

University of British Columbia – Okanagan Campus

Transportation Status Report Fall 2023



May 2024



THE UNIVERSITY OF BRITISH COLUMBIA

Executive Summary

To understand travel patterns and measure progress in achieving a shift to non-automobile modes of transportation, a biennial transportation data collection and monitoring program has been carried out at the UBC Okanagan (UBCO) campus since 2009.

In 2021, UBCO completed a Transportation Plan for the campus. The Plan identified a number of transportation targets to reduce greenhouse gas emissions from commuting. These targets relate to an increased use of sustainable modes of transportation to commute to and from campus, including transit, biking, walking and carpooling. The targets and the corresponding results from the 2023 data collection effort are summarized below.

UBCO Transportation Plan Targets and 2023 Results

TARGET 1: By 2040, at least 55% of all trips to and from campus will be by sustainable modes of transportation (walking, biking or transit).

× In 2023, 43% of all trips were made by transit, walking and biking.

TARGET 2: By 2030 total annual GHG emissions associated with commuting will be reduced by 40% of 2013 levels.

– To be reported through CAP2030 monitoring process.

TARGET 3: By 2040, at least 35% of all trips to and from campus will be by transit.

× In 2023, 26% of all trips to and from campus were made by transit.

TARGET 4: By 2040, at least 20% of all trips to and from campus will be by active modes (biking and walking).

× In 2023, 17% of all trips to and from campus were made by active modes.

TARGET 5: Through 2040, total daily automobile traffic to and from campus will not exceed 14,000 vehicle trips per day.

✓ In 2023, there were 13,820 vehicle trips to campus per day.

TARGET 6: By 2040, at least 35% of all automobile trips to and from campus will be by carpooling, ride-sharing and vanpooling.

× In 2023, 17% of all automobile trips to and from campus were made by carpooling, ride-sharing and vanpooling.

The focus of three of the six targets in UBCO’s Transportation Plan relate to the mode share of trips to and from campus. The sustainable, transit and active mode shares as well as their targets are presented in **Figure A**.

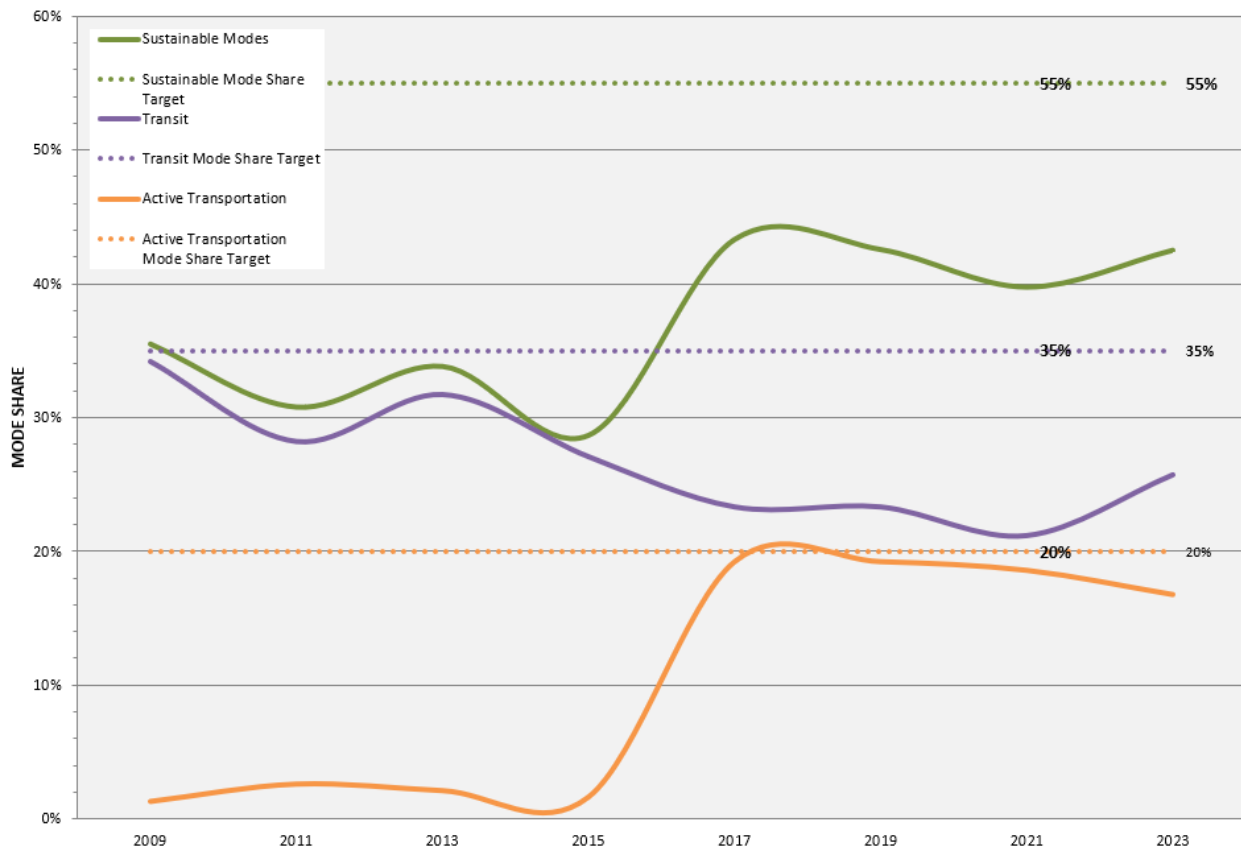


Figure A: Transportation Plan Mode Share Target Tracking

As shown, there is a lot of work required to help the campus reach the transit and sustainable mode share targets set in the 2021 Transportation Plan. There are improvements to the transit mode share, potentially in part to the successful ProPASS program at UBCO that was launched in October 2021. Although the active transportation mode share decreased in 2023, there were actually over 1,200 more walking trips per day compared to 2021. The reason for the decreased mode share is because of the substantial increase in the overall number of person trips, which is shown in **Figure B**.

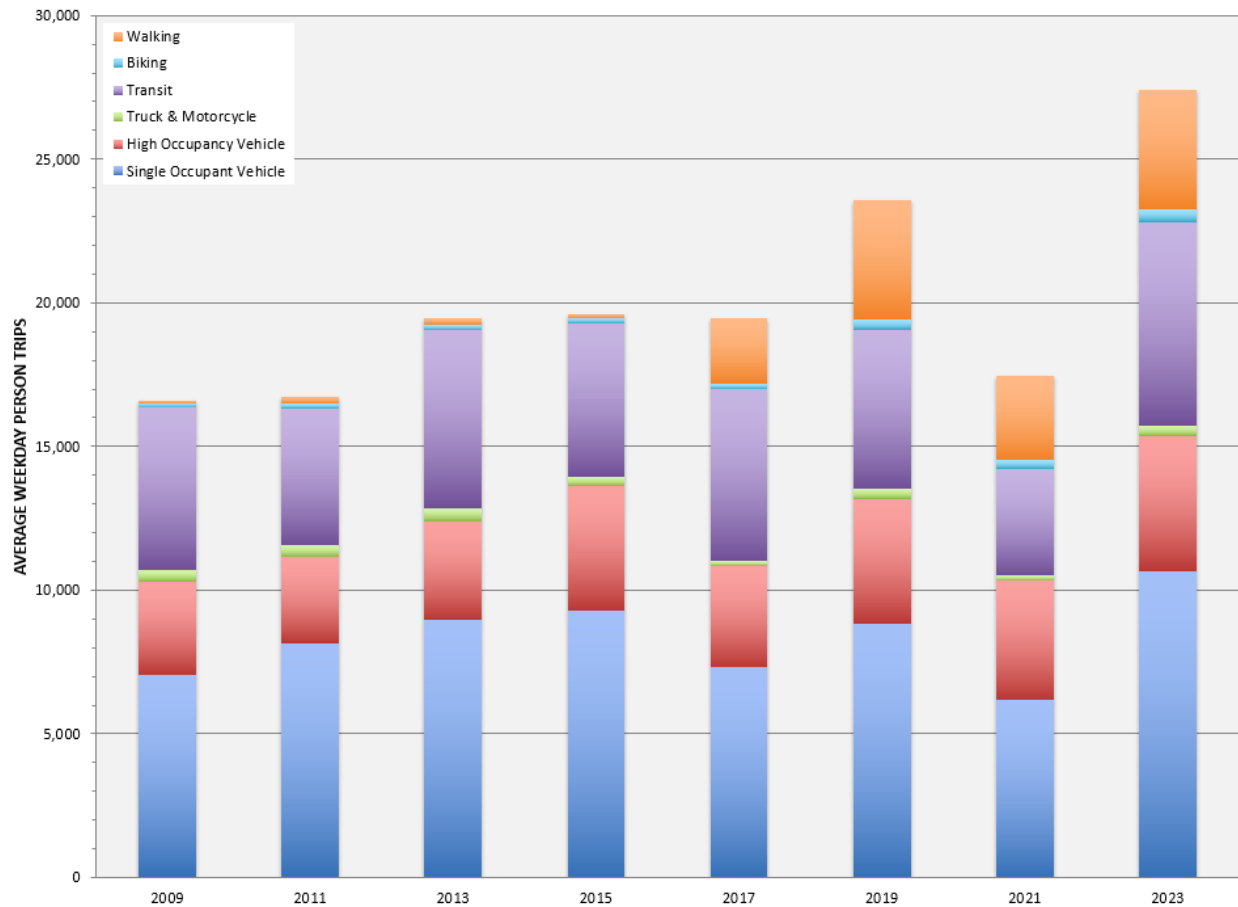


Figure B: Summary of Weekday Person Trips by Mode to / from UBC Okanagan

As can be seen, Single Occupant Vehicle (SOV) trips continue to be the most common way the campus community commutes to and from campus, however transit, walking and High Occupancy Vehicle (HOV) trips are also well used. The most notable difference between 2009 and 2023 is the increase in the walking mode share, as well as the decrease in the transit mode share. These changes correlate with the development of the nearby University South neighbourhood in 2017 where a number of students now live. The close proximity of the University South neighbourhood allows students to walk to campus as opposed to having to live further away and taking public transit using their universal bus pass (U-Pass).

