

UBC Vancouver Transportation Status Report Fall 2019

March 2020

campus + community planning
transportation planning



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THE UNIVERSITY OF BRITISH COLUMBIA

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Executive Summary

The UBC Vancouver Campus's goal for transportation is to reduce automobile trips to and from the campus by encouraging and supporting the more sustainable modes of transportation including transit, biking, walking and carpooling through a comprehensive and integrated transportation management strategy. Every fall since 1997, UBC monitors travel patterns to and from campus. Data for all modes of transportation is collected and analyzed to assess changes year over year and to measure UBC's progress in achieving its transportation targets. These targets and the corresponding results from 2019 data collection are summarized below:

TARGET 1: By 2040 at least two-thirds of all trips to and from UBC will be made by walking, cycling or transit and maintain at least 50% of all trips to and from the campus on public transit.

✓ In 2019 56.5% of all trips were made by transit, walking and cycling.

✓ In 2019 54% of all trips to and from the campus were made by transit.

TARGET 2: Reduce single occupant vehicle trips to and from UBC by 20% from 1997 levels and reduce single occupancy vehicle trips per person to and from UBC by 30% from 1997 levels.

X In 2019 there were 47,300 SOV vehicle trips, which is a 2.8% increase from 1997 values.

✓ In 2019 there were 0.66 SOV trips per person, which is a 39.8% reduction from 1997 values.

TARGET 3: Maintain daily private automobile traffic at or less than 1997 levels.

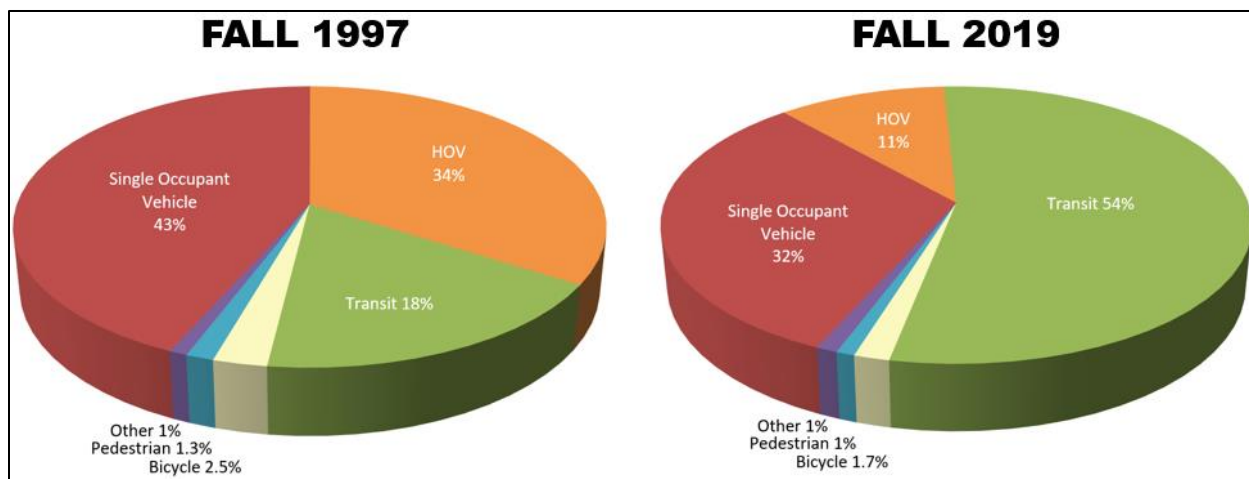
✓ In 2019 there were 54,800 private vehicles per day, which is a 12.2% reduction from 1997 values.

Consistent with every year since 1997, in 2019 UBC did not achieve the target of a 20% reduction in SOV trips to and from UBC from 1997 levels. To reach this target UBC will have to focus on supporting the travel modes with the highest potential, which includes HOV trips and transit trips. Trips by transit are limited by transit capacity during the peak periods, but TransLink is rolling out a new RapidBus line to UBC in January 2020 that will offer a small increase in capacity. UBC is also involved in a vanpool program with TransLink and is exploring incentives for carpooling to the UBC community for implementation in 2020.

As shown in **Figure A**, significant improvements have been made since 1997 in terms of shifting to more sustainable transportation modes. This is largely resulting from successful implementation of UBC's land use and transportation plans.

In 2019 transit accounted for 54% of all trips made to and from campus, which is up slightly from 2018 and a significant increase compared to 1997. The increase is attributed to the u-pass program and is predominantly the result of a shift to transit trips from single occupant and high occupant vehicle trips.

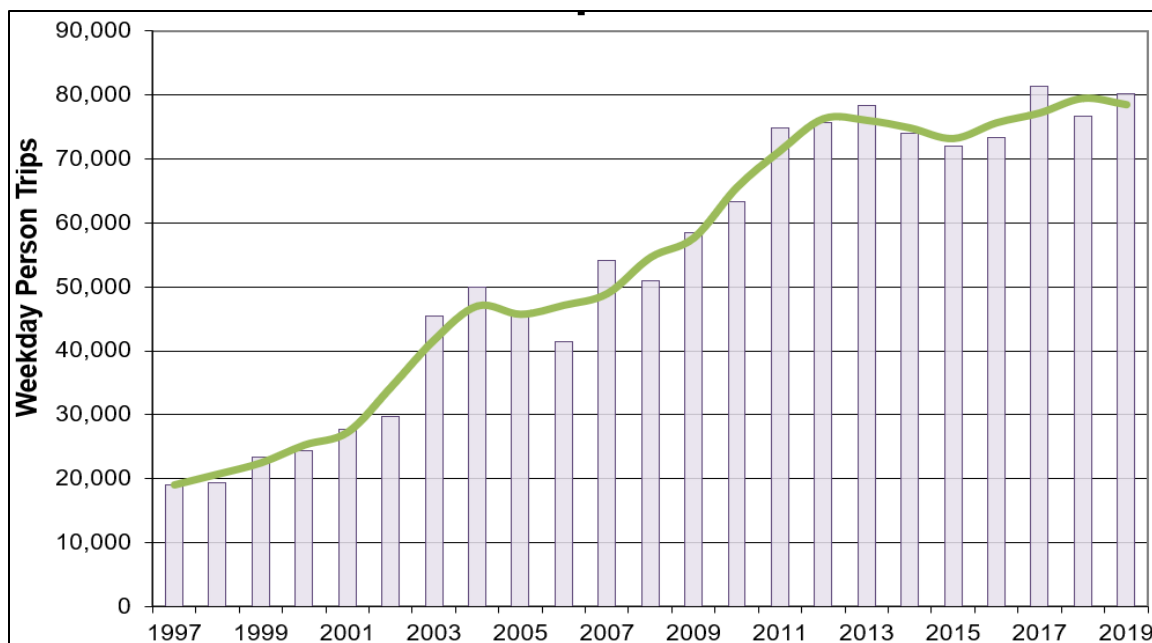
Figure A: Average Weekday Trips by Mode to / From UBC, 1997 vs. 2019



A majority of the data presented in the Transportation Status Report is collected over a single day or a week, depending on the dataset, so fluctuations year to year are expected. Travel choices are also highly susceptible to weather conditions, which further adds variability to the data. As a result, three-year rolling averages are a more meaningful set of data to use to identify travel patterns, which is included in the following figures.

Since 2011, transit trips have generally levelled off as shown below in **Figure B** and during the same period the overall mode share decreased. Possible reasons for this decrease in the number of trips by transit are overcapacity buses to and from campus, reduced customer experience, and increased transit fares. Transit trips will be closely monitored to evaluate the impact of planned transit improvements in the region as part of the Mayor's 10 Year Plan.

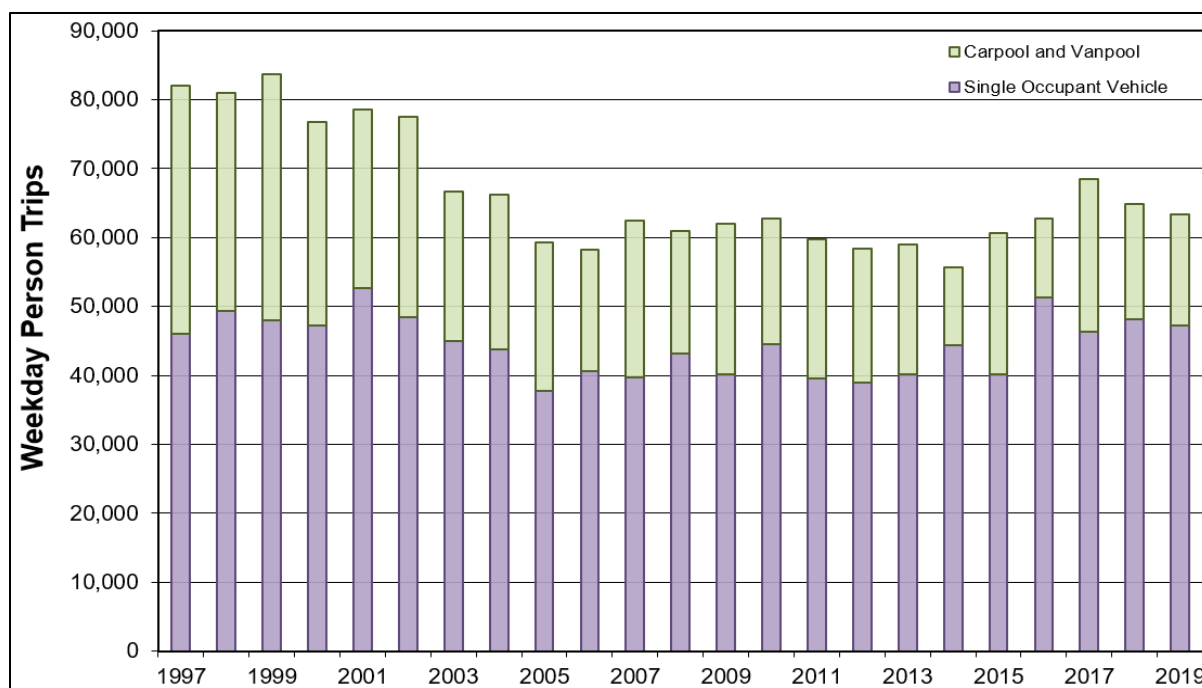
Figure B: Average Weekday Transit Trips to / from UBC, 1997 – 2019



Both single occupant (SOV) and high occupant vehicle (HOV) trips to and from campus were on a decreasing trend following 1997 up until 2016 when the number of SOV trips began to increase, as shown in **Figure C**.

In 2019, the number of SOV trips is back on trend with the past eight years, which is a gradual increase year over year and above 1997 values. This is a trend that needs to be reversed to meet UBC's transportation targets, but with the increase in the on campus residential population will be challenging to overcome without rapid transit.

Figure C: Average Weekday Motor Vehicle Trips to / from UBC, 1997 – 2019



Biking and walking to and from UBC do not account for significant mode shares; however, there are still an impressive number of people biking to and from campus. In 2019 there were 3,800 trips made by walking and biking, up 1,000 over 2018 counts. It is anticipated that the number of bicycle trips and pedestrian will continue to gradually increase, but the mode shares are not expected to increase significantly as a result of the number of trips to and from UBC per day.

UBC formalized a bike share program at UBC in 2019 following a pilot year in 2018, however, that bike share program does not impact commuter trips since it only operates on campus.

In general, the monitoring results from 2019 are back in line with the trend that has been set in previous years and indicate some improvement over 2018. There are some upcoming improvements to transit service in 2020 as well as a planned vanpool program operated by TransLink that will contribute to bringing UBC closer to their transportation targets.

1. Introduction

Consistent with its sustainability goals, UBC is striving to reduce automobile trips to and from the UBC Vancouver Campus by encouraging the use of sustainable modes of transportation, including transit, carpooling, cycling and walking. To date, UBC has implemented several initiatives in support of non-automobile modes of transportation, including a student U-Pass program, bicycle infrastructure and end-of-trip facilities, carshare parking, a vanpool pilot program, and is exploring carpooling programs and incentives. In addition, TransLink, in collaboration with UBC, has made ongoing efforts to improve transit service and increase transit capacity to UBC.

Since 1997, UBC has collected data each fall to monitor travel patterns to and from the Vancouver Campus. A year-to-year comparison of this information provides a measure of UBC's progress in achieving its three transportation targets (refer to section 1.1).

This UBC Transportation Status Report Fall 2019 presents the most recent data that UBC has collected and analysed. The Report provides a snapshot of overall travel trends, and details of travel patterns for each mode of transportation to and from UBC as well as an overview of transportation trend lines since 1997 at UBC.

1.1. Context

Transportation planning at UBC is undertaken within the direction and context provided by several plans and policies, including:

- **UBC Strategic Plan: Shaping UBC's Next Century** sets out UBC's collective vision and purpose, as well as goals and strategies for the years ahead. The Plan builds on the university's previous strategic plan, Place and Promise, and focuses on three themes that are believed to be critical to society today: Inclusion, Collaboration and Innovation. Shaping UBC's Next Century will guide decisions, actions and interactions into the future, and will create a framework for resource allocation across the University.
- **The UBC Land Use Plan.** In June 2010, the Minister of Community and Rural Development enacted legislation that realigned the responsibility for this plan, previously known as the Official Community Plan. The OCP is no longer a regional district bylaw. The University is responsible for the Land Use Plan with direct oversight by the Minister. The Land Use Plan retains a number of transportation demand management objectives aimed at increasing walking, cycling and transit in preference to trips by single-occupant vehicles. The Land Use Plan establishes goals toward building complete communities thereby helping to reduce demands placed on transportation infrastructure.
- **The Vancouver Campus Plan.** In 2010, UBC adopted a new Vancouver Campus Plan, which covers the academic lands of UBC's Vancouver Campus. This plan guides the institutional capital investment in facilities for teaching and research, student housing and campus infrastructure and services.
- **Neighbourhood Plans.** For each of the non-institutional neighbourhoods on campus, there is a neighbourhood plan describing site-specific land uses, development controls, design guidelines, and servicing and transportation strategies consistent with UBC's Land Use Plan. Each neighbourhood is

designed to support the University's academic core, while providing the amenities and services required to achieve a compact, transit-oriented, pedestrian friendly community.

- **The UBC Transportation Plan.** UBC has committed to implement a comprehensive and integrated transportation management strategy. The Transportation Plan is the result of that commitment, and was approved by UBC's Board of Governors in November 1999 and renewed in 2014. The Plan includes targets to ensure accountability, shape decision making and inspire the community to act in ways to achieve UBC's campus vision. The targets identified in The Plan include:
 - **TARGET 1:** By 2040 at least two-thirds of all trips to and from UBC will be made by walking, cycling or transit and maintain at least 50% of all trips to and from the campus on public transit.
 - **TARGET 2:** Reduce single occupant vehicle trips to and from UBC by 20% from 1997 levels and reduce single occupancy vehicle trips per person to and from UBC by 30% from 1997 levels.
 - **TARGET 3:** Maintain daily private automobile traffic at or less than 1997 levels.

