in association with:

UBC CAMPUS TRANSIT PLAN

Transportation Report Card

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UBC Campus Transit Plan

TRANSPORTATION REPORT CARD

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UBC Campus Transit Plan

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SUMMARY

UBC has achieved significant changes in travel patterns over the past five years. Most significant is a 56% increase in transit use, which far surpasses UBC's target of a 20% increase. Bicycle and pedestrian trips to campus have also increased.

Comparing travel conditions at UBC with travel conditions in the region, in Vancouver and at comparable post-secondary institutions indicates that overall, UBC compares well. Transit use at UBC is as high or higher than at the comparators. The parking supply is lower and prices are as high or higher than at SFU and in the Vancouver CBD.

The one area where UBC does not compare as well is automobile use. Although UBC has made progress towards its target of a 20% reduction in single-occupant vehicle (SOV) traffic, the SOV trip rate has decreased only 9%. As well, average vehicle occupancies are lower at UBC than elsewhere, reflecting an overall lower level of carpooling.

Table 1 provides a comparison of actual Fall 2002 conditions with targets established in the 1999 Strategic Transportation Plan. These figures clearly indicate that initiatives to encourage greater use of transit have succeeded. Increased service levels and the change in class start times are the major reasons for the increase in transit use. Continued improvements in transit service and the impending implementation of U-Pass should further increase transit use.

Table 1: Fall 2002 Actual vs. Target Conditions (person trips, 24 hours)

Mode	Fall 2002 Actual		Fall 2002 Targets		
	Trips	Mode %	Trips	Mode %	Mode Share Difference
Single occupant vehicles	48,400	42.6%	42,800	34.8%	+7.8
Carpools and vanpools	29,100	25.6%	46,200	37.6%	-12.0
Transit	29,700	26.2%	26,500	21.5%	+4.7
Bicycles	3,300	2.9%	4,900	4.0%	-1.1
Pedestrians	1,600	1.4%	1,800	1.5%	-0.1
Heavy trucks	400	0.4%	300 max.	0.2%	+0.2
Motorcycle, other	1,000	0.9%	500	0.4%	+0.5
Total person trips	**113,400**	**100%**	**123,000**	**100%**	
Total vehicles	**64,900**		**62,900 ***		
* *Estimated based on target SOV and carpool/vanpool trips*					

UBC must do more in order to reduce single-occupant vehicle trips by the target 20%. Based on experience at other post-secondary institutions and analysis of conditions at UBC, the following initiatives would have the

greatest effect in changing travel patterns, and would enable UBC to achieve target reduction in SOV trips. It is recommended that these initiatives be emphasized in future planning work, including updates to the Strategic Community Plan and Official Community Plan.

- **Implement a U-Pass program.** This would be the single most effective means of achieving changes in travel patterns. At the University of Victoria, transit ridership increased 50% as a result of U-Pass. At the Southern Alberta Institute of Technology in Calgary, transit ridership increased 35%, with an increase of 70% in midday ridership. With corresponding increases in service levels and improvements to transit services on campus, similar increases can be expected at UBC. Some of the increased ridership would occur as a result of reduced SOV trips, particularly if parking management initiatives are implemented at the same time as a U-Pass, as described below.

- **Implement parking management measures** intended to reduce SOV trips. The experience at SFU suggests that the primary way to reduce the proportion of SOV trips is to restrict the supply of parking and access to parking. A range of parking management options could be implemented at UBC, including options to manage the supply of parking and to adjust the price of parking. Reductions in supply can be achieved through redevelopment of surface parking lots and elimination of free parking opportunities on campus and adjacent the campus. Options to adjust parking prices include pricing all parking on a daily basis, and indexing daily parking prices to transit fares. Depending on how these parking management options are implemented, parking revenues could be maintained at current levels.

- **Other programs and facilities,** including improved bicycle routes, secure bicycle parking, an expanded ridematching database, parking incentives for carpoolers, and marketing efforts to maintain awareness of carpooling programs.

- **On-campus housing.** Developing housing on campus — much of which would be occupied by staff, faculty and students — reduces trips to and from UBC, as well as reducing the overall number of trips. Studies conducted at Hampton Place indicate that the number of vehicle trips per household is approximately 40% less than at comparable developments elsewhere in the region.

1.0 INTRODUCTION

For nearly five years, UBC has been working to change travel patterns for trips to and from campus. Through the TREK Program Centre, UBC has developed and implemented a range of transportation facilities and programs, and is continuing to work on implementing other initiatives, such as a U-Pass.

This Report Card provides a summary of how well UBC is doing in achieving its transportation objectives. Specifically, this report:

- Examines changes in travel patterns at UBC since Fall 1997.
- Identifies whether UBC has met specific targets.
- Compares existing transportation conditions at UBC with "trend" conditions which would have occurred had UBC not pursued any transportation initiatives.
- Compares conditions at UBC with conditions elsewhere in the region, and with conditions at comparable post-secondary institutions.

1.1 Targets

The Official Community Plan (OCP) for UBC was adopted by the GVRD in July 1997. The OCP contains several transportation-related objectives which UBC has committed to pursue, including:

- Reducing single-occupant vehicle travel to and from UBC by 20%.
- Increasing transit use to and from UBC by 20%.
- Pursuing implementation of a universal transportation pass (known as a U-Pass).

As a means of meeting these OCP objectives and achieving other related transportation goals, UBC developed a Strategic Transportation Plan (STP), which was adopted in November 1999. The STP describes a comprehensive and integrated transportation strategy, and establishes specific targets consistent with the OCP objectives. These targets are summarized in Table 1.1, as well as 1997 benchmark travel conditions upon which these targets are based. The date for achieving these targets was set as 2002, the year in which the first review and update of the OCP would be undertaken.

Table 1.1: Strategic Transportation Plan Targets (person trips, 24 hours)

Mode	Benchmark (Fall 1997)	Target (Fall 2002)
Single occupant vehicles	46,000	42,800
Transit	19,000	26,500
Heavy trucks	300	300 max.

Source: Table 1, Strategic Transportation Plan, UBC, November 1999

1.2 Changes Affecting Travel at UBC

Since 1997, UBC has implemented several transportation programs intended to change travel patterns and achieve the STP targets. These include:

- **Class start times.** In an effort to minimize morning peak period transit demands, UBC adjusted class start times from the previous campus-wide 8:30 a.m. start time. Since September 2001, some students begin classes at 8:00 a.m., some students remain at 8:30 a.m., and the remainder begin classes at 9:00 a.m. The intent was to reduce the peak demand for transit and increase ridership on existing services. Prior to changing the class start times, it was estimated that the change would mean 13 fewer buses would need to be purchased to provide additional transit service to UBC.

- **Parking supply and prices.** Since 1997, UBC has reduced the supply of parking and increased the price of parking. For example, the B-6 lot has been redeveloped into housing, eliminating 1,000 parking stalls. Parking has been restricted on portions of SW Marine Drive and 16th Avenue. In total, the amount of parking available to commuters has been reduced by approximately 1,200 stalls since 1997. This is equivalent to a reduction in the parking supply from 0.37 to 0.30 parking stalls per student. During the same time, the daily parking cost in the B-lots has increased from $2.00 to $3.50.

