ADMINISTRATIVE REPORT

Date: April 15, 2002
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T&T: April 30, 2002

TO: Standing Committee on Transportation and Traffic

FROM: General Manager of Engineering Services

SUBJECT: Update on Recent Regional Transportation Data

INFORMATION

The General Manager of Engineering Services submits this report for INFORMATION.

COUNCIL POLICY

In May 1997, Council adopted the City of Vancouver Transportation Plan, including the mode split targets which emphasize: the need for increased provision and use of transit; limiting overall road capacity to the present level; maintaining an efficient goods movement network; traffic calming in neighbourhoods; and providing more comfortable biking and walking environments.

Policy 3.10.1 of the City of Vancouver Transportation Plan notes "The Engineering and Planning departments will undertake regular monitoring and reviews of transportation services and use, to establish how transportation patterns are developing, and to recommend additional policy measures needed to achieve the Transportation Plan policies and targets."

In June 1999, Council approved recommendations to improve transportation system monitoring, including requesting that the Greater Vancouver Transportation Authority (TransLink) improve regional data collection.

SUMMARY

1) GREATER VANCOUVER TRIP DIARY SURVEY

Data compiled in the 1999 Trip Diary survey represents the travel behaviour of GVRD residents on a typical late fall day. The survey compares the 1999 data to results of a similar survey that was carried out in 1994. Although the results show significant progress being made for meeting City and regional transportation planning objectives in some areas, it also shows other areas where trends moved in the opposite direction.

At the regional level, results show an increase in travel at a rate greater than the population growth rate. Although Auto Driver mode share was held at the same level as 1994, results showing no increase in Transit mode share are of some concern. Also of concern is a slight decrease in car pooling. On the positive side, the results show a slight increase in regional walking and cycling. Also encouraging is a slight reversal in the past trend (1985 to 1994) of significant auto driver and passenger mode share increases for grade school trips.

Contrary to the regional trend, Vancouver results show an increase in travel at a rate under the city's population growth rate. Auto Driver mode share decreased 4% , while similar to the regional results, car pooling decreased slightly. There was virtually no change in Transit mode share. For walking and cycling, there was a significant increase in both mode share (up 6%) and trips (over 100,000 more or a 47% increase). Although the number of walking and cycling trips increased significantly for commuting purposes (up 30%), the largest increase was for Social / Recreational / Personal purposes (up 60%). Most of the change is likely due to City initiatives encouraging people to live close to employment centres, and improvements such as the expansion of Vancouver's bicycle and greenways networks.

For Downtown, Auto Driver and Auto Passenger mode share trends were similar to the results for Vancouver as a whole. However, a decrease in Transit mode share of almost 5% is of concern. The large increase in walking and cycling mode share for Downtown (up 11%), shows that the Downtown was responsible for a significant part of the overall increase for Vancouver. The primary driver for this increase is believed to be the increase in population that took place in the Downtown from 1994 to 1999 (15,000 new residents).

2) UBC TRANSPORTATION DATA REPORT

Transportation mode information specific to the University of British Columbia sub-area, showing trends for the period from 1997 to 2000, was collected using field counts on typical fall days. The results show that Auto Driver mode share remained about the same, while Transit mode share went up about 5%, mostly at the expense of car pooling mode share

(down about 6%). Walking and Cycling mode share data showed a slight increase (Note: data was only collected at the entrances to UBC, so trips within UBC were not counted).

PURPOSE

This report provides information summarizing two regional transportation monitoring studies that were released in the Fall of 2001:

1) Greater Vancouver Trip Diary Survey, carried out by TransLink in 1999, and
2) Transportation Data Collection Summary Report, carried out by the University of British Columbia in 2000.

These studies highlight areas where it appears that progress is being made in meeting regional and City transportation planning objectives, as well as where there are further challenges.

BACKGROUND

Both the regional and UBC studies were released in the fall of 2001. They provide the most recent information on travel modes and behaviour within the Greater Vancouver region, Vancouver, Downtown and the University of British Columbia (UBC). The Greater Vancouver Trip Diary Survey was carried out by TransLink in 1999. It compares travel data to a similar study that was carried out by the Greater Vancouver Regional District in 1994. The UBC Transportation Data Collection Summary reports on 2000 data specific to UBC, and also compares the results to previous data collected in 1997.

DISCUSSION

1) TRANSLINK GREATER VANCOUVER TRIP DIARY SURVEY (1999)

Travel behaviour data for GVRD residents for a typical fall weekday (October to December) was collected by TransLink in 1999. All household members, 5 years and older, were asked to record their travel patterns over a 24-hour period in a mail-back survey. Approximately 3000 or 60% of the households contacted responded, resulting in a sample size of 0.4% of the GVRD.

