# UBC Vancouver Transportation Status Report Fall 2018

March 2019

campus + community planning
transportation planning

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

# 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 other 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 parking facilities, carshare parking and is exploring carpooling programs and incentives. In addition TransLink 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.

This fall 2018 Transportation Status Report presents the most recent data that UBC has collected. This report provides a picture 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 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. The annual monitoring results are used to assess progress towards meeting the 2005 Strategic Transportation Plan (STP) goals and also help guide future implementation priorities.

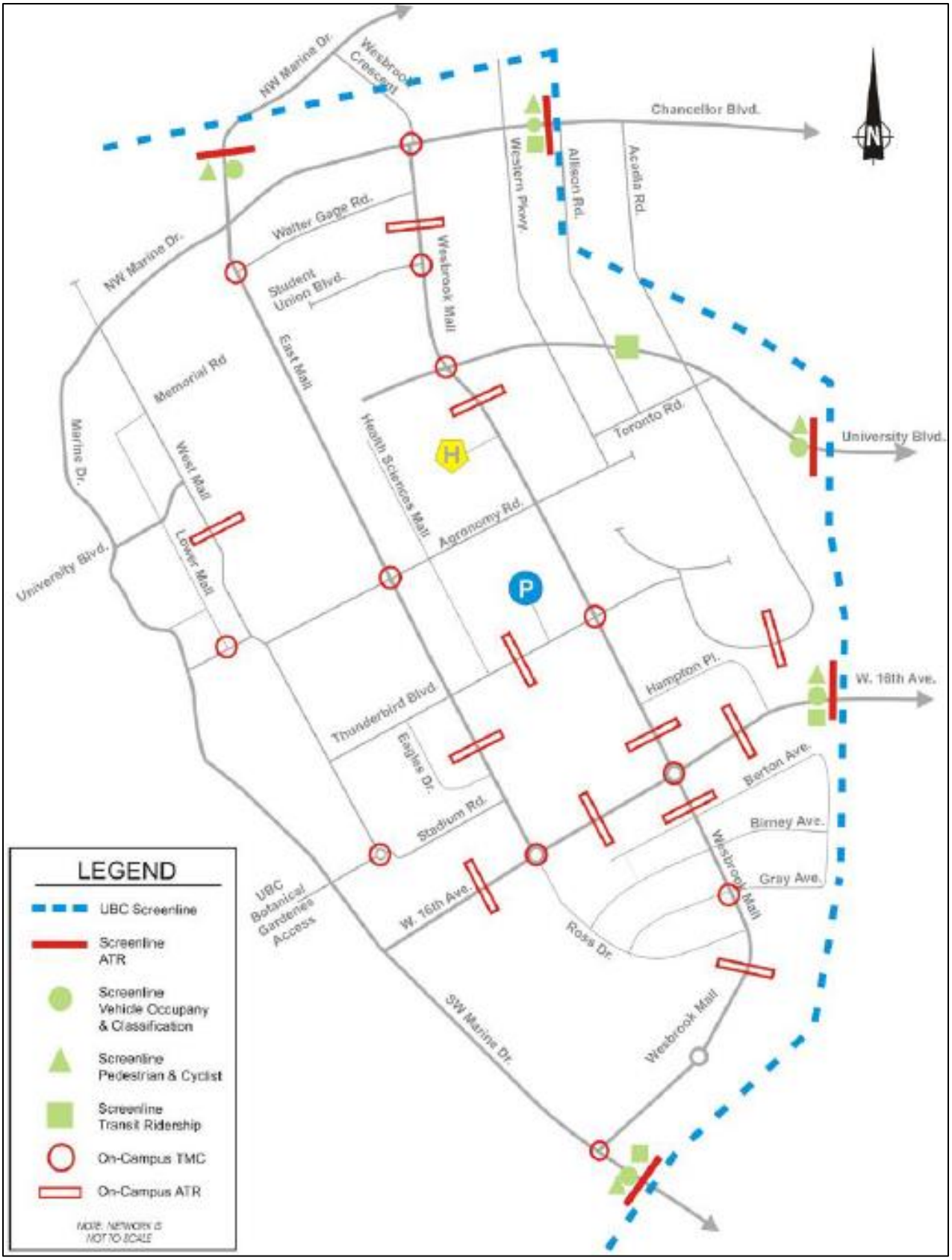
Data collection activities for this year are summarized in ***Table 1.1***, and data collection locations are illustrated in ***Figure 1.1***.

***Table 1.1: Summary of 2018 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. |

| Data Collection Activity | Locations | Description |
|---|---|---|
| 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 70% 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 2018.

  It is important to also 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, 2018 vs. 1997***

| Group | Fall 1997 | Fall 2018 | Increase (count / percentage) | |
|---|---|---|---|---|
| Students | 33,200 | 54,850 | +21,650 | +65.2% |
| Staff | 7,250 | 12,300 | +5,050 | +69.7% |
| Faculty | 1,850 | 4,600 | +2,770 | +151.4% |
| **Totals** | **42,300** | **71,750** | **+29,480** | **+69.7%** |

*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 $35 per month. The U-Pass offers students unlimited access to TransLink Bus, SkyTrain and SeaBus services (all zones), and discounted West Coast Express fares. The Compass Card came into effect for the 2016 data collection period, which replaced the U-Pass card, but the U-Pass program continues.
- **Increased transit service.** In conjunction with introduction of the student U-Pass, TransLink has substantially increased the level of transit service provided to UBC and continues to make service improvements annually. The majority of the increase has been on the Route 99 B-Line. Other improvements since 1997 include new Route 33 on 16$^{th}$ Avenue, and several express routes, including Route 43 on 41st Avenue, Route 44 from downtown, Route 84 from the VCC-Clark SkyTrain station, and Route 480 from Richmond Centre. Recent TransLink ridership data suggests 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, scheduling services will continue to make efforts 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 $16.00 in 2018, and prices for parking permits and short term parking have also increased. As a result of the growth in Electric Vehicle (EV) ownership in the Lower Mainland, UBC has been adding EV charging stations in the parkades across campus. Currently UBC Parking offers access to 62 EV chargers, which is the highest in the region per capita and will continue to add more.
- **Bicycle facilities.** Since 1997, new bicycle lanes have been implemented on several roadways on campus and to / from campus. Most notable was the conversion of University Boulevard west of Blanca, from two lanes in each direction to one travel lane and one bicycle lane in each direction. Bicycle lanes were also added on SW Marine Drive, Wesbrook Mall, East Mall, Thunderbird Boulevard and 16$^{th}$ 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, carpooling, car sharing, cycling, on campus shuttles, 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. All this information can be found at UBC's Campus and Community Planning website:

- This Fall 2018 Transportation Status Report, along with previous Transportation Status Reports.
- 2017 Transportation Survey
- 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 2018 was 145,700. A summary and comparison of daily person trips by mode for 1997 and 2018 are provided in ***Table 2.1*** and ***Figure 2.1***.

***Table 2.1: Weekday Person Trips to / from UBC Vancouver, 1997 vs. 2018***

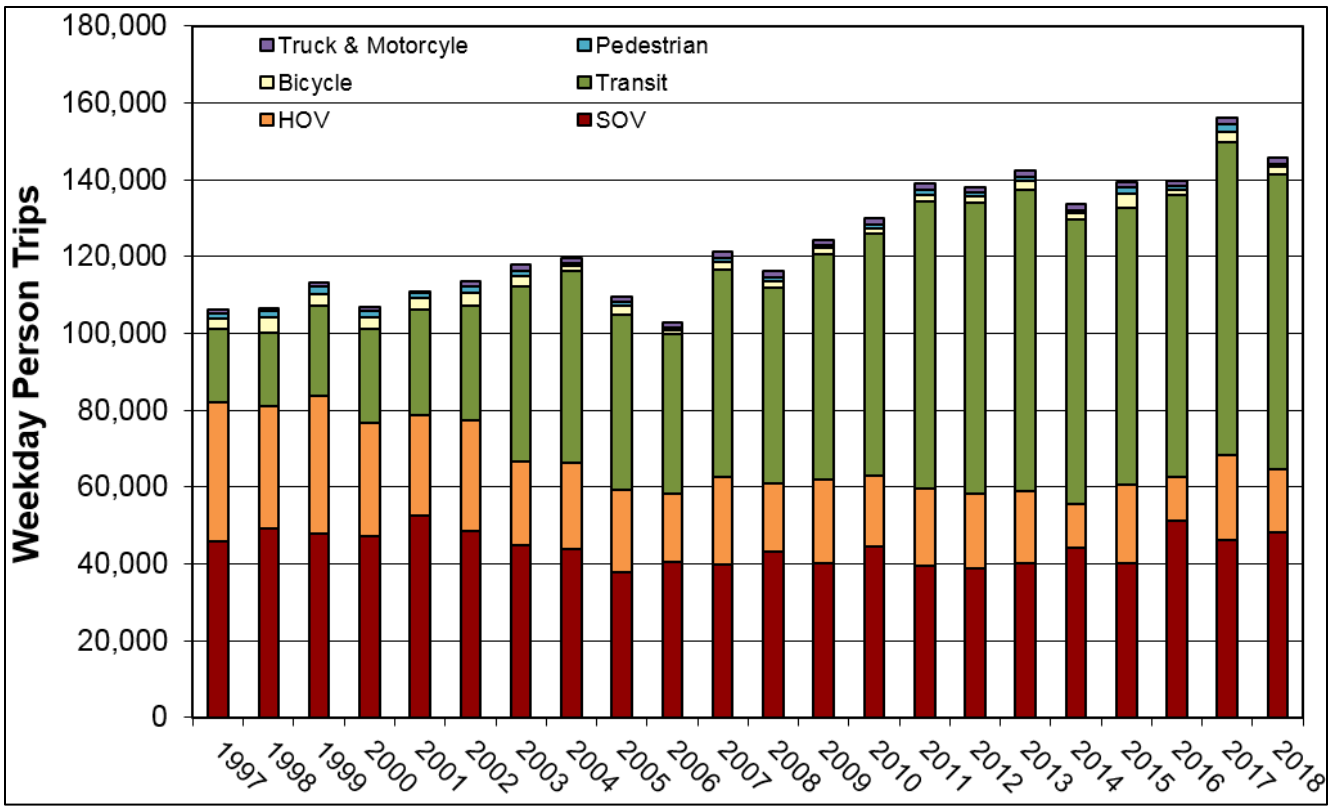
| Travel Mode Classification | Person Trips | | | |
|---|---|---|---|---|
| | Fall 1997 | Fall 2018 | Change (count / percentage) | |
| Single Occupant Vehicle (SOV) | 46,000 | 48,100 | +2,100 | +4.6% |
| Carpool / Vanpool (HOV) | 36,100 | 16,700 | -19,400 | -53.7% |
| Transit | 19,000 | 76,600 | +57,600 | +303.2% |
| Bicycle | 2,700 | 2,100 | -600 | -22.2% |
| Pedestrian | 1,400 | 700 | -700 | -50.0% |
| Truck & Motorcycle | 900 | 1,500 | +600 | +66.7% |
| **Totals** | **106,100** | **145,700** | **+39,600** | **+37.3%** |

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

- The proportion of SOV trips is up nearly 5% from 1997 levels.
- The proportion of HOV trips has decreased by almost 54% from 1997.
- Trips by transit have increased by four times since 1997.
- Bicycle and pedestrian trips do not represent a significant portion of the trips to and from campus. Bicycle and pedestrian trips dropped considerably after 2003 when the u-pass was introduced.

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 – 2018***




As shown in **Figure 2.1**, the number of person trips leveled off between 2011 and 2018 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.

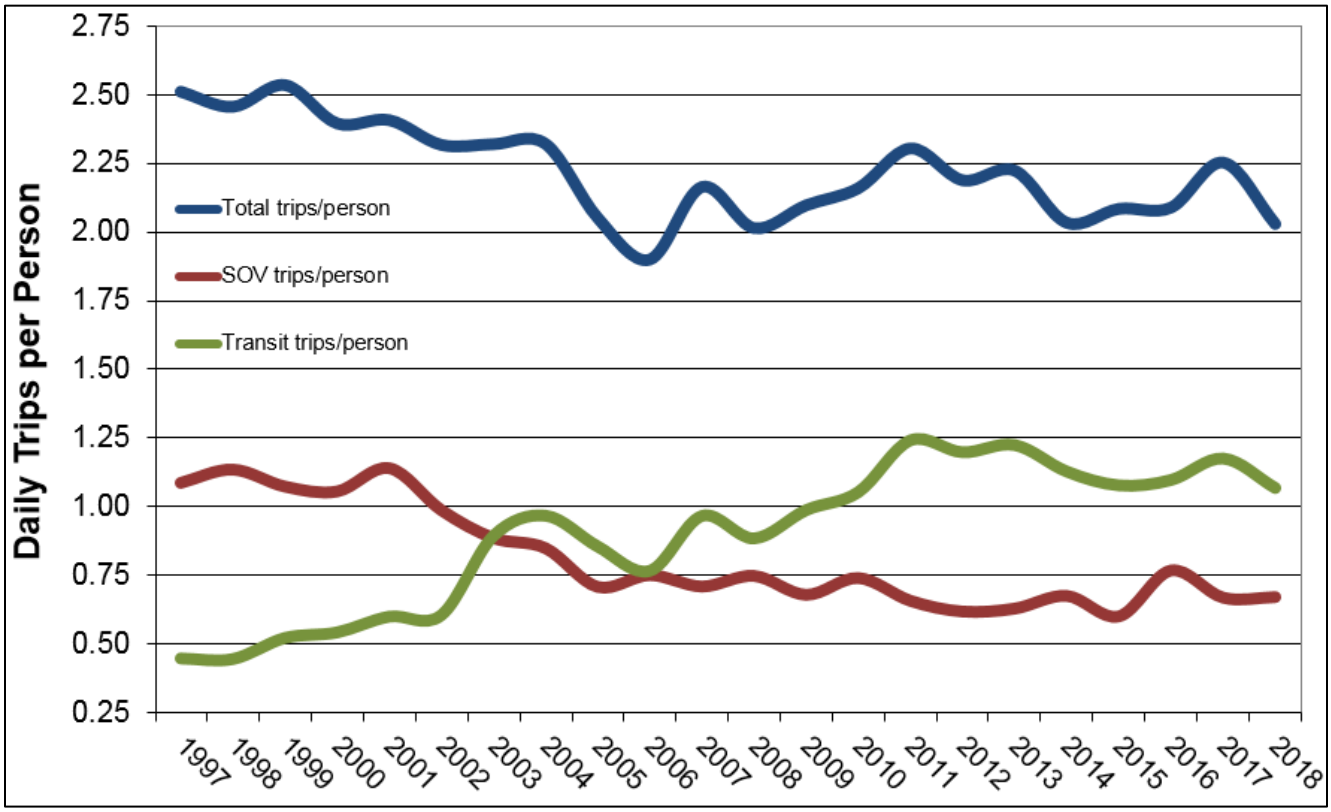
The campus population and trips per person to and from UBC from fall 1997 to fall 2018 are presented in ***Table 2.2*** and ***Figure 2.2***, respectively.

