UTTRI

Research Report

COVid-19 influenced Households' Interrupted Travel Schedules (COVHITS) Survey: Summer 2021 Cycle Report

Kaili Wang, Yicong Liu, Brendan Reilly, Khandker Nurul Habib

October 2021

Civil & Mineral Engineering
UNIVERSITY OF TORONTO

UTTRI

COVid-19 influenced **H**ouseholds' **I**nterrupted **T**ravel **S**chedules (**COVHITS**) Survey: Summer 2021 Cycle Report

Oct 01, 2021

COVHITS Survey 2021

Correspondence:
khandker.nurulhabib@utoronto.ca

Kaili Wang, Yicong Liu, Brendan Reilly
Professor Khandker Nurul Habib

TABLE OF CONTENTS

Executive Summary

The Summer 2021 COVHITS Survey is the second cycle of the COVHITS Survey that was conducted to collect passenger travel demand data during the time that fell between the third stay-at-home order and the stage 3 reopening pausing in Ontario. The survey study area includes the City of Toronto and the Regional Municipalities of Halton, Peel, and York. The survey was a household travel survey. The survey sample was relatively small compared to the Fall 2020 cycle of the COVHITS Survey but carefully designed to get sufficient data for benchmarking travel demand changes resulting from COVID-19 restrictions across the four regions.

The survey was conducted by randomly recruiting people from online survey panels. The final dataset includes single weekday travel diaries of all members (6 years or older) of a total of 1,878 households across the four regions. This includes a total of 2,924 reported weekday trips. This is a relatively small sample survey (compared to the previous cycle of COVHITS Survey) and is more prone to be skewed towards specific population segments (e.g., smaller household size and younger people). Therefore, a sample weight adjustment was made to represent the population distributions across these four regions.

This was the first-ever household travel survey in this area that was conducted in the summer season. Comparable surveys (including the first cycle of the COVHITS Survey and the TTS) have been conducted during the Fall seasons. Travel characteristics revealed from the current survey are influenced by the pandemic-induced restrictions on daily life and all usual changes in travel demand during the summertime. So, the comparison of summary statistics with those of the first cycle of the COVHITS Survey should be considered with caution. Nevertheless, the survey reveals useful information on travel demands in the region in the post-third wave of COVID-19.

Overall, the survey reveals an average trip rate per household of 1.7, lower than the Fall 2020 household trip rate (2.0 trips per household). The percentage of workers working from home dropped by 5 percent from Fall 2020. However, immobility (no trip per day) increased by around 10 percent. Data also reveal a large drop in transit modal share while commensurate increase in driving private cars. An increase in the median trip lengths of driving and non-motorized modes is also significant. While it is difficult to identify what portions of such changes (from fall 2020 to Summer 2021) are to be attributed to COVID-19 and changes in season, it is evident that transit continued to lose market share in the urban travel market starting from the beginning of the pandemic. This cycle of COVHITS included questions on home delivery, and data reveal that 68 percent of households in the region received at least one home delivery of goods per week.

Acknowledgments

Staff from the following organizations and staff from the Data Management Group (DMG) at the Department of Civil & Mineral Engineering, University of Toronto, comprise the **COV**id-19 influenced **H**ouseholds' **I**nterrupted **T**ravel **S**chedules (**COVHITS)** Survey Technical Committee (TAC) members.

These are:

City of Toronto
Metrolinx
Ministry of Transportation, Ontario
Regional Municipality of Halton
Regional Municipality of Peel
Regional Municipality of York
Toronto Transit Commission

This report is prepared by the research group of Professor Khandker Nurul Habib with guidance from the DMG. The contributions of the TAC members to the production of this report and the DMG's ongoing work are gratefully acknowledged.

Further Information

The COVHITS Surveys are parts of a specialized data collection program triggered by the extraordinary contexts of COVID-19's global pandemic-induced travel bans and the ceasing of urban residents' activities. It is sponsored by some member organizations of the Transportation Information Steering Committee (TISC), which also conducted the Transportation Tomorrow Surveys (TTS). The TTS survey datasets (2016, 2011, 2006, 2001, 1996, 1991, and 1986) are currently under the care of the DMG. The DMG is also responsible for maintaining the COVHITS survey databases and making available appropriate travel information for any urban transportation study in the area by the sponsoring organizations. Requests for information from the COVHITS survey should be directed to the address below.