- **Increased transit service.** Each year since 1997, service levels to UBC have been increased, with the result that there is now approximately 30% more capacity on buses travelling to and from UBC each day than in 1997. Much of this increase has been on the Route 99 B-Line, which operates between UBC and the Commercial Drive SkyTrain station. Other routes with increases in service include Routes 25 and 49, the Route 44 express from downtown, and Route 480 from Richmond Centre. As well, a new express service (Route 43) was implemented along 41st Avenue between UBC and the Joyce SkyTrain station.

- **Improvements to bicycle facilities and services.** As a means of improving safety for cyclists and encouraging more people to cycle to

and from UBC, new bicycle facilities were implemented on several roadways on campus and leading to campus. Most notable was the conversion of University Boulevard from two lanes in each direction to one travel lane and one bicycle lane in each direction. Bicycle lanes were also added on 16th Avenue.

On campus, changes include additional bicycle racks, bicycle lockers at the War Memorial Gym, and new services such as the AMS Bike Co-op, the purple and yellow bike program, TREK bike-buddy matching and the Bike Kitchen. The AMS also contributed financially to the installation of bicycle racks on 99 B-Line buses.

- **Carpooling program.** The UBC TREK Program Centre implemented a comprehensive carpooling program in 2001. The program includes access to a web-based ridematching service to help commuters organize carpools. Other carpooling incentives include access to preferred carpool parking, and a rewards program that includes transit vouchers, gift certificates and vehicle maintenance vouchers.

- **Emergency ride home program.** The UBC Emergency Ride Home Program is run through the UBC TREK Program Centre and offers commuters who use a non-automobile mode of travel at least three times per week a 90% reimbursement for the cost of a ride home by taxicab in the event of an emergency.

- **On-campus housing and services.** Since 1997, UBC has developed additional housing on-campus, as a means of reducing the proportion of persons who travel to UBC from off-campus. As well, an increased number and range of commercial services are now available on campus and in the University Endowment Lands adjacent campus, which is intended to further reduce the number of off-campus trips.

In addition, UBC has been working with TransLink to implement a U-Pass program for students, staff and faculty. A U-Pass would provide all students with unlimited access to transit services as well as other transportation programs at UBC. Currently, a student U-Pass is planned for implementation in September 2003, subject to student support in a referendum.

The other significant change affecting travel at UBC is that from 1997 to 2002, the daytime population at UBC increased at an average of 3.0% per year. As indicated in Table 1.2, this amounts to a 16% increase in the daytime population over the four-year period from 1997 to 2002.

Table 1.2: Daytime Population Growth at UBC (students, staff and faculty)

	1997	1998	1999	2000	2001	2002
Daytime population	42,300	43,400	44,800	44,700	46,100	49,000
Change	+15.8%					

Source: UBC Planning and Institutional Research Department

It is important to consider the growth in the daytime population at UBC when comparing changes in travel patterns in different years. In order to reflect population growth, trip rates are used in this document. A trip rate is the average number of trips per person. This provides a consistent method of comparison independent of the effect of population growth.

Another growth-related issue is the effect of growth and increased usage in areas adjacent to UBC, such as the University Endowment Lands (UEL), Pacific Spirit Regional Park and the hospital. Where possible, the travel data presented in this document has been adjusted to discount trips and traffic generated by these other uses, so that the data reflect trips to and from UBC only.

2.0 CONDITIONS AT UBC

This section provides a summary of key characteristics of travel patterns at UBC, both current travel patterns as well as "benchmark" travel patterns in 1997. Several conclusions and recommendations are made based on a comparison with established targets and with trend conditions.

2.1 Changes From 1997 To 2002

Each year, counts are undertaken of trips to and from UBC by all modes of transportation. The first counts were undertaken in 1997, and established benchmark conditions. The most recent counts were undertaken in October 2002. Table 2.1 summarizes the results of these counts for Fall 1997 and Fall 2002 travel conditions. Table 2.2 presents trip rates per capita, as a means of accounting for the effects of growth in comparing conditions in 1997 and 2002.

Table 2.1: 1997 and 2002 Daily Trips, By Mode (person trips, 24 hours)

Mode	Fall 1997		Fall 2002	
	Trips	Mode %	Trips	Mode %
Single occupant vehicles	46,000	43.4%	48,400	42.6%
Carpools and vanpools	36,100	34.0%	29,100	25.6%
Transit	19,000	17.9%	29,700	26.2%
Bicycles	2,700	2.5%	3,300	2.9%
Pedestrians	1,400	1.3%	1,600	1.4%
Heavy trucks	300	0.3%	400	0.4%
Motorcycle, other	600	0.6%	1,000	0.9%
Totals	**106,100**	**100%**	**113,400**	**100%**

Table 2.2: 1997 and 2002 Trip Rates, By Mode (24 hours)

Mode	Trips per Person		Change
	Fall 1997	Fall 2002	
Single occupant vehicles	1.09	0.99	-9.2%
Carpools and vanpools	0.85	0.59	-30%
Transit	0.45	0.61	+35%
Bicycles	0.06	0.07	+5.5%
Pedestrians	0.03	0.03	-1.3%
Heavy trucks	0.01	0.01	+15%
Motorcycle, other	0.01	0.02	+44%
Totals	**2.51**	**2.31**	**-7.7%**

The most significant change since 1997 is a large increase in transit ridership. This is due primarily to corresponding increases in transit service. As described in Section 1.2, transit service levels have increased approximately 30% since 1997, and as a result, ridership has increased 56%. Accounting for population growth, this represents a 35% increase in transit ridership per capita.

Despite the large increase in transit use, the number of single-occupant vehicle trips has not decreased. Although total SOV trips have increased slightly, when the effects of population growth are considered, SOV trips per capita have declined 9.2% since 1997. On the other hand, carpool and vanpool trips have decreased considerably, by 30% on a per capita basis. This indicates that as transit services have been improved and transit capacity increased, people who formerly carpooled and vanpooled have switched to transit. SOV commuters have remained in their cars.

Daily traffic to and from UBC increased slightly from 62,500 motor vehicles per day in 1997 to 64,900 motor vehicles per day in 2002 (excluding buses). This represents a 3.8% increase in total traffic. However, when the effects of population growth are considered, it represents a 10.4% reduction in the motor vehicle trip rate.

The other significant change in travel conditions since 1997 is an overall reduction in the rate of trips to and from UBC each day. The number of trips each day has increased only slightly since 1997, and has increased by less than the increase in the daytime population on campus. As a result, the overall trip rate has decreased by 7.7%. What this means is that on average, people at UBC are making fewer trips to and from campus.