1.2. Transportation Monitoring Program

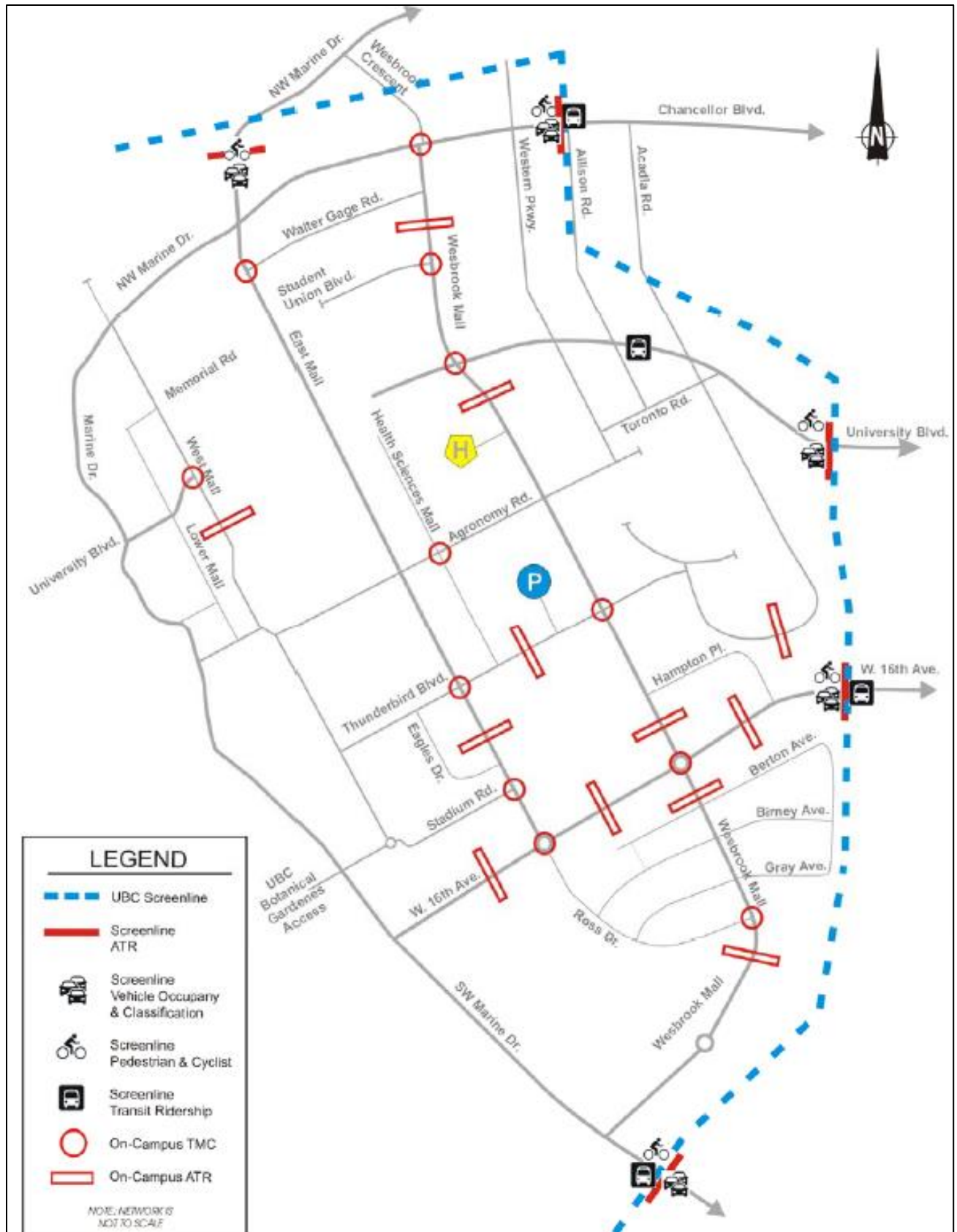
Travel patterns to and from UBC are monitored on an on-going basis through a variety of different data collection methods. Data is collected each fall at the end of October to early November to enable consistent year to year comparisons of travel patterns, mode shares, and traffic volumes. Additional data collection activities may be undertaken at other times of the year to obtain information regarding specific modes of travel, seasonal variations and localized traffic volumes, but are not documented in this report. The annual monitoring results are used to assess progress towards meeting UBC's transportation targets and also help guide future implementation priorities.

Data collection activities for this year are summarized in **Table 1.1**, and data collection locations are illustrated in **Figure 1.1**.

Table 1.1: Summary of 2019 Transportation Data Collection

Data Collection Activity	Locations	Description
Intersection Counts	At intersections throughout campus.	Manual observation for 8 hours (3hrs in AM, 2hrs in Midday, 3hrs in PM) for one day.
Campus Traffic / Speed Counts	Roads throughout campus.	Automatic tube counters on roads for 7 days (24 hours / day).
Screenline Traffic Counts	Screenlines	Automatic tube counters on roads for 7 days (24 hours / day).
Transit Ridership	Screenlines	Manual observation from 6:00AM to 4:30AM for one day.
Vehicle Occupancy & Classification	Screenlines	Manual observation for 8 hours (3hrs in AM, 2hrs in Midday, 3hrs in PM) for one day.
Bicycle and Pedestrian Counts	Screenlines	Manual observation for 15 hours over one day.
Heavy Trucks	Screenlines	Manual observation for 13 hours (6:00AM to 7:00PM) for one day each quarter.
Licence Plate Surveys	South Campus / Wesbrook Village	Licence plate surveys are conducted to understand travel patterns. Every other year.

Figure 1.1: Data Collection Locations



1.3. Changes at UBC Affecting Travel Patterns

There have been a number of changes at UBC that have affected travel patterns among students, staff, faculty and others at UBC. This section of the report identifies key changes that have occurred at UBC since 1997.

- **Population.** The daytime population at UBC has increased by nearly 71% since 1997. This includes increased student enrolment and associated increases in faculty and staff. For the purposes of monitoring trends in travel to and from UBC, the daytime population comprised of students, staff and faculty is used to calculate person trips. **Table 1.2** summarizes population figures for fall 1997 and fall 2019.

It is important to note that the estimate of campus population is challenging. It is dependent on the means by which the data is collected and grouped and is impacted by the increasing trend in online courses and expanding residential campus community. However, efforts are made to allow for consistent cross comparison in the status reports.

Table 1.2: Daytime Population at UBC, 2019 vs. 1997

Group	Fall 1997	Fall 2019	Increase (count / percentage)	
Students	33,200	55,800	+22,600	+68.1%
Staff	7,250	12,150	+4,900	+67.6%
Faculty	1,850	4,250	+2,420	+132.2%
Totals	42,300	72,200	+29,930	+70.8%

Source: UBC Planning and Institutional Research Department

- **Compass Card (U-Pass).** One of the most significant changes affecting travel patterns at UBC has been the student U-Pass, which was introduced in September 2003. The U-Pass is a universal transportation pass that is mandatory for students at a cost to students of \$41 per month. The U-Pass offers students unlimited access to TransLink Bus, SkyTrain and SeaBus services (all zones), and discounted West Coast Express fares. The Compass Card came into effect for the 2016 data collection period, which replaced the U-Pass card, but the U-Pass program continues.
- **Increased transit service.** In conjunction with introduction of the student U-Pass, TransLink has substantially increased the level of transit service provided to UBC and continues to make service improvements annually. The majority of the increase has been on the Route 99 B-Line. Other improvements since 1997 include new Route 33 on 16th Avenue, and several express routes including a new Rapid Bus R-4 Route January 2020 that connects UBC to Joyce Station via 41st Avenue. Recent TransLink ridership data indicates routes to UBC carry the highest passenger volumes in the region.
- **Class start times were changed in September 2001.** In an effort to spread the transit demand in the morning peak period, UBC adjusted morning class start times. Previously, the first classes in the morning all began at 8:30 a.m. This was changed so that some students begin classes at 8:00 a.m., some at 8:30 a.m., and others at 9:00 a.m. Subsequent analysis showed that the desired spreading

of morning peak demands was achieved, and that as a result, 12% more transit trips per day were accommodated on the same number of buses. Although there are limitations with further efforts to spread class start times, Campus Planning will continue to emphasize the importance with scheduling services to continue to spread the class start times out.

- **Parking supply and costs.** UBC has eliminated approximately 3,500 commuter parking stalls on campus since 1997 — a reduction in the commuter parking supply of over 25%. At the same time, the price of parking on campus has increased (UBC does not provide any free parking spaces on campus for commuters). Daily parking rates have increased from \$2.00 in 1997 to \$16.00 in 2019, and prices for parking permits and short term parking have also increased. As a result of the growth in Electric Vehicle (EV) ownership in the Lower Mainland, UBC has been adding EV charging stations in the parkades across campus. Currently UBC Parking offers access to over 70 EV chargers (both Level 2 and fast chargers), which is the highest in the region per capita and will continue to add more as capacity permits and implement strategies to increase turnover of the use of charging stations.
- **Bicycle facilities.** Since 1997, new bicycle lanes have been implemented on several roadways on campus and to / from campus. Most notable was the conversion of University Boulevard west of Blanca, from two lanes in each direction to one travel lane and one bicycle lane in each direction. Bicycle lanes were also added on SW Marine Drive, Wesbrook Mall, East Mall, Thunderbird Boulevard and 16th Avenue. Similarly, the City of Vancouver has made significant progress on bike facilities that connect to the five key routes to and from UBC. All unrestricted roads on campus function as shared roadways that accommodate cyclists as well as motor vehicles. Bicycle racks are provided at every building on campus in addition to secure bike lockers, bike cages and numerous end of trip facilities.
- **Alternative modes of travel.** UBC has encouraged the use of non-single occupancy vehicle (SOV) modes of travel through a range of programs, including a comprehensive transportation demand management strategy that includes transit discount programs, bike-share, carpooling, car sharing, cycling, local transit (shuttles), a vanpool pilot, an emergency ride home program, and other sustainable transportation initiatives.
- **Campus development and land use.** UBC has developed and is continuing to develop additional housing for students, staff, and faculty on-campus as a means of reducing the proportion of persons who travel to UBC from off-campus. At the same time, an increased number and range of commercial services and amenities are now available on campus and in the University Endowment Lands adjacent to campus to reduce the need to travel off campus.

1.4. Understanding the Data

The following terms and measures are used throughout this report to describe various characteristics of travel patterns and trends at UBC:

- A **screenline** is an imaginary line across which trips are recorded. At UBC, the screenline around the campus illustrated by the dotted blue line in **Figure 1.1**. As shown, there are approximately five different entry and exit options.
- **Mode share** (also called “mode split”) refers to the relative proportions of trips by various travel modes during a particular time period. Mode shares are generally reported for single occupant vehicles (SOVs), carpool and vanpools (also called high occupancy vehicles or HOV’s), transit, bicycle, pedestrians and other modes such as motorcycles and trucks.
- The data presented in the Transportation Status Report include **traffic volumes** and **person trips**. Traffic volumes are simply the number of vehicles passing a point, whereas person trips are the number of people passing a point by all modes of transportation. A person trip is a one-way trip made by one person. For example, in one hour there might be 500 vehicles travelling along a section of road (traffic volumes generally reflect vehicles travelling in both directions). These 500 vehicles might include 450 automobiles with a total of 600 persons in them, 30 buses with a total of 1,000 persons in them, and 20 light and heavy trucks with 25 persons in them. The total number of person trips associated with these 500 vehicles is 1,625 person trips.

*Throughout this report, unless otherwise stated all reported trips are in **person trips**.*

- The population at UBC — students, staff, faculty and residents —has increased every year from 1997. This means that when comparing absolute numbers of person trips and traffic volumes, and changes from one year to another reflect the effects of two different factors — changes in travel patterns and increases in population growth. To distinguish changes in travel patterns from changes due to population increase, a different measure is used — **trips per person**. This provides a consistent basis for monitoring travel trends regardless of how much or how little population growth occurs. Trips per person are calculated as the number of person trips divided by the number of persons at UBC during the weekday daytime. The number of persons is calculated as the student enrolment plus the number of staff and faculty (full and part time), as reported by UBC’s Planning and Institutional Research department. Numbers of on-campus residents are not included in the population count, in many cases it could be a double count as a result of many staff, faculty and students living on campus.
- Substantial effort and cost are required to collect travel data at UBC. Consequently, it is neither reasonable nor necessary to collect all data in all locations at all hours of the day and night. Instead, some data are collected during selected **time periods** only (**Table 1.1** indicates the time periods for each type of data collection activity). Traffic data on all routes leading to and from UBC are collected over a period of one week between the end of October and early November using automatic counters placed on the roadway. On the other hand, vehicle occupancy and classification counts are done manually, and as a result are relatively expensive. These counts are undertaken for a total of 8 hours from the morning peak through the afternoon peak periods. Daily totals can be estimated by combining occupancy and classification data with the average daily traffic data.

- **Rolling average.** Much of the data presented in this report is from a single day to a week and observed travel patterns fluctuate from year to year and are heavily influenced by weather. Consequently the results for any particular year should not be considered in isolation. A more meaningful picture of travel patterns is obtained by considering trends over time. To better illustrate trends and minimize the apparent variability from year to year, charts illustrating trips by mode for each year since 1997 include a trend line based on a three-year rolling average. Rolling averages are calculated as the average of a particular year plus the years before and after. This means that for 2006, for example, the rolling average is calculated as the average number of trips in 2005, 2006 and 2007.

1.5. More Information

The following resources provide additional information regarding travel patterns and trends at UBC, as well as transportation services and facilities. Most of this information can be found at UBC's Campus and Community Planning [website](#):

- This UBC Transportation Status Report Fall 2019, along with previous Transportation Status Reports.
- The 2017 Transportation Survey.
- 2014 UBC Transportation Plan.
- The 2005 Strategic Transportation Plan.
- A review of the first 18 months of the student U-Pass program and the results of the Community Transportation Pass (ComPASS) demonstration project.
- Information on other transportation facilities and services on campus.
- Information regarding campus plans and neighbourhood plans.

2. Summary of Transportation at UBC

The following sections present a general summary of transportation to and from UBC including person trips, trips per person, mode share, and vehicle occupancy. Details for each different mode of transportation are presented in **Section 3**.

2.1. Person Trips

The average weekday person trips to and from UBC in fall 2019 was 148,800. A summary and comparison of daily person trips by mode for 1997 and 2019 are provided in **Table 2.1** and **Figure 2.1**.

Table 2.1: Weekday Person Trips to / from UBC Vancouver, 1997 vs. 2019

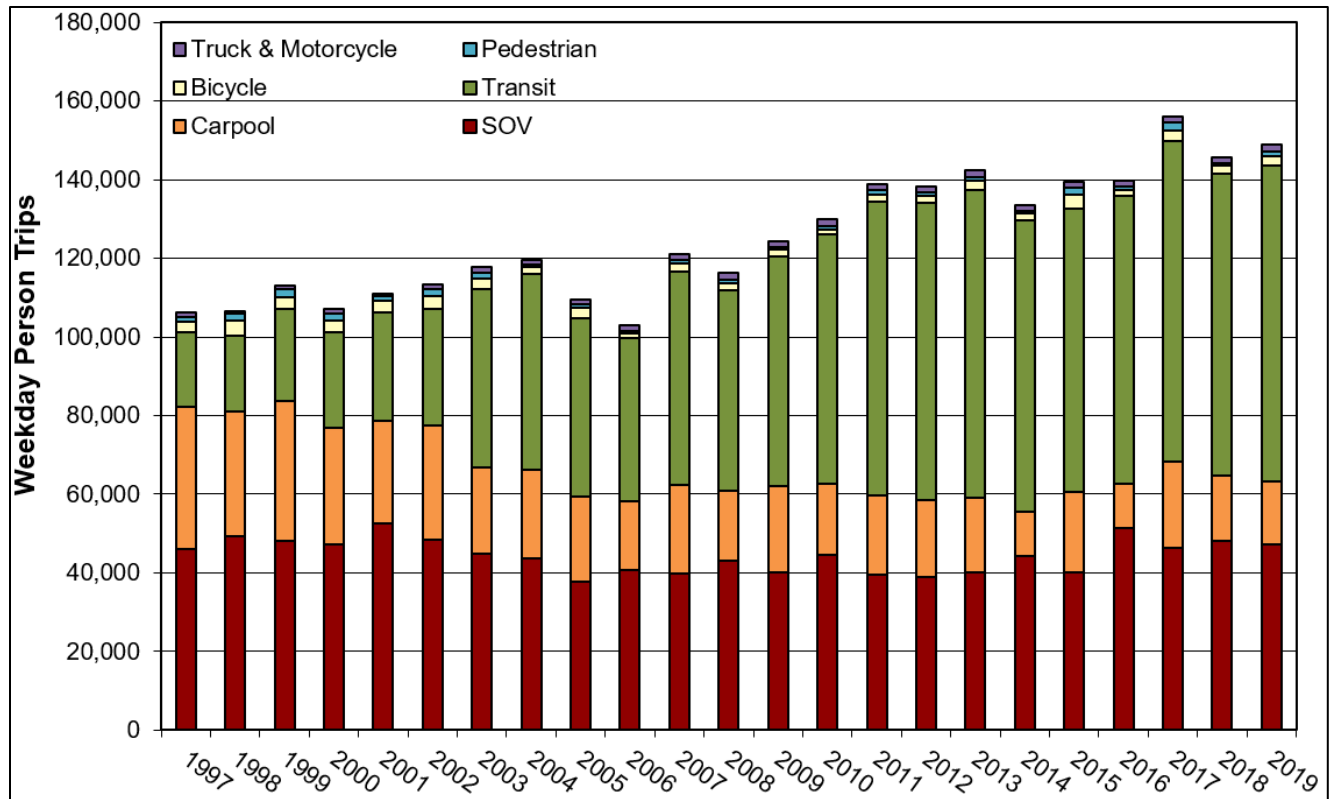
Travel Mode Classification	Person Trips			
	Fall 1997	Fall 2019	Change (count / percentage)	
Single Occupant Vehicle (SOV)	46,000	47,300	+1,300	+2.8%
Carpool / Vanpool (HOV)	36,100	16,000	-20,100	-55.7%
Transit	19,000	80,200	+61,200	+322.1%
Bicycle	2,700	2,500	-200	-7.4%
Pedestrian	1,400	1,300	-100	-7.1%
Truck & Motorcycle	900	1,500	+600	+66.7%
Totals	106,100	148,800	+42,700	+40.2%

Key observations regarding modes of travel to and from UBC include:

- The proportion of SOV trips is up nearly 3% from 1997 levels.
- The proportion of HOV trips has decreased by almost 56% from 1997.
- Trips by transit have increased by over four times since 1997.
- Bicycle and pedestrian trips do not represent a significant portion of the trips to and from campus as a result of the high commuter population at UBC. Bicycle and pedestrian trips also dropped considerably after 2003 when the u-pass was introduced and fluctuate year to year.

