to be considered, with potential implications for the survey timing and/or the need for additional clarification questions required for surveys conducted after the winter post-secondary school term ends.

Overall, given the small effects of the survey phase in the multivariate analysis, and the small relative differences in key travel patterns by survey phase, the conduct of surveys in the Spring has not unreasonably biased the survey results from a typical fall measurement. Furthermore, given that the Spring sample represents only 30% of all surveys, the differences between the overall survey averages and the fall averages are even smaller than the differences observed between the Fall and Spring surveys. Even if there was a statistically significant but very small bias effect to the Spring sample, the small differences this would introduce to the overall result are not likely to make much difference in how the survey results can be interpreted, modelled, or compared to previous survey cycles for trend analysis. The exception is the caveat that there is some under-representation of trips to attend school amongst full-time post-secondary students in the Spring sample, which has only modest overall impact on the overall results, but which may affect some more specific analyses focussing on such students.

# APPENDICES

# Appendix A: Variables Assessed in the Model

**Table 22: Detailed list of variables**

| Variable Name | Categories | Baseline | Indicator variable name used in the model | Level |
|---|---|---|---|---|
| trip_period | 1. Phase1 Fall<br>2. Phase2 Spring | Phase2 | Phase1 | Household |
| region_gtha | 1. GTHA<br>2. Non-GTHA | nongtha | gtha | Household |
| popctrgrp | 1. Urban core or secondary core large<br>2. Urban core or secondary core small medium<br>3. Fringe or other population centre outside the core<br>4. Rural within CMA or CA<br>5. Rural outside CMA or CA | urbancorelarge | urbancoresmallmed<br>fringeorotherpopctr<br>ruralinCMA<br>ruraloutCMA | Household |
| surveymethod | 1. PC<br>2. Mobile<br>3. Phone<br>4. mixed | PC | mobile<br>phone<br>mixedmode | Household |
| sampletype | 1. Addrphsample<br>2. OtherSampleTypes | OtherSampleTypes | Addrphsample | Household |
| densitysqkmgp | 1. densityvhi15kplus<br>2. densityhi5kto15k<br>3. densitymed1500to5k<br>4. densitylo400to1500<br>5. densityrural400less | densityrural400less | densityvhi15kplus<br>densityhi5kto15k<br>densitymed1500to5k<br>densitylo400to1500 | Household |
| dwell_type | 1. house<br>2. apt<br>3. townhouse | house | apt<br>townhouse | Household |
| incomegrp | 1. income125plus<br>2. income0040<br>3. income4080<br>4. income80125<br>5. incomedk | income125plus | income0040<br>income4080<br>income80125<br>incomedk | Household |
| novehicles | 1- Novehicle<br>0- havevehicle | havevehicle | novehicle | Household |
| hhhaschildren | 1- Havechildren<br>0- nochildren | nochildren | hhhaschildren | Household |
| hh0workers | 1- 0 workers<br>0- 1 or more workers | oneplusworkers | Hh0workers | Household |
| primaryrespondent | 1- Primaryrespondent<br>2- Secondary respondent | secondary-respondent | primaryrespondent | Household |