Tables 2.3 and 2.4 provide a comparison of 1997 and 2002 travel conditions during morning and afternoon peak hours. The change in travel patterns during peak hours differs from the change in travel patterns on a 24-hour basis. The number of trips during the morning peak hour has decreased, whereas the number of trips during the afternoon peak hour has increased. The decrease in the morning peak hour likely reflects the effects of the change in class start times.

Table 2.3: Peak Hour Travel Patterns (person trips)

Mode	Morning Peak Hour				Afternoon Peak Hour			
	Fall 1997		Fall 2002		Fall 1997		Fall 2002	
Single occupant vehicles	3,930	36.3%	4,340	41.5%	4,240	46.4%	3,940	36.7%
Carpools and vanpools	4,130	38.1%	2,390	22.8%	2,840	31.1%	2,610	24.3%
Transit	2,350	21.7%	3,190	30.5%	1,600	17.5%	3,650	34.0%
Bicycles	290	2.7%	290	2.8%	270	3.0%	290	2.7%
Pedestrians	80	0.7%	80	0.8%	130	1.4%	130	1.2%
Heavy trucks	30	0.3%	60	0.6%	40	0.4%	20	0.2%
Motorcycle, other	20	0.2%	100	1.0%	20	0.2%	100	0.9%
Totals	**10,830**	**100%**	**10,450**	**100%**	**9,140**	**100%**	**10,730**	**100%**

Table 2.4: Peak Hour Trips by Direction (person trips)

Mode	Morning Peak Hour				Afternoon Peak Hour			
	Fall 1997		Fall 2002		Fall 1997		Fall 2002	
	EB	WB	EB	WB	EB	WB	EB	WB
Single occupant vehicles	950	2,980	980	3,360	2,930	1,310	2,840	1,100
Carpools and vanpools	480	3,650	430	1,970	2,050	790	1,810	790
Transit	160	2,190	220	2,970	1,340	260	2,440	1,220
Bicycles	15	275	15	270	255	15	175	110
Pedestrians	25	55	10	75	70	60	95	30
Heavy trucks	5	25	35	20	30	10	20	0
Motorcycle, other	5	15	30	75	15	5	80	20
Totals	**1,640**	**9,190**	**1,720**	**8,740**	**6,690**	**2,450**	**7,460**	**3,270**

Figures 2.1 through 2.5 provide a comparison of travel patterns throughout the day, by mode, for Fall 1997 and Fall 2002 travel conditions.