***Table 2.2: Weekday Trips Per Person to / from UBC, 1997 – 2018***

| Travel Mode Classification | Trips Per Person | | | |
|---|---|---|---|---|
| | Fall 1997 | Fall 2018 | Change (count / percentage) | |
| Single Occupant Vehicle (SOV) | 1.09 | 0.67 | -0.42 | -38.4% |
| Carpool / Vanpool | 0.86 | 0.23 | -0.62 | -72.7% |
| Transit | 0.45 | 1.07 | +0.62 | +137.7% |
| Bicycle | 0.06 | 0.03 | -0.03 | -54.1% |
| Pedestrian | 0.03 | 0.01 | -0.02 | -70.5% |
| Truck & Motorcycle | 0.02 | 0.02 | -0.00 | -1.7% |
| **Totals** | **2.51** | **2.03** | **-0.48** | **-19%** |
| ***CAMPUS POPULATION**** | ***42,300*** | **71,750** | **+29,450** | **+69.6%** |

**Population reported from fall attendance values.*

***Figure 2.2: Weekday Trips Per Person to / From UBC, 1997 – 2018***




The average number of trips per person in 2018 was 2.03 trips per day, which is almost a 20% decrease from 1997 and a decrease from the 2.25 trips per person in 2017. Since 1997 the number of trips made by transit has generally increased while the number of trips by single occupant vehicles has generally decreased.

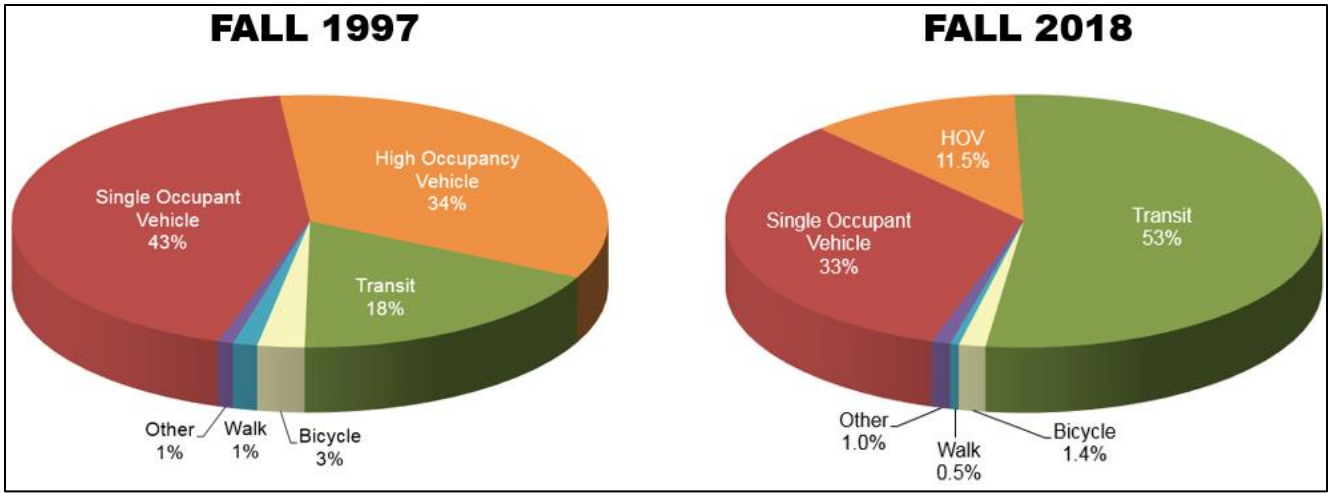
Possible reasons for the decrease in trips per person to and from campus overall since 1997 include:

- More people are living, working and studying 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, within reason and with approval, as a way to reach its transportation targets.

## 2.2. Mode Share Summary

The mode share comparison for 1997 and 2018 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. 2018***




**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 2018 54.5% of all trips were made by transit, walking and cycling.

✓ In 2018 53% 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 in ***Figure 2.5***. In general the wave profile matches the standard work and study hours with rounded peaks around 10am and 5pm.

The peak hour summary of trips by mode is summarized in ***Table 2.3***. Significant observations in the data include:

- The number of trips to campus during the morning peak and from campus during the afternoon peak increased 5% and 46% in 2018 compared to 1997, respectively. For comparison, campus population has increased 70% over the same period.
- The peak travel periods have spread out resulting in more trips throughout the day. However, a sharper peak is 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 result in people switching travel modes, likely to less sustainable travel modes.

***Figure 2.5: Distribution of Average Weekday Person Trips to / from UBC, 1997 vs. 2018***

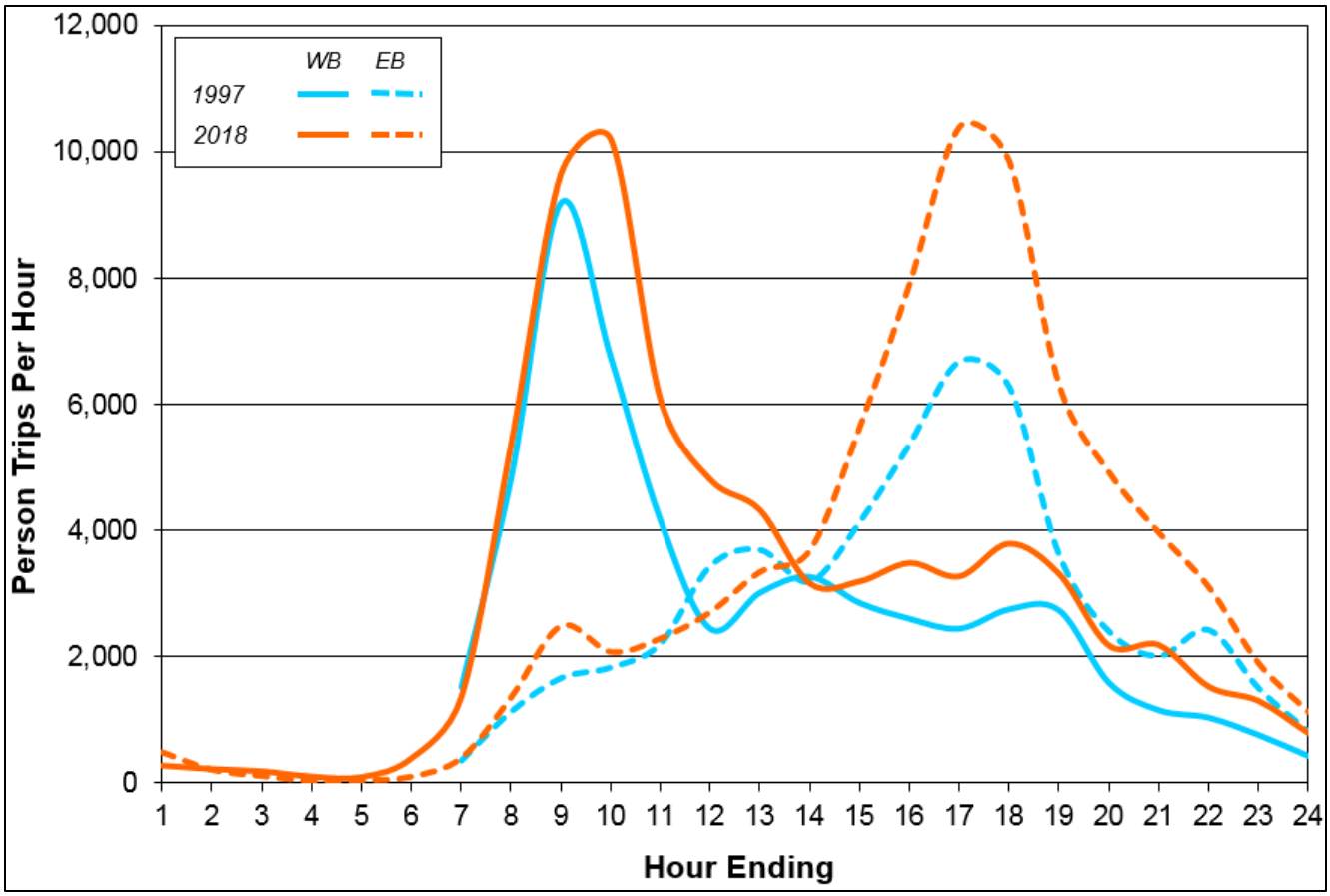


***Table 2.3: Average Peak Hour Person Trips by Mode to/from UBC, 2018***

| Travel Mode Classification | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | Westbound | Eastbound | Westbound | Eastbound |
| Single Occupant Vehicle (SOV) | 2,894 | 1,258 | 1,543 | 2,391 |
| High Occupancy Vehicle | 545 | 365 | 417 | 1,083 |
| Transit | 5,809 | 763 | 1,708 | 6,001 |
| Bicycle | 307 | 26 | 46 | 310 |
| Pedestrian | 51 | 26 | 59 | 50 |
| Truck & Motorcycle | 62 | 52 | 15 | 25 |
| **Totals** | **9,668** | **2,490** | **3,788** | **9,860** |

## 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 56,100 automobiles per weekday in fall 2018 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 2018 this target was not met as SOV trips increased by 4.6% over 1997 levels.

***Table 2.4: Average Weekday SOV and HOV Traffic Volume to/from UBC, 1997 vs. 2018***

| Travel Mode Classification | Fall 1997 | Fall 2018 | Change (count / percentage) | |
|---|---|---|---|---|
| Single Occupant Vehicle (SOV) | 46,000 | 48,100 | +2,100 | +4.6% |
| High Occupant Vehicle (HOV) | 16,400 | 8,000 | -8,400 | –51.2% |
| **Totals** | **62,400** | **56,100** | **–6,300** | **–10.1%** |

The average weekday traffic volumes to / from UBC in a 24-hour period for both fall 1997 and fall 2018 are shown in ***Figure 2.6***. As shown, the traffic volumes have reduced through most of the day, not just at peak periods. The exception is the morning eastbound 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. 2018***

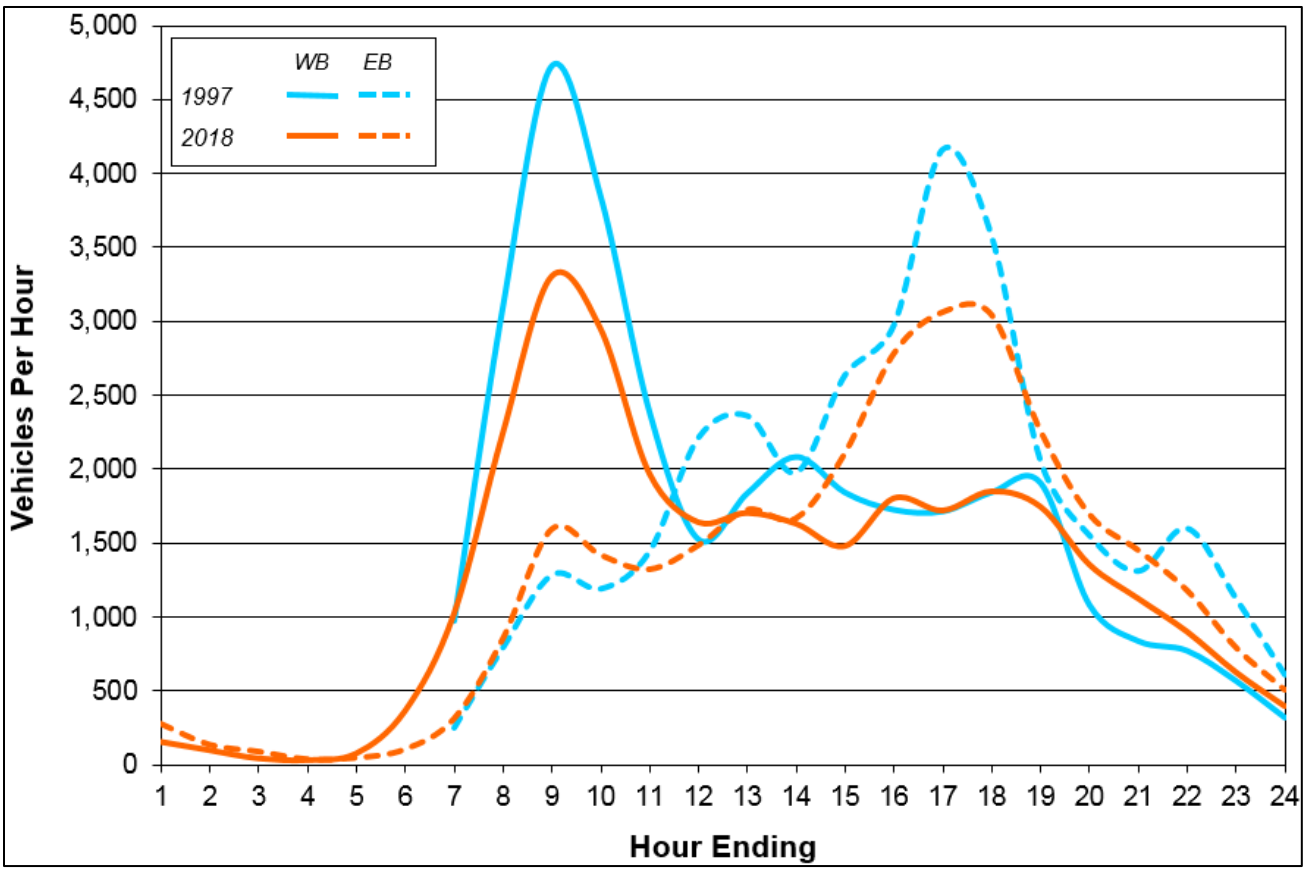



***Table 2.5*** summarizes the daily traffic volumes at each screenline location. It is important to note that these figures include trucks, buses and motorcycles, in addition to SOV's and HOV's so the numbers in the tables below won't match those presented in ***Table 2.4***.