| Variable Name | Categories | Baseline | Indicator variable name used in the model | Level |
|---|---|---|---|---|
| agegrp | 1- age5to10<br>2- age11to17<br>3- age18to24<br>4- age25to34<br>5- age35to54<br>6- age55to64<br>7- age65to74<br>8- age80plus | age5to10 | age11to17<br>age18to24<br>age25to34<br>age35to54<br>age55to64<br>age65to74<br>age80plus | Person |
| gender | 1- Female<br>2- male | male | female | Person |
| licence | 1- has licence<br>2- no licence | nolicence | haslicence | Person |
| transitpass | 1- hastransitpass<br>2- notransitpass | notransitpass | hastransitpass | Person |
| immigrant | 1- immigrant0to2<br>2- immigrant3to5<br>3- immigrant5to10<br>4- immigrant10to15<br>5- immigrant15plus<br>6- immigrantnonres | Immigrant0to2 | immigrant3to5<br>immigrant5to10<br>immigrant10to15<br>immigrant15plus<br>immigrantnonres | Person |
| ethnicity | 1- eth_africa<br>2- eth_easia<br>3- eth_seasia<br>4- eth_sasia<br>5- eth_canada<br>6- eth_caribb<br>7- eth_europe<br>8- eth_indigen<br>9- eth_latin<br>10- eth_mideast<br>11- eth_ocean<br>12- eth_america<br>13- eth_jewish | eth_canada | eth_africa<br>eth_easia<br>eth_seasia<br>eth_sasia<br>eth_caribb<br>eth_europe<br>eth_indigen<br>eth_latin<br>eth_mideast<br>eth_ocean<br>eth_america<br>eth_jewish | Person |
| workerb | 1- Worker<br>2- notworker | notworker | workerb | Person |
| workfromhome | 1- workfromhome<br>2- usualworkplace/ nousualworkplace | usualnousualworkplace | workfromhome | Person |
| occtypegrp | 1- occtype1to5<br>2- occtype8to11<br>3- occtype6to7 | occtype1to5 | occtype8to11<br>occtype6to7 | Person |
| studentK12school | 1- studentK12school<br>2- notstudentK12school | notstudentK12school | studentK12school | Person |
| studentK12homeschool | 1. studentK12homeschool<br>2. notStudentK12homeschool | notStudentK12homeschool | studentK12homeschool | Person |

| Variable Name | Categories | Baseline | Indicator variable name used in the model | Level |
|---|---|---|---|---|
| studentPSEft | 1. studentPSEft<br>2. notstudentPSEft | notstudentPSEft | studentPSEft | Person |
| studentPSEpt | 1. studentPSEpt<br>2. notstudentPSEpt | notstudentPSEpt | studentPSEpt | Person |
| trip_day | 1. monday<br>2. tuesday<br>3. wednesday<br>4. thursday<br>5. friday | monday | tuesday<br>wednesday<br>thursday<br>friday | Trip |

# Appendix B: Model Coefficients

**Table 23: Coefficients for total person trips**

| Y=n_pers_trips | Estimate | Lower (0.025) | Upper (0.975) |
|---|---|---|---|
| **(Intercept)** | 0.1386498 | 0.1212513 | 0.1560362 |
| **mobile** | -0.0491356 | -0.0564887 | -0.0417886 |
| **phone** | -0.0301359 | -0.0419405 | -0.0183497 |
| **mixedmode** | 0.0868549 | 0.0733358 | 0.1003473 |
| **addrphsample** | -0.0314861 | -0.0371376 | -0.0258358 |
| **phase1** | -0.0359121 | -0.0415612 | -0.0302609 |
| **gtha** | -0.0336593 | -0.0407393 | -0.0265769 |
| **urbancoresmallmed** | -0.0248998 | -0.0352387 | -0.0145721 |
| **fringeorotherpopctr** | -0.0337087 | -0.0509955 | -0.0164636 |
| **ruraloutCMA** | -0.088329 | -0.1082128 | -0.0684854 |
| **densityvhi15kplus** | 0.0400847 | 0.0259241 | 0.0542443 |
| **densityhi5kto15k** | 0.0384349 | 0.027321 | 0.0495576 |
| **densitymed1500to5k** | 0.0309417 | 0.0208308 | 0.0410638 |
| **densitylo400to1500** | 0.0391246 | 0.0272612 | 0.0509919 |
| **townhouse** | -0.0074911 | -0.0162377 | 0.001245 |
| **income0040** | -0.1354402 | -0.1470047 | -0.1238912 |
| **income4080** | -0.0341567 | -0.0417442 | -0.0265738 |
| **income80125** | 0.0076699 | 0.0010773 | 0.0142593 |
| **novehicles** | -0.0624602 | -0.0747765 | -0.0501598 |
| **hh0workers** | 0.1427446 | 0.1328649 | 0.1526275 |
| **primaryrespondent** | 0.2943331 | 0.2884289 | 0.3002384 |
| **age11to17** | -0.0704425 | -0.0853481 | -0.0555346 |
| **age18to24** | -0.1508022 | -0.1675183 | -0.1341099 |
| **age25to34** | -0.0472626 | -0.0588605 | -0.0356685 |
| **age35to54** | 0.0407877 | 0.0308276 | 0.0507482 |
| **age55to64** | 0.0219438 | 0.0128841 | 0.0310022 |
| **age80plus** | -0.2774327 | -0.2911338 | -0.2637576 |
| **female** | 0.0066571 | 0.001363 | 0.0119513 |
| **haslicence** | 0.3380511 | 0.3277099 | 0.3484028 |
| **hastransitpass** | -0.0308282 | -0.0412253 | -0.0204466 |
| **immigrant3to5** | -0.0823816 | -0.1024308 | -0.0623956 |
| **immigrant5to10** | -0.0945957 | -0.1114616 | -0.0777728 |
| **immigrant10to15** | -0.0897839 | -0.1054752 | -0.074129 |
| **immigrant15plus** | -0.082742 | -0.0899546 | -0.0755325 |
| **eth_africa** | -0.0563705 | -0.0802996 | -0.0325408 |
| **eth_easia** | -0.0688556 | -0.0783494 | -0.0593706 |
| **eth_seasia** | -0.0599539 | -0.0729114 | -0.0470192 |