Another target is related to automobile trips to campus. As shown in **Figure C**, automobile traffic to and from campus in 2023 increased to the highest ever recorded at 13,820 trips per day. Nearly 78% of the automobile trips were made by single occupant vehicles. It is interesting to note that even though there is still ongoing support for remote work, the trips to campus are the highest ever recorded.

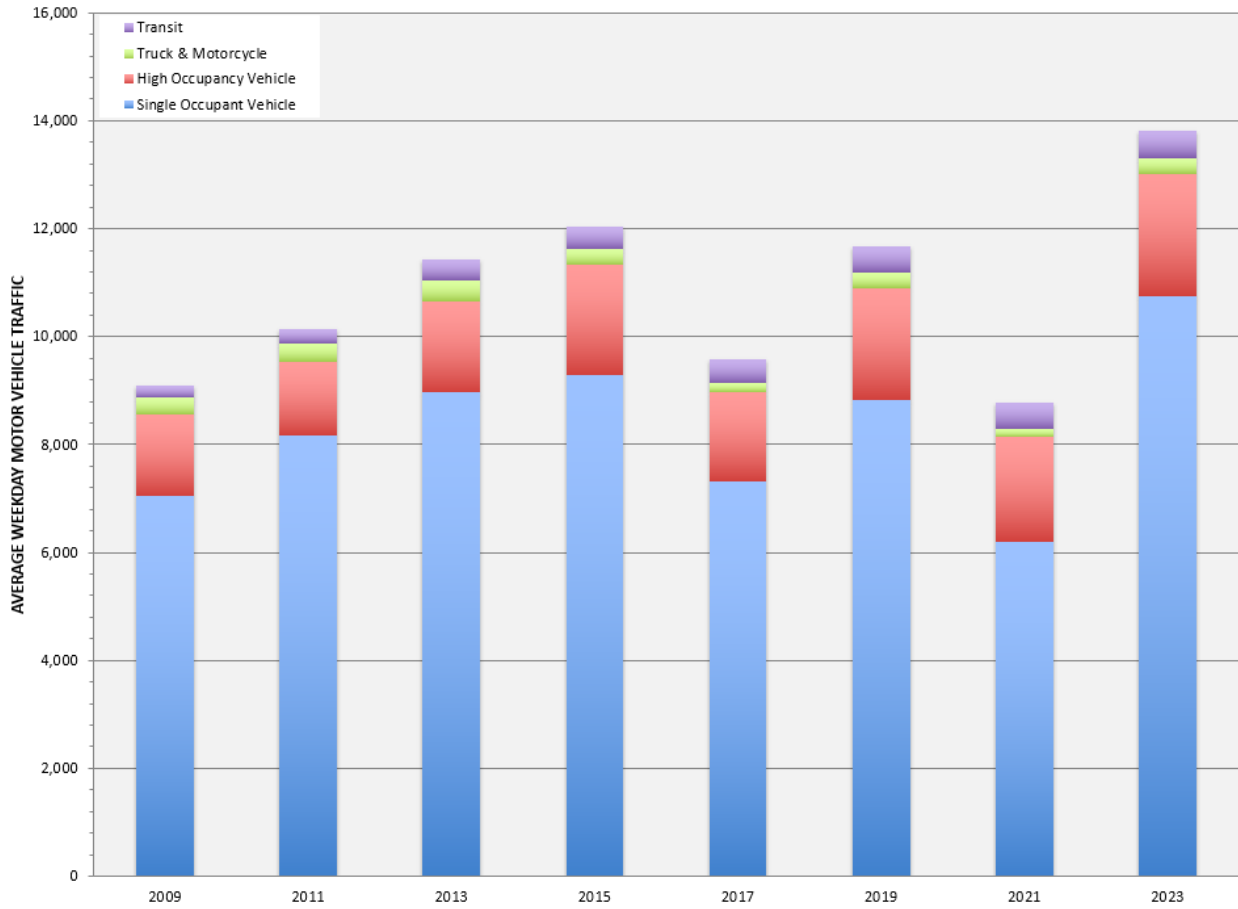


Figure C: Average Weekday Automobile Trips to / from UBC Okanagan

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1 INTRODUCTION

Since 2009, UBC has collected data every two years in the fall to monitor travel patterns to and from the Okanagan Campus. This UBC Okanagan Transportation Status Report Fall 2023 provides a snapshot of overall travel trends, details of travel patterns for each mode of transportation to and from UBCO, as well as an overview of transportation trends since 2009. The monitoring program of the campus has changed with the growth of the campus and it will continue to evolve.

1.1 Context

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

- **The UBC Okanagan Campus Plan** was completed in September 2015 and builds on the foundations of the 2005 and 2009 Master Plans. The Plan describes how the campus will develop to accommodate increased student enrolment and expanded university activities. It provides a long-term planning framework for existing and future academic and research activities, student housing, and associated campus services and infrastructure for the next 20 years. The illustrated Campus Plan is provided in *Figure 1.1*, with the addition of the Innovation Precinct Structure Plan (IPSP), completed in 2018, that covers the northeast quadrant of campus.
- **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.
- **Outlook 2040** is formed from the Strategic Plan. It provides a future view of the Okanagan campus and identifies the steps needed to move the university towards even greater impact and service to the people and communities of BC.
- **The UBC Okanagan Transportation Plan** was developed in 2021 to guide the planning, design and delivery of transportation services, programs and infrastructure for the Okanagan campus for decades to come. The Plan includes targets to ensure accountability, shape decision making, and inspire the community to act in ways to achieve UBC Okanagan's campus vision. The targets identified in the Plan include:

- **TARGET 1:** By 2040 at least 55% of all trips to and from campus will be by sustainable modes of transportation (walking, biking or transit).
- **TARGET 2:** By 2030 total annual GHG emissions associated with commuting will be reduced by 40% of 2013 levels.
- **TARGET 3:** By 2040, at least 35% of all trips to and from campus will be by transit.
- **TARGET 4:** By 2040, at least 20% of all trips to and from campus will be by active modes (biking and walking).
- **TARGET 5:** Through 2040, total daily automobile traffic to and from campus will not exceed 14,000 vehicle trips per day.
- **TARGET 6:** By 2040, at least 35% of all automobile trips to and from campus will be by carpooling, ride-sharing and vanpooling.



Figure 1.1: Illustrative Plan of UBC Okanagan Campus with Innovation Precinct Structure Plan

1.2 Transportation Monitoring Program

Travel patterns to and from UBCO are monitored on an on-going basis through a variety of different data collection methods. Data is collected in the fall 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 bi-annual monitoring results are used to monitor travel patterns on campus. With the completion of the UBCO Transportation Plan in 2021 it is now also used to assess progress towards meeting the targets identified in the Plan and also help guide future implementation priorities.

Data collection activities for 2023 are summarized in **Table 1.1**, and data collection locations are illustrated in **Figure 1.2**.

Table 1.1: Summary of Transportation Data Collection

Data Collection Activity	Locations	Description
Intersection Turning Movement Counts (TMC)	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 Automatic Traffic Recorder (ATR)	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 (6AM to 9PM) over one day.