Survey results compare both changes in mode volumes and mode splits relative to the last regional trip diary survey, carried out in 1994. In interpreting changes from 1994, it is important to note some differences in the way the 1994 survey was carried out:

- Sampled less than half as many GVRD households, and
- Carried out slightly later in the year (data collection actually extended into January 1995).

The Greater Vancouver Trip Diary Survey was reviewed in a TransLink staff report to the TransLink Board in October 2001 (see Appendix A.). Some of the key findings for the five year period from 1994 to 1999 are:

- **Population and Employment Growth Slowing**

In the region, overall population increased by 10.5% or approximately 180,000 in the 5 year period. This is lower than the growth rate of 14% for the previous 5 years (1989 to 1994). This observation is also confirmed in the GVRD's 2000 Annual Report on the Livable Region Strategic Plan.

Although Vancouver's population growth of 46,900 was one of the highest in the region (in terms of absolute numbers), the highest growth rates in the region were in the Northeast Sector (Coquitlam/Port Moody/Port Coquitlam area).

Employment in the GVRD grew by 9.6% between 1994 and 1999, compared to growth of 11.6% between 1989 and 1994.

- **Regional Trips Increasing**

People are travelling more; the total number of trips made by GVRD residents grew by 14.6% while the population grew by 10.6%. Trip growth also outpaced transit supply, which grew by only 10.8%.

- **Regional Modes - Car Pooling Down Slightly, Walk/Bike Up Slightly**

Daily regional mode shares have mostly held steady, as shown in the table below (Exhibit 4. in the TransLink report). The largest percentage increase in trips has been in Walking/Biking. "Other" mode refers to a mix of taxi, motorcycle and school buses - samples of data for this mode are too small to be statistically significant.

Exhibit 4. Regional 24-Hour Mode Trip Shares, 1994-1999

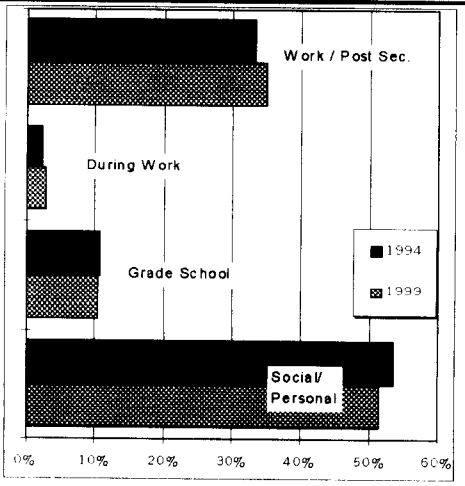
Mode of Travel	1994	1999	94-99 %Chg.	Modal Shares 1994	1999	94-99 Difference
Auto Driver	2,728,500	3,127,600	14.6%	57.1%	57.1%	0.0%
Auto Passenger	914,100	935,300	2.3%	19.1%	17.1%	-2.1%
Transit	488,200	566,200	16.0%	10.2%	10.3%	0.1%
Walk/Bike	608,300	783,500	28.8%	12.7%	14.3%	1.6%
Other	40,900	65,800	60.9%	0.9%	1.2%	0.3%

- **Commuter Trips Share Up Slightly; Personal Trip Share Down Slightly**

As part of the survey, data was collected from residents on their trip purpose. As shown in the table below, commuter (Work / Post Secondary) trips accounted for a third of trips in 1994 and this increased slightly to 35% in 1999. The largest category of trips, Social/Rec./Personal decreased slightly from 53.6% to 51.6%.

Exhibit 9: 24-Hour Purpose and Share of Travel Trip Total, 1994-1999

Trip Purpose	Total Trips 1994	1999	94-99 %Chg.	Purpose Shares 1994	1999	94-99 Diff.
Work/Post Sec.	1,587,000	1,918,300	20.9%	33.2%	35.0%	1.8%
During Work	114,700	157,900	37.7%	2.4%	2.9%	0.5%
Grade School	516,200	575,300	11.4%	10.8%	10.5%	-0.3%
Social/Rec./Personal	2,562,100	2,827,000	10.3%	53.6%	51.6%	-2.0%



- **Past Trend of Regional Grade School Auto Reliance Slowly Reversing**

A significant concern that arose in 1994 was a large increase in automobile use for Grade School trips. As shown in the following table and graph, Auto Passenger use for grade school trips has started to decline and Walk/Bike has increased. This positive trend could be partly explained by ICBC sponsored school programs such as "Way to Go", which encourage students to walk or cycle to school, and partly by shifts in demographics.