There is a lot of variability in trips by mode year over year, highlighting the importance of referencing a three year rolling average. This rolling average is shown for all modes of travel in **Section 3**.

Figure 2.1: Weekday Person Trips to / from UBC, 1997 – 2019



As shown in **Figure 2.1**, the number of person trips leveled off between 2011 and 2019 with the exception of 2017 where a spike in person trips were observed.

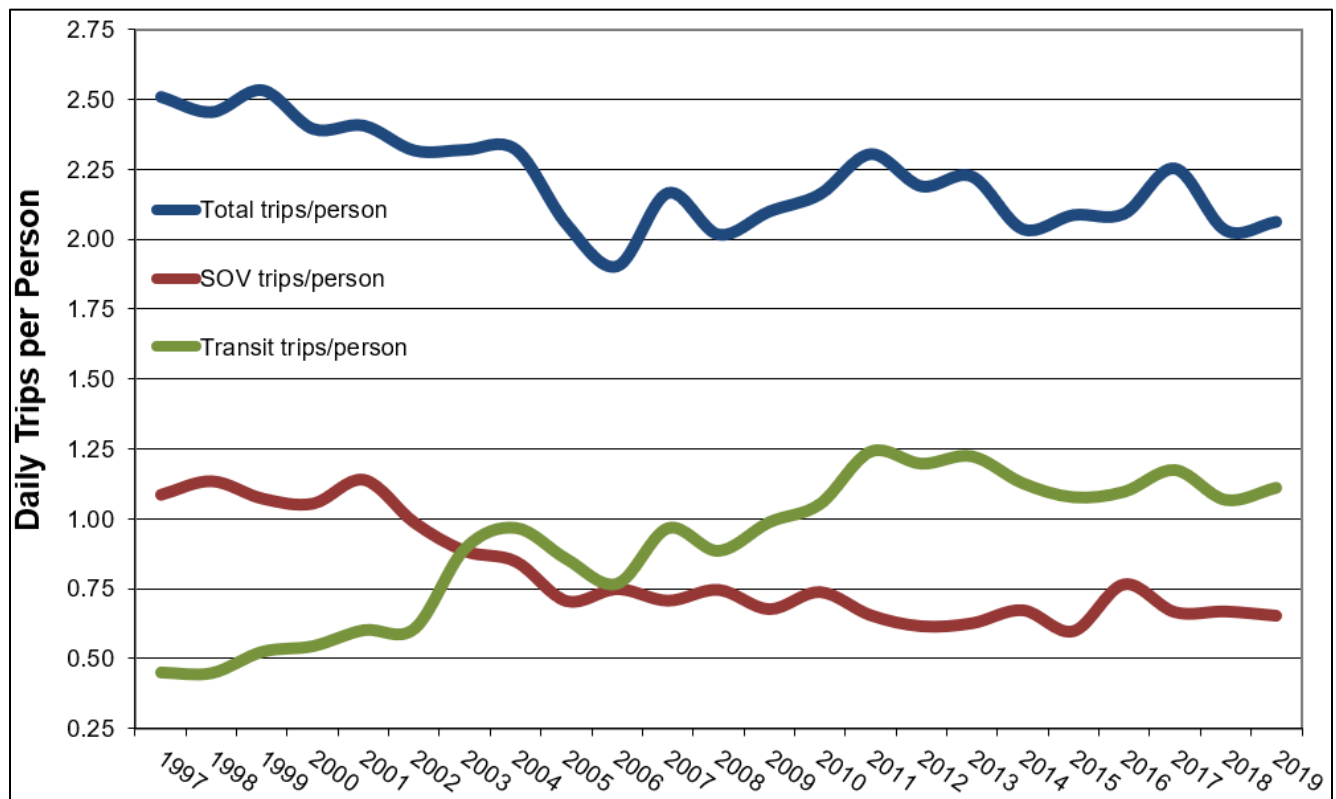
In order to compare travel patterns from year to year on a consistent basis, it is important to negate the effects of population / enrolment growth. To compare the trips per person by mode the average weekday person trips by each mode is divided by the average weekday campus population. The average weekday campus population values include all full and part time students, staff and faculty.

The campus population and trips per person to and from UBC from fall 1997 to fall 2019 are presented in **Table 2.2** and **Figure 2.2**, respectively.

Table 2.2: Weekday Trips Per Person to / from UBC, 1997 – 2019

Travel Mode Classification	Trips Per Person			
	Fall 1997	Fall 2019	Change (count / percentage)	
Single Occupant Vehicle (SOV)	1.09	0.66	-0.43	-39.8%
Carpool / Vanpool	0.86	0.22	-0.63	-74.0%
Transit	0.45	1.11	+0.66	+147.3%
Bicycle	0.06	0.03	-0.03	-45.8%
Pedestrian	0.03	0.02	-0.02	-45.6%
Truck & Motorcycle	0.02	0.02	-0.00	-2.4%
Totals	2.51	2.06	-0.45	-17.8%
CAMPUS POPULATION*	42,300	72,200	+29,900	+70.7%

*Population reported from fall attendance values.

Figure 2.2: Weekday Trips Per Person to / From UBC, 1997 – 2019


The average number of trips per person in 2019 was 2.06 trips per day, which is almost an 18% decrease from 1997 but an increase from the 2.03 trips per person in 2018. Since 1997 the number of trips made by transit has generally increased while the number of trips by single occupant vehicles has generally decreased.

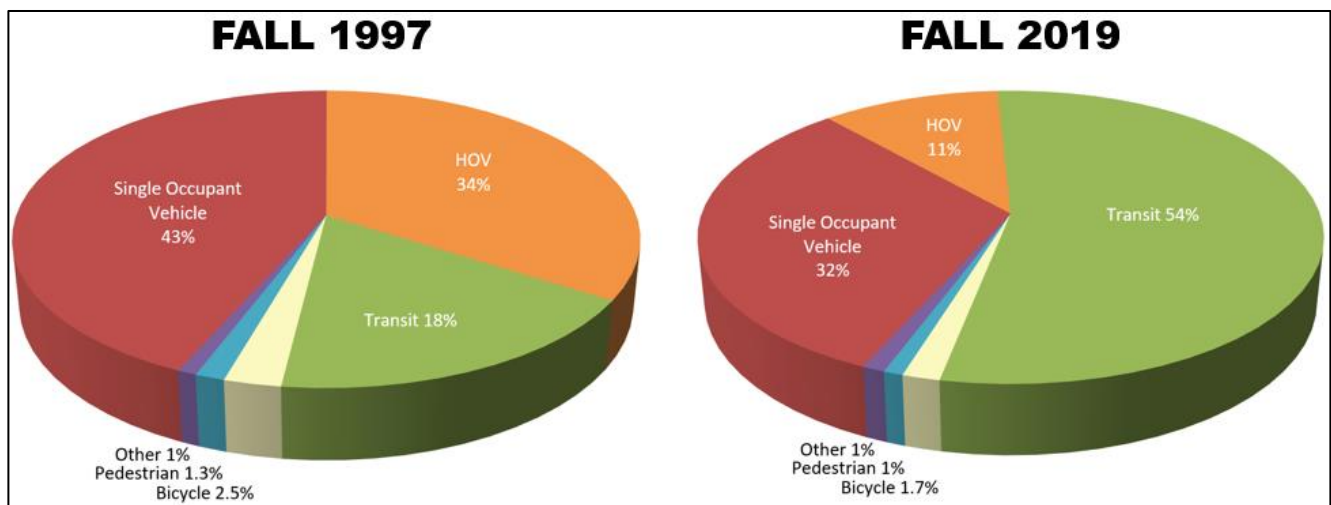
Possible reasons for the decrease in trips per person to and from campus overall since 1997 include:

- UBC's Land Use Plan enables more people to live, work and study on campus
- More services are available on campus, reducing the need for people to travel off campus for errands and essential services.
- Distance education, telecommuting and internet access has reduced the need for some students, staff and faculty to travel to campus each day and in fact the university supports telecommuting (supported by Guidelines for Telecommuting at UBC), as a way to reach its transportation targets.

2.2. Mode Share Summary

The mode share comparison for 1997 and 2019 are shown in **Figure 2.3**. The significant change since 1997 has been the increase in the transit mode share, with trips by transit accounting for over half of all trips to and from UBC, and the decrease in high and single occupancy vehicle mode share.

Figure 2.3: Average Weekday Trips by Mode to / From UBC, 1997 vs. 2019

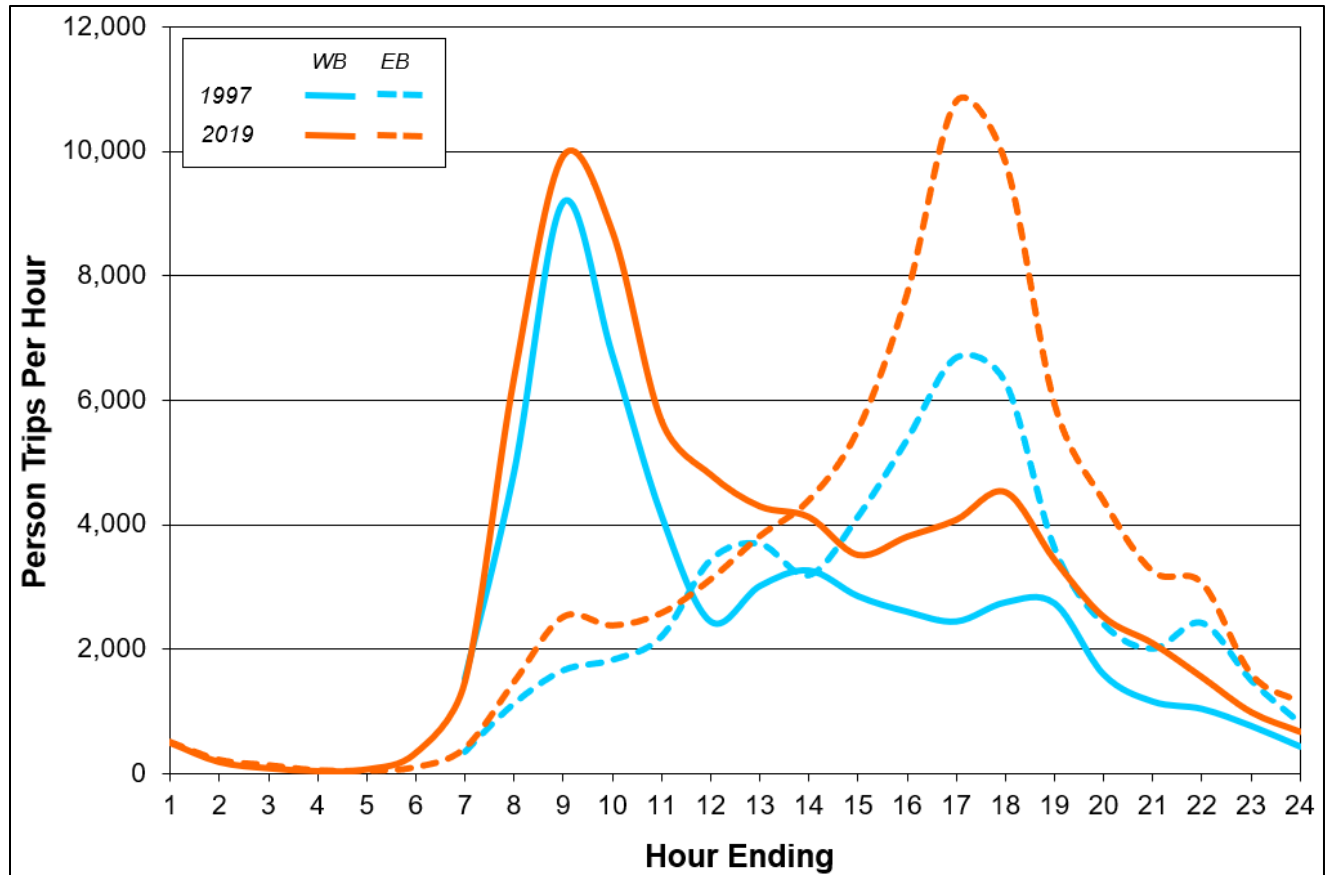


TARGET 1: By 2040 at least two-thirds of all trips to and from UBC will be made by walking, cycling or transit and maintain at least 50% of all trips to and from the campus on public transit.

- In 2019 56.5% of all trips were made by transit, walking and cycling.
- ✓ In 2019 54% of all trips to and from the campus were made by transit.

The distribution of weekday person trips throughout the day compared to 1997 is shown below in **Figure 2.5**. In general, the wave profile matches the standard work and study hours with peaks around 9am and 5pm.

Figure 2.5: Distribution of Average Weekday Person Trips to / from UBC, 1997 vs. 2019



The peak hour summary of trips by mode is summarized in **Table 2.3**. The number of trips to campus during the morning peak and from campus during the afternoon peak increased 8% and 62% in 2019 compared to 1997, respectively. The morning peak demand for trips has not significantly changed, but the evening peak hour has significantly increased. For comparison purposes, the campus population has increased 70% over the same period.

The peak travel periods have spread out slightly compared to 1997 resulting in more trips throughout the day and later into the evening. However, sharp peaks are still visible representing morning and afternoon commuter hours. This puts significant strain on the public transit system and creates overcrowding and poor service / experience to riders, which could push people to less desirable alternatives modes.

Table 2.3: Average Peak Hour Person Trips by Mode to/from UBC, 2019

Travel Mode Classification	AM Peak Hour (8am to 9am)		PM Peak Hour (4pm to 5pm)	
	Westbound	Eastbound	Westbound	Eastbound
Single Occupant Vehicle (SOV)	2,669	1,193	1,288	2,522
High Occupancy Vehicle	507	280	648	938
Transit	6,331	906	2,455	5,922
Bicycle	265	20	63	310
Pedestrian	77	50	50	90
Truck & Motorcycle	73	66	16	30
Totals	9,922	2,515	4,520	9,812

2.3. Traffic Patterns and Vehicle Occupancy

Automobile traffic (single occupant and high occupant vehicles only) to and from UBC has decreased substantially from 62,400 automobiles per weekday in fall 1997 to 54,800 automobiles per weekday in fall 2019 despite a 70% increase in daytime population, as shown in **Table 2.4**. The second target in UBC's transportation plan is to reduce single occupant vehicle trips to and from UBC by 20% from 1997 levels. In 2019 this target was not met as SOV trips increased by 2.8% over 1997 levels.

Table 2.4: Average Weekday SOV and HOV Traffic Volume to/from UBC, 1997 vs. 2019

Travel Mode Classification	Fall 1997	Fall 2019	Change (count / percentage)	
Single Occupant Vehicle (SOV)	46,000	47,300	+1,300	+2.8%
High Occupant Vehicle (HOV)	16,400	7,500	-8,900	-54.3%
Totals	62,400	54,800	-7,600	-12.2%

The average weekday traffic volumes to / from UBC in a 24-hour period for both fall 1997 and fall 2019 are shown in **Figure 2.6**. As shown, the traffic volumes have reduced through most of the day, not just at peak periods. The exceptions are the morning eastbound movement and the later evening westbound movement where an increase in traffic was observed, likely a result of the growth in the on campus residential population that travel into Vancouver for work, school or other.