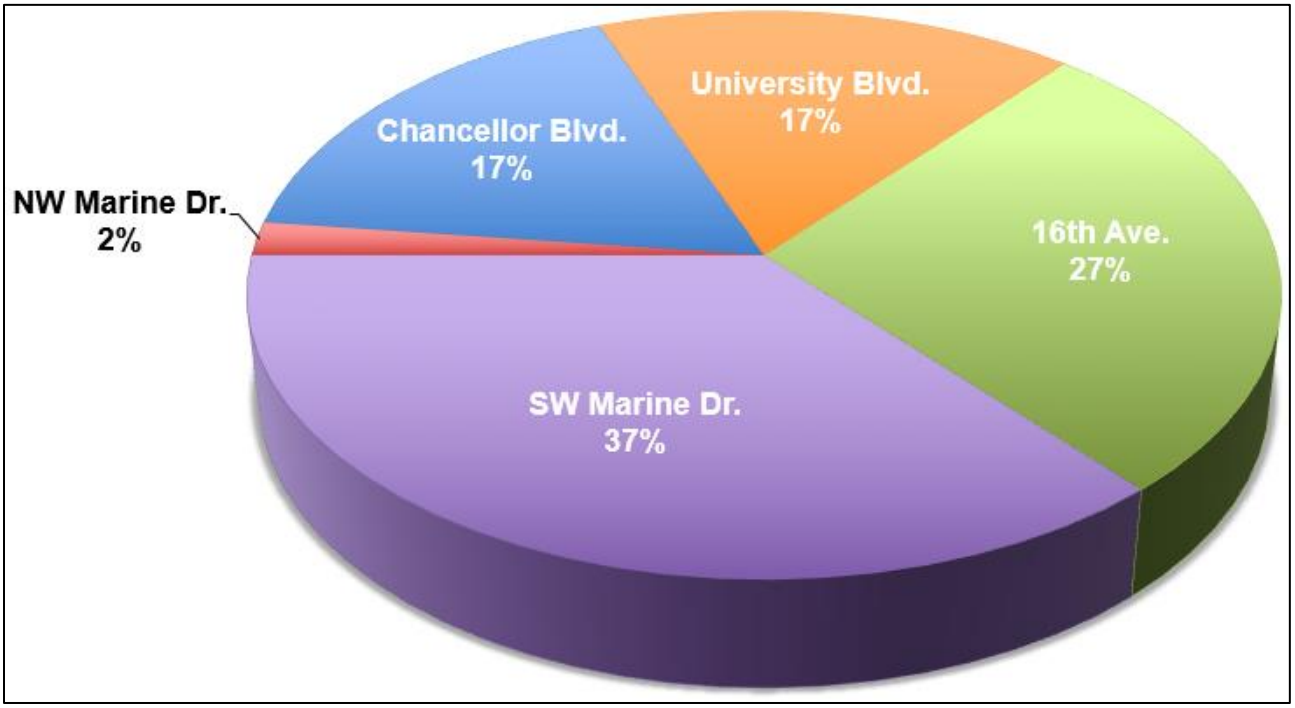
Overall, traffic volumes were 7% lower in fall 2018 than in 1997 with a general decrease observed at all screenline locations with the exception of 16th Avenue where there has been an increase of 28%. The increase on 16th Avenue is mostly attributed to the population growth in Wesbrook Village and congestion on alternative routes.

***Table 2.5: Summary of Average Weekday Traffic Volumes at Screenlines, 1997 vs. 2018***

| Screenline | Average Daily Traffic Volume | | | |
|---|---|---|---|---|
| | Fall 1997 | Fall 2018 | Change (count / percentage) | |
| NW Marine Drive | 2,040 | 1,160 | -880 | -43% |
| Chancellor Boulevard | 11,660 | 10,305 | -1,355 | -12% |
| University Boulevard | 14,610 | 10,330 | -4,280 | -29% |
| 16th Avenue | 12,880 | 16,450 | +3,580 | +28% |
| SW Marine Drive | 23,410 | 21,910 | -1,500 | -6% |
| **Totals** | **64,600** | **60,160** | **-4,440** | **-7%** |

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 followed by 16th Avenue and University Boulevard.

***Figure 2.7: Distribution of Average Weekday Traffic to / from UBC by Screenline, 2018***



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 2018 was 1.14 persons per vehicle, down from 1.32 persons per vehicle in 1997 and 1.21 persons per vehicle in 2017. The average occupancy for high occupancy vehicles decreased from 2.20 in 1997 to 2.07 in 2018. In 2018, 95% of recorded HOV trips were two person trips with three and four person trips at 4% and 1%, respectively. This is lower than 2017 when 13% 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 2016 | Fall 2017 | Fall 2018 |
|---|---|---|---|---|
| Vehicles (SOV's + HOV's) | 1.32 | 1.11 | 1.21 | 1.21 |
| HOV's (Carpools / Vanpools) | 2.20 | 2.18 | 2.12 | 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 very little variation in the vehicle occupancies, but they appear to be higher for afternoon and off peak period trips from campus.

***Table 2.7: Hourly Vehicle Occupancies to / from UBC, 2018***

| Hour Beginning | Westbound | Eastbound | Both Directions |
|---|---|---|---|
| 7:00 a.m. | 1.06 | 1.07 | 1.06 |
| 8:00 a.m. | 1.09 | 1.13 | 1.10 |
| 9:00 a.m. | 1.11 | 1.13 | 1.12 |
| 11:00 a.m. | 1.09 | 1.16 | 1.12 |
| 12:00 p.m. | 1.12 | 1.17 | 1.14 |
| 3:00 p.m. | 1.15 | 1.23 | 1.20 |
| 4:00 p.m. | 1.17 | 1.23 | 1.21 |
| 5:00 p.m. | 1.12 | 1.19 | 1.17 |
| **8-Hour Average** | **1.11** | **1.18** | **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 76,600 weekday transit trips and 53% of all trips to and from UBC each day, which 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 increase in transit ridership 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 2018, 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 – 2018***

| Transit Trips | Before U-Pass | | After U-Pass | | Change 1997-2018 (count / percentage) | |
|---|---|---|---|---|---|---|
| | Fall 1997 | Fall 2002 | Fall 2003 | Fall 2018 | | |
| Person Trips | 19,000 | 29,700 | 45,400 | 76,600 | +57,600 | +303% |
| Trips Per Person | 0.45 | 0.61 | 0.89 | 1.07 | +0.62 | +137% |
| Transit Mode Share | 18% | 26% | 39% | 53% | +34% | +194% |

***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 2013.

***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, 2018***

| 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. | 1,900 | 4,982 | 3,529 | 1,346 | 0 | 11,757 | 15% |
| University Blvd. | 4,099 | 11,596 | 9,027 | 8,625 | 646 | 33,993 | 44% |
| 16th Avenue | 1,688 | 4,342 | 2,672 | 2,382 | 0 | 11,064 | 14% |
| SW Marine Drive | 2,707 | 6,848 | 6,178 | 4,047 | 47 | 19,827 | 26% |
| **Totals** | **10,374** | **27,768** | **21.406** | **16,400** | **693** | **76,641** | **100%** |
| | **15%** | **40%** | **26%** | **17%** | **2%** | | |

*Figure 3.1: Average Weekday Transit Trips to / from UBC, 1997 – 2018*

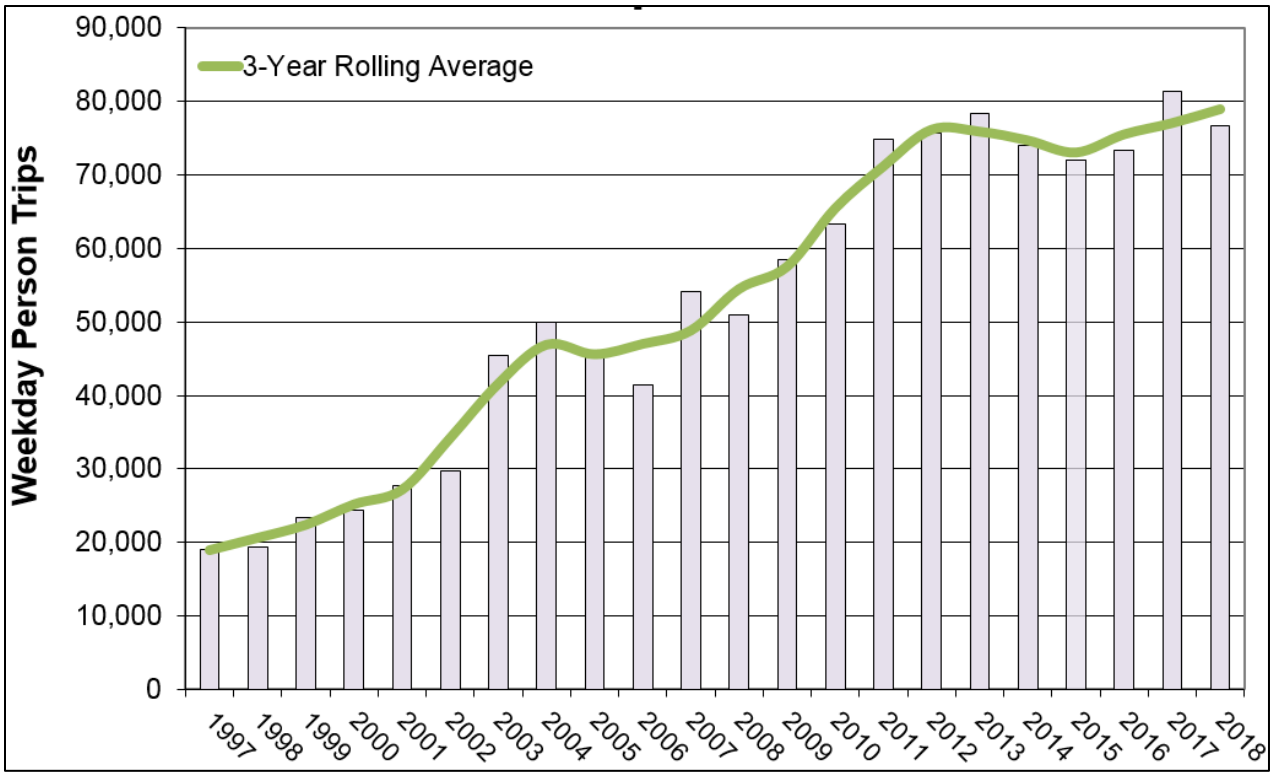



*Table 3.3: Average Weekday Transit Trips to / from UBC by Route, 2018*

| Route | | AM<br>6am to 9am | Midday<br>9am to 3pm | PM Peak<br>3pm to 6pm | Evening<br>6pm to Midnight | Night<br>Midnight to 4:30am | Totals | |
|---|---|---|---|---|---|---|---|---|
| 4 | 4th Avenue | 96 | 1124 | 942 | 1275 | 21 | 3,458 | 4.5% |
| 9 | Broadway | 284 | 480 | 583 | 47 | 0 | 1,394 | 1.8% |
| 14/N17 | Broadway | 668 | 2071 | 1188 | 1555 | 345 | 5,827 | 7.6% |
| 25 | King Edward | 1095 | 2824 | 1593 | 1550 | 0 | 7,062 | 9.2% |
| 33 | 16th Avenue | 573 | 1513 | 1074 | 832 | 0 | 3,992 | 5.2% |
| 41 | 41st Avenue | 592 | 1572 | 1157 | 1387 | 47 | 4,755 | 6.2% |
| 43 | 41st Ave Express | 1006 | 1998 | 1490 | 1094 | 0 | 5,588 | 7.3% |
| 44 | 4th Ave. Express | 692 | 1819 | 1491 | 481 | 0 | 4,483 | 5.8% |
| 49 | 49th Avenue | 459 | 2101 | 2393 | 1020 | 0 | 5,973 | 7.8% |
| 84 | 4th Ave. Express | 1004 | 3014 | 2038 | 865 | 0 | 6,921 | 9.0% |
| 99 | Broadway B-Line | 3046 | 7921 | 6112 | 5743 | 280 | 23,102 | 30.1% |
| 258 | North Shore | 164 | 110 | 197 | 0 | 0 | 471 | 0.6% |
| 480 | Richmond Express | 650 | 1177 | 1138 | 546 | 0 | 3,511 | 4.6% |

| Route | | AM 6am to 9am | Midday 9am to 3pm | PM Peak 3pm to 6pm | Evening 6pm to Midnight | Night Midnight to 4:30am | Totals | |
|---|---|---|---|---|---|---|---|---|
| NIS | Not In Service | 45 | 44 | 10 | 5 | 0 | 104 | 0.1% |
| **Totals** | | **10,374** | **27,768** | **21,406** | **16,400** | **693** | **76,641** | **100%** |
| | | **14.7%** | **40.3%** | **26.3%** | **16.6%** | **2.1%** | | |