| Y=n_pers_trips | Estimate | Lower (0.025) | Upper (0.975) |
|---|---|---|---|
| **eth_sasia** | -0.1055724 | -0.1171628 | -0.0939977 |
| **eth_europe** | 0.0943531 | 0.0880601 | 0.100644 |
| **eth_indigen** | 0.0638527 | 0.0333875 | 0.0941652 |
| **eth_latin** | 0.0215177 | 0.0036972 | 0.0392903 |
| **eth_ocean** | 0.1011598 | 0.0338185 | 0.1677529 |
| **eth_america** | 0.1716526 | 0.1234336 | 0.2194922 |
| **eth_jewish** | 0.2161806 | 0.1638656 | 0.2681038 |
| **workerb** | 0.2215077 | 0.2123091 | 0.2307112 |
| **workfromhome** | -0.2688815 | -0.2790404 | -0.2587367 |
| **occtype8to11** | 0.0352361 | 0.024282 | 0.0461783 |
| **occtype6to7** | 0.030161 | 0.0193929 | 0.0409165 |
| **studentK12school** | 0.5330658 | 0.5162269 | 0.5499038 |
| **studentK12homeschool** | -0.1379936 | -0.1666402 | -0.1095052 |
| **studentPSEft** | 0.0844101 | 0.0659302 | 0.1028627 |
| **studentPSEpt** | 0.0706435 | 0.0456485 | 0.0955385 |
| **tuesday** | 0.0468144 | 0.039405 | 0.0542202 |
| **wednesday** | 0.0513387 | 0.0439293 | 0.0587447 |
| **thursday** | 0.0301741 | 0.023699 | 0.0366479 |
| **hhhaschildren** | 0.2200004 | 0.2125219 | 0.2274777 |