Figure 2.1: SOV Travel Patterns

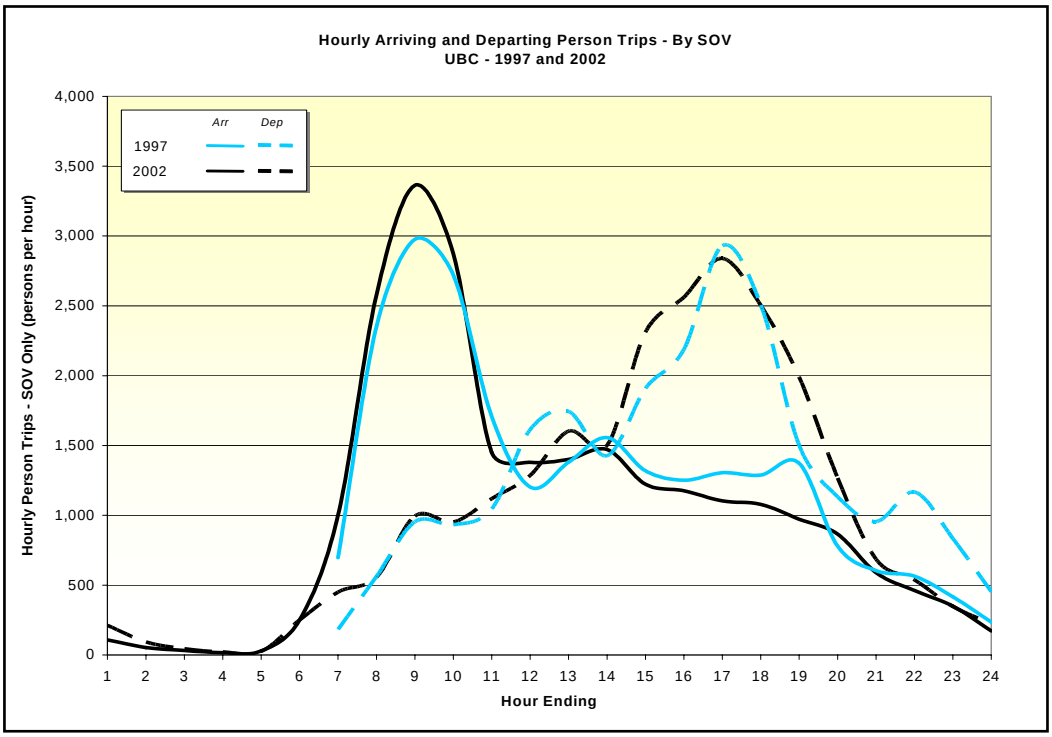


Figure 2.2: HOV Travel Patterns

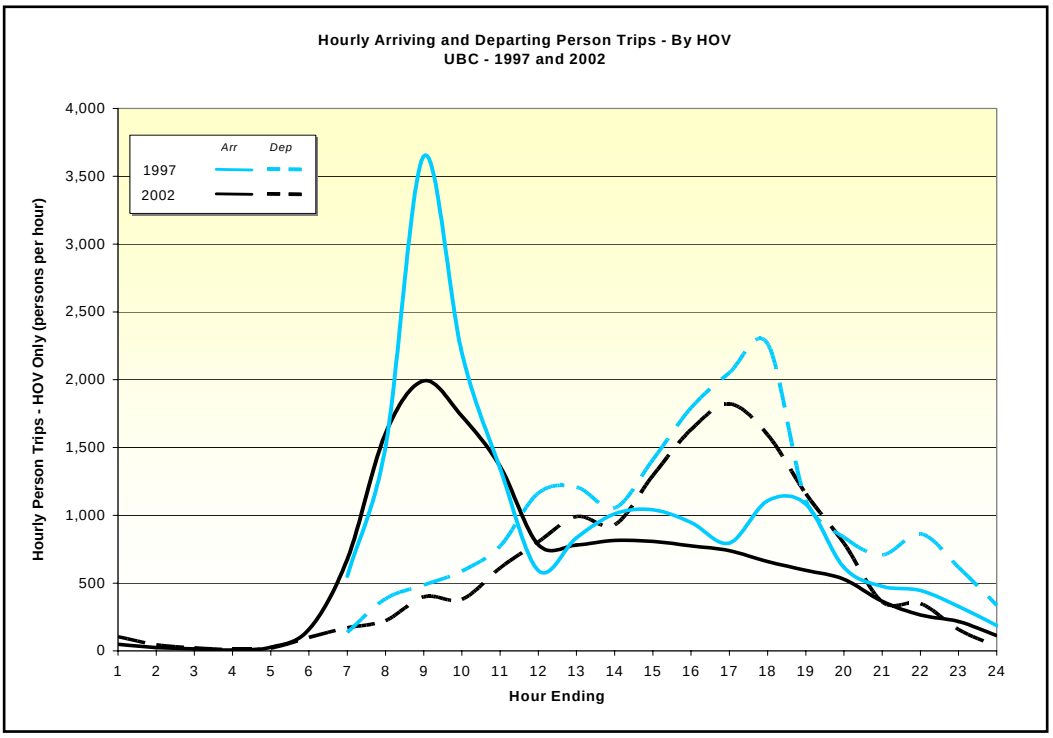


Figure 2.3: Transit Travel Patterns

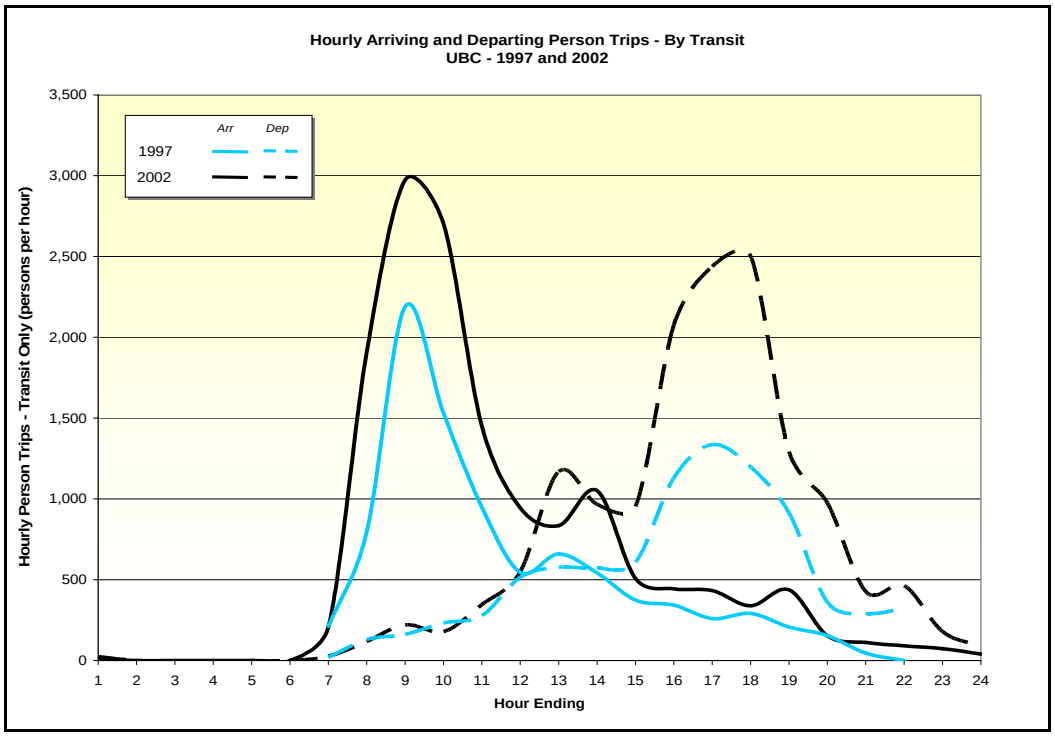


Figure 2.4: Bicycle Travel Patterns

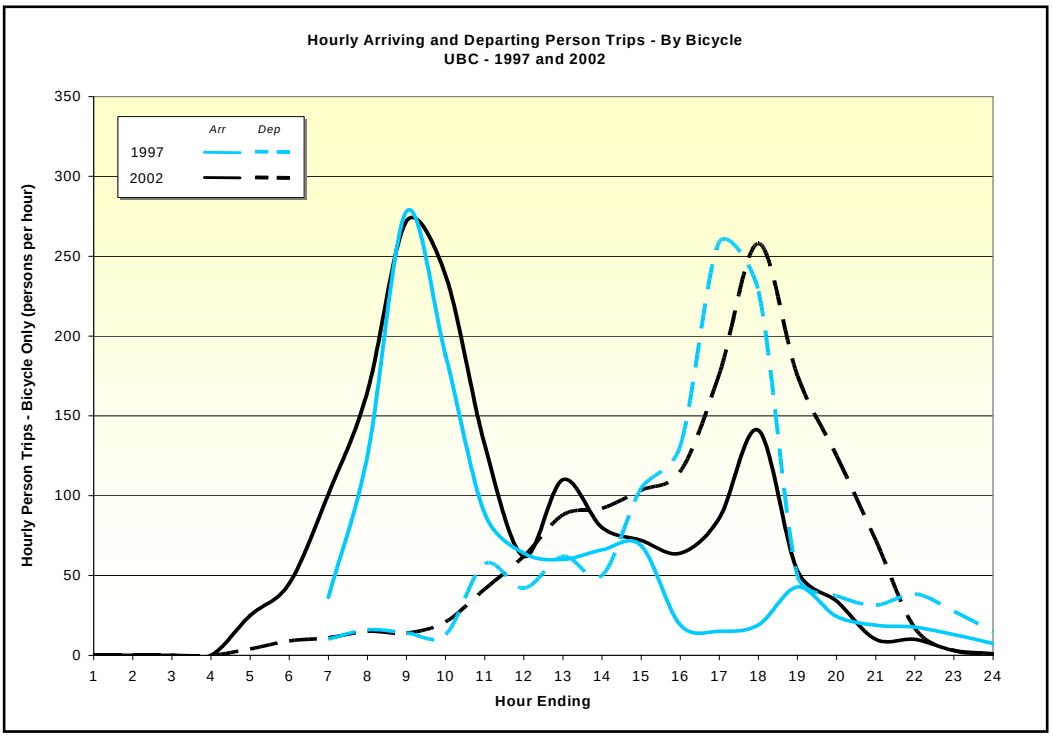
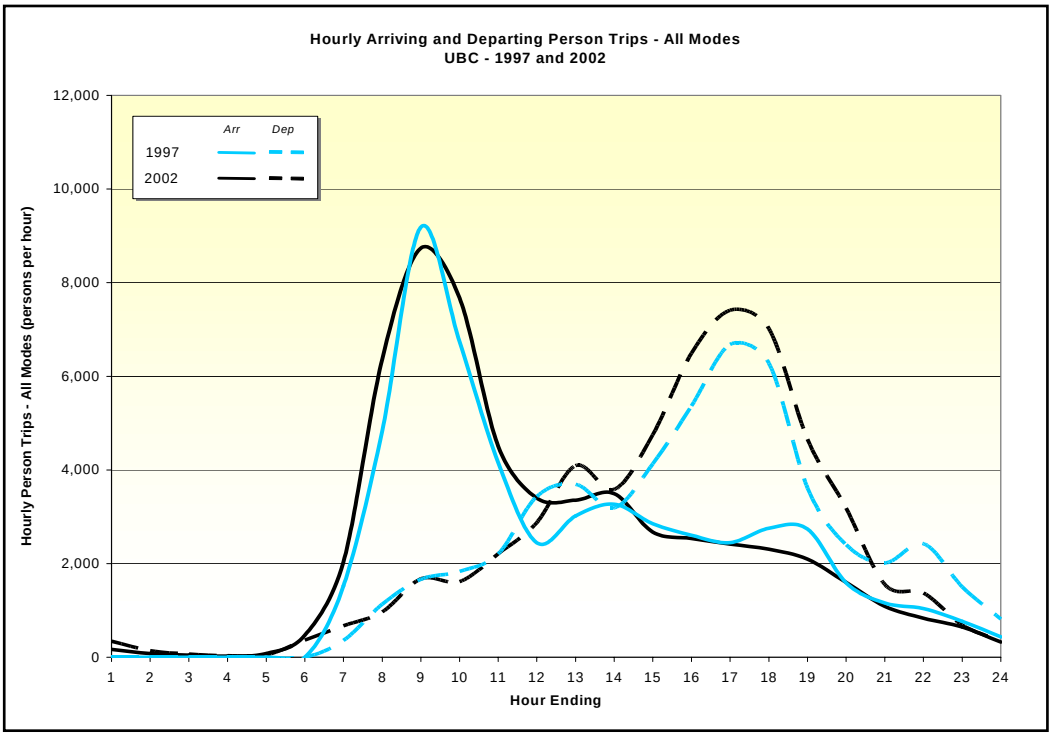