Data Management Group
Department of Civil & Mineral Engineering
University of Toronto
35 St. George Street Toronto, Ontario
M5S 1A4
Tel: (416) 978-3913
Fax: (416) 978-3941
Email: info@dmg.utoronto.ca
Web: www.dmg.utoronto.ca

Background

COVID-19 has changed people's travel patterns. Amid uncertainties in the pandemic's future recurrences in various scales and forms, it is unclear when the new normal situation (concerning daily travel demand) will return and what the new normal will look like. The disruption in daily lives, especially social distancing, the mass experience in telecommuting, e-shopping, and online social/religious activities, may change the travel behaviour of urban residents. Real/revealed ground-truth data/observations on travel demand at different stages of post-COVID-19 lockdown would provide data to assess the effects of lockdown and travel demand returning to 'normalcy'.

The Transportation Tomorrow Survey (TTS) has been the core travel demand dataset in the Greater Golden Horseshoe (GGH) since 1986. The latest TTS was in 2016, and the next one is planned to be in 2021-2022. However, future datasets will benefit from reference data of the same kind of COVHITS Surveys. The COVHITS survey is designed to gather such reference data on passenger travel demand in the Greater Toronto Area. The core of the survey maintains a similar structure to the TTS. However, to capture behavioural changes (that may have already happened), it includes additional questions on topics such as telecommuting and flexible office hours.

Three cycles of COVHITS are planned, the first and second cycles were completed in Fall 2020 and Summer 2021. This report presents a summary of the Summer 2021 COVHITS survey results.

Area of coverage

The coverage area of the COVHITS survey was defined by the participant organizations in the consortium and thus composed of the City of Toronto and Regional Municipalities of Halton, Peel, and York.

PARTICIPATING JURISDICTIONS																			
Survey	City of Hamilton	City of Toronto	Regional Municipality of Durham	Regional Municipality of Halton	Regional Municipality of Peel	Regional Municipality of York	City of Kawartha Lakes	City of Barrie	City of Brantford	City of Guelph	City of Orillia	City of Peterborough	County of Brant	County of Dufferin	County of Peterborough	County of Simcoe	County of Wellington	Regional Municipality of Niagara	Regional Municipality of Waterloo	Town of Orangeville
2021 Summer COVHITS Survey		•		•	•	•														
2020 Fall COVHITS Survey		•		•	•	•														
2016 TTS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