**Table 24. Coefficients for discretionary trips**

| Y=n_discretionary_trips | Estimate | Lower (0.025) | Upper (0.975) |
|---|---|---|---|
| (Intercept) | -0.4411014 | -0.476818 | -0.4054018 |
| mobile | -0.0732262 | -0.0860829 | -0.0603665 |
| phone | -0.0353688 | -0.05422 | -0.0165045 |
| mixedmode | 0.094356 | 0.071628 | 0.1171127 |
| addrphsample | -0.0572044 | -0.066785 | -0.0476236 |
| phase1 | -0.0652801 | -0.0749083 | -0.0556538 |
| gtha | -0.0479069 | -0.059976 | -0.0358403 |
| urbancoresmallmed | -0.0449148 | -0.0625 | -0.0273203 |
| fringeorotherpopctr | -0.0634036 | -0.092676 | -0.0340948 |
| ruraloutCMA | -0.118106 | -0.15118 | -0.0850051 |
| densityvhi15kplus | 0.081692 | 0.0581295 | 0.105255 |
| densityhi5kto15k | 0.0606322 | 0.0417651 | 0.0794928 |
| densitymed1500to5k | 0.0400683 | 0.0229398 | 0.0571881 |
| densitylo400to1500 | 0.053788 | 0.0336897 | 0.0738838 |
| income0040 | -0.1823315 | -0.2003487 | -0.1643071 |
| income4080 | -0.0733986 | -0.0855372 | -0.0612574 |
| hh0workers | 0.1640431 | 0.1487041 | 0.1793793 |
| primaryrespondent | 0.4343688 | 0.4246757 | 0.4440628 |
| age11to17 | -0.0911359 | -0.1220654 | -0.0602059 |
| age25to34 | 0.2581147 | 0.2292669 | 0.2869823 |
| age35to54 | 0.3996749 | 0.3718928 | 0.4274799 |
| age55to64 | 0.362076 | 0.3335327 | 0.3906424 |
| age65to74 | 0.3947908 | 0.3655455 | 0.424057 |
| age80plus | 0.1197789 | 0.0859169 | 0.1536583 |
| female | 0.0271369 | 0.0181312 | 0.0361427 |
| haslicence | 0.5024148 | 0.4860703 | 0.5187639 |
| hastransitpass | -0.1168996 | -0.1348919 | -0.0989025 |
| immigrant3to5 | -0.123788 | -0.1590341 | -0.0885372 |
| immigrant5to10 | -0.1672563 | -0.1972506 | -0.1372593 |
| immigrant10to15 | -0.1569848 | -0.1845066 | -0.1294564 |
| immigrant15plus | -0.1120794 | -0.1242255 | -0.0999312 |
| eth_africa | -0.0946407 | -0.1363011 | -0.0529613 |
| eth_easia | -0.0800216 | -0.0965158 | -0.0635253 |
| eth_seasia | -0.1296086 | -0.1523244 | -0.1068929 |
| eth_sasia | -0.1597035 | -0.1800921 | -0.1393163 |
| eth_europe | 0.155232 | 0.1443918 | 0.1660751 |
| eth_indigen | 0.1321594 | 0.0791842 | 0.1852809 |
| eth_latin | 0.031868 | 0.0005603 | 0.0631965 |
| eth_mideast | -0.0413811 | -0.073585 | -0.0091591 |
| eth_ocean | 0.1935865 | 0.0790571 | 0.3089666 |

| Y=n_discretionary_trips | Estimate | Lower (0.025) | Upper (0.975) |
|---|---|---|---|
| **eth_america** | 0.2632629 | 0.1830887 | 0.3439797 |
| **eth_jewish** | 0.3750706 | 0.2832425 | 0.4676911 |
| **workerb** | -0.4348961 | -0.4493645 | -0.4204355 |
| **workfromhome** | 0.3186065 | 0.3025581 | 0.3346669 |
| **occtype8to11** | -0.2667808 | -0.287521 | -0.2460478 |
| **studentK12school** | -0.2716108 | -0.3079986 | -0.2352171 |
| **studentPSEft** | -0.3433891 | -0.3768605 | -0.309936 |
| **thursday** | -0.0216935 | -0.0316131 | -0.0117719 |
| **hhhaschildren** | 0.3734848 | 0.3604163 | 0.3865573 |