***Table 3.4: Average Peak Hour Weekday Transit Trips to / from UBC by Route, 2018***

| Route | | AM Peak Hour Westbound 8:30am – 9:30am | | PM Peak Hour Eastbound 4:15pm – 5:15pm | |
|---|---|---|---|---|---|
| 4 | 4th Avenue | 79 | 1.2% | 335 | 4.8% |
| 9 | Broadway | 386 | 5.7% | 218 | 3.1% |
| 14/N17 | Broadway | 367 | 5.4% | 371 | 5.3% |
| 25 | King Edward | 659 | 9.7% | 527 | 7.5% |
| 33 | 16th Avenue | 327 | 4.8% | 327 | 4.7% |
| 41 | 41st Avenue | 413 | 6.1% | 342 | 4.9% |
| 43 | 41st Ave.(limited stops) | 336 | 5.0% | 452 | 6.5% |
| 44 | 4th Ave.(limited stops) | 772 | 11.4% | 433 | 6.2% |
| 49 | 49th Avenue | 553 | 8.2% | 958 | 13.7% |
| 84 | 4th Ave.(limited stops) | 650 | 9.6% | 710 | 10.2% |
| 99 | Broadway B-Line | 1774 | 26.1% | 1784 | 25.5% |
| 258 | North Shore Express | 86 | 1.3% | 75 | 1.1% |
| 480 | Richmond Express | 377 | 5.6% | 449 | 6.4% |
| NIS | Not In Service | 5 | 0.1% | 5 | 0.1% |
| **Totals** | | **6,874** | **100%** | **6,896** | **100%** |

Significant observations about transit trips to and from UBC include:

- The number of transit trips has increased in recent years following a period of reduced transit trips from 2014 to 2016.
- Bus routes via University Boulevard account for 45% of all transit trips to and from UBC. Bus routes via 16th Avenue and Chancellor Boulevard account for 14% and 15%, respectively. When combined, ridership in the "UBC Line"1 corridor amounts to 75% 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 26% of all transit trips.
- The 99 B-Line accounts for 30% of all transit trips, which is unchanged from 2017 values.
- The other express bus services (Routes 43, 44, 84, 258 and 480) account for 27% of all transit trips to and from UBC. Adding the Route 99 B-Line increases this to 58% of all transit trips,

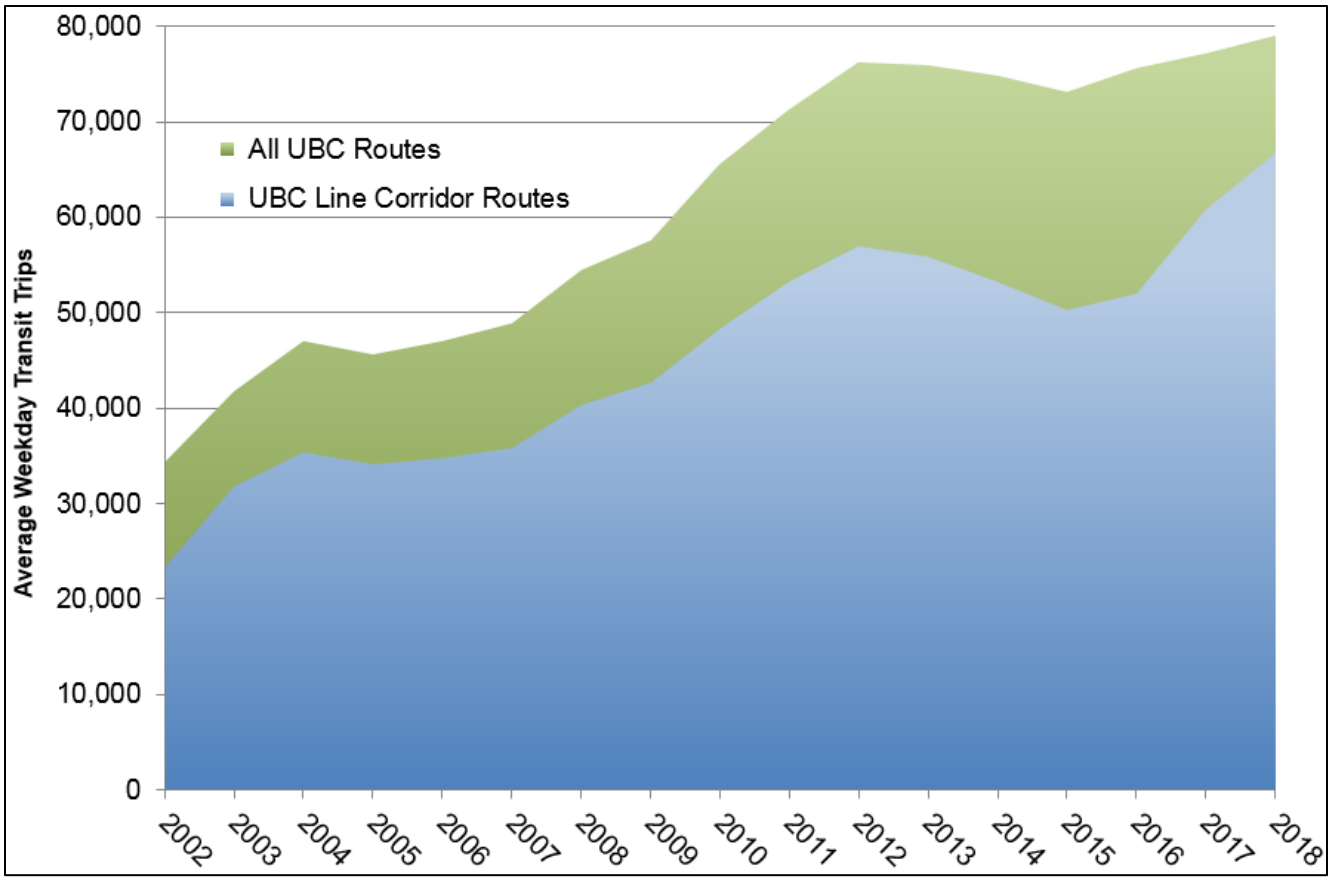
[1] UBC Line refers to the future rapid transit line to UBC that is expected to be used by people currently taking transit to / from UBC via Chancellor Boulevard, University Boulevard and 16th Avenue.

indicating popularity for faster transit service options to / from UBC.

- Trolley bus Routes 4, 9 and 14/17 account for 14% of all transit trips, which is unchanged from 2017.

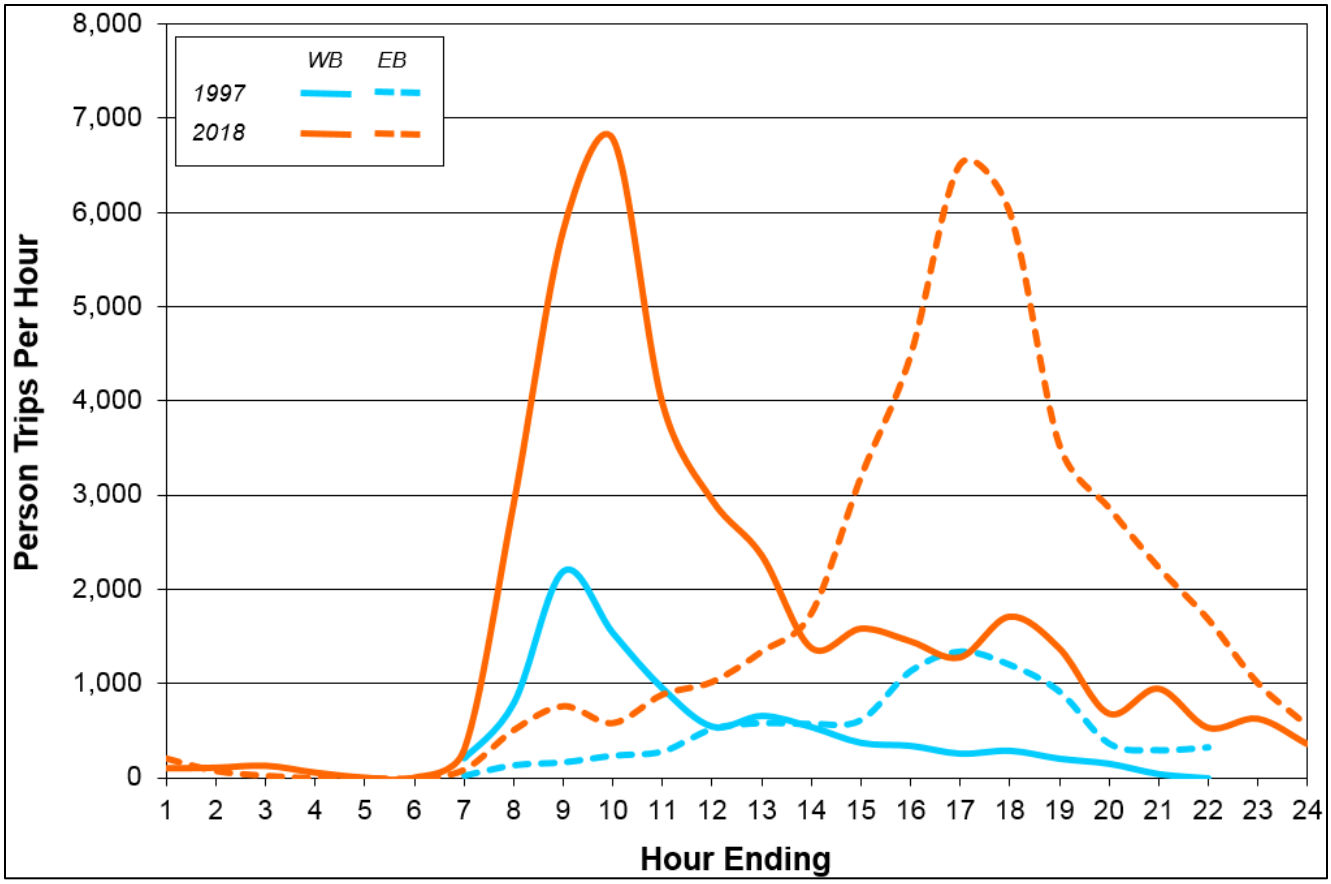
***Figure 3.2*** compares the three year rolling average of ridership on bus routes in the UBC Line corridor with total ridership on all routes.

***Figure 3.2: Average Weekday Transit Trips to / from UBC by Route, 2018***



The daily distribution of transit trips to and from UBC in 2018 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. The sharp peak in the AM peak period reduced in 2018 compared to 2017, which will be monitored over the coming years. A wider spread of peak arrival and departure periods at UBC would allow TransLink to better accommodate the demand. 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. 2018***




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 is rolling out a number of B-Line improvements to meet the demand for express transit connections to UBC. The first to arrive for UBC commuters is the 41 B-Line, which is

planned for September 2019.

## 3.2. Motor Vehicles

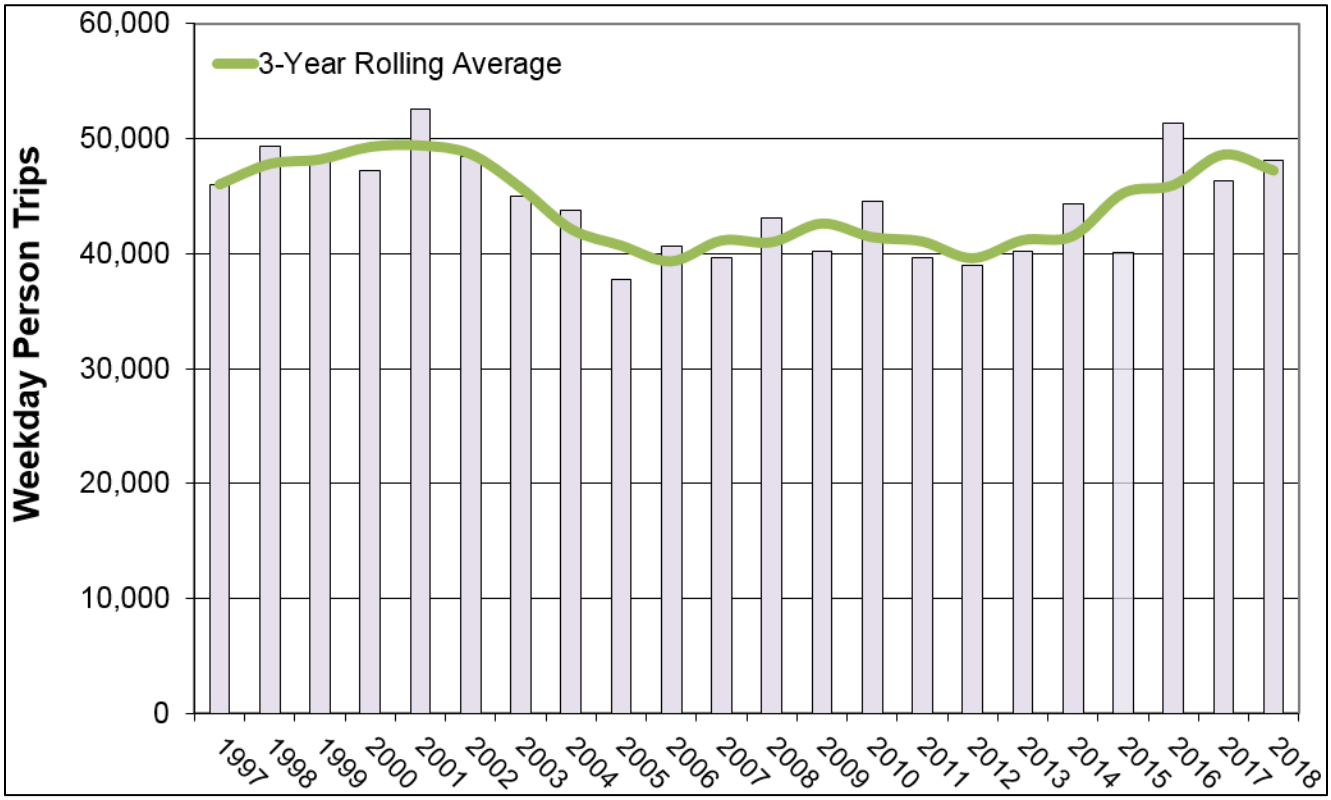
UBC is determined to reduce the amount of vehicle traffic travelling to and from UBC each day as represented in two of the three targets identified in the Transportation Plan.