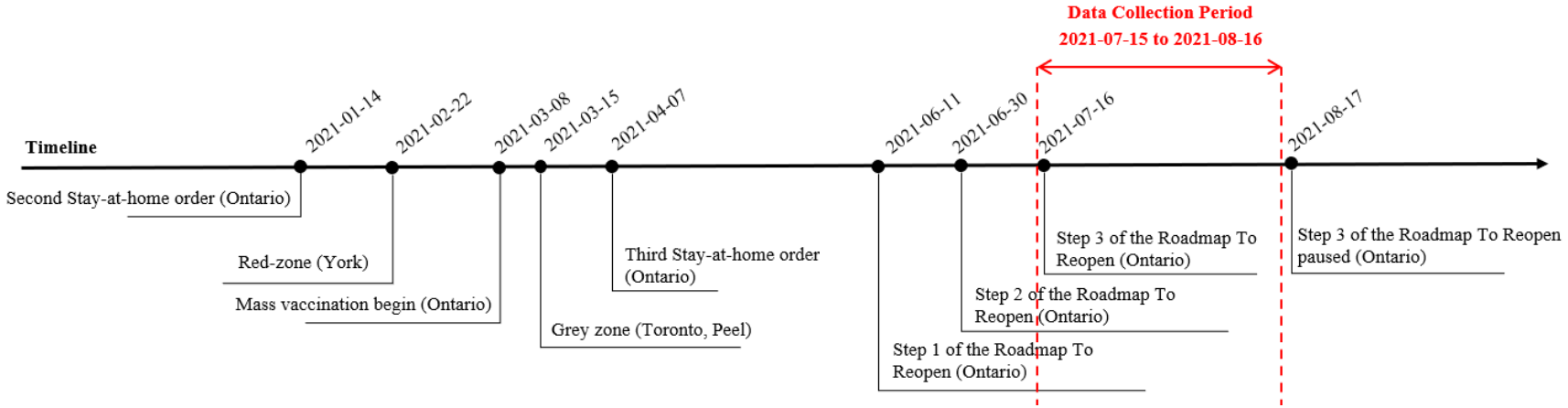
Survey magnitude and timeframe

The Summer 2021 COVHITS survey was conducted using a random sample of residents drawn from online panels. Considering the constraints of timeline and budget, the use of online panels was determined to be the best option for participant recruitment for this study. The survey sample size requirement calculation took into consideration the maximum possible uncertainty in travel behaviour changes and a reasonable design factor. The survey was conducted over a 1-month period of time (July 15 to August 16, 2021).

The final dataset contains responses from a total of 1,878 households. This includes 659 households from Toronto, 268 households from Halton, 476 households from Peel, and 475 households from York. The final dataset is composed of 4,190 individuals from 1,878 households in the study area, with a total of 2,924 recorded weekday trips.

UNEXPANDED/UNADJUSTED RECORDS FOR THE STUDY AREA			
Survey	Households	Persons	Trips
Summer 2021 COVHITS Survey	1,878	4,190	2,924
Fall 2020 COVHITS Survey	3,721	8,096	6,948
2016 TTS	162,708	395,885	798,093

Timeline



Survey content

The COVHITS survey is a retrospective survey of travel taken by every member (age 6 or over) of the household during the weekday prior to the web contact. The survey is a web-based survey implemented in the TRAISI[1] platform.

	INFORMATION COLLECTED																											
	Demographic Information														Travel Information								Other information					
	Household Characteristics					Person Characteristics									Nature of Trip			Means of Travel					Shopping			Transit	Workplace	Stated-preference experiments
	Dwelling unit type	Number of Persons	Vehicles Available	Adult Bikes Available	Household Income	Age	Gender	Possession of Driver's License	Usual Place of Work Location	Usual Place of School Location	Free Parking at Usual Place of Work	Possession of Transit Pass	Occupation Type	Work at Home	Travel modes to work – Pre COVID	Start time	Purpose of Trip	Origin and Destination Points	Travel Mode	Vehicle Occupancy	Used ETR407	Detailed Transit Routes	GO Train & Subway Stations used	In-store shopping frequency	Online shopping frequency	Home delivery frequency	Transit usage by purpose	Workplace Arrangements	Stated preference experiments on household grocery shopping channel choices
2021 Summer COVHITS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			○	○			○		○	○
2020 Fall COVHITS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			○	○	○	○		○	○	
2016 TTS	○	○	○		○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○	○						

[1] TRAISI stands for 'Travel Activity Internet Survey Interface'. It is a software system developed at the University of Toronto to design passenger travel surveys with optimum interactions with the survey respondents through graphical, map and transit scheduling app interfaces. The software system is developed as a part of the TTS2.0 project, led by Professor Khandker Nurul Habib and sponsored by the TISC.

Report content

The purpose of this report is to summarize the Summer 2021 COVHITS survey results. The summary provides demographic and travel characteristics presented in tabular format at the overall study area.

Corresponding data from the 2016 TTS are presented in this report as reference points. The overall TTS and the COVHITS surveys differ in survey area as shown by the participating jurisdictions and as explained in the section of 'Area of Coverage'. Note that the reported 2016 TTS statistics are for the study area of the COVHITS survey only.

The information presented includes socio-demographic, travel characteristics, household's weekly home delivery frequency and patterns revealed by the stated-preference survey. In addition to presenting the magnitude of the trips coming into and leaving an area, the summary tables also describe travel characteristics such as travel purpose, trip start time, travel distance, and travel mode choices. Definitions of terms are listed on the next page.