### Table 25. Coefficients for nondiscretionary trips

| Y=n_non-discretionary_trips | Estimate | Lower (0.025) | Upper (0.975) |
|---|---|---|---|
| (Intercept) | -0.6585794 | -0.7014198 | -0.6156199 |
| gtha | -0.0218927 | -0.0315084 | -0.0122622 |
| ruraloutCMA | -0.0452645 | -0.0744789 | -0.0162924 |
| income0040 | 0.0826412 | 0.0618452 | 0.103326 |
| income4080 | 0.0497816 | 0.0377338 | 0.0618014 |
| income80125 | 0.028755 | 0.0191812 | 0.0383153 |
| novehicles | -0.0971252 | -0.115467 | -0.0788598 |
| hh0workers | -1.6916487 | -1.7315834 | -1.6520814 |
| primaryrespondent | -0.0246564 | -0.0341315 | -0.0151815 |
| age11to17 | -0.2304778 | -0.2470194 | -0.2139269 |
| age18to24 | -0.6158642 | -0.6570462 | -0.5748627 |
| age25to34 | -0.6515791 | -0.6954116 | -0.6078729 |
| age35to54 | -0.611376 | -0.6545809 | -0.5682964 |
| age55to64 | -0.6274453 | -0.6716938 | -0.5833191 |
| age65to74 | -1.0077584 | -1.0539256 | -0.9617138 |
| age80plus | -2.2787985 | -2.3811393 | -2.178759 |
| female | -0.0740474 | -0.0820129 | -0.0660829 |
| haslicence | -0.1320443 | -0.1462607 | -0.1178087 |
| immigrant3to5 | -0.0318841 | -0.0578607 | -0.0061076 |
| eth_easia | -0.0149677 | -0.0273242 | -0.0026458 |
| eth_sasia | -0.0254728 | -0.0399064 | -0.0110908 |
| eth_caribb | -0.0353609 | -0.0601337 | -0.010778 |
| eth_mideast | 0.038235 | 0.0142132 | 0.062083 |
| workerb | 1.5543182 | 1.5386093 | 1.5700467 |
| workfromhome | -1.9670121 | -1.9961156 | -1.9381717 |
| occtype8to11 | 0.2203598 | 0.207728 | 0.2329667 |
| occtype6to7 | -0.1907306 | -0.2045078 | -0.1769847 |
| studentK12school | 1.2319243 | 1.1927027 | 1.2709888 |
| studentK12homeschool | -0.4188513 | -0.4695198 | -0.3689408 |
| studentPSEft | 0.6248929 | 0.6025917 | 0.647136 |
| studentPSEpt | 0.1634721 | 0.1307755 | 0.1958475 |
| tuesday | 0.1165372 | 0.1053866 | 0.1276733 |
| wednesday | 0.1200784 | 0.1089763 | 0.1311662 |
| thursday | 0.1016757 | 0.092093 | 0.1112546 |
| hhhaschildren | -0.0403968 | -0.0511439 | -0.0296584 |

## Appendix C: Odds Ratios

In the odds ratio tables that follow, shading has been used to indicate variables with higher and lower odds ratios. Pink shading is used for lower odds and blue for higher odds. The intensity of the shading increases as the value approaches the highest or lowest value in the table.

### Table 26. Incident rate ratio for total person trips

| Variable | Estimate | Lower | Upper |
|---|---|---|---|
| (Intercept) | 1.15 | 1.13 | 1.17 |
| mobile | 0.95 | 0.95 | 0.96 |
| phone | 0.97 | 0.96 | 0.98 |
| mixedmode | 1.09 | 1.08 | 1.11 |
| addrphsample | 0.97 | 0.96 | 0.97 |
| phase1 | 0.96 | 0.96 | 0.97 |
| gtha | 0.97 | 0.96 | 0.97 |
| urbancoresmallmed | 0.98 | 0.97 | 0.99 |
| fringeorotherpopctr | 0.97 | 0.95 | 0.98 |
| ruraloutCMA | 0.92 | 0.90 | 0.93 |
| densityvhi15kplus | 1.04 | 1.03 | 1.06 |
| densityhi5kto15k | 1.04 | 1.03 | 1.05 |
| densitymed1500to5k | 1.03 | 1.02 | 1.04 |
| densitylo400to1500 | 1.04 | 1.03 | 1.05 |
| townhouse | 0.99 | 0.98 | 1.00 |
| income0040 | 0.87 | 0.86 | 0.88 |
| income4080 | 0.97 | 0.96 | 0.97 |
| income80125 | 1.01 | 1.00 | 1.01 |
| novehicles | 0.94 | 0.93 | 0.95 |
| hh0workers | 1.15 | 1.14 | 1.16 |
| primaryrespondent | 1.34 | 1.33 | 1.35 |
| age11to17 | 0.93 | 0.92 | 0.95 |
| age18to24 | 0.86 | 0.85 | 0.87 |
| age25to34 | 0.95 | 0.94 | 0.96 |
| age35to54 | 1.04 | 1.03 | 1.05 |
| age55to64 | 1.02 | 1.01 | 1.03 |
| age80plus | 0.76 | 0.75 | 0.77 |
| female | 1.01 | 1.00 | 1.01 |
| haslicence | 1.40 | 1.39 | 1.42 |
| hastransitpass | 0.97 | 0.96 | 0.98 |
| immigrant3to5 | 0.92 | 0.90 | 0.94 |
| immigrant5to10 | 0.91 | 0.89 | 0.93 |
| immigrant10to15 | 0.91 | 0.90 | 0.93 |