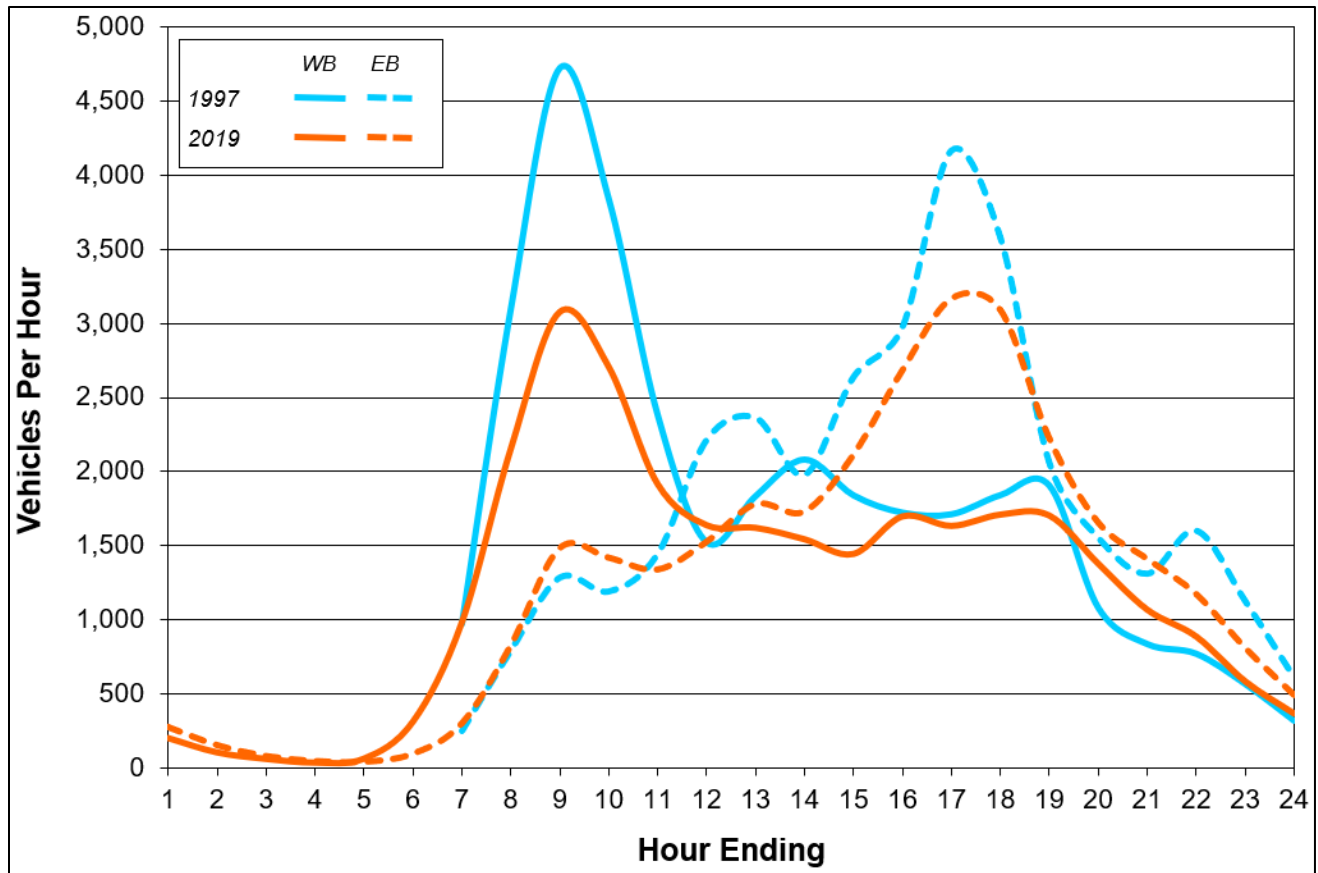
Figure 2.6: Distribution of Average Weekday Traffic Volumes to / from UBC, 1997 vs. 2019


Table 2.5 summarizes the daily traffic volumes at each screenline location. It is important to note that these figures include trucks, buses and motorcycles, in addition to SOV's and HOV's so the numbers in this table won't match those presented in **Table 2.4**.

Table 2.5: Summary of Average Weekday Traffic Volumes at Screenlines, 1997 vs. 2019

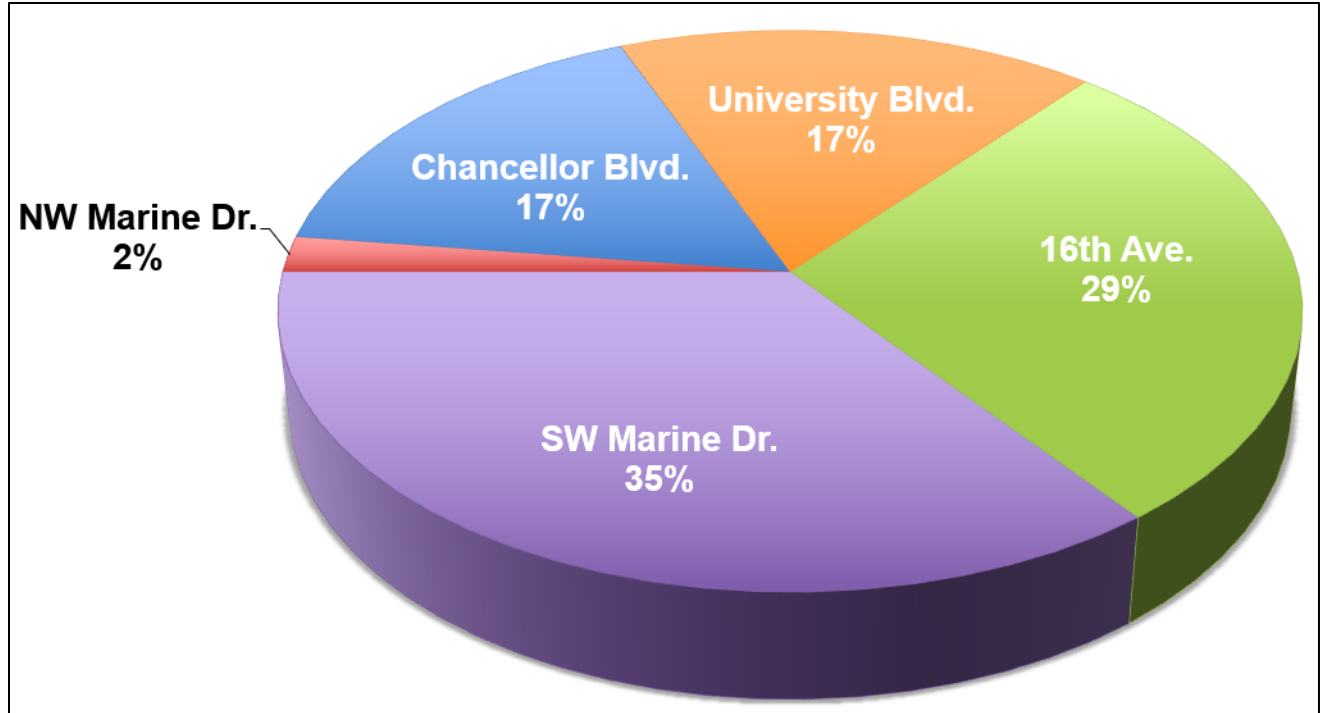
Screenline	Average Daily Traffic Volume			
	Fall 1997	Fall 2019	Change (count / percentage)	
NW Marine Drive	2,040	1,220	-820	-40%
Chancellor Boulevard	11,660	9,850	-1,810	-15%
University Boulevard	14,610	10,180	-4,430	-30%
16th Avenue	12,880	16,720	+3,840	+30%
SW Marine Drive	23,410	20,830	-2,580	-11%
Totals	64,600	58,800	-5,800	-9%

Overall, traffic volumes were 9% lower in fall 2019 than in 1997 with a general decrease observed at all screenline locations with the exception of 16th Avenue where there has been an increase of 30%. The

increase on 16th Avenue is mostly attributed to the population growth in Wesbrook Village and congestion on alternative routes.

The distribution of all traffic volumes to / from UBC by screenline is shown in **Figure 2.7**. As shown, the majority of UBC traffic uses SW Marine Drive and 16th Avenue.

Figure 2.7: Distribution of Average Weekday Traffic to / from UBC by Screenline, 2019



Vehicle occupancy is a measure of the average number of people travelling per vehicle during a certain period of time. As shown in **Table 2.6**, the average vehicle occupancy of all vehicles in 2019 was 1.14 persons per vehicle, down from 1.32 persons per vehicle in 1997, but consistent with 2018 data. The average occupancy for high occupancy vehicles decreased from 2.20 in 1997 to 2.07 in 2019. In 2019, 92% of recorded HOV trips were two person trips with three and four person trips at 6% and 2%, respectively. This is a slight improvement compared to 2018 when only 5% of all HOV trips had three or more people in the vehicle.

Table 2.6: Average Daily Vehicle Occupancy to / from UBC

Travel Mode Classification	Fall 1997	Fall 2017	Fall 2018	Fall 2019
Vehicles (SOV's + HOV's)	1.32	1.21	1.14	1.14
HOV's (Carpools / Vanpools)	2.20	2.12	2.07	2.07

Table 2.7 provides a summary of average automobile occupancies from 7:00 a.m. to 6:00 p.m. Overall there is no significant variation in the vehicle occupancies throughout the day, but they appear to be higher for afternoon trips to and from campus.

Table 2.7: Hourly Vehicle Occupancies to / from UBC, 2019

Hour Beginning	Westbound	Eastbound	Both Directions
7:00 a.m.	1.12	1.11	1.11
8:00 a.m.	1.09	1.11	1.10
9:00 a.m.	1.06	1.13	1.08
11:00 a.m.	1.10	1.17	1.14
12:00 p.m.	1.10	1.18	1.14
3:00 p.m.	1.19	1.16	1.17
4:00 p.m.	1.17	1.18	1.17
5:00 p.m.	1.21	1.16	1.18
8-Hour Average	1.12	1.16	1.14

3. Transportation to and from UBC

This section of the Transportation Status Report describes travel patterns and trends for trips to and from the UBC Vancouver campus for each mode of travel. Information regarding transportation conditions on campus is presented in **Section 4**.

3.1. Transit

Transit ridership at UBC has quadrupled since 1997, which equates to 80,200 weekday transit trips and 54% of all trips to and from UBC each day. This exceeds the target set in the Transportation Plan, which is to maintain at least 50% of all trips to and from the campus on public transit.

The high transit mode share is the result of the student U-Pass program, continued improvements in transit service, a reduced supply of commuter parking, and higher parking costs on campus. **Table 3.1** provides a summary of the increase in transit trips and the transit mode share from fall 1997 to fall 2019, highlighting the change from 2002 to 2003 when the student U-Pass was introduced.

Table 3.1: Summary of Average Weekday Transit Trips to / from UBC, 1997 – 2019

Transit Trips	Before U-Pass		After U-Pass		Change 1997-2018 (count / percentage)	
	Fall 1997	Fall 2002	Fall 2003	Fall 2019		
Person Trips	19,000	29,700	45,400	80,200	+61,200	+322%
Trips Per Person	0.45	0.61	0.89	1.11	+0.66	+147%
Transit Mode Share	18%	26%	39%	54%	+36%	+201%

Figure 3.1 illustrates transit ridership from year to year and includes the three-year rolling average that balances out the variation year over year. A sharp peak was observed in 2003 when the u-pass was

introduced, which was followed by a steady increase and a levelling off in 2011.

Table 3.2 provides a summary of transit trips by corridor, **Table 3.3** provides a summary of transit trips by route and by time period, and **Table 3.4** provides a summary of peak hour trips by route.

Table 3.2: Average Weekday Transit Trips to / from UBC by Corridor, 2019

Corridor	AM Peak 6am to 9am	Midday 9am to 3pm	PM Peak 3pm to 6pm	Evening 6pm to Midnight	Night Midnight to 4:30am	Totals	
Chancellor Blvd.	2,338	4,669	2,653	1,464	0	11,124	14%
University Blvd.	4,192	11,805	9,289	5,240	676	31,202	39%
16th Avenue	1,775	3,667	2,870	1,896	21	10,229	13%
SW Marine Drive	3,916	8,806	8,935	5,979	0	27,636	34%
Totals	12,221	28,947	23,747	14,579	697	80,191	100%
	15%	40%	26%	17%	2%		

Figure 3.1: Average Weekday Transit Trips to / from UBC, 1997 – 2019

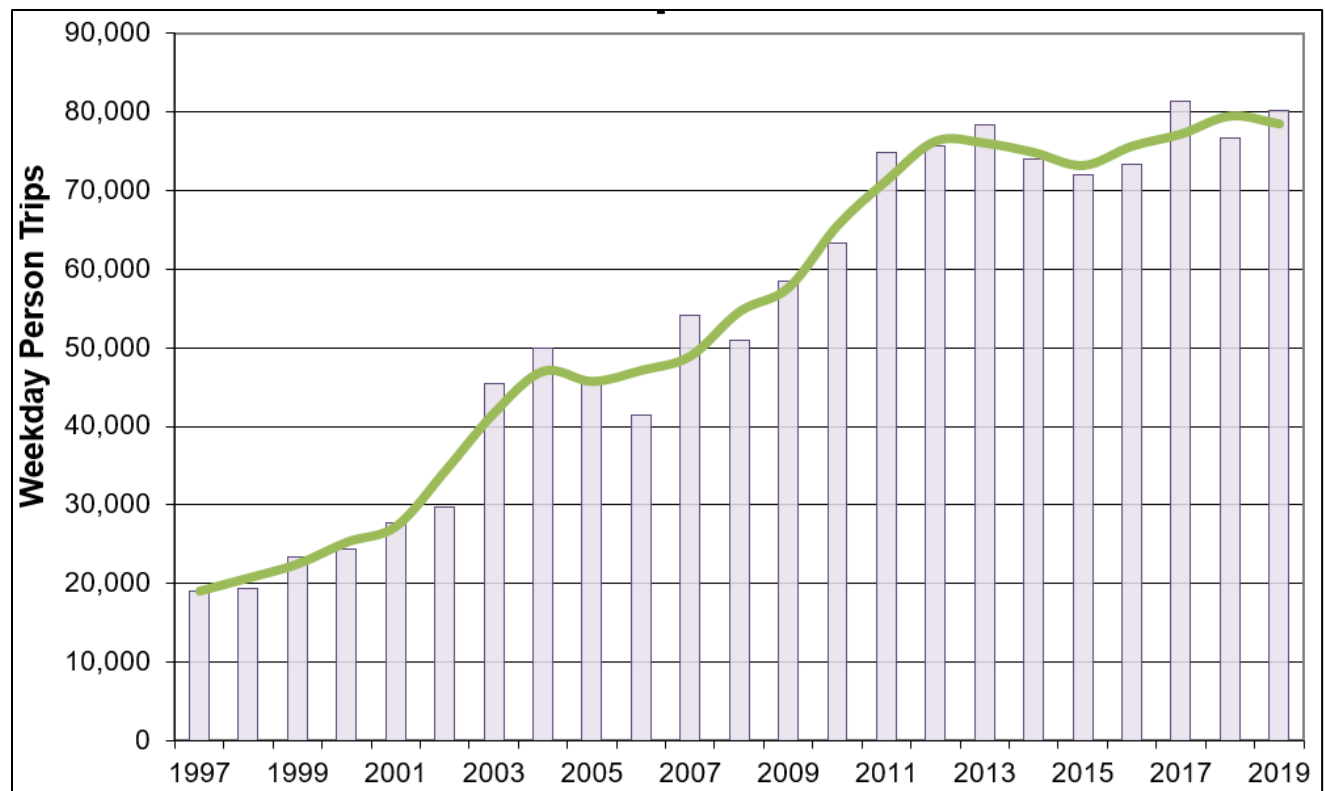


Table 3.3: Average Weekday Transit Trips to / from UBC by Route, 2019

Route		AM	Midday	PM Peak	Evening	Night	Totals	
		6am to 9am	9am to 3pm	3pm to 6pm	6pm to Midnight	Midnight to 4:30am		
4	4th Avenue	390	1,242	977	768	52	3,429	4%
9	Broadway	412	437	892	120	-	1,861	2%
14/N17	Broadway	630	1,872	1,219	1,067	253	5,041	6%
25	King Edward	1,285	2,233	1,864	1,145	21	6,548	8%
33	16th Avenue	485	1,409	948	751	-	3,593	4%
41	41st Avenue	715	1,858	1,615	1,752	-	5,940	7%
43	41st Ave Express	1,859	2,244	2,266	1,934	-	8,303	10%
44	4th Ave. Express	1,036	2,024	1,400	557	-	5,017	6%
49	49th Avenue	576	2,963	3,369	1,486	-	8,394	10%
84	4th Ave. Express	1,140	2,567	1,253	907	-	5,867	7%
99	Broadway B-Line	2,750	8,149	6,008	3,265	371	20,543	26%
258	North Shore	162	83	157	-	-	402	0.5%
480	Richmond Express	766	1,696	1,585	742	-	4,789	6%
NIS	Not In Service	15	170	194	85	-	464	0.6%
Totals		12,221	28,947	23,747	14,579	697	80,191	100%
		15%	40%	26%	17%	2%		

Significant observations about transit trips to and from UBC include:

- The number of transit trips appears to be on the rise again after the decline in 2014-2016 with another year of slight increase in the number of trips by transit.
- Bus routes via University Boulevard account for 39% of all transit trips to and from UBC. Bus routes via 16th Avenue and Chancellor Boulevard account for 13% and 14%, respectively. When combined, ridership in the "UBC Line"¹ corridor amounts to 66% of all transit trips to and from UBC. Bus routes via SW Marine Drive (the majority of which use 41st Avenue in the City of Vancouver) account for the remaining 34% of all transit trips.
- Compared to 2018 monitoring results, the largest difference is the increase in trips arriving via SW Marine Drive and a decrease in trips arriving via University Boulevard. This is as a result of a reduction in trips via the 99 B-Line and an increase in trips via the 49. With the addition of the Rapid-Bus in January 2020, the trips arriving from SW Marine Drive should again show an increase.
- The 99 B-Line accounts for 26% of all transit trips, which is a 4% decrease from 2018 values.
- The other express bus services (Routes 43, 44, 84, 258 and 480) account for 30% of all transit trips to and from UBC. Adding the Route 99 B-Line increases this to 56% of all transit trips, indicating

¹ UBC Line refers to the future rapid transit line to UBC that is expected to be used by people currently taking transit to / from UBC via Chancellor Boulevard, University Boulevard and 16th Avenue.

popularity for faster transit service options to / from UBC.