Figure 2.5: Travel Patterns for All Modes



The most significant change in travel patterns from 1997 to 2002 is that peak period arrivals and departures have spread over a longer time period, likely as a result of the change in class start times introduced in September 2001. As Figure 2.5 indicates, the maximum number of persons arriving on campus during the morning peak period is lower in 2002 than in 1997, despite the 16% increase in the campus population during that time.

Another benefit of the shift in travel times is that transit services are able to carry more passengers to and from UBC with the same number of buses. Analysis of transit ridership before and after the class start times were changed indicates that at least 12% of the ridership increase during the past two years has occurred because of a spreading of the peak demand over a longer time period.

2.2 Comparison To Targets

Table 2.5 provides a comparison of Fall 2002 conditions with Strategic Transportation Plan targets by mode. The targets for Fall 2002 identified in the STP were determined by extrapolating 1997 benchmark transportation conditions to a forecast of 2002 trend conditions, assuming the same mode shares as in 1997, and an increase in trips due to enrolment growth and additional on-campus housing at UBC. Targets for 2002 were established by calculating a 20% reduction in the trend forecast number of single-occupant vehicle trips, and a 20% increase in transit trips. Targets for other modes were established by determining appropriate mode shares such that the total number of person trips equalled the forecast trend number of trips.

Table 2.5: Fall 2002 Actual vs. Target Conditions (person trips, 24 hours)

	Fall 2002 Actual		Fall 2002 Targets		
Mode	**Trips**	**Mode %**	**Trips**	**Mode %**	**Mode Share Difference**
Single occupant vehicles	48,400	42.6%	42,800	34.8%	+7.8
Carpools and vanpools	29,100	25.6%	46,200	37.6%	-12.0
Transit	29,700	26.2%	26,500	21.5%	+4.7
Bicycles	3,300	2.9%	4,900	4.0%	-1.1
Pedestrians	1,600	1.4%	1,800	1.5%	-0.1
Heavy trucks	400	0.4%	300 max.	0.2%	+0.2
Motorcycle, other	1,000	0.9%	500	0.4%	+0.5
Total person trips	**113,400**	**100%**	**123,000**	**100%**	
Total vehicles	**64,900**		**62,900 ***		
** Estimated based on target SOV and carpool/vanpool trips*					

The significant differences between actual and target conditions include:

- **Transit.** Current transit ridership to and from UBC is 3,200 trips per day more than the Fall 2002 target. Ridership has exceeded the target by 12%.

- **Single-occupant vehicles.** The current number of single-occupant vehicle trips is 5,600 higher than the target number of trips, equivalent to 13% more trips than the target.

- **Carpools and vanpools.** The number of carpool and vanpool trips is 17,100 less than the target, equivalent to 37% less than the target number of trips.

- **Bicycles.** The number of recorded bicycle trips has fluctuated each year, and has remained relatively constant. The number of bicycle trips is 3,300 trips or 33% less than the target number of trips.

- **Heavy trucks.** In all traffic counts conducted since Fall 1997, the number of heavy trucks travelling to and from UBC each day has been less than 300 — until Fall 2002 when a total of 443 trucks were observed travelling to and from UBC. This increase in truck traffic is due to several construction projects on campus during Fall 2002, including a new Life Sciences building.

- **Daily trips.** The number of daily trips in Fall 2002 is almost 10,000 trips less than anticipated, equivalent to 7.8% fewer trips.

- **Daily traffic.** Because single-occupant vehicle trips are higher than forecast, daily traffic volumes are 2,000 vehicles higher than the traffic associated volumes with the Fall 2002 targets.

2.3 Comparison to Trend Conditions

This section provides a comparison of "trend" Fall 2002 conditions with actual Fall 2002 conditions. "Trend" conditions are what would have occurred had UBC not pursued any transportation initiatives to encourage use of alternative transportation modes, and had transit service levels to UBC not been increased.

The estimates of "trend" conditions were prepared using the regional emme/2 transportation model, with modifications to reflect conditions at UBC. The emme/2 model was first calibrated to match 1997 and 2002 conditions at UBC. Changes were then made to the model to eliminate the effects of the transportation initiatives implemented between 1997 to 2002. Changes made to the model to reflect "trend" conditions include:

- No increase in transit service levels from 1997 levels
- No increase in parking prices from 1997 levels
- No bicycle lanes and no reduction in the number of traffic lanes on University Boulevard

Table 2.6 provides a comparison of "trend" and actual Fall 2002 conditions. The significant difference is that in the absence of increase levels of transit service and increased parking charges, more trips would have been made in automobiles and fewer trips would have been made by transit. Actual traffic volumes to and from UBC are 6% lower than the trend forecast, and actual transit ridership is 31% higher.

Table 2.6: Fall 2002 Trend vs. Actual Conditions (24 hours)

Mode	Fall 2002		Difference vs. Trend
	Trend	Actual	
Single occupant vehicles	51,100	48,400	-5.3%
Carpools and vanpools	34,400	29,100	-15.4%
Transit	22,700	29,700	+31%
Bicycles	2,900	3,300	+14%
Pedestrians	1,400	1,600	+14%
Heavy trucks	300	400	+25%
Motorcycle, other	600	1,000	+67%
Total person trips	**113,400**	**113,400**	**–**
Total vehicles	**69,000**	**64,900**	**-5.9%**

Table 2.7 indicates that 70% of the increase in transit ridership which has been achieved in comparison to the trend forecast is due to increased transit service levels, and 30% is due to increased parking charges. Table 2.7 also indicates that half the reduction in traffic volumes which has been achieved in comparison to the trend forecast is due to increased transit service levels, and half is due to increased parking charges.