The samples of each municipality of the COVHITS survey are weight-adjusted to the corresponding municipality's key population statistics (household size and age distribution). This is to ensure that the samples are true representations of corresponding populations. Statistics for the whole study area presented in this report are based on the pooled samples that are further weight-adjusted to the relative proportions of the corresponding total population of the municipalities. Numeric figures presented in this report are rounded.

Data Key

HOUSEHOLD CHARACTERISTICS	
Households	Total number of households in the area
Dwelling Type	Distribution of households by dwelling type: house, townhouse, or apartment.
Household Size	Distribution of households by the number of persons in residence at the time of the survey interview.
Number of Available Vehicles	Distribution of households by number of vehicles available to the household for personal use.
Number of Available Adult Bikes	Distribution of households by number of adult bikes available to the household for personal use.
Household Income	Distribution of households' annual income before tax.
Household Averages:	
Persons/household	Total population divided by total number of households.
Workers/household	Total number of employed persons (full-time, part-time, work-from-home) divided by total number of households.
Drivers/household	Total number of persons in possession of a driver's licence divided by the total number of households. The calculation excludes a small % of households for which the total number of drivers was unknown.
Vehicles/household	Total number of vehicles available for personal use divided by the total number of households.
Trips/day/household	Total number of daily trips made by persons aged 6 and over divided by the total number of households.

POPULATION CHARACTERISTICS	
Records	Total population residing in private dwellings in the area at the time of the survey. Excludes residents living in collective dwellings (who were not surveyed). For COVHITS survey, records will be the total number of records collected in each region.
Age	Distribution of population by age group.
Median Age	50% of the population are above and 50% are below the median age.
Daily Trips per Person	For TTS, number of trips made by persons aged 11 and over divided by the number of persons aged 11 and over. For COVHITS, number of trips made by persons aged 6 and over divided by the number of persons aged 6 and over.
Daily Work Trips per Worker	Number of work trips made by employed persons divided by the number of employed persons.
Employment Type	Full time outside the home, part-time outside the home, work at home (full-time or part-time).
Student	% of population who are students.
Licensed	% of population with a valid driver's licence. Persons with unknown licence status were excluded from the calculation.
Transit pass	% of population in possession of a valid transit pass. Persons with unknown data were excluded from the calculation.
Workplace Arrangement	Usual place of work. WFH only: work from home only; Hybrid: mix of work outside of home and work from home; WOHO only: work outside of home only; No usual place: no usual place of work, no fixed work location.
Usual Mode of Travel to Work	Typical/Usual mode of travel to work.
Study Arrangement	Usual place of school arrangement. SFH only: study from home only; Hybrid: mix of study from home and go to school; Go to School: travel to school to study.

TRAVEL CHARACTERISTICS	
Trip Rates	For TTS, number of trips made by persons (residents of a designated region) aged 11 and over divided by the number of persons (residents of a designated region) aged 11 and over. For COVHITS, number of trips made by persons (residents of a designated region) aged 11 and over as well as aged 6 and over are divided by the corresponding number of persons (residents of a designated region).
Trips Made by Residents of the Area	Survey statistics for all trips made by population residing within the given geography reported on.
Trips Made to the Area	Survey statistics for all trips with a destination within the given geography reported on, whether made by residents of the given geography or by residents of all other geographies included in the Study Area.
Time Period	Two time periods are reported: the morning peak travel period of 6:00 to 8:59 a.m. and the full 24-hour day.
Trips	Total estimated average trips for the reported time period on weekdays (estimates based on the survey data expanded to represent the total population).