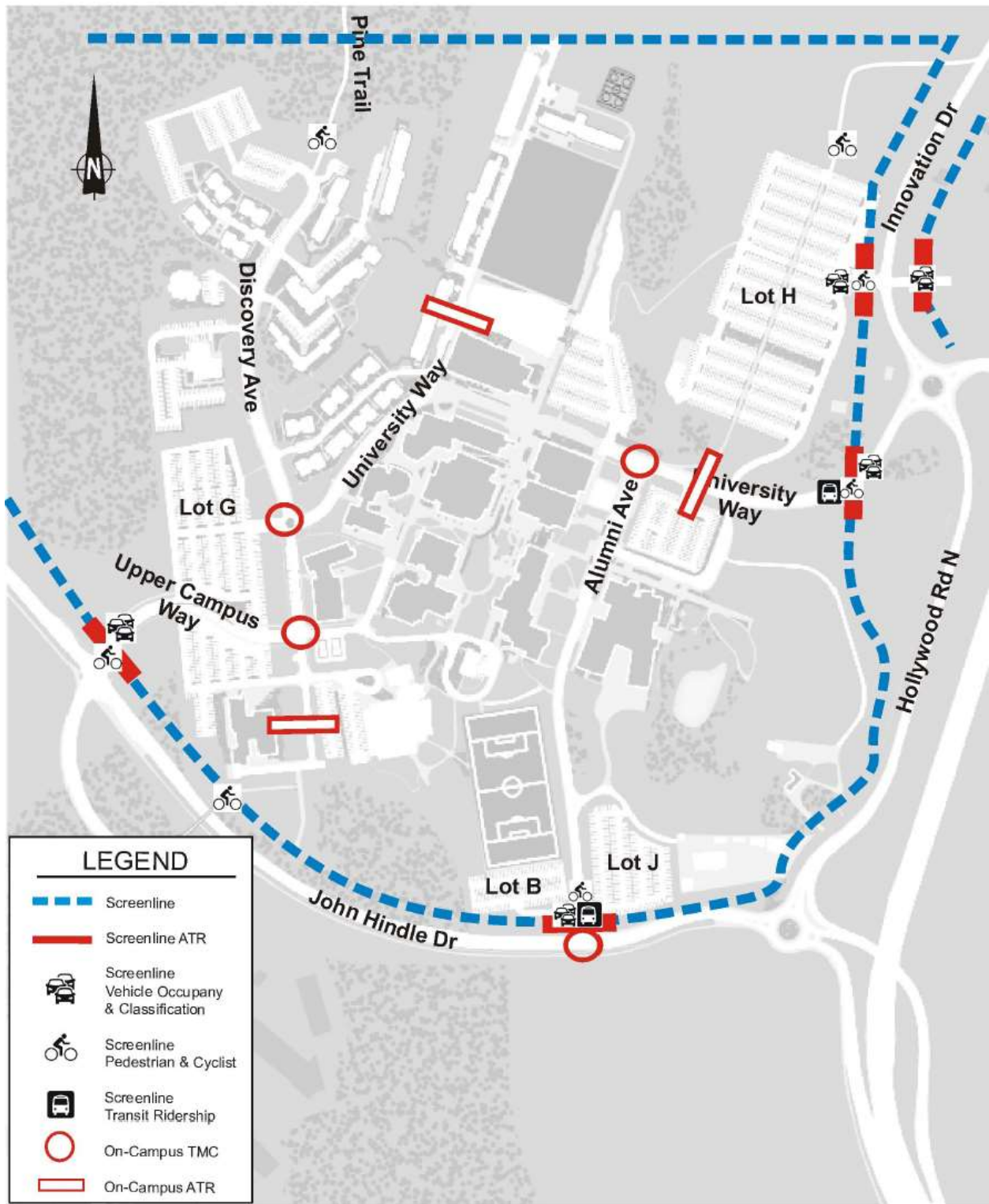


Figure 1.2: 2023 Data Collection Locations

1.3 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 UBCO, the screenline around the campus is illustrated by the dotted blue line in **Figure 1.2**. As shown, there are 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), high occupancy vehicles (HOVs), transit, bicycles, 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 UBCO — students, staff, faculty and others — increases each year. 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 average daytime population on campus. The average daytime population is calculated as the student enrolment plus the number of staff and faculty (FTE), as reported by UBC’s Planning and Institutional Research department.
- Substantial effort and cost are required to collect travel data at UBCO. 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. 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 are estimated by combining occupancy and classification data with the average daily traffic data.

1.4 Changes at UBCO Affecting Travel Patterns

UBC is striving to reduce automobile trips to and from the UBC Okanagan Campus by encouraging the use of sustainable modes of transportation, including transit, carpooling, biking and walking. To date, UBCO has implemented several initiatives in support of non-automobile modes of transportation, including a student U-Pass program, a discounted staff and faculty transit pass program, bike / scooter share, bicycle infrastructure and end-of-trip facilities, and carpool parking. In addition, BC Transit has made ongoing efforts to improve transit service and increase transit capacity to UBCO. A summary of the key changes that have affected travel patterns among students, staff, faculty and community members are as follows:

- Population.** The average daytime population at the UBC Okanagan campus has increased by approximately 88% since 2009. This includes increased student enrolment and associated increases in faculty and staff. For the purposes of monitoring trends in travel to and from UBCO, the daytime population comprised of students, staff and faculty is used to calculate person trips. **Table 1.2** summarizes population figures for fall 2009, 2019, 2021 and 2023, which are based on full time equivalent (FTE) counts provided by PAIR.

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

Table 1.2: Average Daytime Population at UBC Okanagan

Group	Fall 2009	Fall 2019	Fall 2021	Fall 2023	Comparison 2023 to 2009 (count / percentage)	
Students	5,670	9,925	10,230	10,180	+4,510	+80%
Staff & Faculty	720	1,365	1,470	1,830	+1,110	+154%
Totals	6,400	11,290	11,700	12,010	+5,620	+88%

Source: UBC Planning and Institutional Research Department

- Student U-Pass for transit.** One of the most significant programs affecting travel patterns at UBCO has been the student U-Pass. The U-Pass is a universal transportation pass that is mandatory for students at a nominal monthly cost. The U-Pass offers students unlimited access to BC Transit.
- Increased transit service.** BC Transit and the City of Kelowna have been increasing the level of transit service provided to UBCO and continues to make service improvements annually. A new Transit Exchange was built on the UBC Okanagan campus in 2015, which improved the transit experience for the UBCO community. Also, UBCO staff continuously work with City of Kelowna staff to try to align bus schedules with class times.

- **Staff and Faculty transit pass discount.** In 2021, UBCO partnered with BC Transit and their ProPASS program to provide all staff and faculty the opportunity to purchase transit passes at a 15% discount. In 2022, UBCO enhanced the program and increased the discount to 50%, which has resulted in a 13% uptake in the program.
- **Parking supply and costs.** UBCO has been increasing the price of parking on campus to keep up with local pricing and to manage demand. Additionally, as a result of the growth in Electric Vehicle (EV) ownership, UBCO has been adding EV charging stations in the parking lots across campus and will continue to add more as demand increases and capacity permits.
- **Bicycle facilities.** Over the last five years, there have been substantial improvements to the City of Kelowna's cycling network, including connections to the UBCO campus. The most notable are the rail to trail conversion and connection via the Bulman Road underpass (under Hwy 97), the Multi Use Pathway (MUP) along John Hindle Drive, and a new pedestrian and cyclist overpass connecting to the University South neighbourhood. All local roads on campus function as either shared roadways that accommodate bicycles or have dedicated bike lanes. Bicycle racks are provided at every building on campus, in addition to secure bike lockers and some end-of-trip facilities.

2 Summary of Transportation at UBCO

This section presents a general summary of transportation to and from UBCO including person trips, trips per person and mode share. Details for each different mode of transportation are presented in **Section 3**.

For the 2023 monitoring program, the following changes around the university influenced travel patterns:

- Alumni Avenue was closed to through traffic due to construction, resulting in changes to travel patterns of vehicles and buses.
- The nearby University South development has continued to grow, bringing a lot more of the campus community within walking and biking distance of the campus.
- Some adjustments to service times of transit routes serving the campus to address gaps in service.

2.1 Person Trips

The average weekday person trips to and from UBCO in fall 2023 was 27,525, which is 17% more than the number of weekday trips in 2019. This suggests a full return to on campus activities, however, there is still ongoing support for remote work, so this increase may be attributed to general population growth and increased on-campus activity. A summary and comparison of daily person trips by mode are provided in **Table 2.1** and **Figure 2.1**.

Table 2.1: Weekday Person Trips to / from UBC Okanagan

Travel Mode Classification	Person Trips					Change 2023-2009 (count / %)	
	Fall 2009	Fall 2019	Fall 2021	Fall 2023			
Single Occupant Vehicle (SOV)	7,040	8,820	6,205	10,755	3,715	+53%	
High Occupancy Vehicle (HOV)	3,260	4,365	4,125	4,720	1,460	+45%	
Truck and Motorcycle	400	370	200	355	-45	-11%	
Transit	5,680	5,495	3,695	7,075	1,395	+25%	
Biking	100	380	315	465	365	+365%	
Walking	120	4,160	2,935	4,155	4,035	+3,363%	
Totals	16,600	23,590	17,475	27,525	10,925	+66%	

In 2023, the highest number of person trips per day were recorded since data collection started in 2009. When compared to 2019 there are 3,930 more trips per day in 2023. The main differences when comparing 2019 to 2023 is an increase in SOV trips and transit trips.

It is expected to see some variability in trips by mode year over year. Once there are more years of data to analyze, a 3-year rolling average will be more indicative of travel trends.