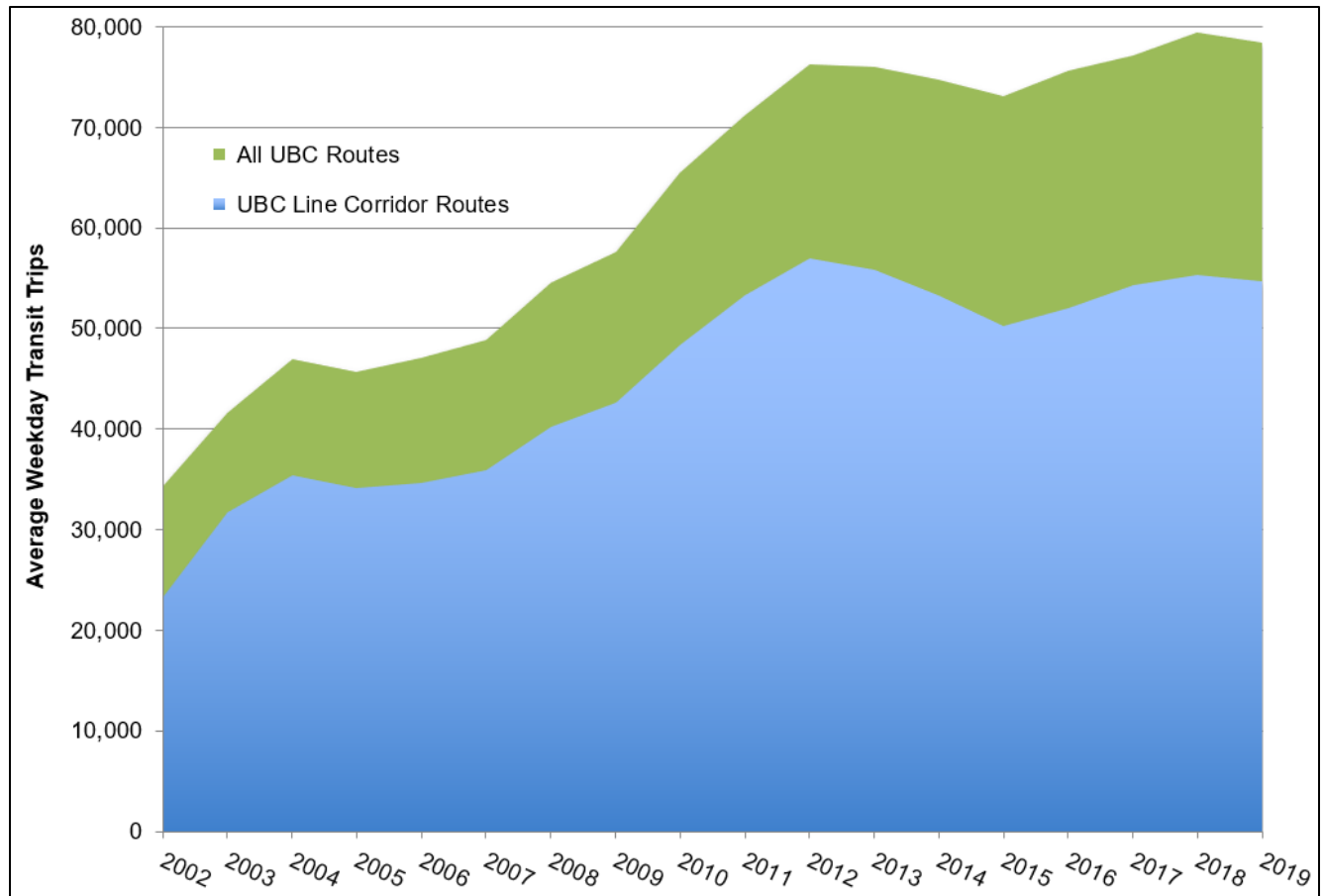
- Trolley bus Routes 4, 9 and 14/17 account for 13% of all transit trips, which is down slightly from 2018 (14%).

Table 3.4: Average Peak Hour Weekday Transit Trips to / from UBC by Route, 2019

Route		AM Peak Hour Westbound 8:30am – 9:30am		PM Peak Hour Eastbound 4:15pm – 5:15pm	
4	4th Avenue	201	3%	307	5%
9	Broadway	270	4%	241	4%
14/N17	Broadway	300	5%	315	5%
25	King Edward	659	10%	587	9%
33	16th Avenue	209	3%	292	4%
41	41st Avenue	466	7%	489	7%
43	41st Ave.(limited stops)	507	8%	544	8%
44	4th Ave.(limited stops)	504	8%	392	6%
49	49th Avenue	612	10%	1,108	17%
84	4th Ave.(limited stops)	652	10%	395	6%
99	Broadway B-Line	1,583	25%	1,454	22%
258	North Shore Express	63	1%	55	0.8%
480	Richmond Express	359	6%	415	6%
NIS	Not In Service	5	0.1%	21	0.3%
Totals		6,390	100%	6,615	100%

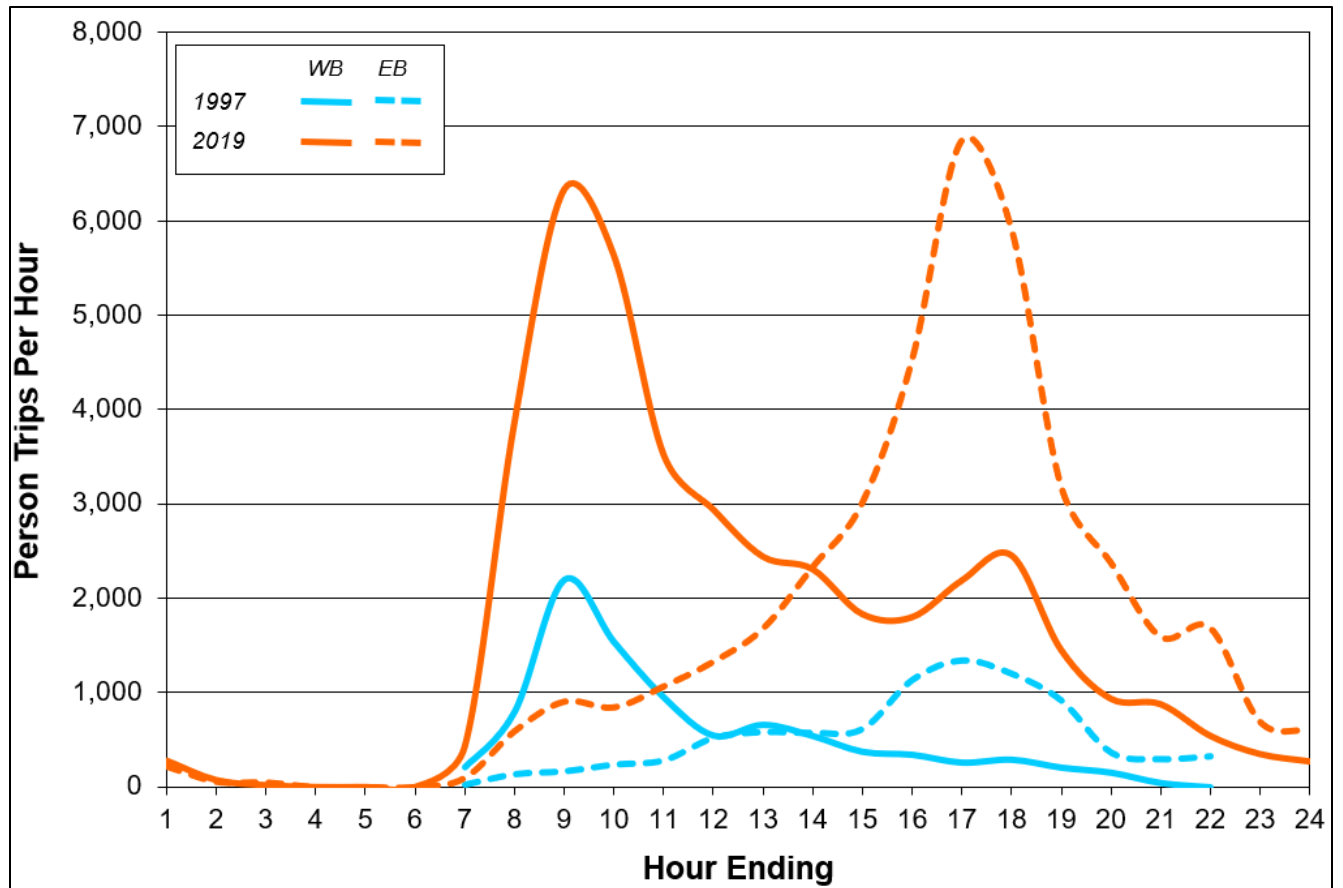
Figure 3.2 compares the three-year rolling average of ridership on bus routes in the UBC Line corridor with total ridership on all routes. It is showing that trips by transit on all routes and along the UBC Line corridor specifically has levelled off since 2017.

Figure 3.2: Average Weekday Transit Trips to / from UBC by Route, 2019



The daily distribution of transit trips to and from UBC in 2019 is shown in **Figure 3.3** including a comparison with fall 1997 transit trips. Not only does this illustrate the significant increase in transit ridership since 1997, but it also illustrates there are significant peak periods of transit demand. A wider spread of peak arrival and departure periods at UBC would allow TransLink to better accommodate the demand as passengers would be more likely to use transit. A majority of the transit routes to UBC are at capacity during the peak periods with overcrowding consistently observed, which results in unsatisfied customers and people choosing alternative modes instead as evidenced by the 2017 transportation survey discussed below.

Figure 3.3: Distribution of Average Weekday Transit Trips to / from UBC, 1997 vs. 2019



In 2017, UBC carried out a transportation survey of the campus community to gather more detailed information about travel to / from and around campus. Their top three responses to a question about what would increase the likelihood of travelling to campus by public transit more often were shorter travel times, less overcrowding of buses, and increased frequency of service. Of people that currently do take transit to travel to / from UBC the average travel time from respondents was 50.5 minutes, one way. Given this information it suggests strong support for rapid transit and a high likelihood that vehicle trips would be replaced by rapid transit trips if there was a rapid transit connection to UBC. In the meantime, TransLink will be launching the new Rapid Bus fleet that includes one route to UBC (R-4) starting in January 2020 as well as other express route improvements.

3.2. Motor Vehicles

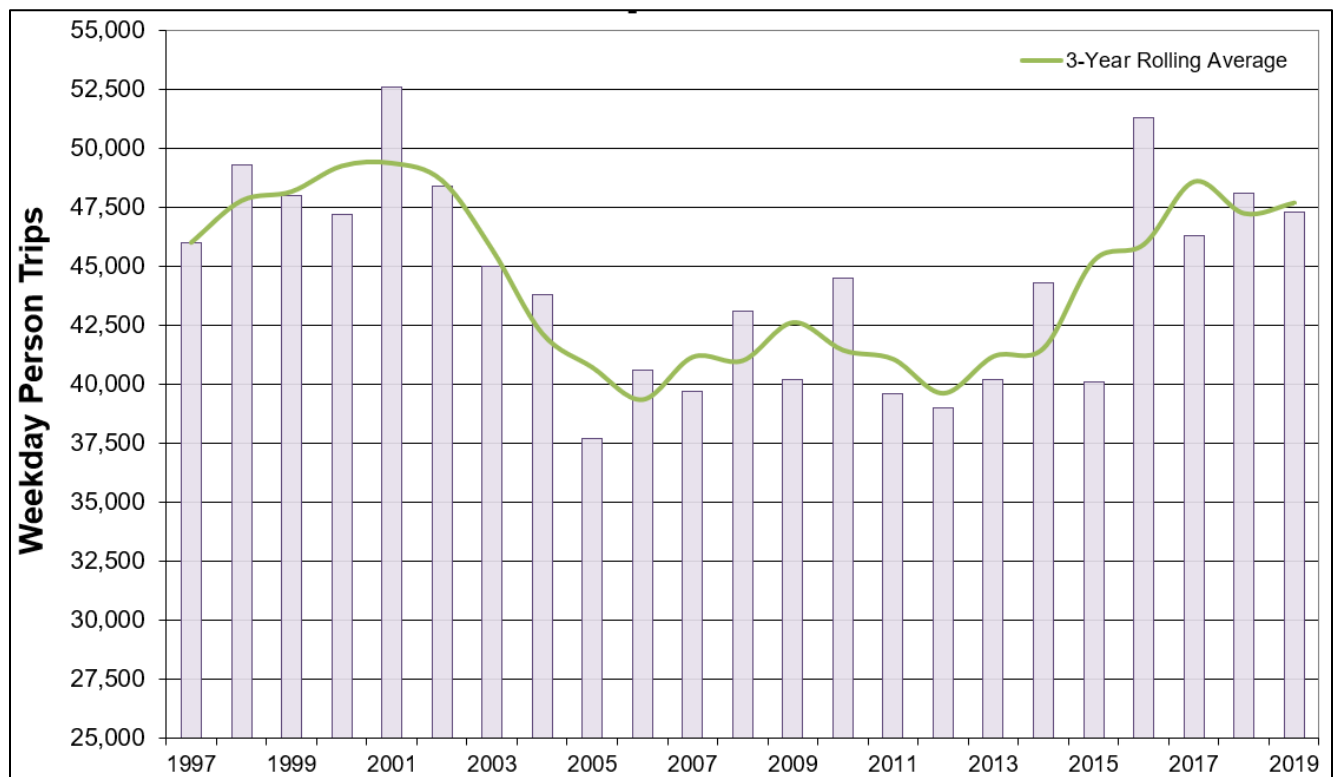
UBC is committed to reducing the amount of vehicle traffic travelling to and from UBC each day as represented in two of the three targets identified in the Transportation Plan.

Table 3.5 provides a comparison of SOV travel in fall 1997 and fall 2019, and **Figure 3.4** provides a summary of year-by-year changes and the three-year rolling averages.

Table 3.5: Summary of SOV Trips to / from UBC, 1997 vs. 2019

Average Weekday SOV Trips	Fall 1997	Fall 2019	Change 1997-2019 (count / percentage)	
Person Trips	46,000	47,300	+1,300	+2.8%
Trips Per Person	1.09	0.66	-0.43	-39.8%
SOV Mode Share	43%	32%	-11.6%	-26.7%

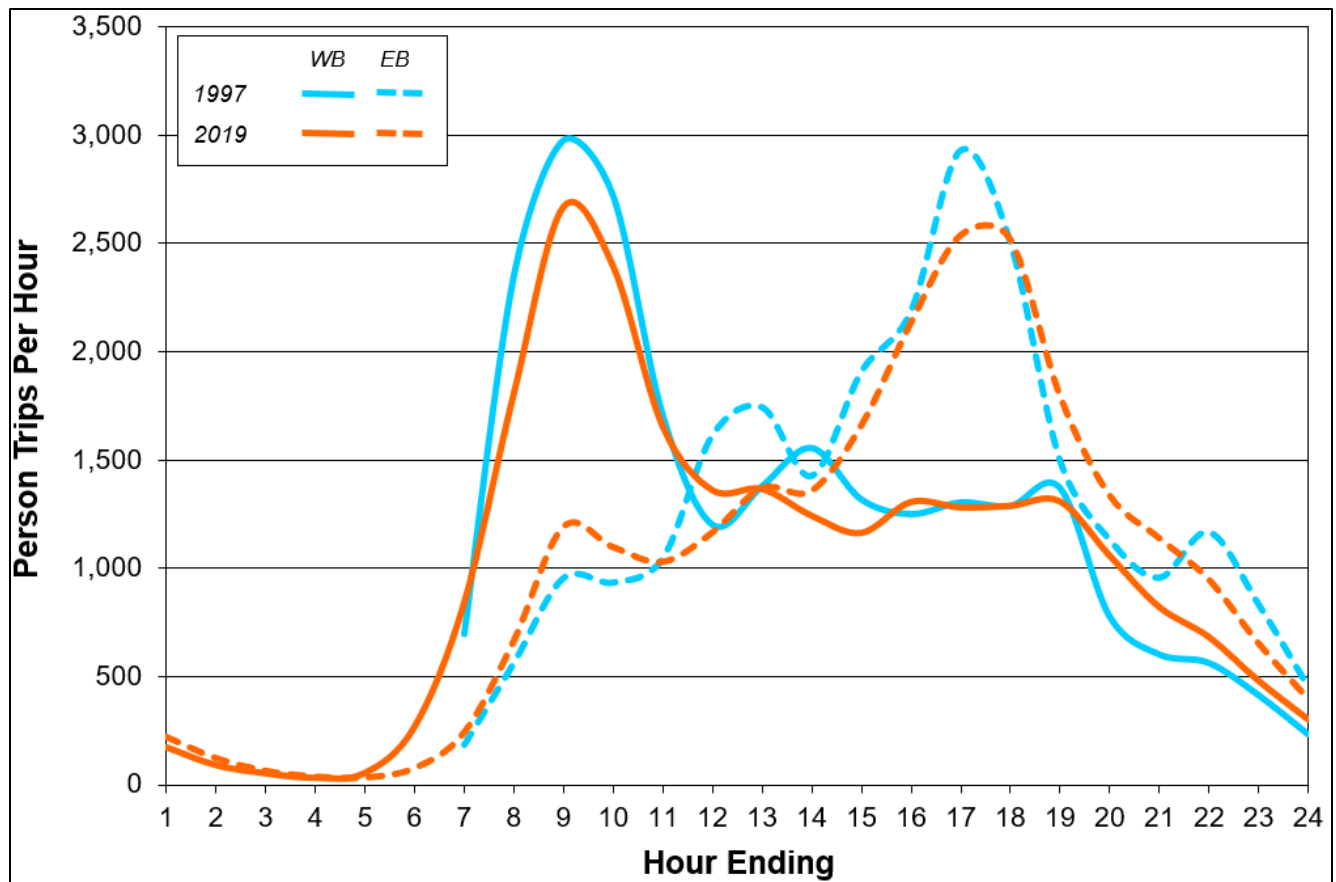
Figure 3.4: Average Weekday SOV Trips to / from UBC, 1997 - 2019



This year there was a slight reduction in SOV trips compared to 2018, but in general it is continuing the trend with the past eight years that shows a gradual increase year over year. Unfortunately, with this trend UBC will continue to have SOV trips above 1997 values and therefore not in a position to achieve the target set in the Transportation Plan.