***Table 3.5*** provides a comparison of SOV travel in fall 1997 and fall 2018, 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. 2018***

| Average Weekday SOV Trips | Fall 1997 | Fall 2018 | Change 1997-2018 (count / percentage) | |
|---|---|---|---|---|
| Person Trips | 46,000 | 48,100 | +2,100 | +4.6% |
| Trips Per Person | 1.09 | 0.67 | –0.42 | –38.6% |
| SOV Mode Share | 43% | 33% | –10 | –23% |

***Figure 3.4: Average Weekday SOV Trips to / from UBC, 1997 - 2018***

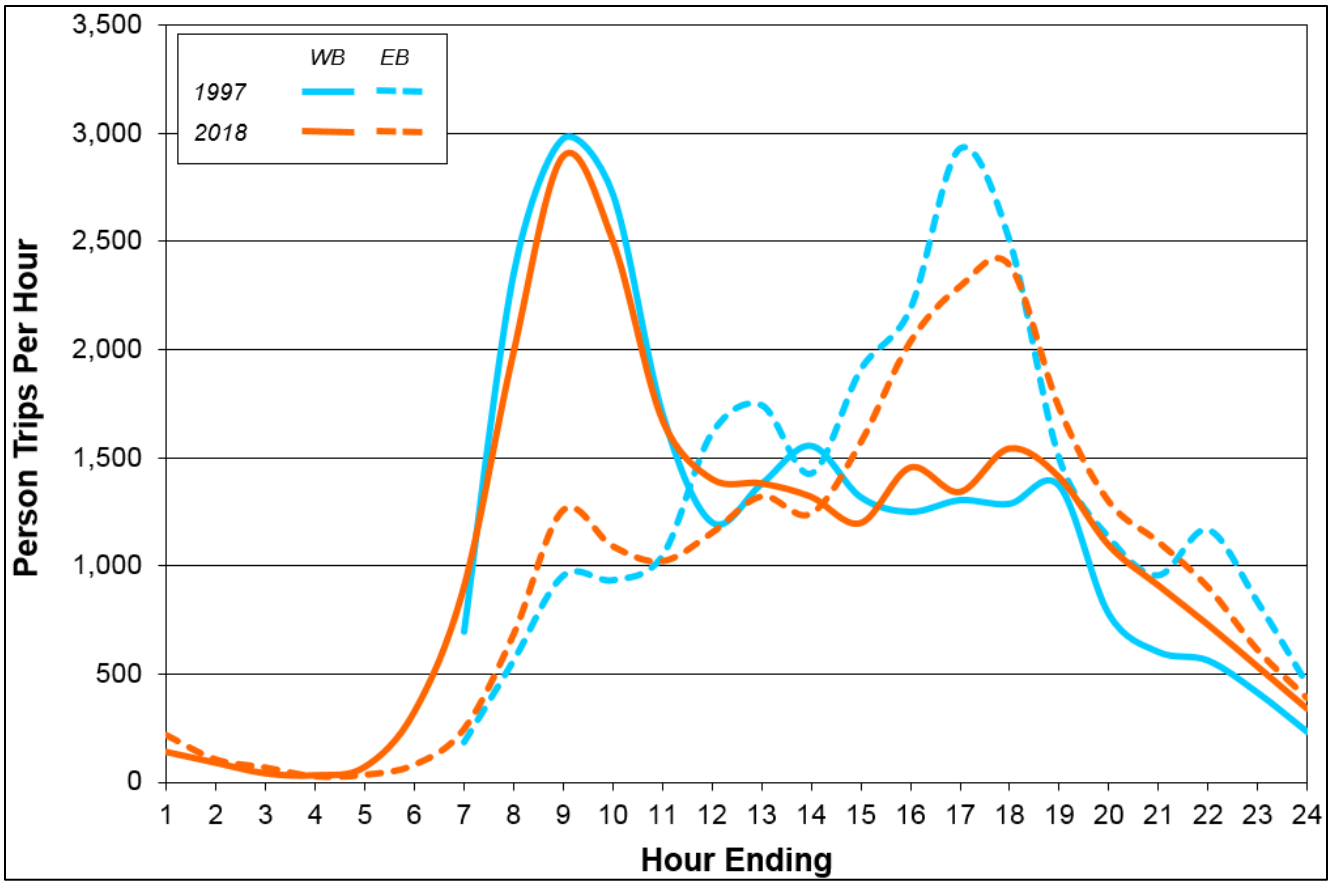



As suspected, the spike in 2016 was another anomaly similar to the drop in 2015, these types of spikes are anticipated with single day data collection efforts. The 2018 values are back on trend with the past seven years that shows a gradual increase year over year, although it does result in SOV

vehicle trips higher than 1997 values.

***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 2018 follow the same peak travel pattern in 1997, but in general more trips westbound starting at 4pm through later into the 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. 2018***



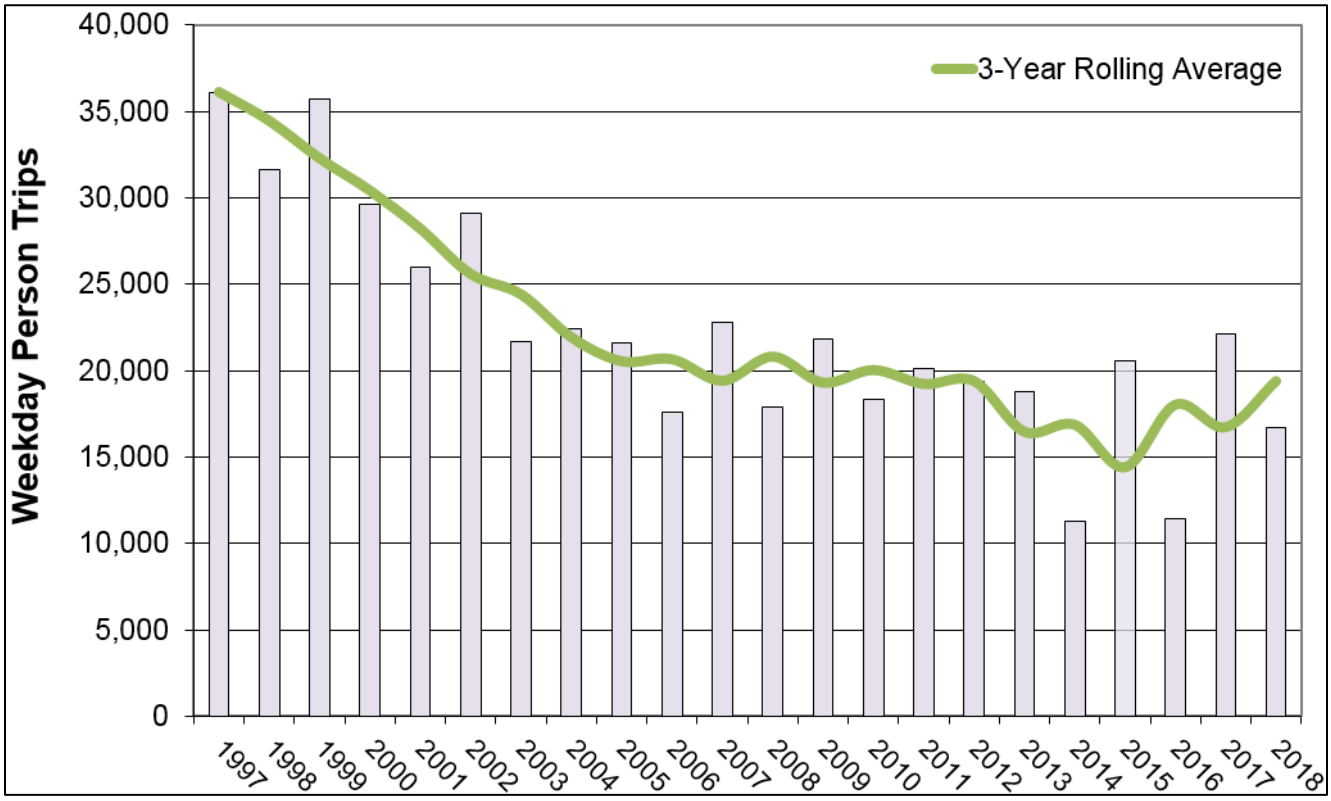

From the 2017 Transportation Survey the campus community was asked why they chose to drive alone. Their top three responses were to pick-up children from daycare and schools, public transit is not an option because they live too far away, and they do not like to take public transit in general. Of the respondents that identified they travelled alone, 75% of them said they would take transit if there was a rapid transit connection to UBC.

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 2018 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. 2018***

| Average Weekday HOV Trips | Fall 1997 | Fall 2018 | Change 1997-2018 (count / percentage) | |
|---|---|---|---|---|
| Person Trips | 36,100 | 16,700 | –19,400 | –38.8% |
| Trips Per Person | 0.85 | 0.32 | –0.53 | –53.7% |
| HOV Mode Share | 34% | 11.5% | –22.5 | –66% |

***Figure 3.6: Average Weekday HOV Trips to / from UBC, 1997 – 2018***

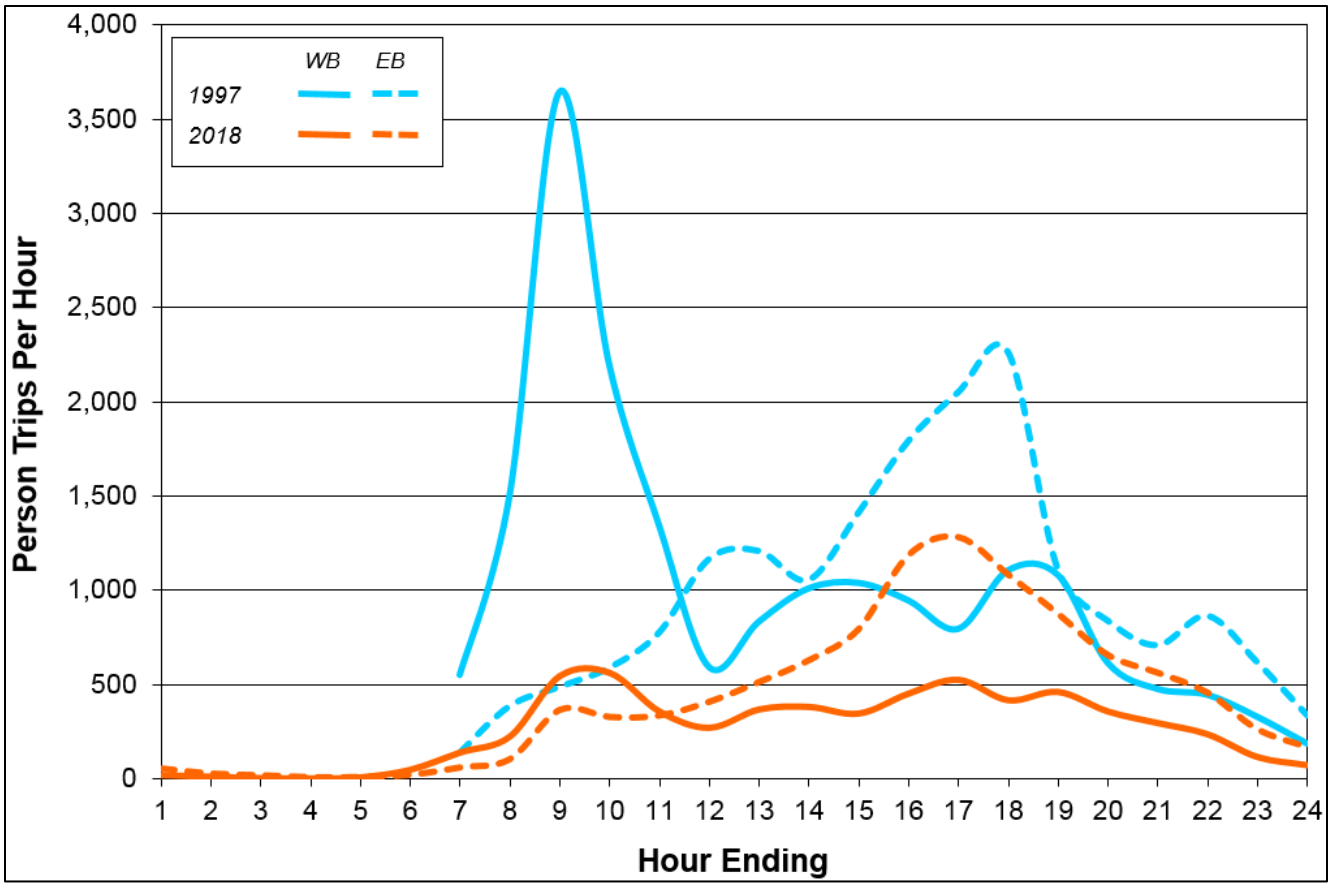



As shown in ***Figure 3.6***, HOV trips have decreased significantly since 1997 and over the last five years have exhibited a lot of fluctuation. There are significant barriers to HOV in general, but UBC is working on increasing this mode share with pilot programs and incentives offered through UBC Parking in addition to better understanding the barriers to 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 higher amount of HOV trips departing campus during the afternoon peak period. This could be because it may be 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.