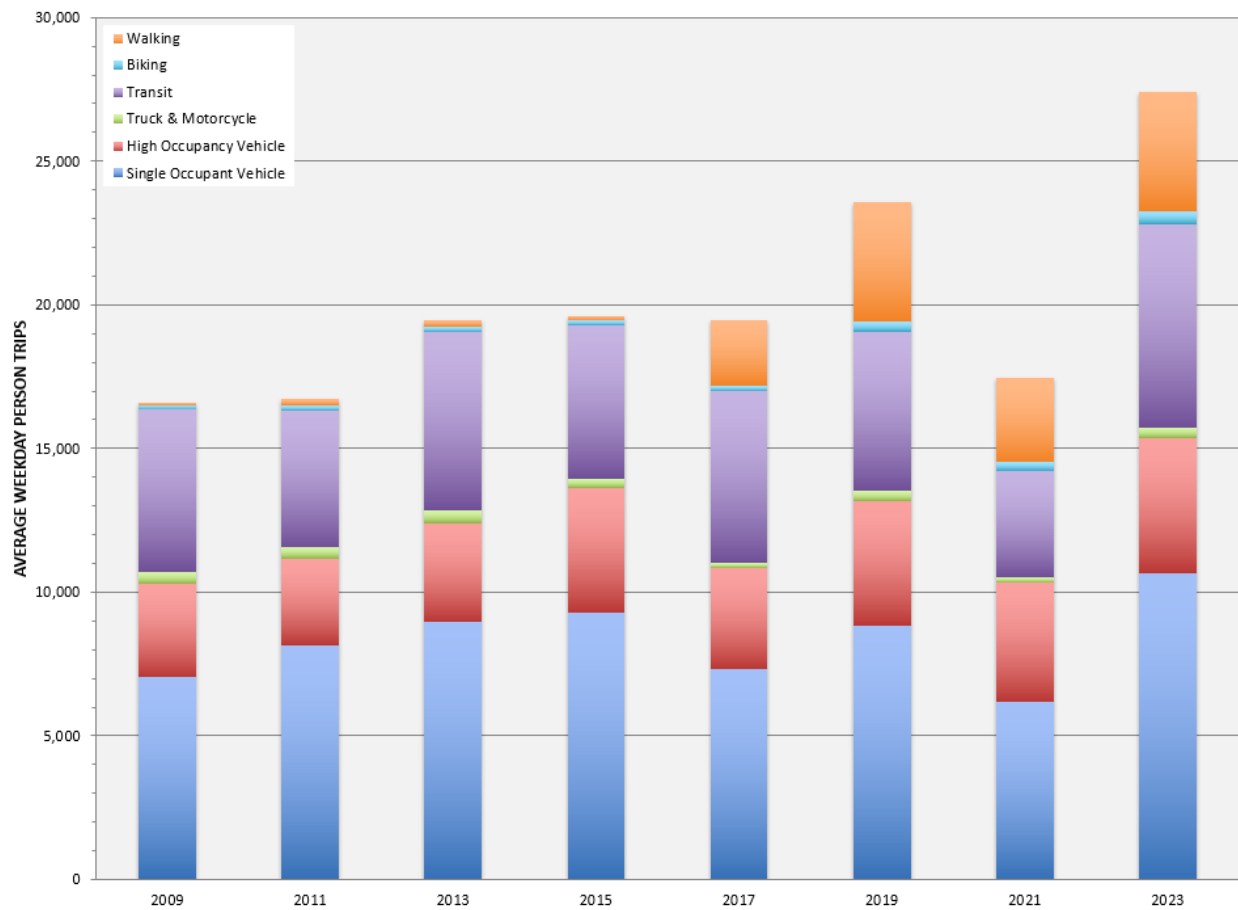


Figure 2.1: Weekday Person Trips to / from UBCO

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 for each mode is divided by the average weekday campus population. The average weekday campus population values include FTE's of all full and part time students, staff and faculty. In 2021 a new methodology was used by UBC's Planning and Institutional Research Office (PAIR) to better estimate the average weekday population on campus. As a result, there may be some larger differences to past years.

The campus population and trips per person to and from UBCO are presented in **Table 2.2**.

Table 2.2: Weekday Trips Per Person to / from UBC Okangan

Travel Mode Classification	Trips Per Person				
	Fall 2009	Fall 2019	Fall 2021	Fall 2023	% Change 2023-2009
Single Occupant Vehicle	1.10	0.78	0.53	0.89	-19%
High Occupant Vehicle	0.51	0.39	0.35	0.39	-23%
Truck & Motorcycle	0.06	0.03	0.02	0.03	-53%
Transit	0.89	0.49	0.32	0.59	-34%
Biking	0.02	0.03	0.03	0.04	148%
Walking	0.02	0.37	0.25	0.35	1745%
Totals	2.59	2.09	1.49	2.28	-12%
CAMPUS POPULATION	6,400	11,290	11,700	12,010	88%

The trips per person in 2023 are much higher than recent years as a result of the increased number of trips to and from campus. Compared to 2019, the biggest differences are an increase in SOV and transit trips per person.

2.2 Mode Share Summary

The mode share comparison for 2009 and 2023 is shown in **Figure 2.2** and the tracking of the Transportation Plan mode share targets is presented in **Figure 2.3**. The most notable difference between 2009 and 2023 is the increased walking mode share and the decreased transit and SOV mode share. Over the last few years, the correlation of an increase in people walking and a decrease in people taking transit was observed. However, in 2023, there was an increase in transit trips and a decrease in walking trips compared to 2019. This is likely the result of population growth in the University South neighbourhood stabilizing. Many of the residents in that neighbourhood are students, who would otherwise have lived further from campus and likely have used their U-Pass and taken transit to campus.

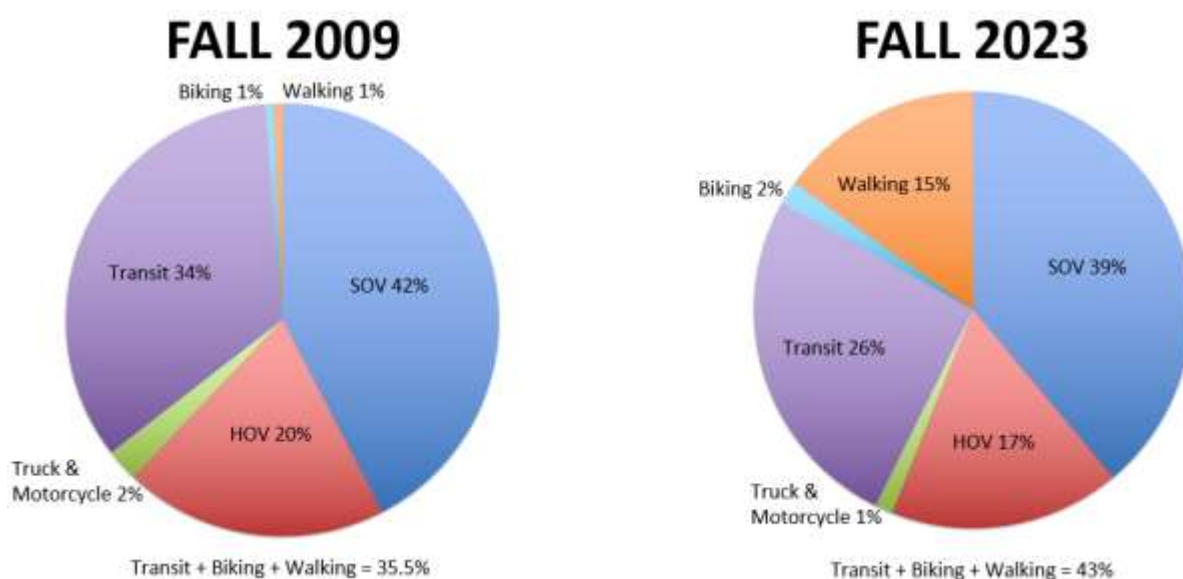


Figure 2.2: Average Weekday Mode Share To / From UBC, 2009 vs. 2023

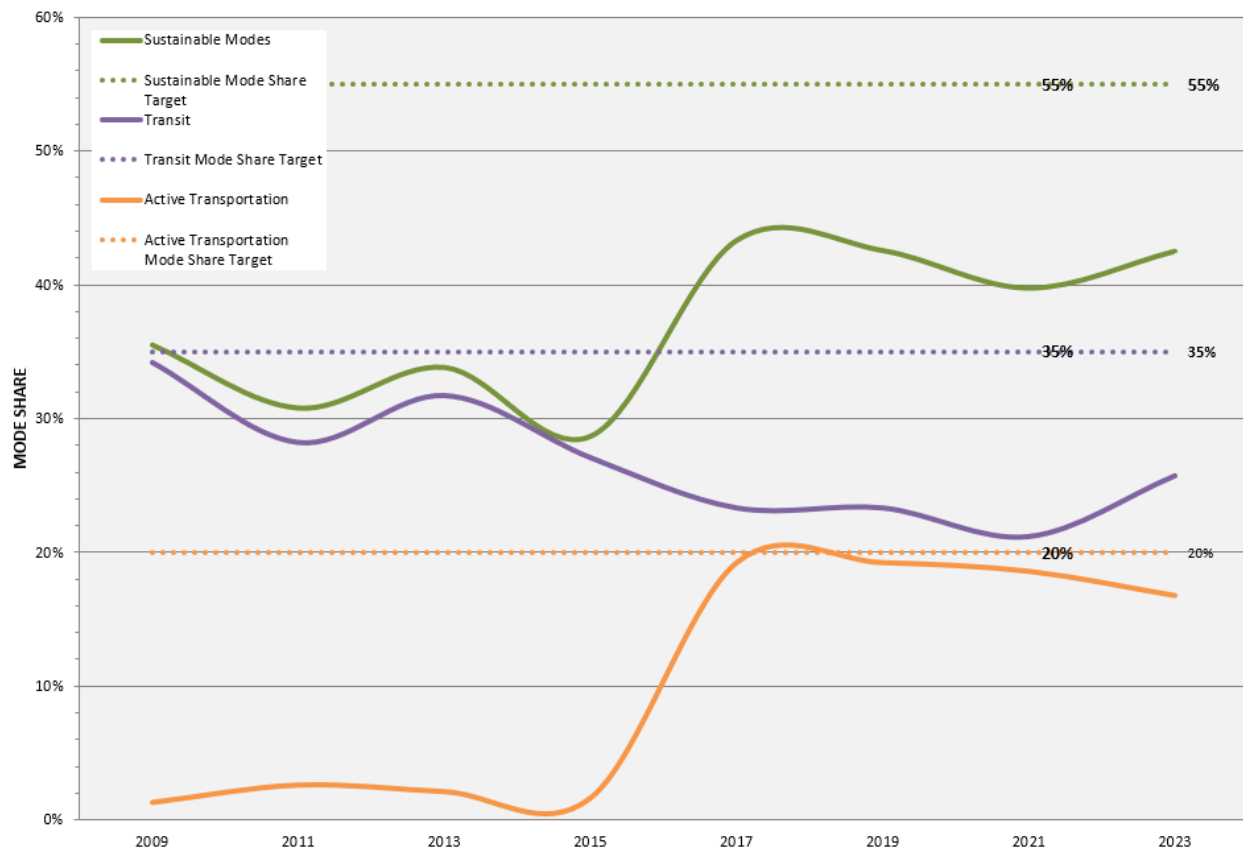


Figure A: 2021 Transportation Plan Mode Share Target Tracking

UBCO Transportation Plan Targets

TARGET 1: By 2040 at least 55% of all trips to and from campus will be by sustainable modes of transportation (walking, biking or transit).