| | | | |
|---|---|---|---|
| **immigrant15plus** | 0.92 | 0.91 | 0.93 |
| **eth_africa** | 0.95 | 0.92 | 0.97 |
| **eth_easia** | 0.93 | 0.92 | 0.94 |
| **eth_seasia** | 0.94 | 0.93 | 0.95 |
| **eth_sasia** | 0.90 | 0.89 | 0.91 |
| **eth_europe** | 1.10 | 1.09 | 1.11 |
| **eth_indigen** | 1.07 | 1.03 | 1.10 |
| **eth_latin** | 1.02 | 1.00 | 1.04 |
| **eth_ocean** | 1.11 | 1.03 | 1.18 |
| **eth_america** | 1.19 | 1.13 | 1.25 |
| **eth_jewish** | 1.24 | 1.18 | 1.31 |
| **workerb** | 1.25 | 1.24 | 1.26 |
| **workfromhome** | 0.76 | 0.76 | 0.77 |
| **occtype8to11** | 1.04 | 1.02 | 1.05 |
| **occtype6to7** | 1.03 | 1.02 | 1.04 |
| **studentK12school** | 1.70 | 1.68 | 1.73 |
| **studentK12homeschool** | 0.87 | 0.85 | 0.90 |
| **studentPSEft** | 1.09 | 1.07 | 1.11 |
| **studentPSEpt** | 1.07 | 1.05 | 1.10 |
| **tuesday** | 1.05 | 1.04 | 1.06 |
| **wednesday** | 1.05 | 1.04 | 1.06 |
| **thursday** | 1.03 | 1.02 | 1.04 |
| **hhhaschildren** | 1.25 | 1.24 | 1.26 |

**Table 27. Incident rate ratio for discretionary trips**

| Variable | Estimate | Lower | Upper |
|---|---|---|---|
| (Intercept) | 0.64 | 0.62 | 0.67 |
| mobile | 0.93 | 0.92 | 0.94 |
| phone | 0.97 | 0.95 | 0.98 |
| mixedmode | 1.10 | 1.07 | 1.12 |
| addrphsample | 0.94 | 0.94 | 0.95 |
| phase1 | 0.94 | 0.93 | 0.95 |
| gtha | 0.95 | 0.94 | 0.96 |
| urbancoresmallmed | 0.96 | 0.94 | 0.97 |
| fringeorotherpopctr | 0.94 | 0.91 | 0.97 |
| ruraloutCMA | 0.89 | 0.86 | 0.92 |
| densityvhi15kplus | 1.09 | 1.06 | 1.11 |
| densityhi5kto15k | 1.06 | 1.04 | 1.08 |
| densitymed1500to5k | 1.04 | 1.02 | 1.06 |
| densitylo400to1500 | 1.06 | 1.03 | 1.08 |
| income0040 | 0.83 | 0.82 | 0.85 |
| income4080 | 0.93 | 0.92 | 0.94 |
| hh0workers | 1.18 | 1.16 | 1.20 |
| primaryrespondent | 1.54 | 1.53 | 1.56 |
| age11to17 | 0.91 | 0.89 | 0.94 |
| age25to34 | 1.29 | 1.26 | 1.33 |
| age35to54 | 1.49 | 1.45 | 1.53 |
| age55to64 | 1.44 | 1.40 | 1.48 |
| age65to74 | 1.48 | 1.44 | 1.53 |
| age80plus | 1.13 | 1.09 | 1.17 |
| female | 1.03 | 1.02 | 1.04 |
| haslicence | 1.65 | 1.63 | 1.68 |
| hastransitpass | 0.89 | 0.87 | 0.91 |
| immigrant3to5 | 0.88 | 0.85 | 0.92 |
| immigrant5to10 | 0.85 | 0.82 | 0.87 |
| immigrant10to15 | 0.85 | 0.83 | 0.88 |
| immigrant15plus | 0.89 | 0.88 | 0.90 |
| eth_africa | 0.91 | 0.87 | 0.95 |
| eth_easia | 0.92 | 0.91 | 0.94 |
| eth_seasia | 0.88 | 0.86 | 0.90 |
| eth_sasia | 0.85 | 0.84 | 0.87 |
| eth_europe | 1.17 | 1.16 | 1.18 |
| eth_indigen | 1.14 | 1.08 | 1.20 |
| eth_latin | 1.03 | 1.00 | 1.07 |