Mode of Travel	1985	1994	1999	94-99 Diff.
Auto Driver	2.1%	3.7%	2.5%	-1.2%
Auto Passenger	29.7%	45.0%	41.9%	-3.1%
Transit	10.4%	7.0%	6.4%	-0.5%
Walk/Bike	51.8%	40.9%	44.3%	3.4%
Other	5.9%	3.4%	4.8%	1.4%

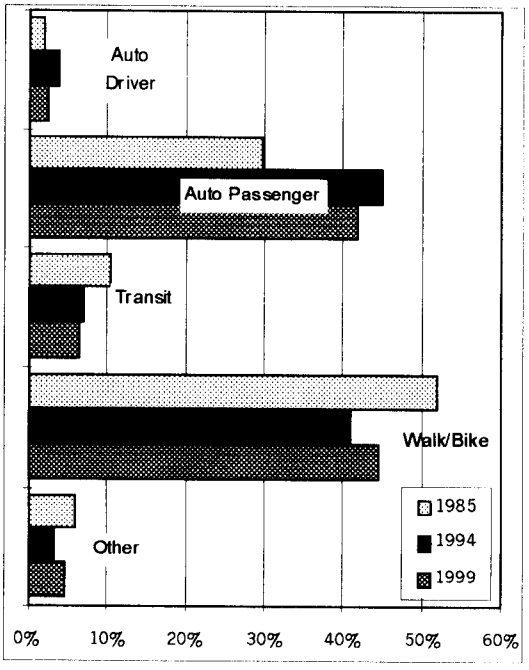


Exhibit 13: 24-Hour Grade School Trip Shares, 1994-1999

FURTHER DATA - VANCOUVER

Further Trip Diary data specific to Vancouver was obtained from TransLink. When looking at the data for Vancouver and its sub-areas, it should be kept in mind that the accuracy of survey data generally decreases with the size of the area being looked at, as sample sizes get smaller .

- **Vancouver Modes - Driving and Car Pooling Down Slightly; Walk/Bike Up**

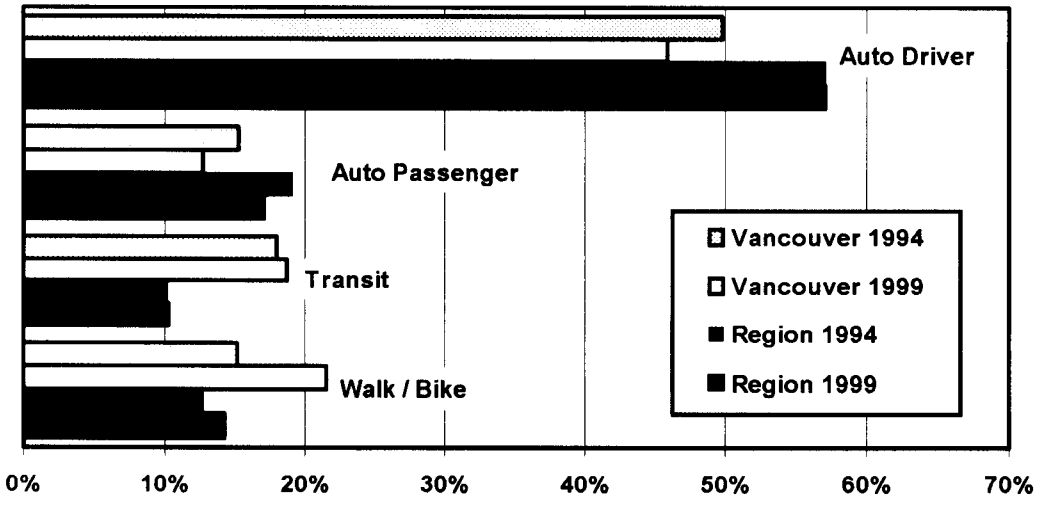
Mode Shares by origin for Vancouver are shown in Table 1. and Figure 1. below. Figure 1. also provides a comparison with corresponding data for the region.

TABLE 1. Vancouver 24-Hour Trip Origin Shares, 1994-1999

Vancouver (All)

Mode of Travel	1994		1999		Change	
	Share	Trips	Share	Trips	Trips #	Trips %
Auto Driver	49.9%	746,536	45.9%	714,276	-32,260	-4.3%
Auto Passenger	15.3%	228,376	12.7%	197,429	-30,947	-13.6%
Transit	18.0%	270,026	18.8%	291,777	21,751	8.1%
Walk/Bike	15.2%	227,095	21.5%	334,413	107,318	47.3%
Other/Unknown	1.7%	25,345	1.1%	16,955	-8,390	-33.1%
Total		1,497,378		1,554,851	57473	3.8%
Auto Occupancy		1.31		1.28		

FIGURE 1. 24-Hour Mode Shares - Vancouver and Region 1994 vs. 1999



The Trip Diary results above show Vancouver trips increasing by 3.8% in total, while during this period, Vancouver's population grew by 8.9%. Results show Auto Driver trips decreasing 4.3%. City counts of vehicles entering and leaving Vancouver increased about 8% during the same period. This would appear to indicate that the decrease in Auto Driver trips is due to reduced auto use by those living and working in Vancouver. Walk/Bike had by far the largest change in both mode split and number of trips. In comparing this increase to the overall increase in Walk/Bike trips across the region, Vancouver accounted for 58% of the growth. The increase can be attributed to the City encouraging new residential development close to employment centres (e.g. Downtown), and improvements such as the expansion of the City's bicycle and greenway networks.