Figure 3.5 illustrates the arrival and departure patterns of SOV trips to and from UBC throughout the day, including a comparison with fall 1997 SOV trips. SOV trips observed in 2019 follow the same peak travel patterns in 1997, but with lower peak values. There are however, more trips into the later evening. This increase in late afternoon and evening trips as well as the increase in off-peak direction trips are anticipated to continue as the campus residential population increases.

Figure 3.5: Distribution of Average Weekday SOV Trips to / from UBC, 1997 vs. 2019



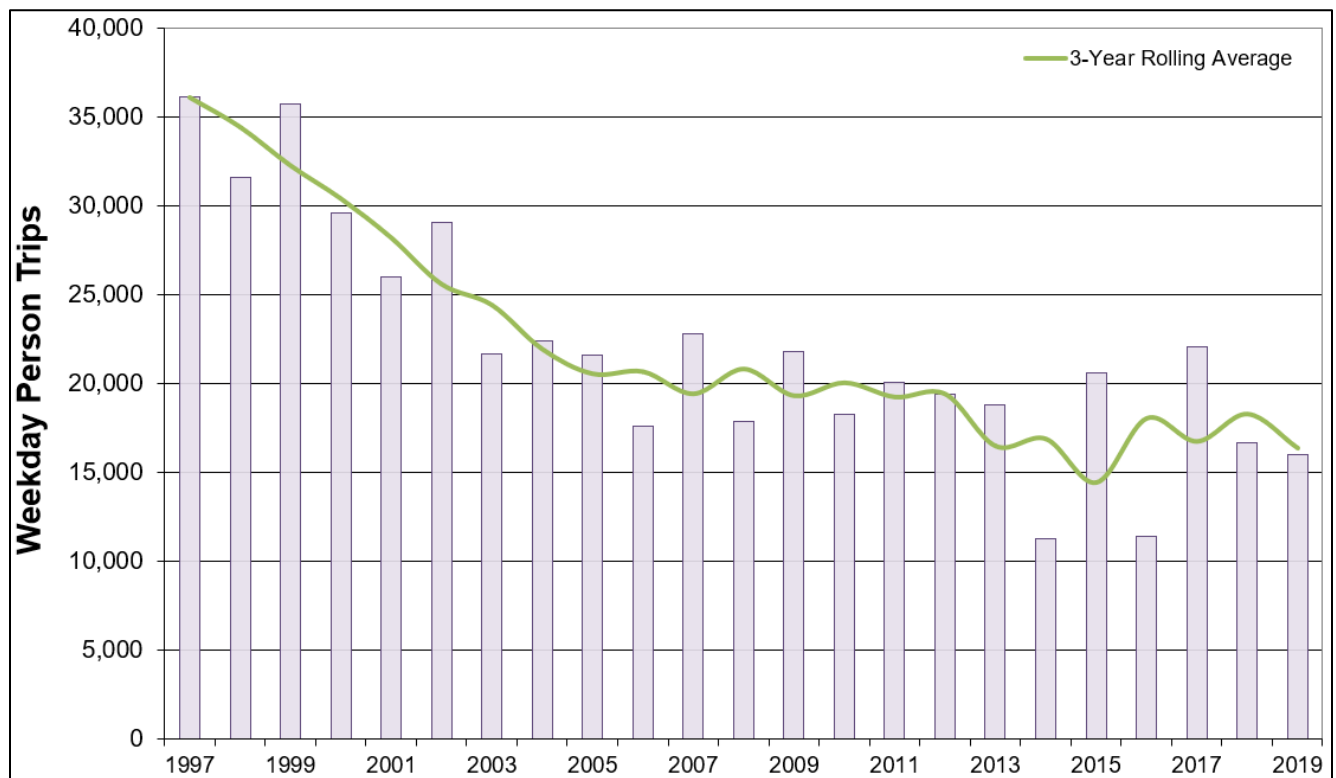
From the 2017 Transportation Survey the campus community was asked why they chose to drive alone. Their top three responses were to pick-up children from daycare and schools, public transit is not an option because they live too far away, and they do not like to take public transit in general. Of the respondents that identified they travelled alone, 75% of them said they would take transit if there was a rapid transit connection to UBC. Although rapid transit isn't planned for quite a while, a new RapidBus route, R-4, started running to UBC in January 2020. It will be interesting to monitor the impacts of that additional, higher service bus route to UBC during the fall 2020 monitoring period.

Carpooling, or High Occupancy Vehicle travel (HOV), has decreased substantially since 1997. A summary of the trend in HOV travel in fall 1997 and fall 2019 is provided in **Table 3.6**, and a summary of year-by-year changes and the three-year rolling average is provided in **Figure 3.6**.

Table 3.6: Summary of HOV Trips to / from UBC, 1997 vs. 2019

Average Weekday HOV Trips	Fall 1997	Fall 2019	Change 1997-2019 (count / percentage)	
Person Trips	36,100	16,000	-20,100	-55.7%
Trips Per Person	0.85	0.22	-0.63	-74%
HOV Mode Share	34%	10.8%	-23.3%	-68%

Figure 3.6: Average Weekday HOV Trips to / from UBC, 1997 – 2019

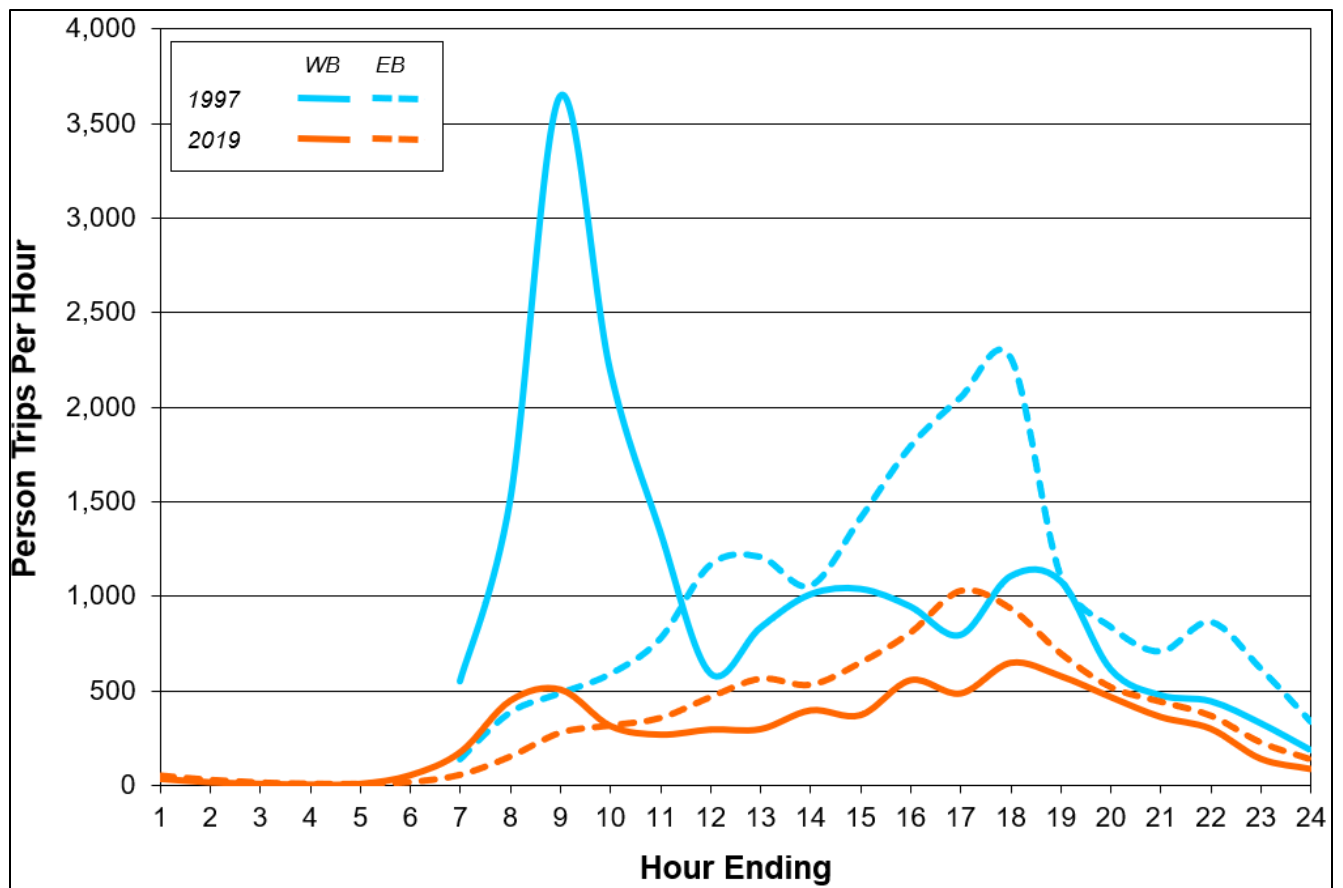


As shown in **Figure 3.6**, HOV trips have decreased significantly since 1997 and over the last six years have exhibited a lot of fluctuation. There are significant barriers to HOV in general, but UBC is working on increasing this mode share with pilot programs and incentives offered through UBC Parking in addition to better understanding the barriers to carpooling / vanpooling.

Figure 3.7 illustrates the arrival and departure patterns of HOV trips to and from UBC throughout the day, including a comparison with fall 1997 HOV trips. One observation is the greater amount of HOV trips departing campus during the afternoon peak period. This may be because it is easier to coordinate rides while at work as opposed to early in the morning or people are less rushed to return home compared to having to arrive to work on time.

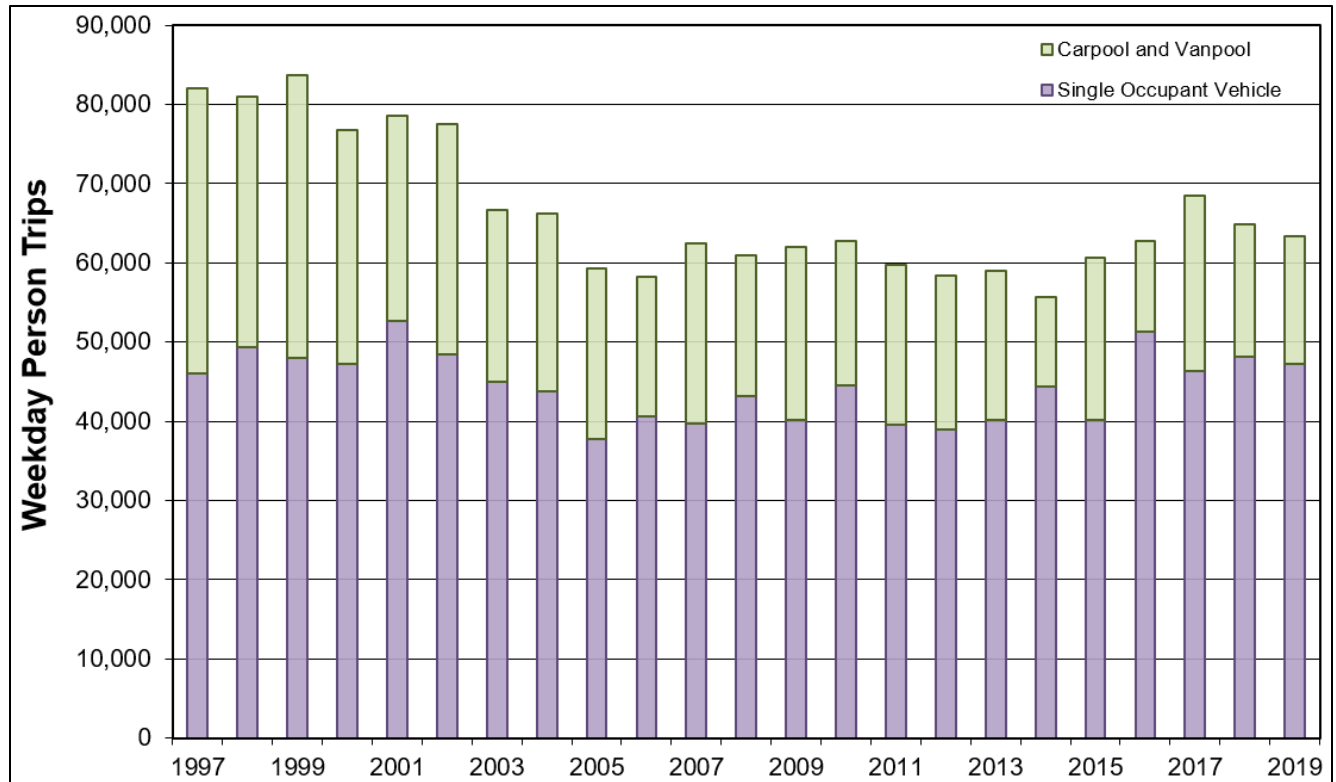
The 2017 Transportation Survey asked the campus community why they drive alone and what would make them choose to travel by more sustainable options such as carpooling. The primary response was the need to carry out other errands such as picking children up from daycare / school. This identifies that flexibility is a requirement when exploring carpooling programs. Respondents also identified that more carpool incentives would increase the likelihood of them carpooling over travelling alone.

Figure 3.7: Distribution of Average Weekday HOV Trips to / from UBC, 1997 vs. 2019



In fall 2019, daily motor vehicle traffic was 54,800 vehicles per day, which is 7,600 less than the 1997 level. **Figure 3.8** provides a summary of the trend in daily motor vehicle traffic volumes from 1997 to 2019. The number of automobiles travelling to campus daily has generally levelled off just over 60,000 vehicles, but with variations in the split between SOV and HOV trips.

Figure 3.8: Average Weekday Motor Vehicle Trips to / from UBC, 1997 – 2019



TARGET 2: Reduce single occupant vehicle trips to and from UBC by 20% from 1997 levels and reduce single occupancy vehicle trips per person to and from UBC by 30% from 1997 levels.

- In 2019 there were 47,300 SOV vehicle trips, which is a 2.8% increase from 1997 values.
- ✓ In 2019 there were 0.66 SOV trips per person, which is a 39.8% reduction from 1997 values.

TARGET 3: Maintain daily private automobile traffic at or less than 1997 levels. Private automobiles include single occupant vehicles and carpools / vanpools, but do not include buses, motorcycles and trucks.

- ✓ In 2019 there were 54,800 private vehicles per day, which is a 12.2% reduction from 1997 values.

In 2019 UBC did not achieve the target of a 20% reduction in SOV trips to / from UBC from 1997. The greatest opportunity for future years is to convert the SOV trips to public transit or HOV trips. UBC has been participating in a vanpool pilot program, is exploring carpooling incentives for staff, and TransLink is planning a new RapidBus to campus for January 2020.

As a result of the significant uptake of car sharing in Vancouver, there is interest in tracking the number of car share trips to and from campus. Car share vehicles were counted at screenline locations over an eight-hour period, which is presented below in **Table 3.6b**. UBC provides around 160 dedicated parking stalls to multiple car share providers in addition to overflow parking on the roof level of parkades.

Table 3.6b: Summary Car Share Trips to and from UBC

Car-Share Vehicle Trips	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019
1-Person Trips	299	388	408	503	497
2-Person Trips	45	41	73	41	101
3+ Person Trips	5	7	39	9	13
Totals	349	436	520	553	611

As shown, there has been a significant increase in car share trips to / from UBC with an increase over 75% in just four years. Results from the 2019 Transportation Survey of the campus community identified Car2Go and Evo as the top two car share providers that respondents had memberships to. Respondents also identified the top three reasons they use car share vehicles are to run errands / shopping, when the weather is poor, and for commuting to school / work.