| | | | |
|---|---|---|---|
| **eth_mideast** | 0.96 | 0.93 | 0.99 |
| **eth_ocean** | 1.21 | 1.08 | 1.36 |
| **eth_america** | 1.30 | 1.20 | 1.41 |
| **eth_jewish** | 1.46 | 1.33 | 1.60 |
| **workerb** | 0.65 | 0.64 | 0.66 |
| **workfromhome** | 1.38 | 1.35 | 1.40 |
| **occtype8to11** | 0.77 | 0.75 | 0.78 |
| **studentK12school** | 0.76 | 0.73 | 0.79 |
| **studentPSEft** | 0.71 | 0.69 | 0.73 |
| **thursday** | 0.98 | 0.97 | 0.99 |
| **hhhaschildren** | 1.45 | 1.43 | 1.47 |

**Table 28. Incident rate ratio for nondiscretionary trips**

| Variable | Estimate | Lower | Upper |
|---|---|---|---|
| (Intercept) | 0.52 | 0.50 | 0.54 |
| gtha | 0.98 | 0.97 | 0.99 |
| ruraloutCMA | 0.96 | 0.93 | 0.98 |
| income0040 | 1.09 | 1.06 | 1.11 |
| income4080 | 1.05 | 1.04 | 1.06 |
| income80125 | 1.03 | 1.02 | 1.04 |
| novehicles | 0.91 | 0.89 | 0.92 |
| hh0workers | 0.18 | 0.18 | 0.19 |
| primaryrespondent | 0.98 | 0.97 | 0.98 |
| age11to17 | 0.79 | 0.78 | 0.81 |
| age18to24 | 0.54 | 0.52 | 0.56 |
| age25to34 | 0.52 | 0.50 | 0.54 |
| age35to54 | 0.54 | 0.52 | 0.57 |
| age55to64 | 0.53 | 0.51 | 0.56 |
| age65to74 | 0.37 | 0.35 | 0.38 |
| age80plus | 0.10 | 0.09 | 0.11 |
| female | 0.93 | 0.92 | 0.94 |
| haslicence | 0.88 | 0.86 | 0.89 |
| immigrant3to5 | 0.97 | 0.94 | 0.99 |
| eth_easia | 0.99 | 0.97 | 1.00 |
| eth_sasia | 0.97 | 0.96 | 0.99 |
| eth_caribb | 0.97 | 0.94 | 0.99 |
| eth_mideast | 1.04 | 1.01 | 1.06 |
| workerb | 4.73 | 4.66 | 4.81 |
| workfromhome | 0.14 | 0.14 | 0.14 |
| occtype8to11 | 1.25 | 1.23 | 1.26 |
| occtype6to7 | 0.83 | 0.82 | 0.84 |
| studentK12school | 3.43 | 3.30 | 3.56 |
| studentK12homeschool | 0.66 | 0.63 | 0.69 |
| studentPSEft | 1.87 | 1.83 | 1.91 |
| studentPSEpt | 1.18 | 1.14 | 1.22 |
| tuesday | 1.12 | 1.11 | 1.14 |
| wednesday | 1.13 | 1.12 | 1.14 |
| thursday | 1.11 | 1.10 | 1.12 |
| hhhaschildren | 0.96 | 0.95 | 0.97 |