Trip Purpose (for trips made by residents of the area):	Distribution of all trips made by residents across the following categories:
HB-W	Home-based work: Home to work and work to home.
HB-S	Home-based school: Home to school and school to home.
HB-D	Home-based discretionary: All other home-based trips.
N-HB	Non-home-based: All trips where neither end is home.
Trip Purpose (for trips to the area):	Distribution of all trips made to the area across the following categories:
Work	Destination purpose is work.
School	Destination purpose is school.
Home	Destination purpose is to return home.
Other	Other destination purpose, such as shopping, entertainment, pick someone up/drop someone off, etc.
Modes of travel:	
Driver	Automobile driver.
Pass.	Automobile passenger.
Transit	Public transit (local transit). If a trip uses more than one mode category which includes public transit, then public transit is given preference as the primary mode. In cases where both GO Train and local transit were used, GO Train is the dominant classification.
GO Train	GO Train. In cases where both GO Train and local transit were used, GO Train is the dominant classification.
Walk	Walk
Cycle	Bicycle
Other	Other modes of travel. Includes motorcycle, taxi, school bus, and all other modes.
Median Trip Length (km):	Trip length measured as the straight-line distance between the origin and destination coordinates of the trip within the GTHA.
-	-Reported for trips with the following motorized modes: driver, passenger, transit, and GO Train.
-	-Reported for trips with the following non-motorized mode: walk.
-	-Reported for trips with the following non-motorized mode: bicycle
OTHER INFORMATION	
Weekly Home Delivery Frequency	The weekly frequency of household's using online stores purchase merchandise and delivered to home.

Comparability of 2020-2021 COVHITS Survey cycles and the 2016 TTS

Caution should be undertaken when comparing data between the 2021 Summer COVHITS survey, 2020 Fall COVHITS survey and the 2016 TTS. The comparability between datasets may be affected by several factors, including the coverage of the survey, sample size, how well the target population (residents of private households) is represented by the sample source used in the given dataset, and changes in survey methods.

The 2016 TTS has the following key characteristics.

- **Survey mode**: The 2016 TTS used a mix of computer-aided telephone interview (CATI) and computer-aided web interview (CAWI) survey methods.
- **Coverage**: The 2016 TTS covered 5% of households in the survey area and could be easily expanded to the whole population.
- **Sample frame**: In 2016, an address-based sample frame was adopted to obtain coverage of all households, not just those with directory-listed telephone landlines. A portion of the random address sample was matched to listed phone numbers and received a high response in both telephone and online surveying. However, the 'address-only' portion of the sample, which received only a survey invitation letter, had a lower response. While it was necessary to use an address-only sample to achieve coverage of cell-phone-only households, there is likely a higher non-response bias in this portion of the sample. However, this is compensated for in part by data weighting.
- **Survey timeframe**: The 2016 TTS was conducted over the 3 months in Fall: from September to December 2016.
- **Travel diary**: The 2016 TTS collected travel diaries of household members only aged 11 years or more.
- **Sample expansion**: The 2016 TTS is expanded to the population in the survey area. An iterative proportional fitting procedure was undertaken to adjust the household weights according to the following controls: dwelling type, household size, and household members' age by gender. As the method employed made household-level adjustments based on the age/gender demographics of all household members, 2016 expanded household counts in the survey data match the Census household counts.

The 2020 COVHITS has the following key characteristics:

- **Survey mode**: The 2020 COVHITS survey was conducted using a computer-aided web interview (CAWI) survey method only.
- **Coverage**: The 2020 COVHITS survey sample size was calculated as the minimum size required to draw regional statistical inferences and is very small compared to that of the TTS.
- **Sample frame**: The 2020 COVHITS survey was conducted using an online commercial survey panel as a sample frame only.
- **Survey timeframe**: The 2020 COVHITS survey was conducted over 1 month in the Fall: from October to November 2020.
- **Travel diary**: The 2020 COVHITS Survey collected travel diaries of household members aged 6 years or more.
- **Sample weighting**: The 2020 COVHITS survey sample presented in this report was too small to be reliably expanded to the total population of the survey areas. However, to make the regional (as municipalities) sample representative to the corresponding population, a simple two factor (household size and age) based weights are estimated to make each regional sample a random representative sample of their population. An iterative proportional fitting procedure is used to calculate sample weigh-adjustment values.