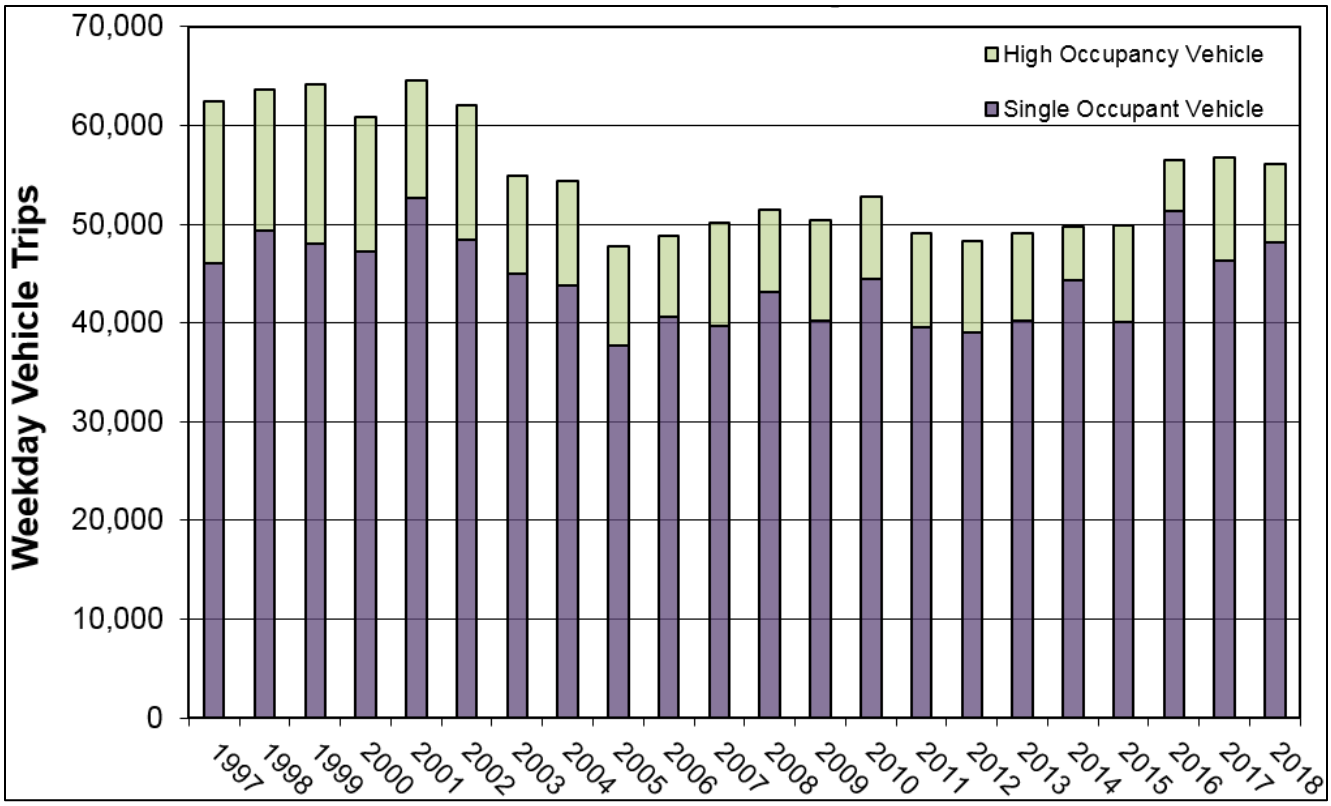
The 2017 Transportation Survey asked the campus community why they drive alone and what would make them choose to travel by more sustainable options such as carpooling. The primary response was the need to carry out other errands such as picking children up from daycare / school. This identifies that 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. 2018***



In fall 2018, daily motor vehicle traffic was 56,100 vehicles per day, which is 6,300 less than the 1997 level. **Figure 3.8** provides a summary of the trend in daily motor vehicle traffic volumes from 1997 to 2018. The number of automobiles travelling to campus daily has levelled off over the past three years, but with variations in the split between SOV and HOV trips.

***Figure 3.8: Average Weekday Motor Vehicle Trips to / from UBC, 1997 – 2018***




**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 2018 there were 48,100 SOV vehicle trips, which is a 4.6% increase from 1997 values.

✓ In 2018 there were 0.67 SOV trips per person, which is a 38.6% 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 2018 there were 56,100 private vehicles per day, which is a 10.1% reduction from 1997 values.

In 2018 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 is piloting an HOV program for staff and TransLink is rolling out a new B-Line to campus in 2019.

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 |
|---|---|---|---|---|
| 1-Person Trips | 299 | 388 | 408 | 503 |
| 2-Person Trips | 45 | 41 | 73 | 41 |
| 3+ Person Trips | 5 | 7 | 39 | 9 |
| **Totals** | **349** | **436** | **520** | **553** |

As shown, there has been a significant increase in car share trips to / from UBC with an increase over 50% in just three years. Results from the 2018 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 mode share is being replaced by car share and how many times do the vehicles that are driven to campus move each 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 2018. 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, which 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. 2018***

| Average Weekday Bicycle Trips | Before U-Pass | | After U-Pass | | Change 1997-2018 (count / percentage) | |
|---|---|---|---|---|---|---|
| | Fall 1997 | Fall 2002 | Fall 2004 | Fall 2018 | | |
| Person Trips | 2,700 | 3,300 | 1,600 | 2,100 | -600 | -22.2% |
| Trips Per Person | 0.06 | 0.07 | 0.03 | 0.03 | -0.03 | -54.1% |
| Bicycle Mode Share | 2.5% | 2.9% | 1.3% | 1.4% | -1.1 | -43.4% |

***Figure 3.9: Average Weekday Bicycle Trips to / from UBC, 1997 – 2018***

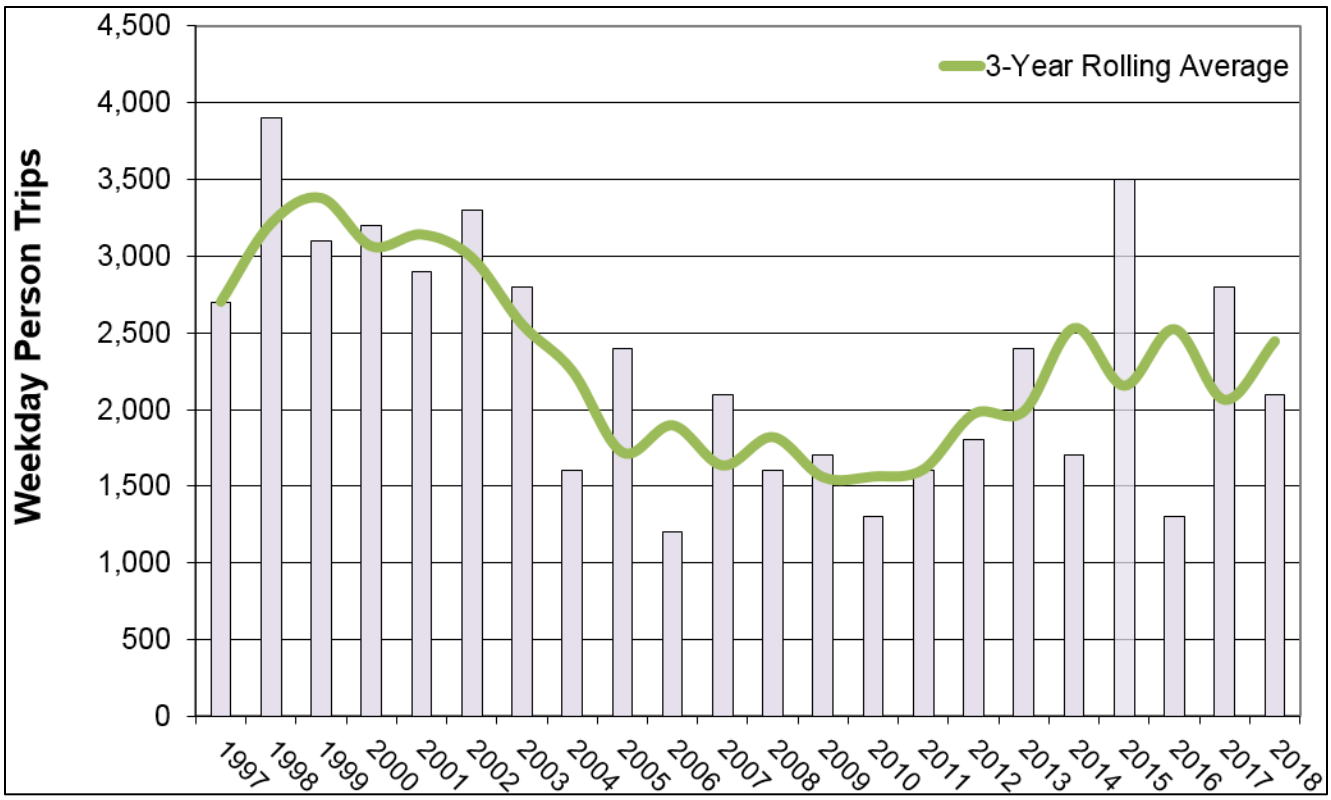
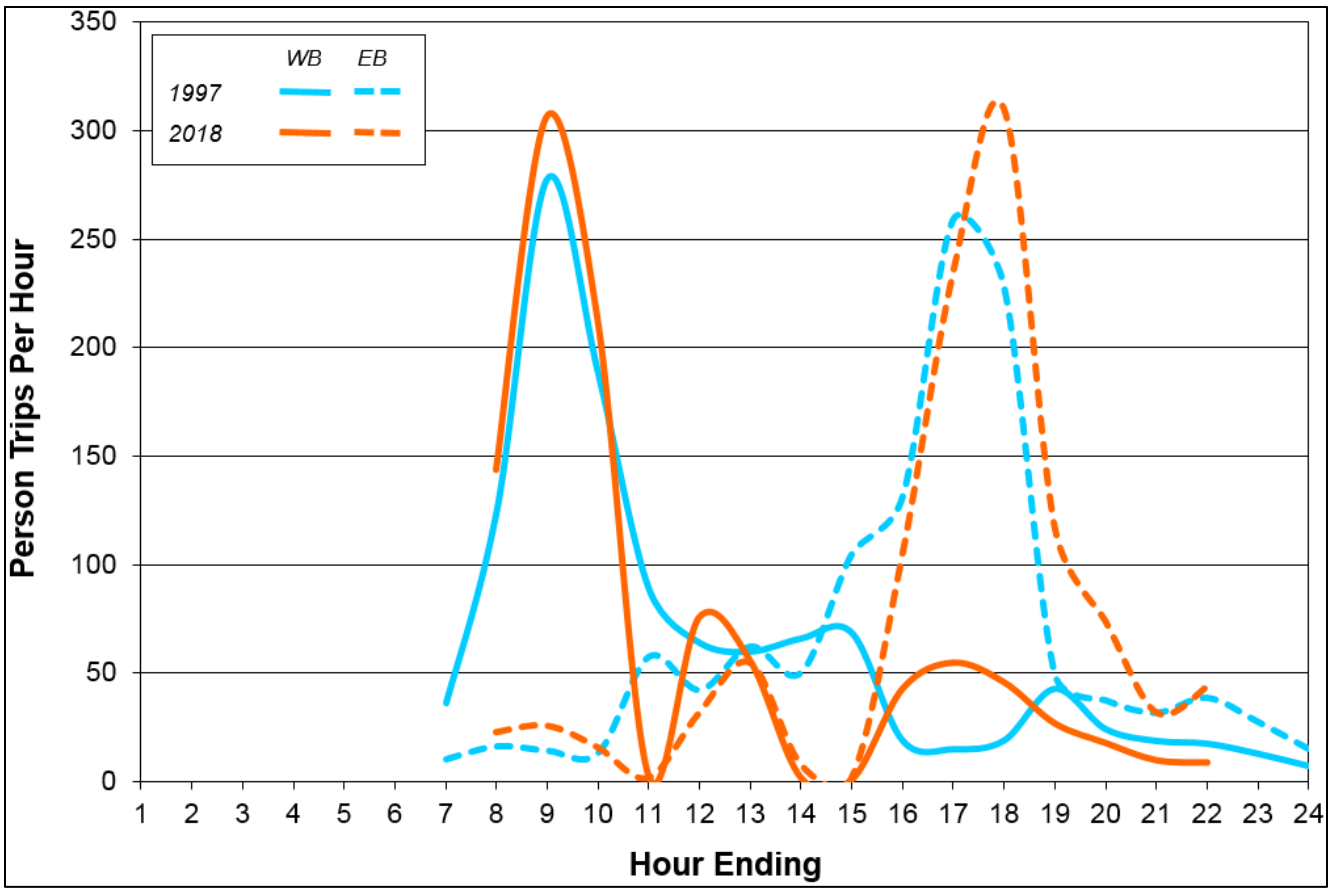



***Figure 3.10*** illustrates the arrival and departure patterns of bicycle trips to and from UBC throughout the day, for 2018 and 1997 bicycle trips.

As can be seen, bicycle trips match peak morning (westbound) and evening (eastbound) travel patterns, and consistent with 2017 the peak volumes in the morning and evening are higher than 1997 values. What is different and impacting the overall trip counts are the number of bicycle 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 2018 UBC launched a bike share pilot program on the campus. This program does not have an impact on commuter trips however, as the program services on campus trips only. It is likely that the number of bike trips between Vancouver and the UBC campus will increase with a united bike share program in the future, though it is unlikely to have a significant impact on the mode share for the campus.