- × In 2023 43% of all trips were made by transit, walking and biking.

TARGET 3: By 2040, at least 35% of all trips to and from campus will be by transit.

- × In 2023, 26% of all trips to and from campus were made by transit.

TARGET 4: By 2040, at least 20% of all trips to and from campus will be by active modes (biking and walking).

- × In 2023 17% of all trips to and from campus were made by active modes.

The hourly distribution of weekday person trips throughout the day in 2023 is shown in **Figure 2.4**, which follows the expected pattern with a peak of trips to campus in the morning and a peak of trips from campus in the afternoon. It is interesting to note the two sharp peaks in the morning and the rounder peak in the afternoon. The two peaks in the morning could be attributed to a staff start time between 8am and 9am and a more common class start time between 10am and 11am. It is most desirable to have more rounded peaks, like the afternoon outbound trips in **Figure 2.4**, to reduce the strain on the transportation network.

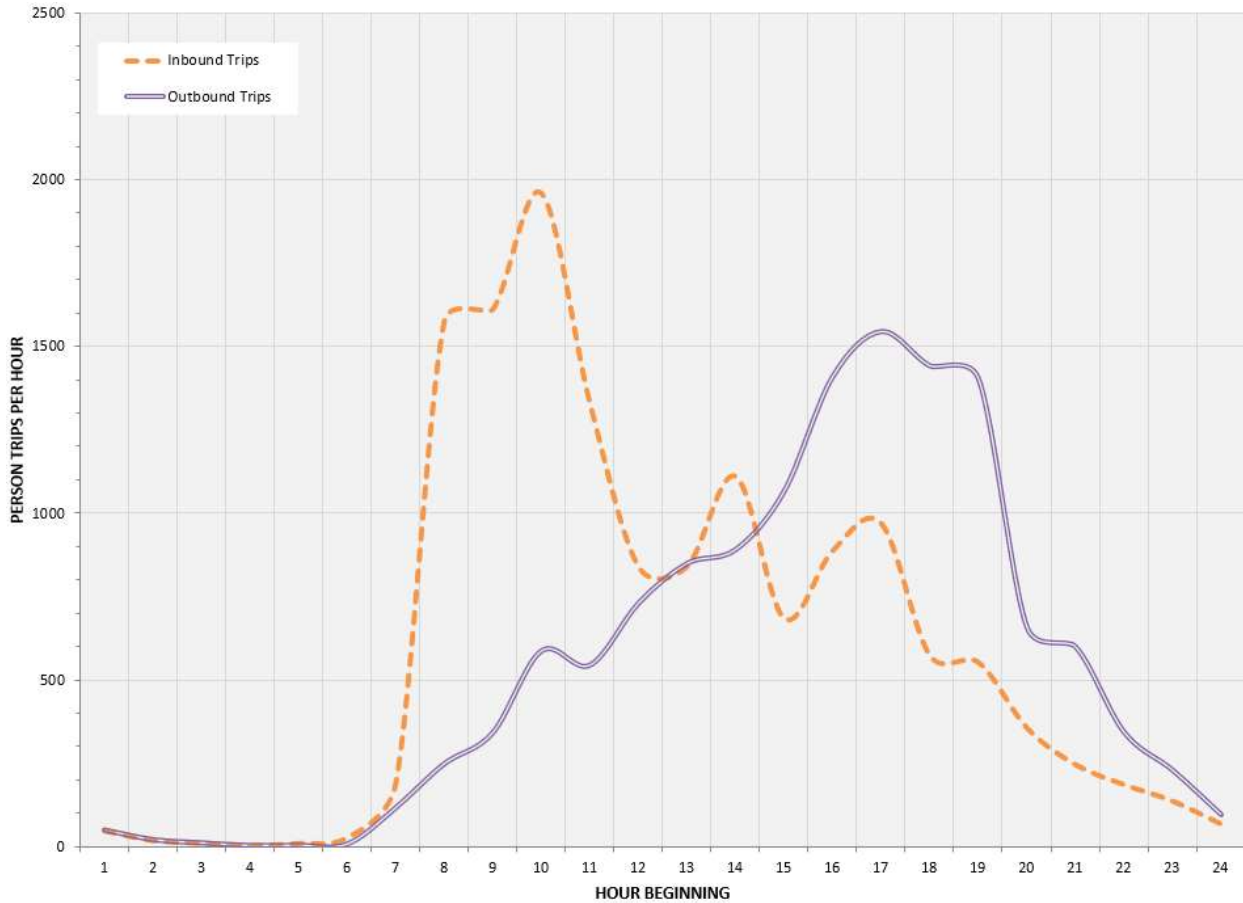


Figure 2.4: Hourly Distribution of Average Weekday Person Trips to / from UBCO

3 Transportation to and from UBCO

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

3.1 Transit

Transit usage has been declining on campus, particularly since the development of the University South neighbourhood where many students now reside and instead walk or bike to campus, however, there was an increase in transit usage and transit mode share in 2023. This is captured in the trips by transit routes summary provided in **Table 3.1**.

Table 3.1: Summary of Average Weekday Transit Trips to / from UBCO

Route	Fall 2009	Fall 2019	Fall 2021	Fall 2023	2023 Split
4 Pandosy (Hwy 97)	-	362	258	489	7%
6 Glenmore	30	528	354	693	10%
8 Pandosy (Rutland)	1,290	1,394	1,064	2,115	30%
13 Quail Ridge	-	275	56	170	2%
23 Lake Country	660	748	492	1,042	15%
90 Vernon	140	208	138	353	5%
97 Express	3,60	1,744	1,334	2,215	31%
Totals (Rounded)	5,680	5,260	3,695	7,075	100%

In 2023, transit usage saw a substantial increase from 2019. This could be for multiple reasons including improvements to service hours, increased student population, and the discounted staff and faculty transit pass program (ProPASS).

Comparing the routes to campus, the 97 Express and the 8 Pandosy routes carry the most passengers to / from campus with 61% of all transit trips. Although the combined total is the same (roughly 60% of all transit trips), route 8 Pandosy carries the same number of passengers to and from campus as the 97 Express. In previous years, the 97 carried approximately 8% more passengers than the 8.

During the development of the Transportation Plan, the community raised the need for increased transit service north of the campus such as to Quail Ridge and Lake Country. This need is supported by the growth in ridership on route 23 Lake Country, nearly 300 more trips per day compared to 2019 and 15% of all transit trips.

The daily distribution of transit trips to and from UBCO in 2023 is shown in **Figure 3.1**. The morning peak in inbound transit trips occurs between 7am and 10am followed by more surges in inbound trips at 1pm and 3-5pm. The multiple surges throughout the day is a unique pattern in travel behavior that hasn't

occurred before. This could be attributed to more evening classes on campus, but this will be monitored in future years to try and get a better understanding behind this change.

The afternoon peak in outbound transit trips occurs between 3pm and 7pm, which is a much more distributed behaviour. A distributed peak in demand is desired because sharp peaks in transit demand translate to overcrowding and poor service / experience for transit riders, which tends to push passengers to less sustainable alternatives. UBCO staff will be monitoring this closely and work on strategies to spread the arrival times to campus more evenly.