However, part of the increase might also be attributed to an increased awareness by survey subjects in 1999 of walking and cycling trips. Results of the City's Pedestrian Study, to be carried out later this year, should help confirm the increase in pedestrian trips.

- **Vancouver Commuter Trips by Auto Decline; Transit and Walk/Bike Up**

As shown in Table 2. below, commuter (Work/Post Secondary) trips by Auto Drivers declined by 6.4%, while shares increased slightly for Transit and Walk/Bike. A much larger Walk/Bike increase (trips up 59.6%) is shown for Social/ Recreational/ Personal purposes. The reason for this significant change could be increased walking and cycling opportunities provided by new bike routes and greenways in the city. Some of the increase may also be attributable to increased reporting of walking and cycling trips. This could be due to increased awareness since 1994, or a misunderstanding by some survey subjects of what constitutes a Social/ Recreational/ Personal trip. For example, there could have been misunderstandings about reporting of walking trips for exercise or dog walking.

TABLE 2. Vancouver 24-Hour Purpose and Share of Origin Travel Trips

Trip Purpose	Total Trips			Purpose Shares		
	1994	1999	94-99 % Change	1994	1999	94-99 Diff.
Work/Post Sec.						
Auto Driver	310,992	288,539	-7.2%	53.7%	47.3%	-6.4%
Auto Passenger	39,553	37,983	-4.0%	6.8%	6.2%	-0.6%
Transit	140,217	167,004	19.1%	24.2%	27.4%	3.2%
Walk/Bike	86,395	111,886	29.5%	14.9%	18.3%	3.4%
TOTAL*	**578,791**	**611,636**	**5.7%**	**38.7%**	**39.2%**	**0.5%**
During Work	**44,120**	**51,265**	**16.2%**	**2.9%**	**3.3%**	**0.3%**
Grade School	**116,800**	**124,626**	**6.7%**	**7.8%**	**8.0%**	**0.2%**
Social/Rec./Per.						
Auto Driver	401,874	389,005	-3.2%	53.1%	50.5%	-2.6%
Auto Passenger	140,388	110,999	-20.9%	18.5%	14.4%	-4.1%
Transit	105,392	105,229	-0.2%	13.9%	13.7%	-0.3%
Walk/Bike	99,021	158,059	59.6%	13.1%	20.5%	7.4%
TOTAL*	**756,999**	**772,969**	**2.1%**	**50.6%**	**49.5%**	**-1.0%**

*TOTALS do not sum since "Other" mode omitted for clarity

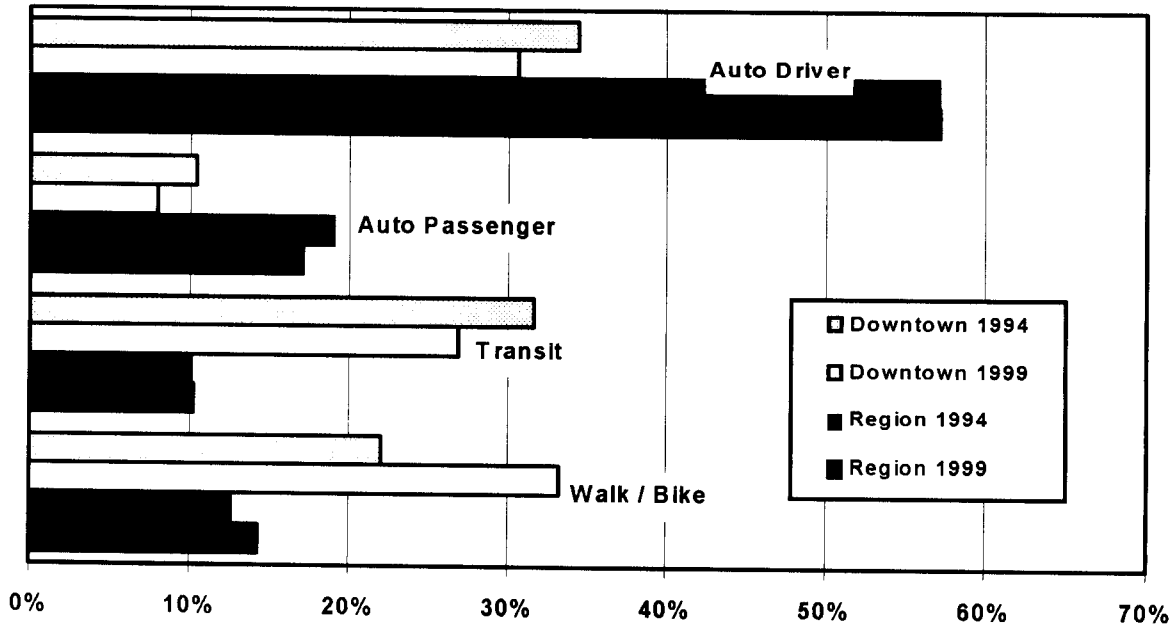
- **Downtown Modes - Driving and Transit Decline; Walk/Bike Increases Significantly**