The 2021 Summer COVHITS has the following key characteristics:

- **Survey mode**: The 2021 COVHITS survey was conducted using a computer-aided web interview (CAWI) survey method only.
- **Coverage**: The 2021 COVHITS survey sample size was calculated as the minimum size required to draw regional statistical inferences and is very small compared to that of the TTS.
- **Sample frame**: The 2021 COVHITS survey was conducted using an online commercial survey panel as a sample frame only.
- **Survey timeframe**: The 2021 COVHITS survey was conducted over 1 month in Summer: from July to August 2021.
- **Travel diary**: The 2021 COVHITS Survey collected travel diaries of household members aged 6 years or more.
- **Sample weighting**: The 2021 COVHITS survey sample presented in this report was too small to be reliably expanded to the total population of the survey areas. However, to make the regional (as municipalities) sample representative to the corresponding population, a simple two factor (household size and age) based weights are estimated to make each regional sample as a random representative sample of their population. An iterative proportional fitting procedure is used to calculate sample weigh-adjustment values.

Readers should exercise caution while comparing statistics between the 2021 COVHITS survey and 2016 TTS due to the key survey characteristics differences mentioned above. However, this report presents key statistics of both surveys side-by-side, considering the 2016 TTS data as the reference dataset of regular Fall months of the year. To ensure compatibility:

- All TTS statistics that are presented in the report are of four regions (Toronto, Halton, Peel, and York) only, not of the whole TTS area.
- All TTS statistics are of an expanded (to the full population) sample. The COVHITS survey statistics are of the weight-adjusted sample.
- 2021 Summer COVHITS was collected in the summer season, whereas TTS and 2020 Fall COVHITS were collected in the fall season.

Area summaries

THE STUDY AREA

THE STUDY AREA

HOUSEHOLD CHARACTERISTICS

Households (unweighted)		Dwelling Type				Household Size					Number of Available Vehicles					Household Averages				
		House	Townhouse	Apartment	other	1	2	3	4	5+	0	1	2	3	4+	Persons	Workers	Drivers	Vehicles	Trips/Day
2016 TTS	2,093,200	46%	10%	44%	N/A	25%	28%	17%	17%	12%	17%	41%	32%	8%	3%	2.7	1.4	1.8	1.4	5.2
2020 Fall COVHITS	327,185 (3,721)	58%	12%	28%	2%	25%	28%	17%	17%	12%	14%	44%	34%	7%	1%	2.7	1.6	1.9	1.6	2.1 (of age 6+) 2.0 (of age 11+)
2021 Summer COVHITS	164,684 (1,878)	58%	12%	30%	1%	25%	28%	17%	17%	12%	11%	46%	35%	5%	3%	2.7	1.7	2.0	1.6	1.7 (of age 6+) 1.7 (of age 11+)

HOUSEHOLD CHARACTERISTICS

	Number of Adult Bikes					Household Income						
	0	1	2	3	4+	$0 - $14,999	$15,000 - $39,999	$40,000 - $59,999	$60,000 - $99,999	$100,000 - $124,999	$125,000 and above	Decline / don't know
2016 TTS	N/A	N/A	N/A	N/A	N/A	5%	14%	14%	21%	10%	18%	18%
2020 Fall COVHITS	44%	24%	22%	7%	2%	3%	12%	14%	28%	16%	20%	8%
2021 Summer COVHITS	40%	27%	22%	7%	4%	3%	13%	13%	31%	14%	21%	6%

POPULATION CHARACTERISTICS

Population/records (unweighted)		Age							Daily Trips per Person age 11+ (6+)	Daily Work Trips per Worker	Population (unweighted)		Employment Type			Student	Licensed	Transit Pass
		0-10	11-15	16-25	26-45	46-64	65+	Median					Full Time	Part Time	At Home			
												2,744,000	46%	7%	4%	23%	69%	20%
											Male	415,586 (3,789)	45%	7%	7%	27%	68%	15%
												216,026 (2,015)	47%	9%	N/A	24%	72%	20%
2016 TTS	5,653,900	12%	6%	13%	29%	26%	14%	38.3	2.2	0.83	Female	2,909900	34%	10%	4%	22%	61%	22%
2020 Fall COVHITS	873,671 (8,096)	12%	6%	13%	29%	26%	13%	39.0	0.84 (0.85)	0.35		445,505 (4,190)	35%	10%	7%	26%	64%	14%
2021 Summer COVHITS	443,792 (4,190)	12%	6%	13%	29%	26%	14%	38.8	0.71 (0.69)	0.23		218,749 (2,118)	37%	13%	N/A	26%	65%	19%