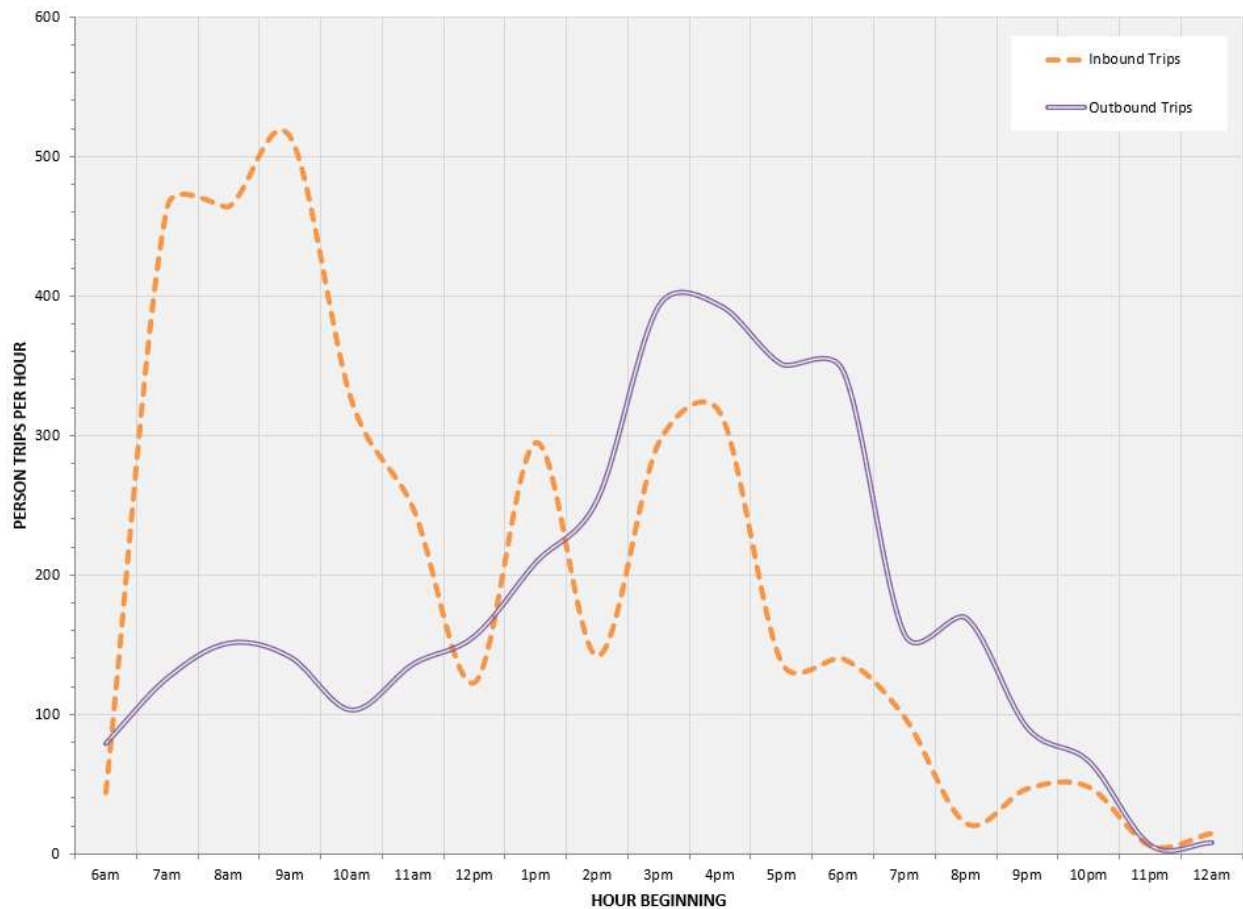


Figure 3.1: Distribution of Average Weekday Transit Trips to / from UBCO

3.2 Biking and Walking

Table 3.5 and **Figure 3.4** provide summaries of the trend in biking and walking trips from the last few years. Bicycles and pedestrians were counted at seven access points in 2023. A new screenline was added in 2021 as a result of a new pathway connecting H Lot north to the Innovation Precinct.

Table 3.5: Summary of Average Weekday Bicycle and Pedestrian Trips to / from UBCO at Screenlines

Screenline	Bicycles			Pedestrians		
	2019	2021	2023	2019	2021	2023
University Way	26	15	11	444	31	700
Alumni Avenue	190	138	136	144	75	48
West Campus / Upper Campus	102	69	31	163	57	74
H Lot	-	16	15	-	19	161
JHD Overpass	29	31	233	3,213	2,496	2,875
Pine Trail	33	28	19	195	187	151
Path North of Lot H	-	19	22	-	71	145
Totals	380	315	465	4,160	2,935	4,155

Key observations regarding bicycle and pedestrian trips include:

- The number of trips by bicycle were higher in 2023 compared to both 2019 and 2021.
- Bike trips to and from campus are distributed mostly between Alumni Avenue for trips arriving from the south / east and the John Hindle Drive overpass for trips arriving from the west. This is different from previous years where many cyclists used Upper Campus Way. Once the City of Kelowna completes dedicated cycling infrastructure on Glenmore Road to John Hindle Drive, it is anticipated that more people will cycle and connect to campus using Upper Campus Way.
- UBCO partnered with Lime to bring bike and scooter share to the campus, which has proven to be well received by the campus community given the usage numbers. This partnership possibly contributes to the higher number of bicycle trips in 2023.
- Pedestrian activity is approximately the same as it was in 2019, however, the numbers are an overestimate because they include people who drove and parked in the Overflow Lot east of Innovation Drive then walked to campus via University Way. In 2023 there were 700 pedestrians per day using University Way compared to 31 in 2021 when the Overflow Lot was closed. UBCO will adjust screenline locations in future years if the Overflow lot is still in place.
- A majority of the pedestrian trips are along the John Hindle Drive Overpass.
- There was a decrease in pedestrians using the Pine Trail to Quail Ridge. This is consistent with the transit data that also showed a decrease in trips via the 13 Quail Ridge route.

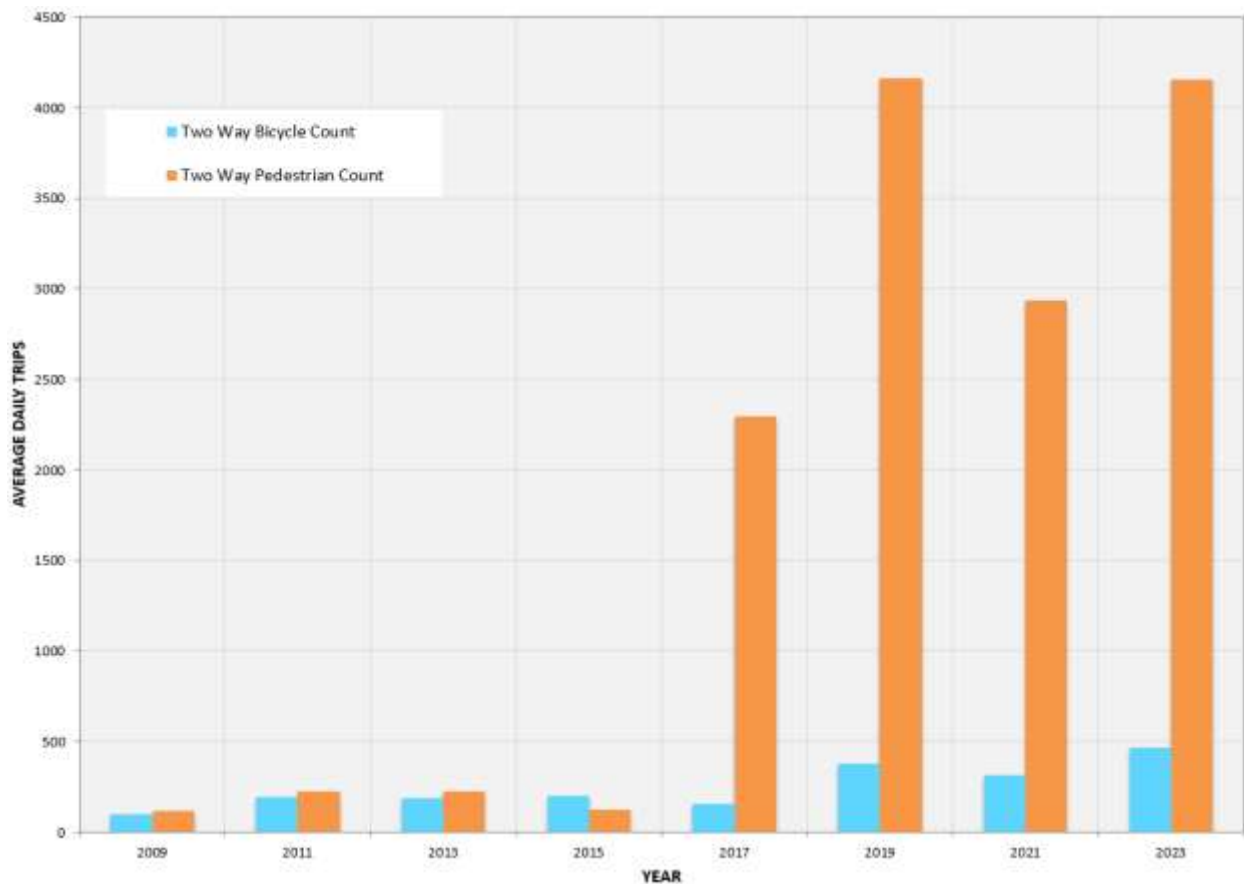


Figure 3.4: Summary of Average Weekday Bicycle Trips to / from UBCO

Most buses operating on transit routes serving the UBC Okanagan campus are equipped with bicycle racks, each of which has space for two bicycles. UBC tracks the demand for bike racks on buses to identify trends and to identify capacity issues to share with BC Transit and the City of Kelowna. Below is a summary of the usage of racks over the past three monitoring periods:

- In 2023, total of 27 bicycles were on buses at a 3% usage rate.
- In 2021, total of 30 bicycles were on buses at a 3% usage rate.
- In 2019, total of 55 bicycles were on buses at a 7% usage rate.

Overall, there tends to be very low demand to take bikes on buses to or from the UBCO campus.

3.3 Automobile Traffic

UBC is committed to reducing the amount of automobile traffic travelling to and from UBCO each day. Automobile traffic includes single occupancy vehicles (SOV's), high occupancy vehicles (HOV's), motorcycles, trucks, and transit buses. A summary of average weekday automobile traffic to and from the UBCO campus is provided in **Table 3.2** and **Figure 3.2**.