Mode Shares by origin for Downtown Vancouver are shown in Table 3. and Figure 2. below. Table 3. does not show data for the number of trips due to the low sample sizes collected in 1994 (changes in the number of trips between 1994 and 1999 cannot be accurately compared). Figure 2. also provides a comparison with corresponding data for the region.

TABLE 3. Downtown 24-Hour Mode Trip Shares, 1994-1999

	Downtown			
Mode of Travel	**1994**	**1999**	**Change**	**2021 Targets**
Auto Driver	34.5%	30.6%	-3.9%	36%
Auto Passenger	10.4%	7.9%	-2.5%	12%
Transit	31.6%	26.9%	-4.7%	34%
Walk/Bike	22.0%	33.2%	11.2%	18%
Total				n/a
Auto Occupancy	1.3	1.26		1.33

FIGURE 2. 24-Hour Mode Shares - Downtown and Region 1994 vs. 1999



Similar to the mode results for the whole of Vancouver, Auto Driver and Auto Passenger mode shares for the Downtown decreased slightly. Of concern is that Downtown transit mode share decreased about 5%. More positively, Walk/Bike mode share increased significantly (up by 11%.) . The substantial increase in this mode can be partly explained by the increase in population in the downtown between 1994 and 1999 (grew by 15,000). 1996 census data showed that people living downtown walk significantly more than in other areas of the city or the region. As noted previously, there may also be some over estimation of the magnitude of the increase in the Walk/Bike mode in the Trip Diary survey.

- **Comparison to Transportation Plan Targets**

Table 3. also provides a comparison of the 1994-1999 Trip Diary Survey Results to the City's 1997 Transportation Plan targets (Section 2.5) for the Downtown . The Plan sets Mode targets for 2021, in terms of mode percentages and volumes, for the City as well as the sub-areas of Downtown, Central Broadway and Rest of City. Progress towards Transportation Plan targets for the downtown can be summarized as follows for the 1999 Trip Diary mode shares:

- Auto Driver is better than target, with trend showing improvement;
- Auto Passenger is below target, with trend showing decline;
- Transit is below target, with trend showing decline; and
- Walk/Bike is better than target, with trend showing improvement.

2) UBC DATA COLLECTION SUMMARY REPORT (2001)

The University of British Columbia (UBC) also recently reported on transportation monitoring results. In October 2001, the UBC Trek Program Centre at the UBC released a Transportation Data Collection Summary report covering typical fall days in the period between 1997 and 2000. The Summary section of this report is attached as Appendix B. The full report (35 pages) is on file with the City Clerk's Office and is also available from the UBC Trek website (http://www.trek.ubc.ca).

Information in the report that is of most interest to Vancouver is the data on mode shares over a 24-hour period. The City's Transportation Plan identified UBC and the University Endowment Lands (UEL) as being the city's largest traffic generator after the Downtown. Accordingly, the City's Transportation Plan includes targets for UBC/UEL even though this sub-area is outside the municipal boundary for the City.

The report notes that since travel data is collected over a short period each year, daily fluctuations can be expected to account for variations in travel numbers of 5% to 10%. Some further discussion on study accuracy is noted below in the section titled "Comparison to TransLink Trip Diary Survey"

The total number of person trips at UBC are reported as increasing by only 1% between 1997 and 2000, while staff, faculty and students during this period increased by about 6%. Estimated 24-Hour mode shares crossing the screen-line into the UBC campus are shown in Table 4. below.

Table. 4. UBC 24-Hour Mode Trips Shares, 1997-2000

Mode of Travel	1997		2000		Change	2021 Targets**
	Share	Trips	Share	Trips	Trips	Share
Auto Driver	43.3%	46,000	44.2%	47,200	1,200	41%
Auto Passenger	34.1%	36,200	27.7%	29,600	-6,600	16%
Transit	17.9%	19,000	22.8%	24,300	5,300	33%
Walk/Bike	3.9%	4,100	4.5%	4,800	700	10%
Total*		106,175		106,775	600	
Auto		1.32		1.26		1.39

* Totals do not sum since "Other" mode has not been shown for clarity

** Transportation Plan targets are for both UBC and UEL

- **UBC Car-Pooling Decreases**

Auto Passenger or car-pooling mode share decreased by about 6% and the number of trips decreased about 18%. As shown in the Greater Vancouver Trip Diary Survey, the trend in the region has also been towards slightly lower levels of car-pooling. In the case of UBC, the report notes that UBC commuters appear to have shifted from car pools and van pools to public transit (see next bullet for transit trend).