Table 2.7: Fall 2002 Trend vs. Actual Transit Ridership and Traffic Volumes (24 hours)

	Trend		
	No Transit Service Increases, No Parking Increases	No Transit Service Increases	Actual
Daily transit trips	22,700	25,000	29,700
Proportion of difference	*← 30% →*		*← 70% →*
Daily vehicles	69,000	67,000	64,900
Proportion of difference	*← 49% →*		*← 51% →*

3.0 REGIONAL COMPARISON

This section provides a comparison of travel patterns at UBC with travel patterns in the region, in the City of Vancouver and at other comparable post-secondary institutions. Based on this comparison, several conclusions and recommendations are made.

3.1 Comparison to GVRD

Compared to the region as a whole, considerably more people use transit at UBC and fewer people carpool. Table 3.1 provides a comparison of numbers of trips and resulting mode shares for the entire region and for UBC.

Table 3.1: GVRD and UBC Mode Shares (person trips, 24 hours)

Mode	GVRD (Fall 1999)		UBC Screenline (Fall 2002)	
	Trips	Mode Share	Trips	Mode Share
Single occupant vehicles	2,329,000	42.5%	48,400	42.6%
Carpools and vanpools	1,735,000	31.7%	29,100	25.6%
Transit	565,000	10.3%	29,700	26.2%
Bicycles	91,000	1.7%	3,300	2.9%
Pedestrians	694,000	12.7%	1,600	1.4%
Other	62,000	1.1%	1,400	1.3%
Totals	**5,476,000**	**100%**	**113,400**	**100%**

Source: Greater Vancouver Trip Diary Survey, GVRD/TransLink

Table 3.2 provides a comparison of work and post-secondary school trips in the region with trips to and from UBC, which are predominantly work and school trips. The proportion of SOV trips is significantly higher for regional work and school trips than for all regional trips and for UBC trips, and carpooling is proportionately lower.

Table 3.2: GVRD and UBC Mode Shares, Work/School Trips (person trips, 24 hours)

Mode	GVRD (Fall 1999)		UBC Screenline (Fall 2002)
	Work/School Trips	Other Trips	All Trips (predominantly work/school trips)
Single occupant vehicles	57.9%	31.6%	42.6%
Carpools and vanpools	14.9%	43.4%	25.6%
Transit	17.3%	6.1%	26.2%
Bicycles	9.1%	17.5%	2.9%
Pedestrians			1.4%
Other	0.8%	1.4%	1.3%
Totals	**100%**	**100%**	**100%**

Source: Greater Vancouver Trip Diary Survey, GVRD/TransLink

Table 3.3 provides a comparison of vehicle occupancies in the region, for all trips and for work and post-secondary school trips. The latter is a more relevant comparison with UBC, where trips are predominantly work and school trips. The average vehicle occupancy for trips to and from UBC is higher than for work and school trips in the GVRD, which means that 7% fewer automobiles carry the same number of persons to work and school at UBC as in the GVRD on average.

Table 3.3: GVRD and UBC Vehicle Occupancies, 24 Hours

	GVRD (Fall 1999)		UBC Screenline (Fall 2002)
	Work/School Trips	Other Trips	All Trips (predominantly work/school trips)
Average vehicle occupancy	1.12 persons/vehicle	1.44 persons/vehicle	1.21 persons/vehicle

Source: Greater Vancouver Trip Diary Survey, GVRD/TransLink

As indicated in Table 3.4, people at UBC make fewer trips to and from UBC each day than the regional average. It is important to recognize, however, that the numbers indicated in Table 3.4 for UBC only reflect trips to and from UBC, and do not include trips between locations elsewhere in the region.

Table 3.4: GVRD and UBC Trip Rates, 24 Hours

	GVRD		UBC Screenline	
	1994	1999	Fall 1997	Fall 2002
Daily person trips (24 hours)	4,780,100	5,478,400	106,100	113,400
Daytime population	1,800,000	1,980,000	42,300	49,000
Trip rate (trips per person)	2.66	2.77	2.51	2.31
Change	+4.1%		-7.7%	

Source: Greater Vancouver Trip Diary Survey, GVRD/TransLink

Of more significance is the change in trip rates in the region and at UBC in recent years. From 1994 to 1999, the population of the GVRD increased 10.6%. During the same time period, the daily number of person trips increased 14.6% — 4.0% more than the growth in population. As a result, the trip rate in the region increased by 4.1% to 2.77 trips per person. In comparison, the trip rate at UBC decreased 7.7% over five years, to 2.31 trips per person.

3.2 Comparison to Vancouver

Much of what happens at UBC is affected by what happens in Vancouver. Almost everyone who travels to and from UBC starts in Vancouver or travels through Vancouver. Transit ridership at UBC is affected by transit service levels and vehicle loads on routes in Vancouver. Bicycle use is affected by the availability of bicycle routes in Vancouver. And automobile use is affected by roadway capacity and traffic congestion in Vancouver.

For this reason, it is appropriate to compare travel patterns at UBC with travel patterns in Vancouver. Table 3.5 provides a summary of travel patterns for the entire City of Vancouver, as well as for the Central Business District (CBD). The Vancouver CBD is the largest single trip destination in the region, and UBC is the second-largest.

Table 3.5: Vancouver and UBC Mode Shares, 24 Hours

Mode	Vancouver (1999)		Vancouver CBD (1999)		UBC Screenline (Fall 2002)	
	Daily Person Trips	Mode Share, Non-Walk Trips	Daily Person Trips	Mode Share, Non-Walk Trips	Daily Person Trips	Mode Share, Non-Walk Trips
Single occupant vehicles	776,000	43.7%	77,000	33.4%	48,400	43.3%
Carpools and vanpools	514,000	29.0%	55,000	23.8%	29,100	26.0%
Transit	418,000	23.6%	90,500	39.3%	29,700	26.5%
Bicycles	44,000	2.5%	8,000	3.5%	3,300	2.9%
Pedestrians	333,000	–	101,000	–	1,600	–
Other	22,000	1.2%	n/a		1,400	1.3%
Totals	**2,107,000**	**100%**	**331,500**	**100%**	**113,400**	**100%**

Source: Downtown Transportation Plan, City of Vancouver, 2001 and Greater Vancouver Trip Diary Survey, GVRD/TransLink

The significant difference between travel patterns in Vancouver and UBC is the amount of walking. In Vancouver — and particularly in the CBD where there is a large amount of residential development adjacent the CBD — a significant proportion of trips are made by walking.

Because UBC is separated from Vancouver by Pacific Spirit Regional Park, it is not practical for most people to walk to UBC. Consequently, a more useful and appropriate comparison involves comparing mode shares for all non-walking trips. As Table 3.5 indicates, the significant difference between UBC and the Vancouver CBD is that transit use is almost 50% higher in the CBD as a proportion of non-walking trips, with a correspondingly lower level of single-occupant vehicle travel.