Table 3.2: Average Weekday Automobile Trips to / from UBCO

Travel Mode Classification	Fall 2009	Fall 2019	Fall 2021	Fall 2023	% Split 2023
Single Occupant Vehicle (SOV)	7,040	8,820	6,203	10,755	78%
High Occupancy Vehicle (HOV)	1,520	2,065	1,932	2,265	16%
Motorcycles & Trucks	325	309	165	290	2%
Transit Buses	210	470	465	510	4%
Totals	9,095	11,664	8,765	13,820	100%

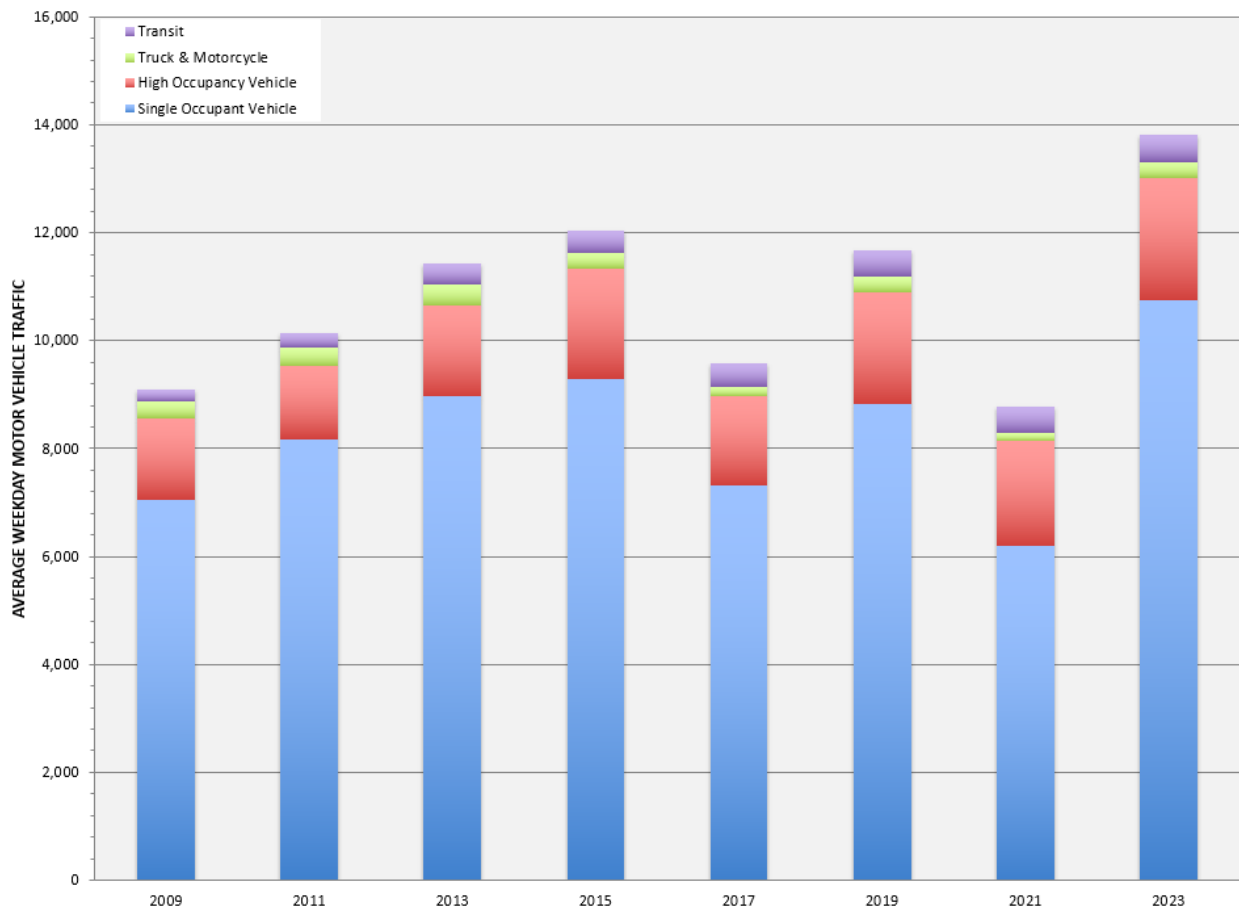


Figure 3.2: Daily automobile trips to / from UBCO

As shown, automobile traffic to and from campus was at an all-time high in 2023 with 13,820 trips per day. This is surprising given the ongoing strong support for remote work, so it is possible there are more trips occurring throughout the day to go off campus and return.

To confirm if this is the case, we can look at when automobile trips are occurring throughout the day. The number of automobile vehicle trips per hour for SOV's and HOV's inbound and outbound from campus are presented in **Figure 3.3**. The distribution of SOV trips is similar to what was observed for transit trips in **Figure 3.1** with multiple surges of inbound trips throughout the day and a sharper peak for inbound trips in the morning compared to outbound trips in the afternoon. The morning inbound peak is much sharper though with a majority of people arriving by SOV between 9am and 10am. Sharp peaks like what is observed for SOV trips put a lot of strain on the transportation network on campus and in the region, and causes delays to all automobile modes.

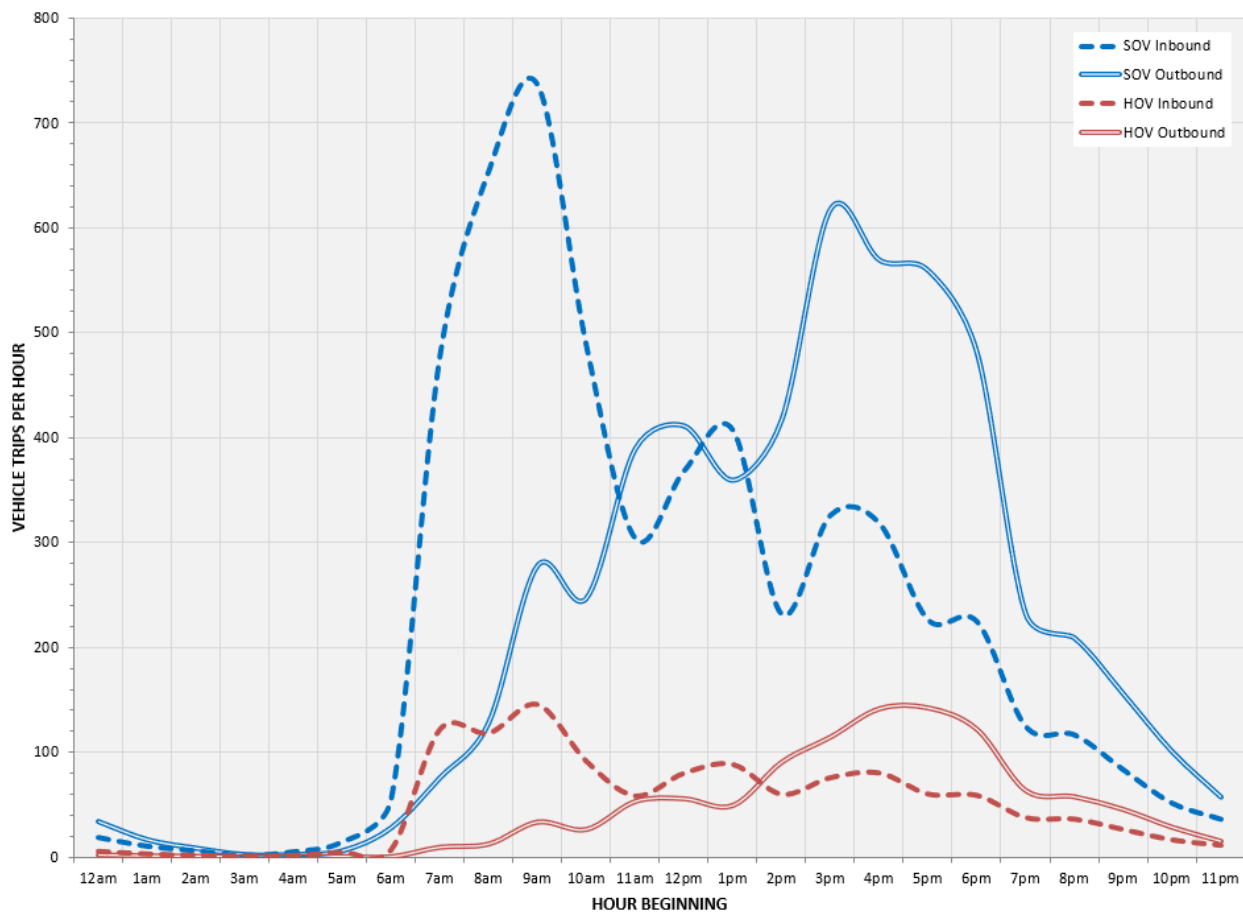


Figure 3.3: Distribution of SOV and HOV Vehicle Traffic to / from UBC

Table 3.3 summarizes the daily traffic volumes at each screenline location. As shown, Upper Campus Way carries the greatest number of vehicle trips per day followed by University Way. This is a bit surprising since Upper Campus Way does not provide access to quite as many parking spaces, but it does allow for good access to the core of the campus on the uphill side, so it may be more heavily used by people getting dropped-off and picked-up.

Table 3.3: Summary of Average Weekday Traffic Volumes at Screenlines

Screenline	Average Weekday Traffic Volume 2023	
	Count	Split
Lot H Access	2,940	21%
Alumni Avenue	1,210	9%
University Way	3,840	28%
Upper Campus Way	5,080	37%
Lot I Access (Overflow Lot)	750	5%
Totals	13,820	100%

Vehicle occupancy allows UBC to understand travel patterns of the community. Vehicle occupancy is a measure of the number of people travelling per vehicle. The average daily vehicle occupancies are presented in **Table 3.4**, which for all vehicles increased slightly compared to 2019, but decreased in HOV vehicles.

Table 3.4: Average Daily Vehicle Occupancy to / from UBC Okanagan

Travel Mode Classification	Fall 2009	Fall 2017	Fall 2019	Fall 2021	Fall 2023
Vehicles (SOV's + HOV's)	1.20	1.20	1.15	1.22	1.16
HOV's (Carpools / Vanpools)	2.15	2.11	2.12	2.13	2.08

UBCO is planning to create programs and incentives to increase the number of HOV trips made to and from campus since carpooling has the potential to reduce the number of vehicles arriving to campus to park and to reduce greenhouse gas emissions associated with commuting.

Transportation Plan Targets

TARGET 5: Through 2040, total daily automobile traffic to and from campus will not exceed 14,000 vehicle trips per day.

✓ In 2023 there were 13,820 vehicle trips per day to and from campus.

TARGET 6: By 2040, at least 35% of all automobile trips to and from campus will be by carpooling, ride-sharing and vanpooling (HOV's).

× In 2023, 16% of all automobile trips were made by carpool, ride-share or vanpools.