- **UBC Transit Trips Increase**

UBC mode share for transit increased about 5% and the number of trips increased by about 28%. The increase in transit use is attributed to an increase in transit service by BC Transit / TransLink of 30% during this time period.

- **UBC Walking and Cycling Trips Up**

UBC mode share for the Walk/Bike mode increased slightly across the UBC screenline locations. Of the estimated 700 additional trips made by these modes in a 24-hour period, 200 were attributed to walking and 500 were attributed to cycling. The report attributes the cycling increase, in part, to bicycle lane improvements made to University Boulevard, and the walking increase, in part, to up to 200 vehicles a day parked on the UEL portion of W. 16th Avenue (majority being UBC students avoiding pay parking on campus).

- **Comparison to Transportation Plan Targets**

Table 4. also provides a comparison of the UBC results to the City's 1997 Transportation Plan 2021 targets. Although the Transportation Plan target includes both UBC and the UEL, the majority of travel in this area is generated by UBC.

Progress towards Transportation Plan targets for UBC can be summarized as follows for the 1999 Trip Diary mode shares:

- Auto Driver exceeds target , with trend showing increase;
- Auto Passenger is above target, with trend showing decrease;
- Transit is below target, with trend showing increase; and
- Walk/Bike results for the UBC study show a positive trend, but are not comparable to the Transportation Plan target because of differences in the way the UBC data was derived (see next bullet for explanation).

- **Comparison to TransLink Trip Diary Survey**

Mode share data obtained from TransLink for the UBC/UEL sub-area produced similar results for most modes, as shown below:

Mode of Travel	**UBC (2000)**	**TransLink -UBC/UEL (1999)**
Auto Driver	44%	44%
Auto Passenger	28%	n/a*
Transit	23%	24%
Walk/Bike	5%	19%

* sample size too small to give a reliable number

TransLink's trip diary indicated Auto Driver and Transit mode shares that were roughly the same. However, the Trip Diary results for the Walk/Bike mode was substantially higher (19% versus 5%). This can be explained by the screen line method used by the UBC study - although this method is accurate in estimating mode share for longer trips (auto and transit), it misses short trips made by walking and bicycling inside the screenline area (i.e. within the UBC Campus). These shorter trips make up a significant number of trips for the cycling and walking modes. The UBC methodology also excludes comparison to the City's Transportation Plan targets for the Walk/Bike mode.

CONCLUSION

A key strategy in Vancouver's Transportation Plan is to accommodate growth in transportation demand through transit, walking and biking. The Greater Vancouver Trip Diary Survey shows that between 1994 and 1999, success was achieved in some key areas. Travel within Vancouver increased at a slower rate than the rate of population growth. Single occupant automobile use in both the city as a whole and Downtown decreased slightly, while significant increases in walking and cycling modes occurred.

Data from the UBC Transportation Data Collection Summary also shows positive trends for the UBC sub-area with a significant increase in transit mode share. The UBC report attributes the increase in Transit mode share primarily to a significant increase in transit service that occurred at the same time.

Working against the City's Transportation Plan objectives are trends shown in the Trip Diary Survey for both transit and car pooling. The Survey showed car pooling decreased slightly for both Vancouver and the Downtown, when Plan targets for 2021 call for an increase. Of greater concern relative to Plan targets, is the data showing lack of any significant transit mode growth in the city, and a drop in transit mode share in the Downtown of almost 5%.

Relative to the Greater Vancouver region, Vancouver had more success in slowing its rate of travel increase and improving its walking and cycling mode shares. Contrasting the results for Vancouver, regional Trip Diary results show an increase in travel at a rate greater than the population growth rate. While walking and cycling mode share increased by over 6% in Vancouver, regionally the increase was less than 2%.

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Appendix A
Report to TransLink Board -
Greater Vancouver Trip Diary Survey

To: GVTA Board of Directors

From: Clive Rock, Manager, Strategic Planning

Date: September 24, 2001

Subject: **Recent Trends in Travel Behaviour: Analysis of the Greater Vancouver Trip Diary Survey**

Staff Recommendation:
That the Board receive for information the report titled *"Recent Trends in Travel Behaviour: Analysis of the Greater Vancouver Trip Diary Survey"* and forward the report to municipalities, the GVRD, and the Provincial and Federal Ministers of Transport.

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1) PURPOSE

The purpose of this report is to inform the Board of recent changes in the daily travel behaviour of GVRD residents. The trends tracked in this survey will be used in responding to the needs of the region as a whole, as well as in various parts of the region such as the growing suburban areas.