***Figure 3.10: Distribution of Average Weekday Bicycle Trips to / from UBC, 1997 vs. 2018***




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 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.
- In 2015, total of 245 bicycles were on buses at a 5.9% usage rate.

There was a reduction in the count of bikes on buses during the count day. However, it is generally more common to observe bikes on buses throughout the rainy / winter months.

Another observation from that data is that more cyclists bring their bikes on buses westbound to campus and the most popular transit routes for cyclists to travel with their bicycles is the 99 B-Line as well as route 25 that connects the campus to Brentwood Station.

***Table 3.8*** provides a summary of the trend in pedestrian trips from fall 1997 to fall 2018, 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 is most likely attributed to weather, but this will be closely monitored 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 Ministry 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. 2018***

| Average Weekday Pedestrian Trips | Before U-Pass | | After U-Pass | | Change 1997-2018 (count / percentage) | |
|---|---|---|---|---|---|---|
| | Fall 1997 | Fall 2002 | Fall 2004 | Fall 2018 | | |
| Person Trips | 1,400 | 1,600 | 600 | 700 | -700 | -50% |
| Trips Per Person | 0.03 | 0.03 | 0.01 | 0.01 | -0.02 | -70.5%- |
| Pedestrian Mode Share | 1.3% | 1.4% | 0.5% | 0.5% | -0.8% | -63.6% |

***Figure 3.11: Average Weekday Pedestrian Trips to / from UBC, 1997 – 2018***

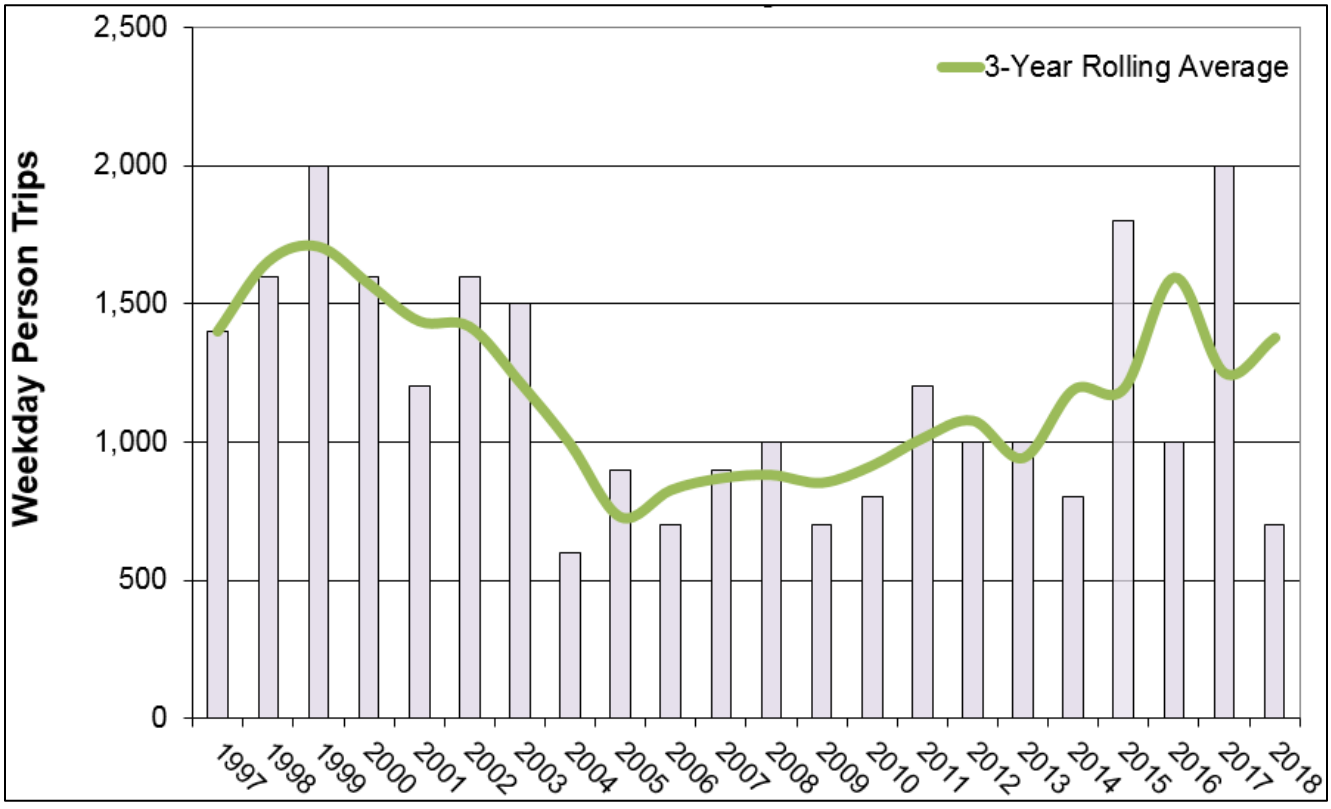
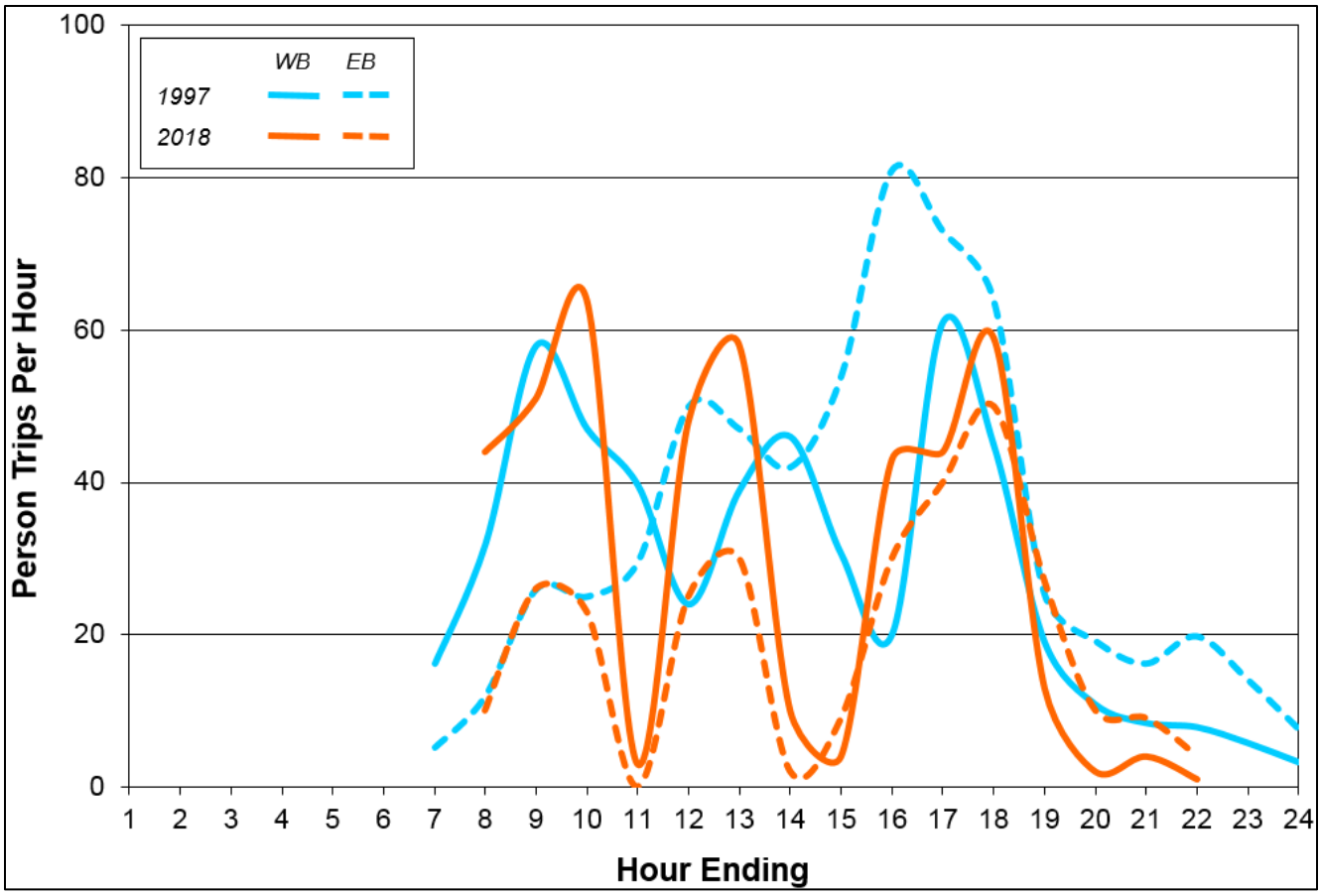


***Figure 3.12*** illustrates the arrival and departure patterns of pedestrian trips to and from UBC throughout the day, including a comparison with fall 1997 pedestrian trips. The arrival and departure pattern to campus in 2018 shows three peaks throughout the day. Overall, there are more people walking to campus throughout the day compared to walking from campus and there are very few trips outside of the three peak periods, which start at 9am, 12noon, and 5pm.

***Figure 3.12: Distribution of Average Weekday Pedestrian Trips to / from UBC, 1997 vs. 2018***




## 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 regulations, which apply to all trucks with a gross vehicle weight (GVW) of more than 11,800 kg. 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 makes 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 noise than vehicle weights.

Counts of heavy truck traffic were undertaken on a quarterly basis during 2018; 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.

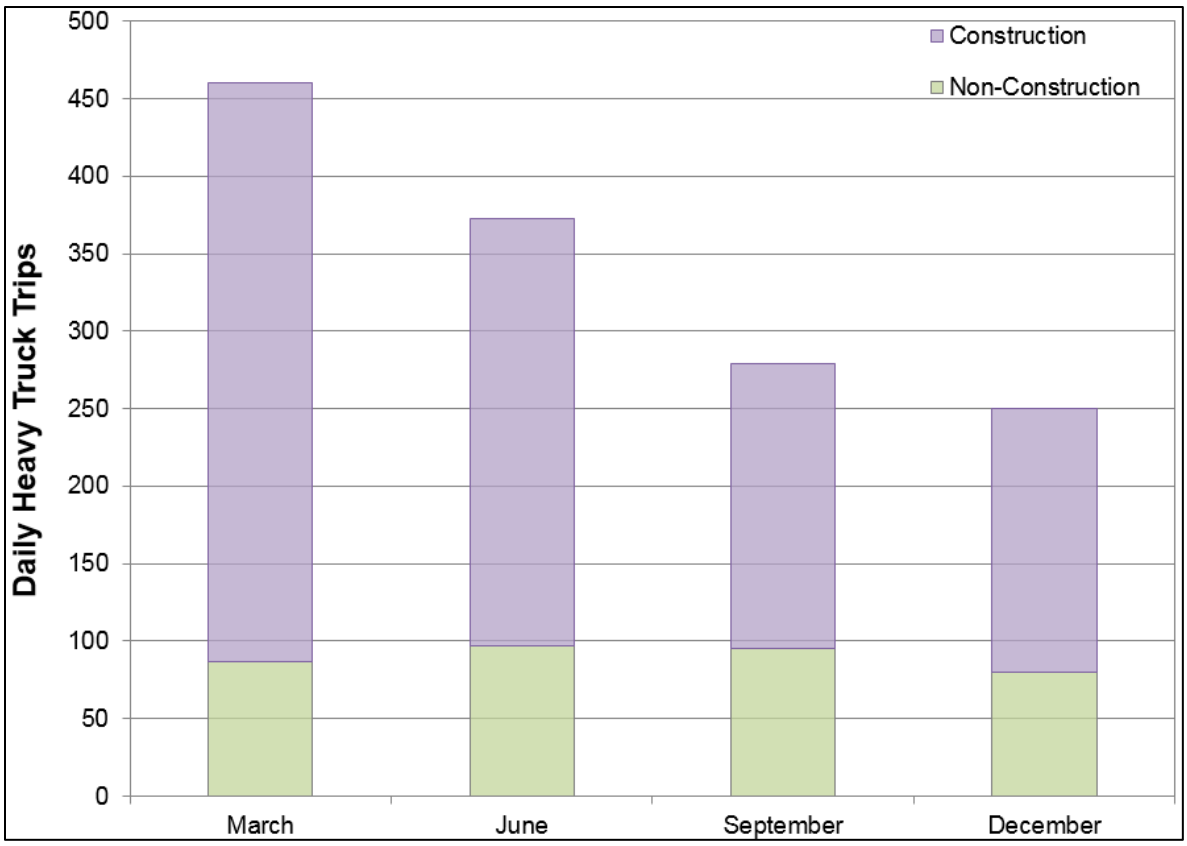
***Table 3.9: Average Weekday Heavy Truck Trips to / from UBC, 2018***

| Route | Type of Truck | | Totals |
|---|---|---|---|
| | Construction | Non-Construction | |
| Chancellor Boulevard | 22.8 | 9.8 | 32.5 (9.5%) |
| University Boulevard | 30.0 | 16.8 | 46.8 (13.7%) |
| 16th Avenue | 17.0 | 12.0 | 29 (8.5%) |
| SW Marine Drive and 41st Avenue | 181.0 | 51.3 | 232.3 (68.2%) |
| **Totals** | **250.8 (73.6%)** | **89.8 (26.4%)** | **340.5** |

As shown in the table, an average of 340 heavy truck trips per day were counted to / from UBC. Of the 340 trips, 251 (73.6%) of them were construction related trips. This is a significant decrease from 2017 and previous year counts.

Of the four routes to / from UBC, SW Marine Drive carries 68% of construction related trips. The remaining three routes experience similar truck traffic with University Boulevard experiencing slightly more with 13.7% of all trips. Throughout the year there were more trucks counted in March, but the lower counts in June, September and December reduced the average daily truck traffic for the year.