Table 3.6 provides a comparison of vehicle occupancies in Vancouver and at UBC. Average vehicle occupancies for trips to and from UBC are lower than for trips in Vancouver.

Table 3.6: Vancouver and UBC Vehicle Occupancies, 24 Hours

	Vancouver (Fall 1999)	Vancouver CBD (Fall 1999)	UBC (Fall 2002)
Average vehicle occupancy	1.27 persons/vehicle	1.29 persons/vehicle	1.21 persons/vehicle

Source: Greater Vancouver Trip Diary Survey, GVRD/TransLink

Tables 3.7 and 3.8 provide a comparison of the parking supply and prices in the Vancouver CBD and at UBC. On a per capita basis, the number of parking stalls in the Vancouver CBD is slightly higher than at UBC. This likely reflects the significant amount of commercial, entertainment, cultural and tourism uses in the Vancouver CBD.

Table 3.7: Vancouver and UBC Parking Supply

	Vancouver CBD (2000)	UBC (2001/2002)
Number of commuter parking stalls	55,000	11,500
Daytime population	200,000 est.	46,100
Parking stalls per person	0.29	0.25

Source: Downtown Transportation Plan, City of Vancouver, 2001

Table 3.8: Vancouver and UBC Parking Prices

	Vancouver CBD (Fall 2002)	UBC (Fall 2002)
Hourly	$1.00–$4.00/hr, $13.00 max	$2.50/hr, $12.50 max
Daily	$5.00–$13.00/day	$3.50/day surface $12.50/day parkades
Monthly	$75–$170/mo unreserved $175–$250/mo reserved	$50/mo surface (student) $52/mo (staff) $66–$75/mo parkade (student)
Carpool	No special carpool rate	$42/mo

Source: EasyPark Vancouver

Hourly and daily parking prices at UBC are comparable to prices in the Vancouver CBD. On the other hand, permit parking prices at UBC are considerably less than monthly parking prices in the Vancouver CBD — the highest permit parking price at UBC is less than the lowest monthly price in the Vancouver CBD.

3.3 Comparison to SFU

Simon Fraser University is comparable to UBC in many ways. It is relatively isolated on top of Burnaby Mountain, in the same way that UBC is relatively isolated at the western end of the Point Grey Peninsula. It is served by several transit routes — all with frequent service — as is UBC. It is the only other large post-secondary campus in the region, although with a daytime population of 13,500, SFU's Burnaby Mountain campus is only 30% the size of UBC's Point Grey campus.

Table 3.9 provides a summary of daily person trips and resulting mode shares for SFU's Burnaby Mountain campus and UBC's Point Grey campus. The significant difference between the two is in the level of carpooling. The carpool mode share is 40% higher at SFU than at UBC. This likely reflects the limited supply of student parking permits at SFU. Each year, the demand

for parking permits at SFU exceeds the supply, and many students who want a parking permit do not receive one.

Table 3.9: SFU and UBC Mode Shares, 24 Hours

Mode	SFU Screenline (Fall 2000)		UBC Screenline (Fall 2002)	
	Daily Person Trips	Mode Share	Daily Person Trips	Mode Share
Single occupant vehicles	16,500	39.9%	48,400	42.6%
Carpools and vanpools	14,800	35.7%	29,100	25.6%
Transit	9,800	23.7%	29,700	26.2%
Bicycles	100	0.2%	3,300	2.9%
Pedestrians	0	0%	1,600	1.4%
Other	200	0.5%	1,400	1.3%
Totals	**41,400**	**100%**	**113,400**	**100%**

Source: Burnaby Mountain Travel Data, SFU/BMCC by Urban Systems Ltd., November 2000

The higher level of carpooling at SFU is reflected in a higher average vehicle occupancy, as indicated in Table 3.10. The higher vehicle occupancy at SFU means that 12% fewer automobiles carry the same number of persons than at UBC.

Table 3.10: SFU and UBC Vehicle Occupancies, 24 Hours

	SFU (Fall 2000)	UBC (Fall 2002)
Average vehicle occupancy	1.37 persons/vehicle	1.21 persons/vehicle

Source: Burnaby Mountain Travel Data, SFU/BMCC by Urban Systems Ltd., November 2000

Table 3.11 provides a comparison of responses from SFU students and UBC students to market research surveys undertaken by TransLink. In each survey, students were asked a range of questions regarding their travel patterns. The surveys were managed so as to ensure that the sample group was representative of the student population at each institution. A total of 700 SFU students and 710 UBC students were interviewed, including students who live on campus as well as students who live off-campus.

The reported mode shares in Table 3.11 must be considered with the proverbial "grain of salt." Inconsistencies in reporting are common with such surveys. For example, 13% of persons at SFU who did not have access to a motor vehicle indicated that they drove alone to or from school. Reported transit mode shares at both SFU and UBC are significantly higher than observed transit mode shares. Reported carpooling at both SFU and UBC is far lower than observed, and reported SOV travel at UBC is lower than observed.

Table 3.11: SFU and UBC Vehicle Availability and Reported Mode Shares, 24 Hours

Mode	SFU				UBC			
	Reported (Fall 2001)			Actual (Fall 2000)	Reported (Winter 2002)			Actual (Fall 2002)
	Access to Vehicle	No Vehicle	Total		Access to Vehicle	No Vehicle	Total	
Single occupant vehicles	54.8%	13.3%	38.9%	39.9%	41.1%	2.8%	24.7%	42.6%
Carpools and vanpools	11.7%	6.1%	9.6%	35.7%	20.7%	14.9%	18.2%	25.6%
Transit	32.5%	73.3%	48.1%	23.7%	23.9%	47.6%	34.1%	26.2%
Bicycles	0.3%	0%	0.2%	0.2%	2.3%	4.9%	3.4%	2.9%
Pedestrians and Skaters	0.4%	5.9%	2.5%	0%	11.5%	29.3%	19.1%	1.4%
Other	0.3%	1.4%	0.7%	0.5%	0.5%	0.4%	0.5%	1.3%
Totals	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: U-Pass Transit Surveys, TransLink, 2001 and 2002

Despite these inconsistencies, the data in Table 3.11 provide useful comparisons between SFU and UBC. Students with access to a vehicle are more likely to drive alone at SFU that at UBC. This suggests that at UBC, other travel options such as transit, carpooling and walking are more likely to be seen as attractive options to driving. Students without access to an automobile are far more likely to use transit at SFU, whereas at UBC, walking is a popular option for students without access to a vehicle. This likely reflects the higher level of on-campus student housing at UBC, as well as the proximity of student housing on UEL and in Point Grey.

Tables 3.12 and 3.13 provide a comparison of the parking supply and prices at SFU's Burnaby Mountain campus and at UBC's Point Grey campus. On a per capita basis, the number of parking stalls at SFU is considerably higher than at UBC.