This type of report and its findings regarding trends and mounting congestion serve to highlight why transportation remains a significant public concern.

2) BACKGROUND

Travel surveys are invaluable in providing indications to the effectiveness of past transportation investments and programs, identifying future needs and trends as well as monitoring the achievement of regional transportation objectives.

The collection of detailed travel behaviour information is also required to update the Greater Vancouver transportation computer model, used in planning for major transportation facilities, testing land use scenarios, and developing long range plans. This process of continuously surveying traveller behaviour and updating computer models is not unique to this region and occurs in most major cities throughout the world.

Previous regional travel surveys include the 1994 Greater Vancouver Trip Diary Survey, 1992 Greater Vancouver Travel Survey, and the 1985 Metropolitan Vancouver Origin-Destination Survey. The 1994 and 1985 surveys collected data on 24-hour travel patterns

while the 1992 survey collected information for only the AM peak period (6AM-9AM). This report presents the recently derived data from the Fall 1999 Trip Diary Survey and compares it to the results of the 1994 Trip Diary Survey.

While the data was gathered in 1999, the whole exercise of designing, processing and delivering the results of a detailed trip diary survey can take up to two years. This timeframe is comparable to the various provincial and national surveys that are periodically undertaken. Therefore, the reporting of travel surveys will generally be for data that was collected a few years back.

3) DISCUSSION

3.1) Survey Design and Response

The 1999 Trip Diary survey was a self-completion mail-back survey randomly sent to a sample of GVRD residents asking household members to record their 24-hour travel patterns. The survey was conducted during the last quarter of 1999, specifically from the beginning of October to the end of December, and therefore the resulting statistics are representative for a typical late fall weekday. A total of 4,973 survey packages were sent out in two waves to GVRD households who were contacted by phone. Participants agreed to have all their household members complete the survey.

A total of 2,990 households returned completed surveys. This resulted in a return rate of 60%, or a 0.4% sample size based on a total of 742,000 households in the GVRD. The 2,990 households that returned the surveys consisted of 7,063 household members that participated in completing the surveys. This resulted in a database of 22,000 trip records which was used to produce statistics useful for monitoring trends in regional travel behaviour.

A unique feature of the 1999 Trip Diary survey was the joint collaboration with the Translink's 1999 Usage and Attitude (U&A) survey. The two surveys were conducted together for cost-effectiveness, as well to provide the opportunity to link both surveys together for a more in-depth view of travel attitudes and behaviours. The U&A survey dealt with the general travelling behaviour and attitudes of GVRD residents 16 years and older. Conversely, the Trip Diary survey did not collect subjective information but focused on collecting detailed 24-hour travel information of each member of a surveyed household who is 5 years of age or older.

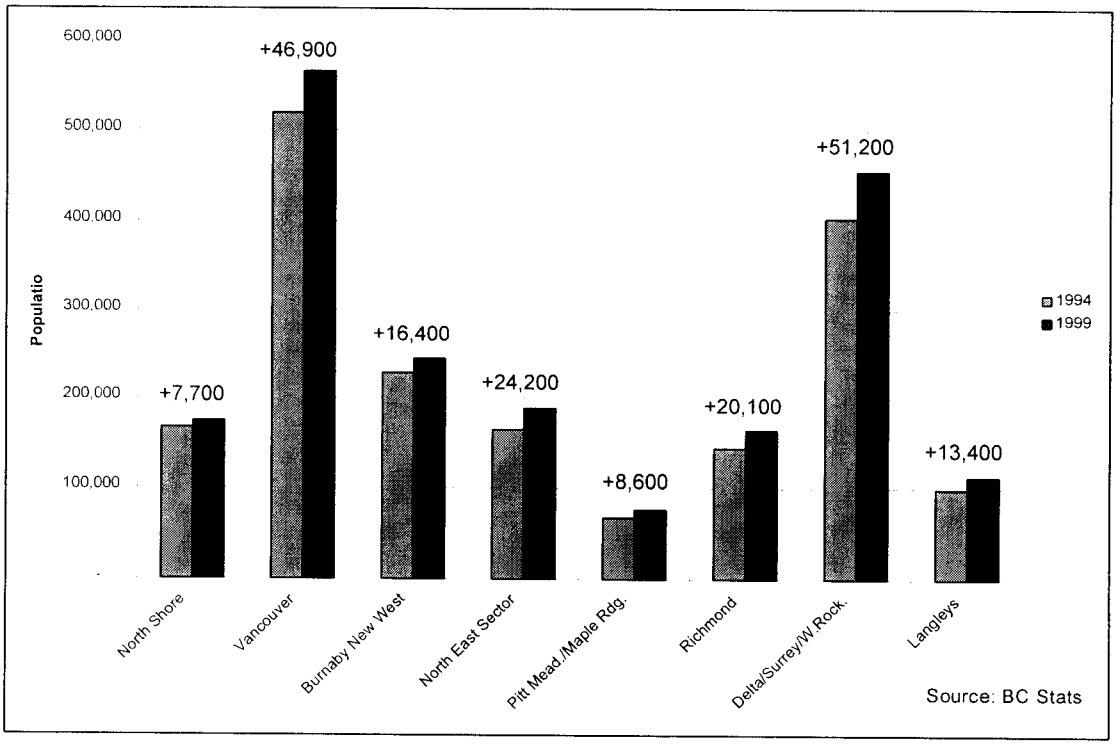
3.2) 1994-1999 Demographic and Transportation Supply Trends