4 Traffic Conditions At UBC

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

In 2023, traffic speed data was not collected due to changes in equipment availability with the consultant used for data collection and an industry change in the preferred methodology of speed data collection. UBC will explore other ways to collect speed data and possibly replace existing practice with site specific speed monitoring. In the meantime, traffic speed data from previous years is copied below.

4.1 Traffic Speeds

Traffic speeds were recorded at a number of locations on campus over one week using pneumatic tubes. The locations of the counts are identified in **Figure 1.1**.

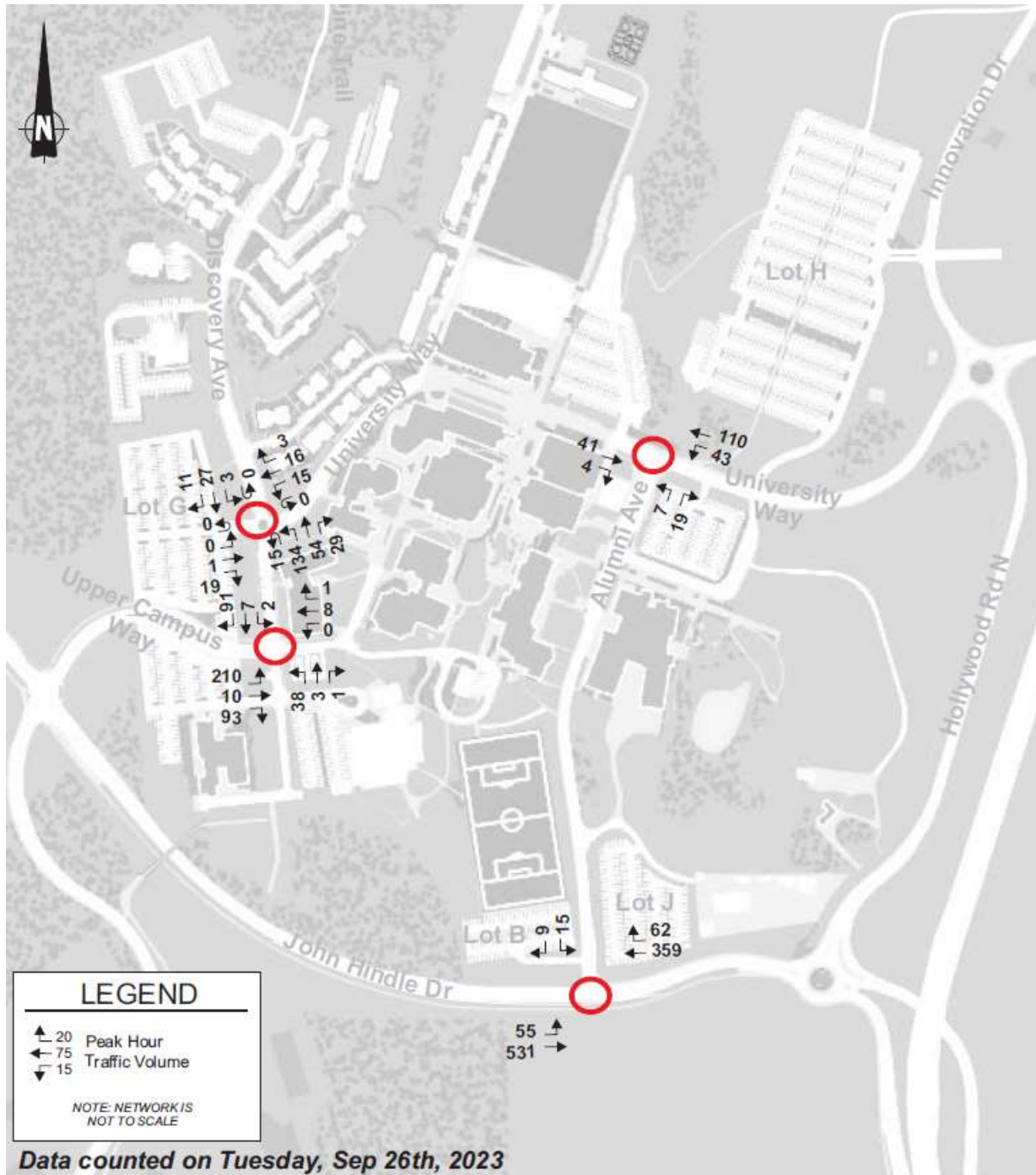
The 85th percentile speed is typically used for the purposes of representing travel speeds and is the speed below which 85% of the traffic travels. The average 85th percentile speed data over the last few monitoring periods is summarized in **Table 4.1**. Data highlighted in red represents locations where current year collected speed data is more than 5km/h above the posted speed limit of 30km/h.

Table 4.1: Average 85th Percentile Traffic Speeds (km/h) on Campus

Location (Speed Limit km/h)	Eastbound / Northbound				Westbound / Southbound			
	Fall 2015	Fall 2017	Fall 2019	Fall 2021	Fall 2015	Fall 2017	Fall 2019	Fall 2021
University Way – west of Innovation (30km/h)	50	34	48	49	50	31	48	50
University Way – East of Discovery Avenue (30km/h)	23	34	39	35	29	37	34	40
Discovery Avenue – North of University Way (30km/h)	36	40	36	36	39	45	32	32
Discovery Avenue – North of Upper Campus Way (30km/h)	35	32		37	38	31	37	37
Knowledge Lane (30km/h)	28	26	-	-	28	24	-	-
Alumni Avenue – South of University Way (30km/h)	44	41	36	32	45	43.5	39	35
Alumni Avenue – North of J Lot Access (30km/h)	52	42	49	43	54	43	52	42
Upper Campus Way (30km/h)	-	-	43	39	-	-	41	42

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 demands on campus during the AM and PM peak hours.



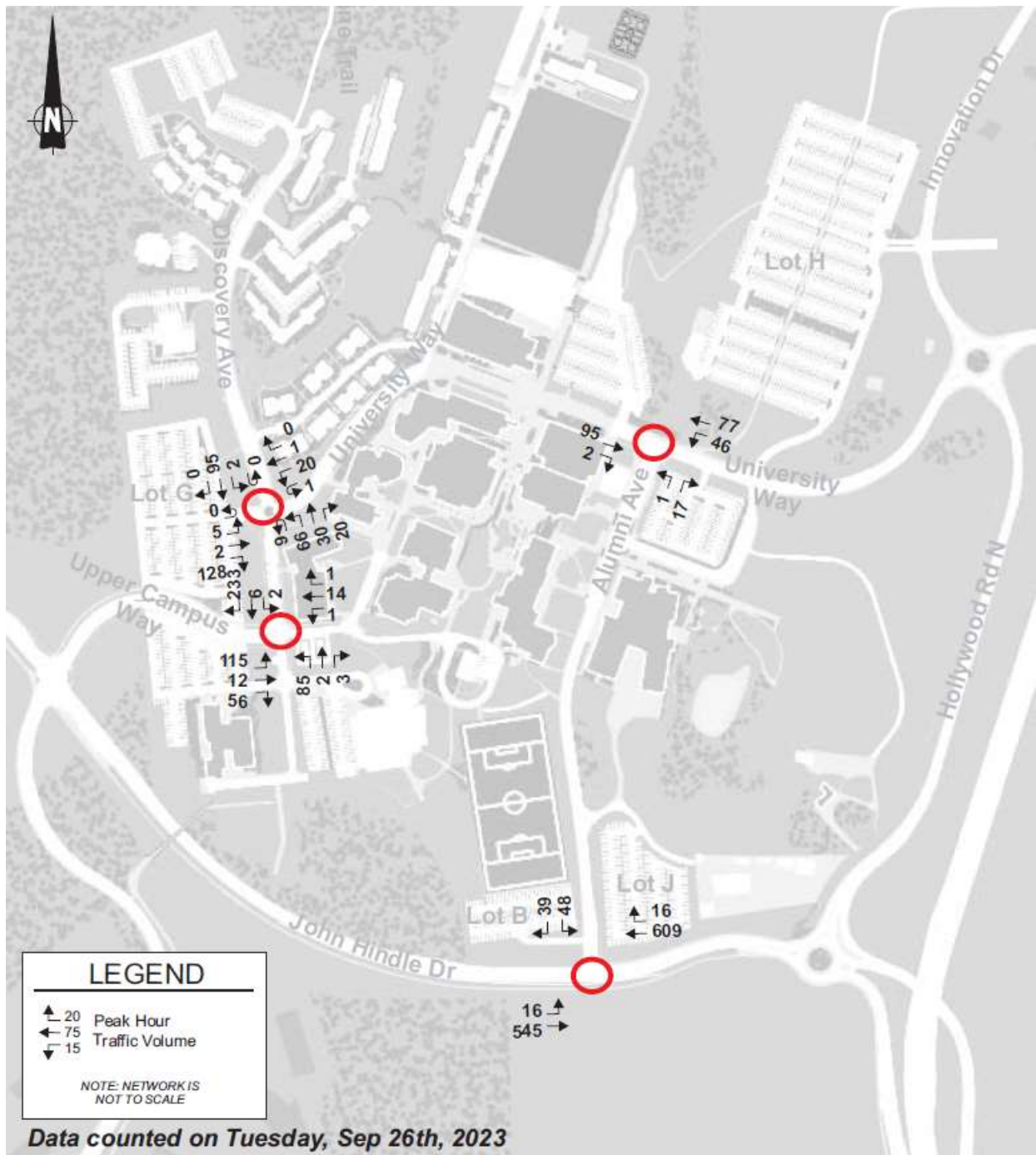


Figure 4.2: Afternoon / Evening Peak Hour Traffic Volumes at UBCO

This concludes the results of the 2023 Transportation Status Report.