POPULATION CHARACTERISTIC														
	Current Workplace Arrangement				Pre-COVID Workplace Arrangement				Pre-COVID Usual Mode of Travel to Work			Current Study Arrangement		
	WFH only	Hybrid	WOHO only	No usual place	WFH only	Hybrid	WOHO only	No usual place	Auto Driver	Transit	Other	SFH only	Hybrid	Go to School
2016 Census	N/A	N/A	N/A	N/A	7%	N/A	81%	12%	62%	25%	13%	N/A	N/A	N/A
2020 Fall COVHITS	46%	11%	38%	6%	14%	18%	60%	7%	65%	24%	10%	54%	25%	21%
2021 Summer COVHITS	39%	14%	42%	5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TRIP RATES BY STUDY AREA RESIDENTS						
	0	1	2	3	4	5+
2016 TTS (11+)	22%	1%	49%	8%	11%	8%
2020 Fall COVHITS (6+)	61%	2%	31%	4%	2%	1%
2020 Fall COVHITS (11+)	62%	2%	30%	4%	2%	1%
2021 Summer COVHITS (6+)	71%	3%	19%	3%	2%	2%
2021 Summer COVHITS (11+)	70%	3%	20%	3%	2%	2%

TRIPS MADE BY RESIDENTS OF THE STUDY AREA																	
Time Period	Trips (unweighted)	% 24hr	Trip Purpose				Mode of Travel						Median Trip Length (km)				
			HB-W	HB-S	HB-D	N-HB	Driver	Pass.	Transit	GO Train	Walk & Cy	Other	Driver	Pass.	Transit	Walk & Cy	
6-9 AM	2,717,700	25.0%	50%	19%	22%	9%	55%	11%	17%	3%	11%	3%	8.2	3.5	8.0	1.3	2016 TTS
	142,433 (1,362)	22.0%	60%	24%	13%	3%	64%	8%	11%	N/A	15%	3%	13.6	4.7	11.1	1.1	2020 Fall COVHITS (11+)
	163,601 (1,463)	23.5%	52%	34%	11%	2%	55%	14%	10%	N/A	16%	5%	13.6	3.8	10.2	1.0	2020 Fall COVHITS (6+)
	46,209 (495)	16.8%	68%	2%	23%	7%	77%	11%	6%	N/A	5%	1%	18.1	15.3	13.0	1.9	2021 Summer COVHITS (11+)
	48,603 (509)	17.0%	65%	5%	23%	7%	73%	14%	6%	N/A	6%	1%	18.1	13.1	13.0	1.6	2021 Summer COVHITS (6+)
24 Hrs	10,874,300		36%	12%	38%	14%	58%	13%	16%	1%	9%	3%	6.4	4.3	7.0	1.4	2016 TTS
	647,071 (6,715)		37%	11%	35%	18%	66%	8%	8%	N/A	16%	2%	11.5	6.1	12.2	1.1	2020 Fall COVHITS (11+)
	696,803 (6,948)		34%	16%	33%	17%	62%	11%	8%	N/A	16%	3%	11.5	5.2	11.7	1.0	2020 Fall COVHITS (6+)
	275,267 (2,865)		33%	2%	40%	25%	68%	12%	9%	N/A	9%	0.5%	17.2	16.2	8.9	2.0	2021 Summer COVHITS (11+)
	286,017 (2,924)		32%	3%	40%	25%	66%	14%	10%	N/A	10%	0.5%	17.2	15.1	8.6	1.8	2021 Summer COVHITS (6+)