More research is required to determine the overall benefits of car share at UBC. For example, what travel mode is being replaced by car share and how many times do the vehicles that are driven to campus move throughout the day.

3.3. Bicycles and Pedestrians

Table 3.7 and **Figure 3.9** provide summaries of the trend in bicycle trips from fall 1997 to fall 2019. There was a significant decrease in trips by bike after the U-Pass program was introduced in 2003. However, with the exception of 2014 and 2016 there has been a general increase in the number of bicycle trips since 2010. This is likely correlated with continued improvements to bike infrastructure at UBC and in the City of Vancouver as well as the general popularity of biking in the region including the uptake of e-bikes that increases the distance cyclists are willing to travel to commute. It is important to note that bicycle trips are recorded over a single day, so variations in data year over year are highly anticipated, particularly as weather tends to have a direct correlation with bike trips.

Table 3.7: Summary of Average Weekday Bicycle Trips to / from UBC, 1997 vs. 2019

Average Weekday Bicycle Trips	Before U-Pass		After U-Pass		Change 1997-2019 (count / percentage)	
	Fall 1997	Fall 2002	Fall 2004	Fall 2019		
Person Trips	2,700	3,300	1,600	2,500	-200	-7.4%
Trips Per Person	0.06	0.07	0.03	0.03	-0.03	-45.8%
Bicycle Mode Share	2.5%	2.9%	1.3%	1.7%	-0.9%	-34%

Figure 3.9: Average Weekday Bicycle Trips to / from UBC, 1997 – 2019

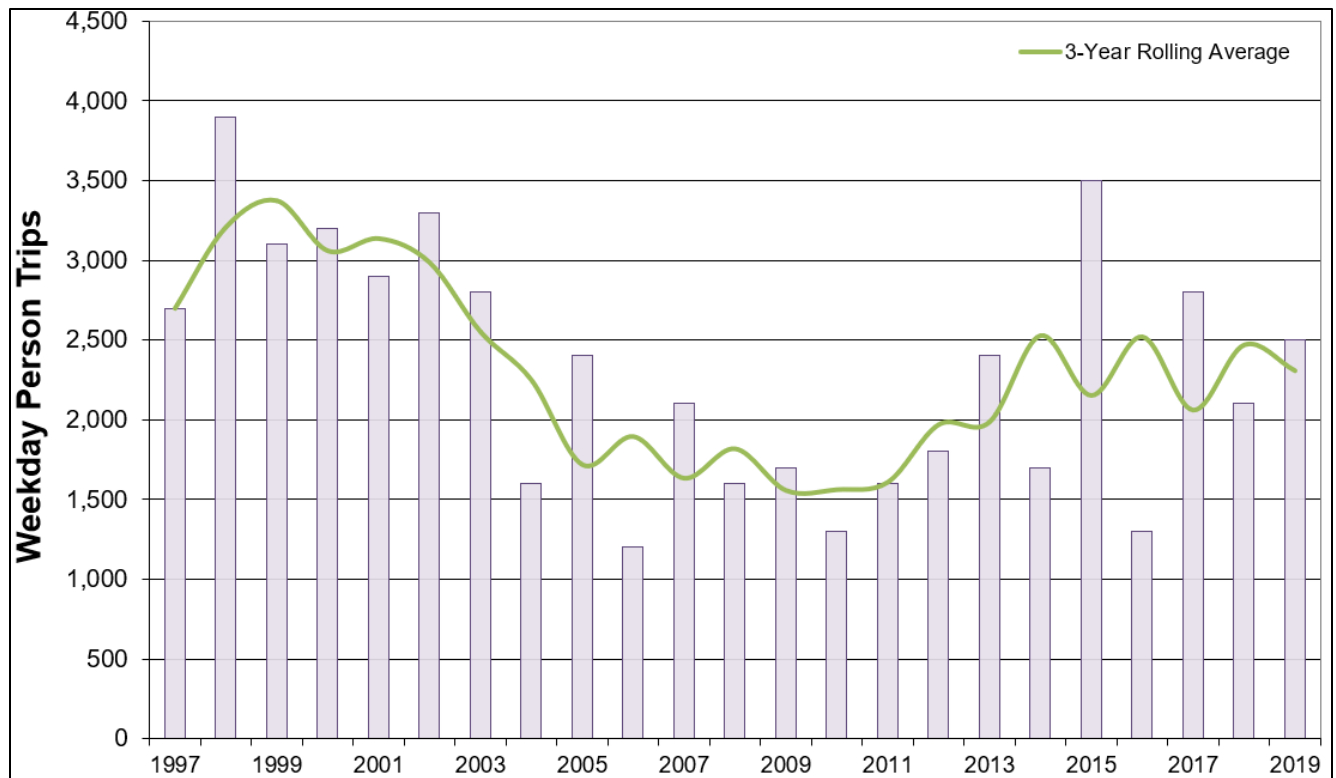
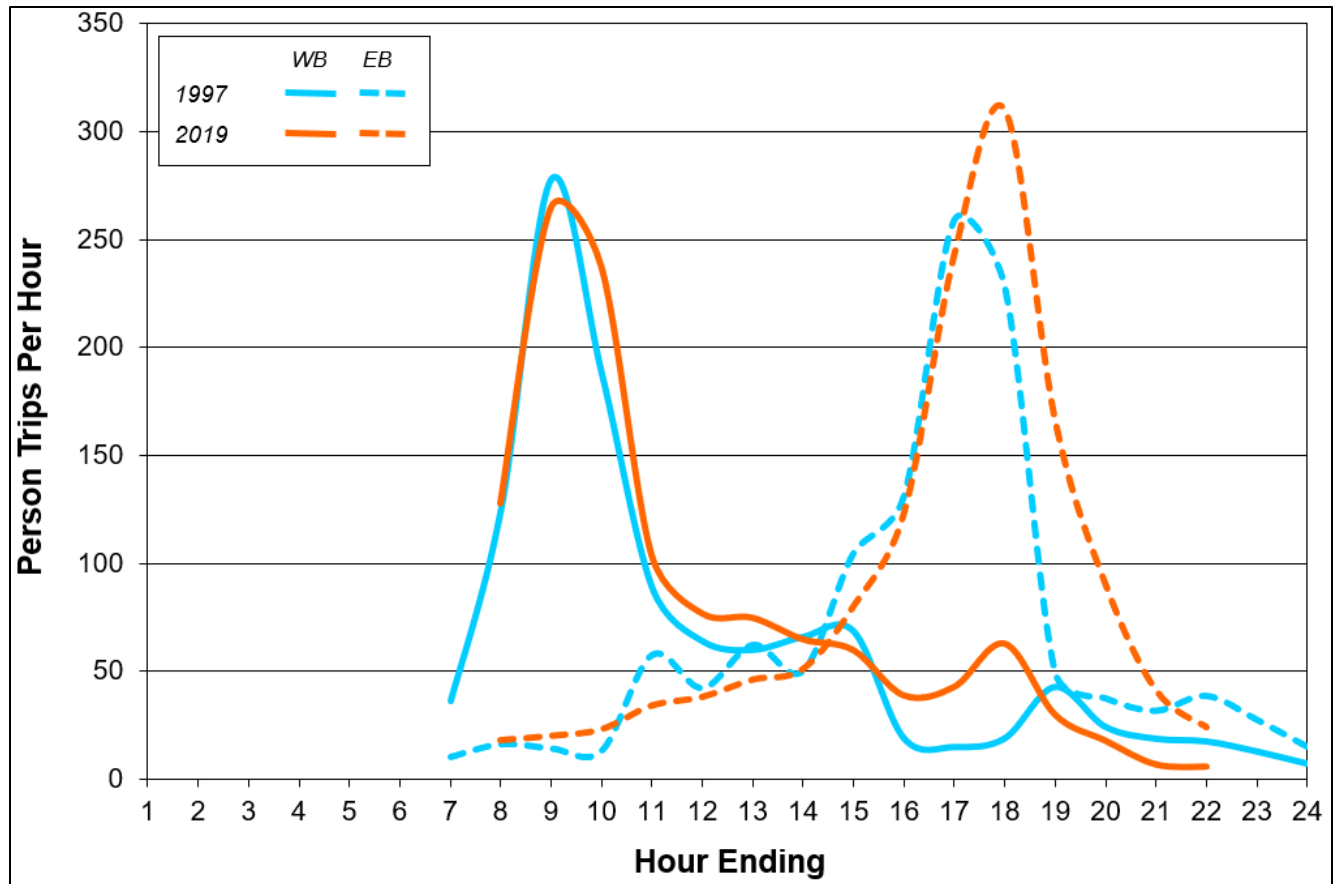


Figure 3.10 illustrates the arrival and departure patterns of bicycle trips to and from UBC throughout the day, for 2019 and 1997 bicycle trips.

As can be seen, bicycle trips match peak morning (westbound) and evening (eastbound) travel patterns, and consistent with the past few years the peak volumes in the morning and evening are higher than 1997 values. The 2019 counts are very close to what was counted in 1997, but with fewer trips throughout the day. The trips that occurred during the day in 1997 may have been trips into Vancouver for errands or lunch. These trips may still occur, but on campus instead as a result of the growth in services, commercial, and retail establishments on campus.

In 2019 UBC entered into a new bike share program with HOPR on campus. This program does not have an impact on commuter trips since the program services on campus trips only. In the future, if there is a united bike share program between UBC and the City of Vancouver, it is likely the number of bike commuter trips would increase. However, it is unlikely to have a significant impact on the mode share for the campus given the volume of trips to and from UBC each day.

Figure 3.10: Distribution of Average Weekday Bicycle Trips to / from UBC, 1997 vs. 2019



All buses operating on transit routes serving UBC are equipped with bicycle racks, each of which has space for two bicycles. Below is a summary of the usage of racks over the past four years:

- In 2019, total of 212 bicycles were on buses at a 4.6% usage rate.
- In 2018, total of 130 bicycles were on buses at a 2.8% usage rate.
- In 2017, total of 192 bicycles were on buses at a 4.2% usage rate.
- In 2016, total of 180 bicycles were on buses at a 4.1% usage rate.

Thus, in 2019 the highest number of bikes on buses were observed compared to the previous three years.

Directionally, more cyclists bring their bikes on buses westbound to campus and the most popular transit routes for cyclists to travel with their bicycles are the 99 B-Line, route 25 that connects the campus to Brentwood Station, and route 84 that connects the campus to downtown.

Table 3.8 provides a summary of the trend in pedestrian trips from fall 1997 to fall 2019, and **Figure 3.11** illustrates year-by-year changes. Similar to bicycle trips, pedestrian trips decreased significantly after the U-Pass was introduced and pedestrian trips have fluctuated over the past few years. In general pedestrian trips have followed an upward trend since 2004 as shown by the three-year rolling average, up until 2018. In 2018 there was a significant drop in the number of pedestrians counted. This was most likely attributed to weather, as the count is back up in 2019.

Over the long term, UBC doesn't anticipate to see a significant increase in pedestrian trips or pedestrian mode share to and from campus as a result of the location of the campus and the distance to where a majority of the campus population is living. However, UBC will continue to make improvements to infrastructure and will work with the BC Ministry of Transportation and Infrastructure on making improvements to bike and pedestrian connections to the campus.

Table 3.8: Summary of Average Weekday Pedestrian Trips to / from UBC, 1997 vs. 2019

Average Weekday Pedestrian Trips	Before U-Pass		After U-Pass		Change 1997-2019 (count / percentage)	
	Fall 1997	Fall 2002	Fall 2004	Fall 2019		
Person Trips	1,400	1,600	600	1,300	-100	-7.1%
Trips Per Person	0.03	0.03	0.01	0.02	-0.02	-45.6%-
Pedestrian Mode Share	1.3%	1.4%	0.5%	0.9%	-0.4%	-33.8%

Figure 3.11: Average Weekday Pedestrian Trips to / from UBC, 1997 – 2019

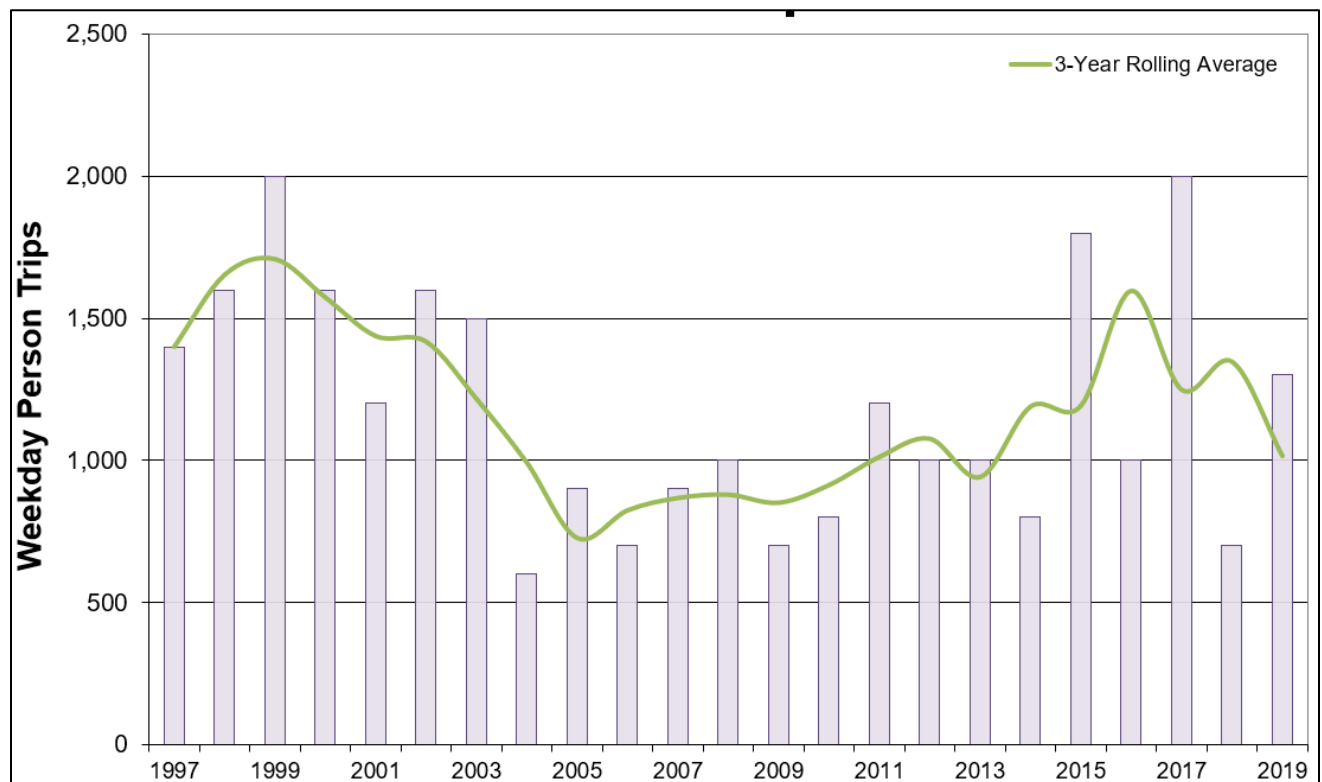
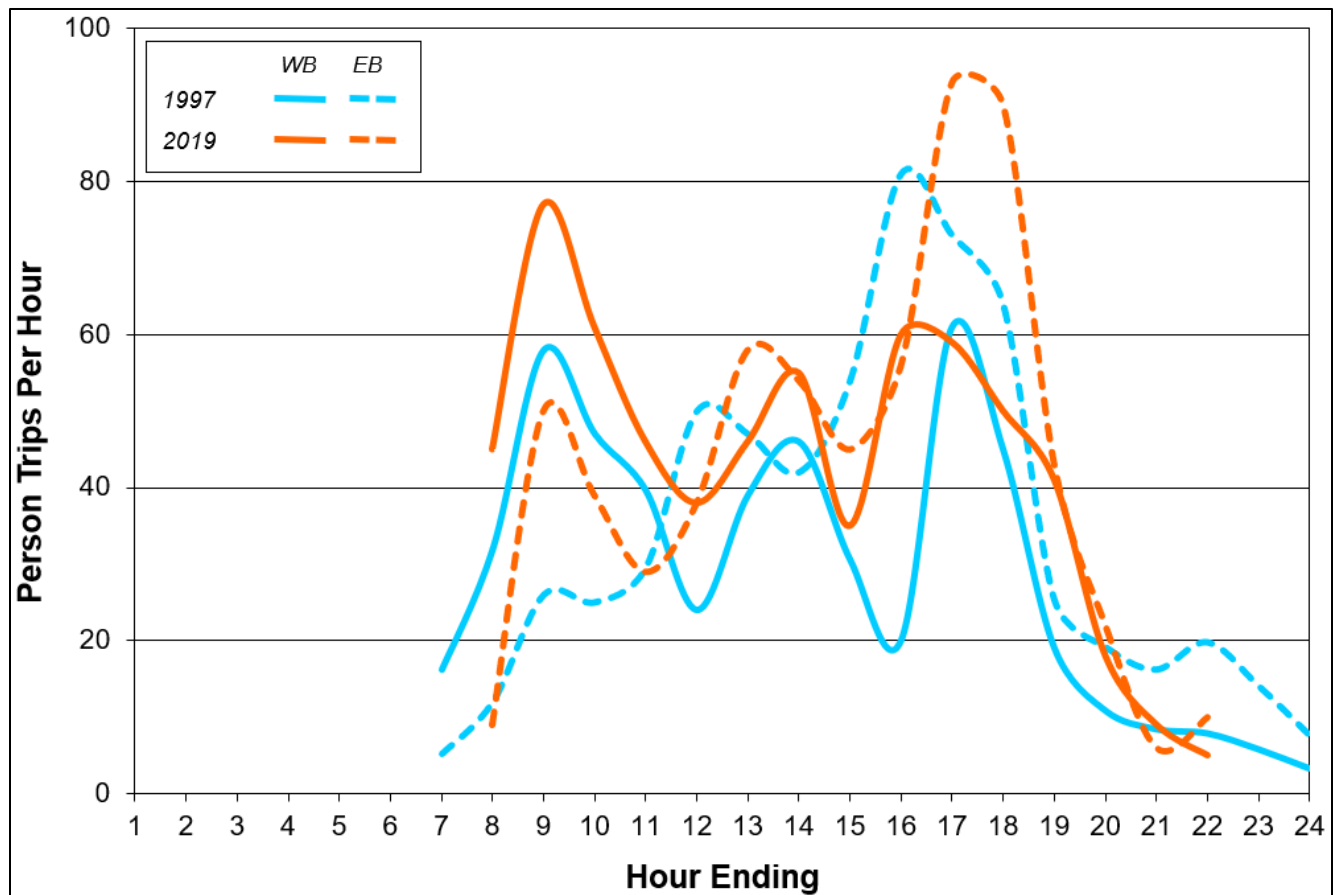


Figure 3.12 illustrates the arrival and departure patterns of pedestrian trips to and from UBC throughout the day, including a comparison with fall 1997 pedestrian trips. The arrival and departure pattern to campus in 2019 shows three peaks throughout the day. Overall, there are more people walking from campus throughout the day compared to walking to campus and there are very few trips outside of the three peak periods, which start at 9am, 1pm, and 5pm.