Table 3.12: SFU and UBC Parking Supply

	SFU (2001)	UBC (2001/2002)
Number of commuter parking stalls	5,800	11,500
Daytime population	13,500	46,100
Parking stalls per person	0.43	0.25

Source: Travel Demand Management Options, Simon Fraser University by Urban Systems Ltd., October 2001

Parking prices at UBC are higher than at SFU in all categories except carpools. SFU is currently considering options to increase parking prices as a means of financing travel demand management initiatives similar to those which UBC has implemented and is pursuing.

Table 3.13: SFU and UBC Parking Prices

	SFU (Fall 2002)	UBC (Fall 2002)
Hourly	$1.75/hr, $9.00 max	$2.50/hr, $12.50 max
Daily	$9.00/day parkade	$3.50/day surface $12.50/day parkades
Monthly	$24/mo surface (student) $26/mo surface (staff) $65/mo parkade (staff)	$50/mo surface (student) $52/mo (staff) $66–$75/mo parkade (student)
Carpool	$44/mo	$42/mo

Source: Simon Fraser University

3.4 Comparison To U-Vic

The University of Victoria is the only large post-secondary institution in B.C. outside the Lower Mainland. As indicated in Table 3.14, daily trips to and from U-Vic are about half the number of trips to and from UBC. Table 3.14 also provides a comparison of mode shares for U-Vic and UBC. Table 3.15 provides a comparison of average vehicle occupancies.

Table 3.14: U-Vic and UBC Mode Shares, 24 Hours

Mode	U-Vic Screenline				UBC Screenline	
	Winter 1996, no U-Pass		2000, with U-Pass		Fall 2002	
	Daily Person Trips	Mode Share	Daily Person Trips	Mode Share	Daily Person Trips	Mode Share
Single occupant vehicles	24,700	44.5%	24,100	45.0%	48,400	42.6%
Carpools and vanpools	16,000	28.8%	10,900	20.4%	29,100	25.6%
Transit	6,200	11.2%	9,500	17.8%	29,700	26.2%
Bicycles	3,800	6.8%	3,000	5.6%	3,300	2.9%
Pedestrians	4,800	8.7%	6,000	11.2%	1,600	1.4%
Other	n/a		n/a		1,100	1.0%
Totals	**55,500**	**100%**	**53,500**	**100%**	**113,400**	**100%**

Sources: 1996 Traffic Survey Report, University of Victoria by Bunt & Associates, May 1996, and 2000 Campus Traffic Survey, University of Victoria by Bunt & Associates

Table 3.15: U-Vic and UBC Vehicle Occupancies

	U-Vic (Peak Period, 2000)	UBC (24 Hours, Fall 2001)
Average Vehicle Occupancy	1.28 persons/vehicle	1.21 persons/vehicle

Source: 2000 Campus Traffic Survey, University of Victoria by Bunt & Associates

Introduction of a U-Pass at U-Vic in 1999 contributed to a 53% increase in transit trips from 1996 to 2000, even though the daily number of person trips to and from campus remained relatively constant during this period. BC Transit reports that transit ridership to U-Vic has continued to increase in 2001 and 2002 by approximately 10% each year.

Despite the significant increases in transit ridership at U-Vic as a result of the U-Pass, the transit mode share at UBC is considerably higher that at U-Vic. However, the combined mode share for transit, cycling and walking is lower at UBC than at U-Vic — 30.5% at UBC as compared with 34.6% at U-Vic in 2000. A greater proportion of people travel to campus in automobiles at UBC than at U-Vic.

The higher level of walking and cycling at U-Vic reflects the fact that the U-Vic campus is immediately adjacent to residential areas on all sides, and that trip lengths in the Victoria region are less than in the GVRD.

Average vehicle occupancies are higher at U-Vic than at UBC, reflecting a greater number of carpools with three or more persons. This means that 5.5% fewer automobiles carry the same number of persons at U-Vic as at UBC.

The increase in transit ridership at U-Vic primarily resulted in a decrease in carpooling. This is similar to the decline in carpooling observed at UBC from 1997 to 2002, when transit service levels and ridership increased substantially.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The changes in travel patterns at UBC over the past five years indicate that initiatives to encourage greater use of transit have succeeded. As a result the STP target of a 20% increase in transit use has been achieved and exceeded. Increased service levels and the change in class start times are the major reasons for the increase in transit use. Continued improvements in transit service and the impending implementation of U-Pass should further increase transit use.

Comparing travel patterns at UBC to travel patterns in the region, in Vancouver and at comparable post-secondary institutions indicates that overall, UBC compares well. Transit use at UBC is as high or higher than at the comparators. The parking supply is lower and prices are as high or higher than at SFU and in the Vancouver CBD.

The one area where UBC does not compare as well is automobile use, and specifically a relatively low level of carpooling. The result is that the average vehicle occupancy at UBC is lower than at any other comparator, except in comparison to regional work and school trips. What this indicates is that there is opportunity for UBC to reduce the proportion of SOV trips and increase the proportion of carpool trips.

UBC has made progress towards the target, but has not yet achieved the target of reducing SOV travel by 20%. Efforts to increase transit use, as well as changes in parking supply and pricing have had an effect — the SOV trip rate has decreased by 9.2%. However, the number of SOV trips still exceeds the STP target.

In order to achieve the target of reducing SOV travel by 20%, UBC must do more. Based on experience at other post-secondary institutions and analysis of conditions at UBC, the following initiatives would have the greatest effect in changing travel patterns, and would enable UBC to achieve the SOV target. It is recommended that these initiatives be emphasized in future planning work, including updates to the Strategic Community Plan and Official Community Plan.

- **Implement a U-Pass program.** This would be the single most effective means of achieving changes in travel patterns. At the University of Victoria, transit ridership increased 50% as a result of U-Pass. At the Southern Alberta Institute of Technology in Calgary, transit ridership increased 35%, with an increase of 70% in midday ridership. With corresponding increases in service levels and improvements to transit services on campus, similar increases can be expected at UBC. Some of the increased ridership would occur as a result of reduced SOV trips,

particularly if parking management initiatives are implemented at the same time as a U-Pass, as described below.

- **Implement parking management measures** intended to reduce SOV trips. The experience at SFU suggests that the primary way to reduce the proportion of SOV trips is to restrict the supply of parking and access to parking. A range of parking management options could be implemented at UBC, including options to manage the supply of parking and to adjust the price of parking. Reductions in supply can be achieved through redevelopment of surface parking lots and elimination of free parking opportunities on campus and adjacent the campus. Options to adjust parking prices include pricing all parking on a daily basis, and indexing daily parking prices to transit fares. Depending on how these parking management options are implemented, parking revenues could be maintained at current levels.

- **Other programs and facilities,** including improved bicycle routes, secure bicycle parking, an expanded ridematching database, parking incentives for carpoolers, and marketing efforts to maintain awareness of carpooling programs.

- **On-campus housing.** Developing housing on campus — much of which would be occupied by staff, faculty and students — reduces trips to and from UBC, as well as reducing the overall number of trips. Studies conducted at Hampton Place indicate that the number of vehicle trips per household is approximately 40% less than at comparable developments elsewhere in the region.