***Figure 3.13: Heavy Truck Trips to / from UBC, 2018***



# 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 85$^{th}$ 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 85$^{th}$ percentile speed data from 2013 to 2018 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 85$^{th}$ Percentile Traffic Speeds (km/h) Eastbound / Northbound, 2012 – 2018***

| Location | Speed Limit (km/h) | Eastbound / Northbound | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fall 2013 | Fall 2014 | Fall 2015 | Fall 2016 | Fall 2017 | Fall 2018 |
| Wesbrook Mall s/o Gage | 50 | – | – | – | 55.3 | 55.2 | 54 |
| Wesbrook Mall s/o University | 50 | 47.1 | 49.3 | 51.2 | 48.8 | 49.1 | 49.5 |
| Thunderbird w/o Wesbrook | 30 | 47.1 | 47.1 | 47.0 | 46.6 | 46.6 | 52.7 |
| West Mall s/o University Blvd | 30 | – | – | – | – | 29.6 | 29.2 |
| West Mall n/o Thunderbird | 30 | - | 38.9 | 36.0 | 30.4 | - | - |
| East Mall s/o Thunderbird | 50 | 66.0 | 50.7 | 52.6 | 50.6 | 50.8 | 51.2 |
| Wesbrook Mall n/of 16$^{th}$ Ave | 50 | 49.0 | 54.4 | 49.8 | 50.9 | 51.8 | 52 |
| Wesbrook Mall s/o 16th Ave. | 50 | 37.5 | 32.8 | 37.2 | 32.6 | 33.2 | 33.4 |
| Stadium Rd at Main Mall | 30 | – | – | – | 48.8 | 49.6 | - |
| 16th Ave w/o East Mall | 60 | 78.3 | 72.1 | 69.5 | 60.9 | 71.0 | 68.3 |
| 16th Ave w/o Wesbrook Mall | 50 | 68.6 | 67.0 | 56.3 | 56.6 | 57.5 | 66.3 |
| 16th Ave e/o Wesbrook Mall | 50 | 74.8 | 72.9 | 72.1 | 69.2 | 66.6 | 66.4 |
| Chancellor e/o Western Pkwy | 50 | 56.3 | 57.1 | 55.7 | 58.7 | 55.3 | 58 |
| University e/o Toronto Rd | 50 | 77.5 | 59.6 | 58.1 | 57.9 | 59.0 | 59.6 |

***Table 4.2: Average 85th Percentile Traffic Speeds (km/h) Westbound / Southbound, 2010 – 2017***

| Location | Speed Limit (km/h) | Westbound / Southbound | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fall 2013 | Fall 2014 | Fall 2015 | Fall 2016 | Fall 2017 | Fall 2018 |
| Wesbrook Mall s/o Gage | 50 | – | – | – | 50 | 50.6 | 50.2 |
| Wesbrook Mall s/o University | 50 | 44.2 | 49.6 | 53.8 | 48.1 | 48.5 | 48.9 |
| Thunderbird w/o Wesbrook | 30 | 44.2 | 40.4 | 42.4 | 43.3 | 39.9 | 53.8 |
| West Mall s/o University Blvd | 30 | – | – | – | – | 31.4 | 31.9 |
| West Mall n/o Thunderbird | 30 | - | 39.1 | 35.6 | 32.6 | - | - |
| East Mall s/o Thunderbird | 50 | 56.6 | 50.5 | 55.9 | 53.2 | 53.3 | 53.7 |
| Wesbrook Mall n/of 16th Ave | 50 | 55.5 | 50.1 | 55.5 | 53.3 | 53.1 | 52.9 |
| Wesbrook Mall s/o 16th Ave. | 50 | 38.4 | 31.6 | 36.5 | 31.8 | 32.6 | 31.9 |
| Stadium Rd at Main Mall | 30 | – | – | – | 47.7 | 48.2 | - |
| 16th Ave w/o East Mall | 60 | 72.6 | 69.4 | 75.8 | 68.5 | 71.0 | 71.2 |
| 16th Ave w/o Wesbrook Mall | 50 | 60.1 | 58.2 | 61.7 | 59.7 | 59.5 | 58.4 |
| 16th Ave e/o Wesbrook Mall | 50 | 73.9 | 65.0 | 63.2 | 60.1 | 61.2 | 60.1 |
| Chancellor e/o Western Pkwy | 50 | 71.2 | 60.7 | 59.2 | 60.1 | 59.6 | 61.1 |
| University e/o Toronto Rd | 50 | 58.7 | 56.9 | 58.1 | 57.1 | 60.0 | 61.9 |

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.

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, 2018***

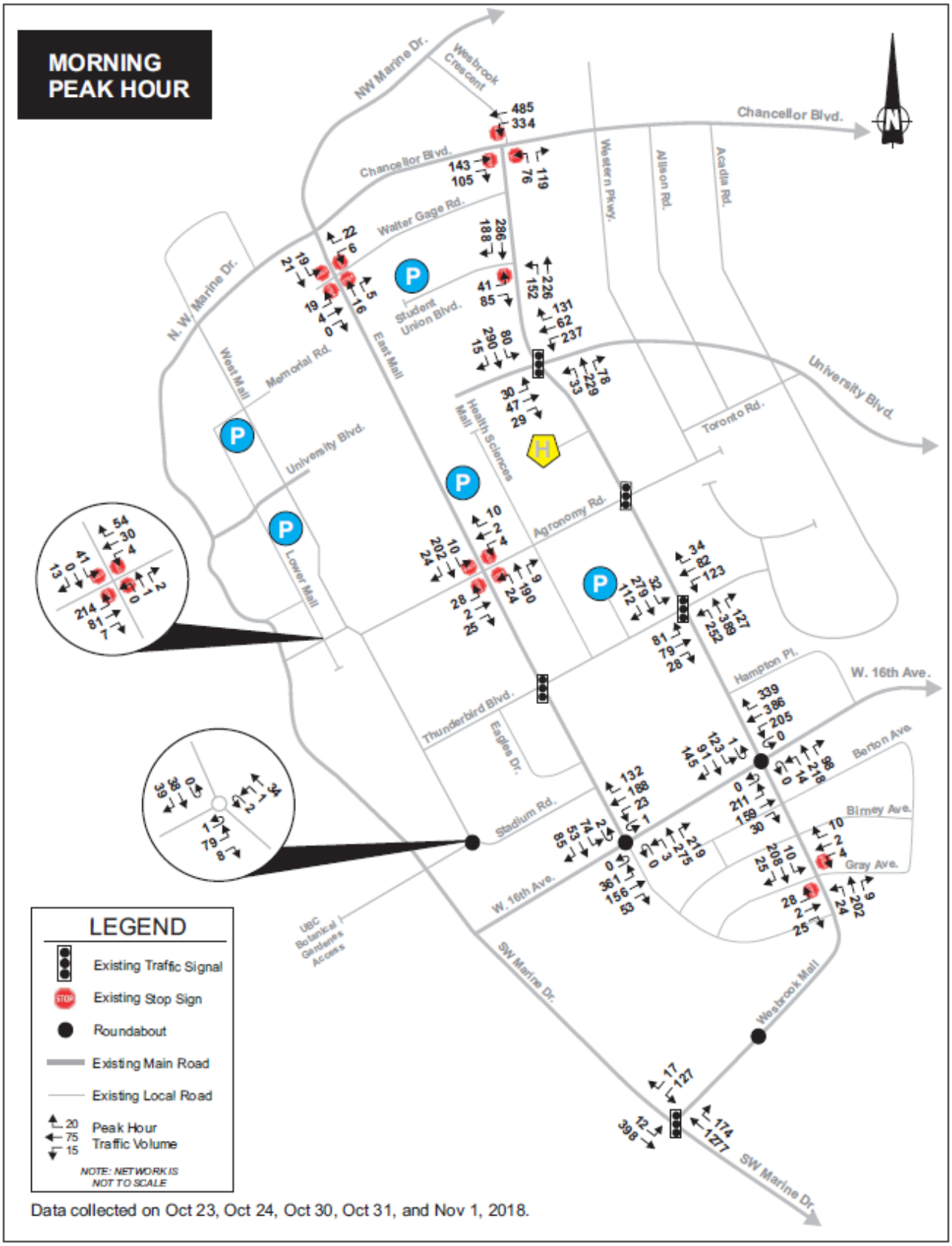
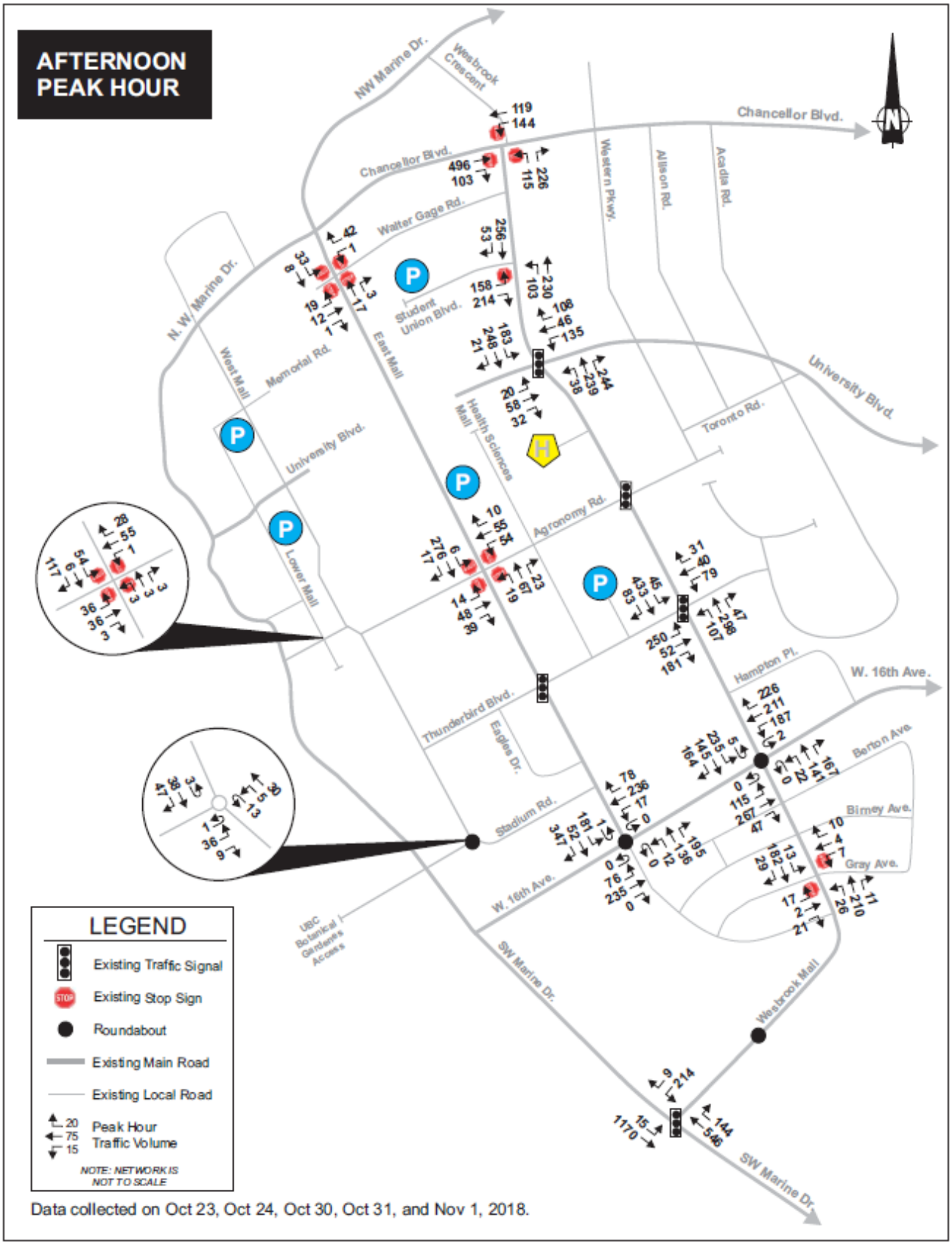


***Figure 4.2: Afternoon / Evening Peak Hour Traffic Volumes at UBC, 2018***



## 4.3. Travel Patterns

A licence plate survey was conducted to determine origins and destinations of traffic on Wesbrook Mall between 16th Avenue and SW Marine Drive. Data was collected over a 12 hour period from 7am to 7pm over one day to see where vehicles are going within this corridor.

The results of the licence plate survey are summarized in ***Table 4.3*** and in ***Figure 4.3***.

***Table 4.3: Summary of Travel Patterns on Wesbrook Mall in Wesbrook Place, 2018 vs (2016)***

| Destination of Trip | Northbound | | Southbound | |
|---|---|---|---|---|
| | Trips 2018 (2016) | % Distribution 2018 (2016) | Trips 2018 (2016) | % Distribution 2018 (2016) |
| Through | 660 (705) | 38% (40%) | 515 (266) | 12% (15%) |
| Wesbrook Place | 652 (530) | 37% (30%) | 3156 (2943) | 77% (77%) |
| South Research Campus | 440 (542) | 25% (30%) | 448 (287) | 11% (8%) |

**Counts do not include buses.*

Key observations regarding travel patterns on Wesbrook Mall in South Campus are as follows:

- There are a greater number of through trips northbound (660) compared to southbound (512). In total 38% of all vehicles turning onto Wesbrook Mall from SW Marine Drive travel through Wesbrook Place to 16th Avenue.
- Over three quarters of all trips southbound are destined to areas within Wesbrook Place. The number of trips into the Village is up 7% compared to 2016 counts.
- Trips into South Research Campus from 16th Avenue has increased by 56%, but has decreased northbound from SW Marine Drive by 19%

***Figure 4.3: Travel Patterns on Wesbrook Mall between 16th Avenue and SW Marine Drive***