Figure 3.12: Distribution of Average Weekday Pedestrian Trips to / from UBC, 1997 vs. 2019



3.4. Heavy Trucks

Construction activity at UBC and the day-to-day function of the university generate truck traffic. The City of Vancouver, through which all trucks must travel to reach UBC, manages heavy truck traffic through a number of bylaws and regional regulations. For the purposes of monitoring travel patterns to and from UBC, heavy trucks are defined as vehicles with three or more axles. This simpler definition is to make it easier to monitor heavy truck traffic, as it is only necessary to count the number of axles on a truck to determine whether it is a "heavy truck". In addition, the purpose of the monitoring is more related to volume and noise than vehicle weights.

Counts of heavy truck traffic were undertaken on a quarterly basis during 2019; in March, June, September and December, which are summarized in **Table 3.9**. **Figure 3.13** illustrates numbers of trucks observed in each of the four quarterly counts.

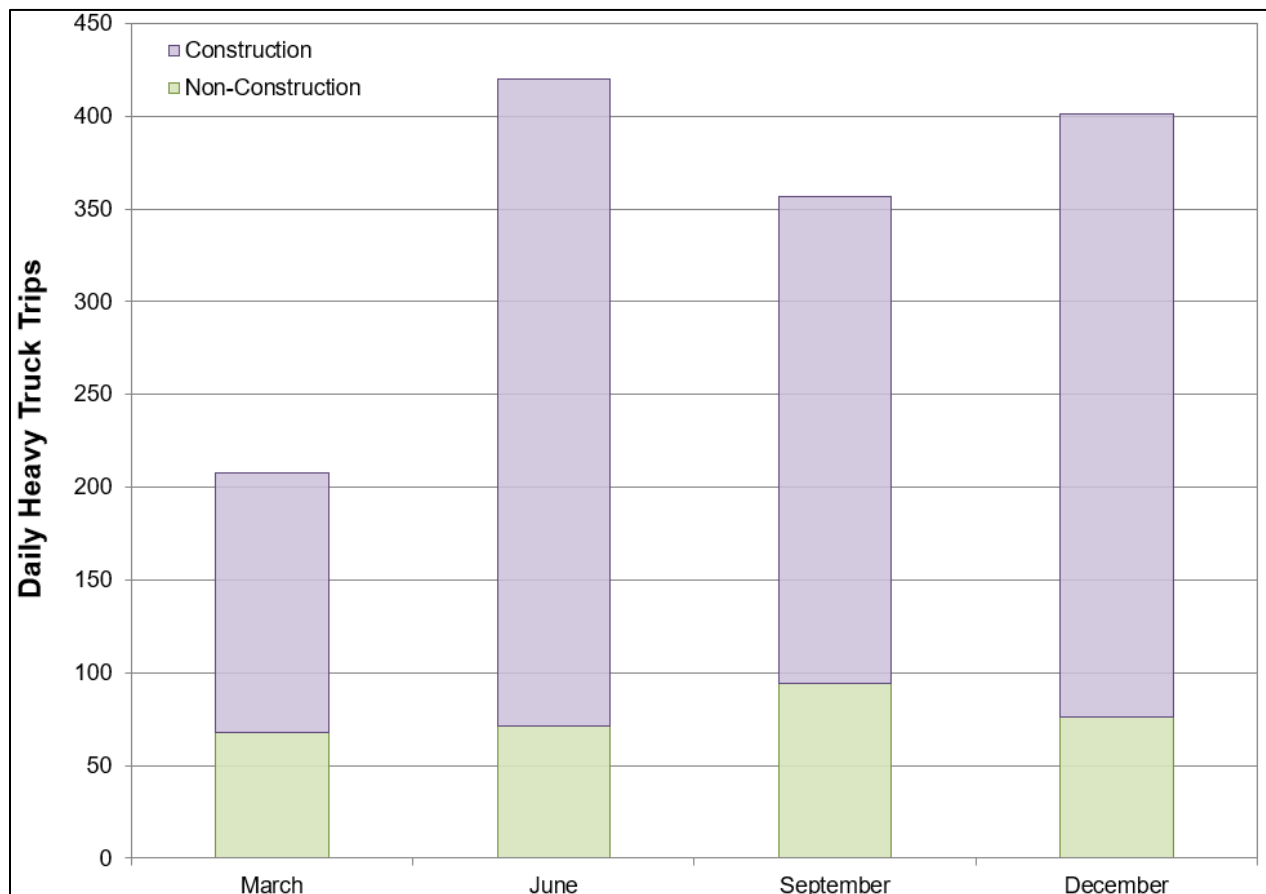
Table 3.9: Average Weekday Heavy Truck Trips to / from UBC, 2019

Route	Type of Truck		Totals
	Construction	Non-Construction	
Chancellor Boulevard	23.8	12.0	35.8 (10.8%)
University Boulevard	28.3	15.3	43.5 (12.6%)
16th Avenue	29.5	9.0	38.5 (11.1%)
SW Marine Drive and 41st Avenue	187.8	41.0	228.8 (66%)
Totals	269.3 (77.7%)	77.3 (22.3%)	346.5 (100%)

As shown in the table, an average of 346 heavy truck trips per day were counted to / from UBC. Of the 346 trips, 269 (77.7%) of them were construction related trips. This is consistent with 2018 counts and is a decrease from previous year counts.

Of the four routes to / from UBC, SW Marine Drive carries 66% of construction related trips, which is anticipated to be the busier route as it is a truck route. The remaining trucks are equally split between the other three routes. There were fewer trucks counted in March, but the other counts in June, September and December were comparable.

Figure 3.13: Heavy Truck Trips to / from UBC, 2019



4. Traffic Conditions At UBC

This section of the *Transportation Status Report* summarizes transportation conditions on campus, particularly traffic volumes and speeds at key locations throughout the campus.

4.1. Traffic Speeds

Traffic speeds were recorded over one week on campus using pneumatic tubes. The locations are identified in **Figure 1.1**.

The 85th percentile speed is typically used for the purposes of representing travel speeds and represents the speed below which 85% of the traffic travels. The average 85th percentile speed data from 2014 to 2019 is summarized in **Tables 4.1 and 4.2** for eastbound / northbound traffic and westbound / southbound traffic, respectively. Data highlighted in red represents locations where collected speed data is above the posted speed limit.

Table 4.1: Average 85th Percentile Traffic Speeds (km/h) Eastbound / Northbound, 2014 – 2019

Location	Speed Limit (km/h)	Eastbound / Northbound					
		Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019
Wesbrook Mall s/o Gage	50	–	–	55.3	55.2	54	50.4
Wesbrook Mall s/o University	50	49.3	51.2	48.8	49.1	49.5	45.3
Thunderbird w/o Wesbrook	30	47.1	47.0	46.6	46.6	52.7	37.3
West Mall s/o University Blvd	30	–	–	–	29.6	29.2	33.2
West Mall n/o Thunderbird	30	38.9	36.0	30.4	–	–	–
East Mall s/o Thunderbird	50	50.7	52.6	50.6	50.8	51.2	48.5
Wesbrook Mall n/of 16 th Ave	50	54.4	49.8	50.9	51.8	52	53.2
Wesbrook Mall s/o 16th Ave.	50	32.8	37.2	32.6	33.2	33.4	33
Stadium Rd at Main Mall	30	–	–	48.8	49.6	–	–
16th Ave w/o East Mall	60	72.1	69.5	60.9	71.0	68.3	68.4
16th Ave w/o Wesbrook Mall	50	67.0	56.3	56.6	57.5	66.3	56
16th Ave e/o Wesbrook Mall	50	72.9	72.1	69.2	66.6	66.4	67.3
Chancellor e/o Western Pkwy	50	57.1	55.7	58.7	55.3	58	53.8
University e/o Toronto Rd	50	59.6	58.1	57.9	59.0	59.6	61.5

Table 4.2: Average 85th Percentile Traffic Speeds (km/h) Westbound / Southbound, 2014 – 2019

Location	Speed Limit (km/h)	Westbound / Southbound					
		Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019
Wesbrook Mall s/o Gage	50	–	–	50	50.6	50.2	44.4
Wesbrook Mall s/o University	50	49.6	53.8	48.1	48.5	48.9	48.6
Thunderbird w/o Wesbrook	30	40.4	42.4	43.3	39.9	53.8	46.6
West Mall s/o University Blvd	30	–	–	–	31.4	31.9	29.7
West Mall n/o Thunderbird	30	39.1	35.6	32.6	–	–	–
East Mall s/o Thunderbird	50	50.5	55.9	53.2	53.3	53.7	57.4
Wesbrook Mall n/of 16 th Ave	50	50.1	55.5	53.3	53.1	52.9	54.3
Wesbrook Mall s/o 16th Ave.	50	31.6	36.5	31.8	32.6	31.9	31.2
Stadium Rd at Main Mall	30	–	–	47.7	48.2	–	–
16th Ave w/o East Mall	60	69.4	75.8	68.5	71.0	71.2	68.2
16th Ave w/o Wesbrook Mall	50	58.2	61.7	59.7	59.5	58.4	61.3
16th Ave e/o Wesbrook Mall	50	65.0	63.2	60.1	61.2	60.1	60.4
Chancellor e/o Western Pkwy	50	60.7	59.2	60.1	59.6	61.1	57.7
University e/o Toronto Rd	50	56.9	58.1	57.1	60.0	61.9	59.5

Key observations regarding traffic speeds on campus include:

- Traffic speeds on BC Ministry of Transportation and Infrastructure roadways to and from campus exceed the posted speed limit of 50 km/h. This includes 16th Avenue, University Boulevard, and Chancellor Boulevard. Speed limits on 16th Avenue were changed in 2017 to extend the 50 km/h speed limit into Pacific Spirit Park from the City of Vancouver.
- According to the UBC Road and Traffic Rules, internal road speed limits are 30km/h (not including Wesbrook Mall). Roads on campus with average speeds in excess of 30 km/h include East Mall, and Thunderbird Blvd. Reasons for less speeding on the internal roadways include heavy pedestrian traffic and traffic calming measures. To address speeding on East Mall traffic calming measures are being explored for implementation in 2020.

These locations of excessive speeds will be shared with the BC Ministry of Transportation and Infrastructure to flag this issue as well as with the RCMP to inform their speed enforcement program.

4.2. Traffic Volumes

Peak hour traffic volumes collected over one day at key intersections on campus are illustrated in **Figures 4.1** and **4.2**. The turning volumes are not intended to represent average daily traffic volumes or conditions, but are intended to provide a general overview of traffic patterns to / from and on campus during the AM and PM peak hours.

Figure 4.1: Morning Peak Hour Traffic Volumes at UBC, 2019

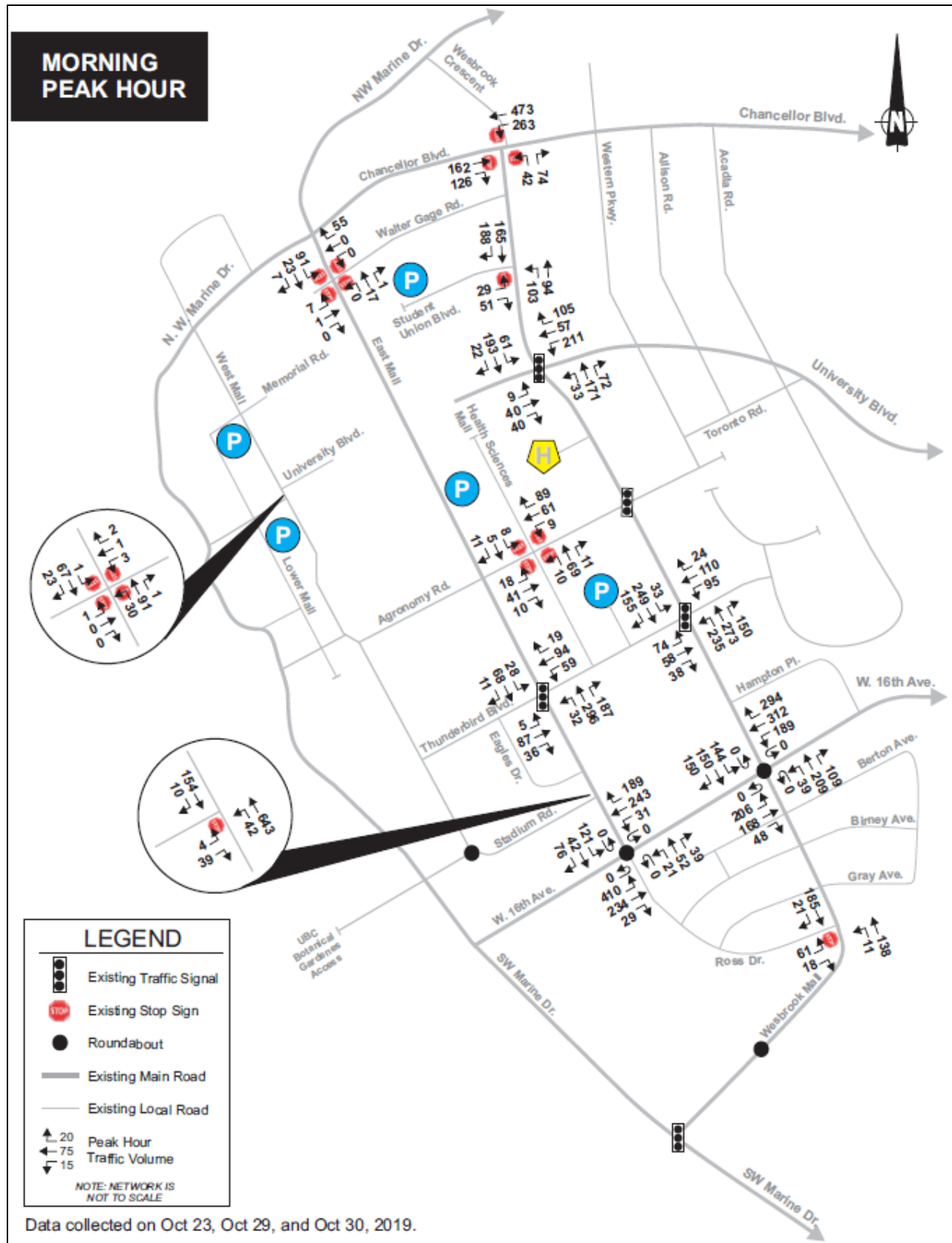


Figure 4.2: Afternoon / Evening Peak Hour Traffic Volumes at UBC, 2019