TRIPS MADE TO THE STUDY AREA																	
Time Period	Trips (unweighted)	% 24hr	Trip Purpose				Mode of Travel						Median Trip Length (km)				
			Work	School	Home	Other	Driver	Pass.	Transit	GO Train	Walk & Cy	Other	Driver	Pass.	Transit	Walk & Cy	
6-9 AM	2,650,618	24.8%	55%	20%	6%	19%	55%	11%	18%	3%	11%	3%	11.1	6.7	9.7	1.2	2016 TTS
	139,569 (1,320)	21.9%	58%	23%	6%	13%	63%	8%	11%	N/A	15%	3%	11.3	4.4	10.0	1.1	2020 Fall COVHITS (11+)
	160,549 (1,420)	23.4%	51%	33%	5%	11%	55%	14%	10%	N/A	16%	5%	11.3	3.7	9.3	1.0	2020 Fall COVHITS (6+)
	43,869 (478)	16.3%	62%	2%	12%	24%	76%	11%	7%	N/A	6%	1%	16.1	15.3	13.0	1.9	2021 Summer COVHITS (11+)
	46,263 (492)	16.6%	59%	5%	11%	25%	72%	15%	6%	N/A	7%	1%	16.1	13.1	13.0	1.6	2021 Summer COVHITS (6+)
24 Hrs	10,700,208		22%	6%	44%	28%	58%	13%	16%	1%	9%	3%	10.4	8.1	9.1	1.3	2016 TTS
	636,772 (6,568)		22%	7%	45%	26%	66%	8%	8%	N/A	16%	2%	9.9	5.8	10.5	1.1	2020 Fall COVHITS (11+)
	686,316 (6,800)		21%	10%	45%	25%	61%	11%	8%	N/A	17%	3%	9.9	5.1	10.1	1.0	2020 Fall COVHITS (6+)
	268,527 (2,775)		19%	1%	47%	32%	68%	12%	10%	N/A	10%	0.5%	16.2	15.6	8.9	2.0	2021 Summer COVHITS (11+)
	279,276 (2,850)		19%	2%	47%	33%	65%	14%	10%	N/A	10%	0.4%	16.2	14.6	8.6	1.8	2021 Summer COVHITS (6+)

Weekly Home Delivery Frequency by Households						
	0	1	2	3	4	5+
2021 Summer COVHITS	32%	24%	18%	12%	5%	9%

Lessons Learned from 2021 Summer COVHITS Survey

This section summarizes the key challenges and opportunities that the research team experienced in completing this survey. These are as follows:

- Using an online survey panel made it possible to collect data within a short time period, but it needs to be clear that there are limits on the sample size collected through such an approach. Such limits depend on the size of panels and the spatial distribution of panel members' home locations.

- Collecting revealed weekly home delivery data has been tested successfully in the 2021 Summer COVHITS cycle. Such information will enrich the dataset providing additional information regarding home delivery trips attracted by households.

Appendix

Sample Weighting to match individual region's household size and age distributions

- On the individual level, weighting factors are calculated using an iterative proportional fitting (IFP)procedure constrained to household size (on the household level) and age cohort of census data (on the person level).
- Weighting factors were calculated for each sample based on household size and age cohort in each sub-region.

			PERCENTILE								
Regions	Mean	Std Dev.	Min.	0.01	0.05	0.25	0.5	0.75	0.95	0.99	Max
Toronto	132.63	98.82	1	37.42	42.74	74.73	115.53	160.00	308.50	494.16	1127.97
York	3.76	3.04	1	1.00	1.08	1.71	3.06	4.37	10.16	16.73	23.12
Peel	4.85	3.28	1	1.00	1.00	2.03	4.08	6.22	11.42	16.34	19.92
Halton	22.35	19.25	1	1.00	4.88	10.09	16.61	27.30	52.84	124.31	143.24

Sample Weighting to combine individual region's data for the whole study area by matching regional population distributions

- On the study area level, weighting factors are calculated to match the weighted-adjusted sub-regional population distributions with relative proportion of weighted population counts between regions within the study area.

	Toronto	York	Peel	Halton
Normalized study area weight	1.00	15.72	14.86	2.49