A brief look at background changes that influence travel can help to provide a context upon which to regard changes in travel behaviour. Key background influences are population and employment changes, as well as changes in the supply of transit and private automobile ownership.

(a) Population and Employment Trends: Overall Growth Slowing Down

The region's population grew by 10.5% from approximately 1.80 million in 1994 to 1.98 million in 1999. This is slower than the growth rate of approximately 14% from 1989 to 1994. Employment in the GVRD grew by 9.6% between 1994 and 1999 from 899,700 to 986,400. Exhibit 1 shows the population growth by regional *subareas*, the set of municipal spatial aggregations used in the 1999 Trip Diary survey.

Exhibit 1: Population Growth by Subarea, 1994-1999.



(b) Surrey/Delta/White Rock and Vancouver had the Greatest Population Growth

The highest growth between 1994 and 1999, in terms of absolute population numbers, were observed in the Surrey/Delta/White Rock subarea with an addition of 51,200 people, followed by Vancouver with an increase of 46,900 people. The North East Sector followed with the third highest increase of 24,200 people.

(c) North-East Sector[1] and Richmond Experience the Fastest Growth Rates

While the Surrey/Delta/White Rock and Vancouver subareas experienced the highest absolute growth, their growth rates were not the highest in the region. The highest

[1] The North-East Sector subarea consists of Anmore, Belcarra, Coquitlam, Port Moody and Port Coquitlam.

population growth rates were observed in the North-East Sector and Richmond subareas, with 14.7% and 14.0% growth, respectively, between 1994 and 1999. The third highest growth was found in the Langley subarea with a growth of 13.5% since 1994. The lowest growth rate was found in the North Shore subarea with a growth of 4.6%.

(d) Transit Supply Not Keeping up with Growth in Trips

In terms of transit supply, there has been a steady increase in revenue vehicle hours provided (buses and SkyTrain) at a growth of 10.8% from 3.6 million hours to 4.0 million hours between 1994 and 1999. Although this parallels the growth rate of the region's population of 10.6% between the 5-year period, it falls short of the 14.6% growth in travel during this period. Also, it should be noted that because of decreasing speeds of transit vehicles due to congestion, in practice, the carrying capacity of the system relative to the population may well have declined slightly.

The number of active transit buses grew by 18.5%, from approximately 945 buses in 1994, to 1,120 buses in 1999. Similarly, the number of active SkyTrain vehicles rose 15.4% from 130 cars to 150 cars. In November 1995, the West Coast Express commuter rail line was opened linking Mission to Vancouver downtown, with 31 commuter rail vehicles in operation by 1999. These improvements have resulted in a 14.1% increase in transit ridership, from approximately 110.4 million in 1994 to 126.0 million in 1999. As this increase was greater than the growth in population, ridership per capita increased from an average annual transit ridership of 61.3 rides per GVRD resident in 1994 to 63.2 rides in 1999.

(e) Vehicle Ownership Continues to Grow up to 3.6 More Vehicles per Hour

Vehicle ownership has grown at a rate of 15.6% from 1,021,200 vehicles insured and registered in the GVRD in 1994, to 1,180,400 in 1999. As this is higher than population growth rate, it resulted in a slightly upward trend of automobile ownership, with a ratio of 0.59 vehicles per person in 1999, up from 0.57 vehicles per person in 1994. To put this growth into perspective, this is equivalent to approximately 3.6 additional vehicles insured and registered in the GVRD every hour of the 5-year period.

3.3) Findings

(a) People are Travelling More - Trips Growing Faster than Population

The total number of daily trips made by GVRD residents grew from 4.8 million in 1994 to 5.5 million in 1999, a 14.6% increase (Exhibit 2). This is higher than the population growth rate of 10.6% and just under the growth in auto ownership of 15.6% during the same period.

In terms of the share of trips throughout the day, travel during the morning and afternoon peak periods grew more in comparison to other time periods during the day, accounting

for just under 48% of all daily trips in 1999, up from 47% in 1994. This indicates that travelling is still dominated in the morning and afternoon peak periods. Mid-day shares held steady, accounting for almost a third of all daily trips for both time periods and growing at the same rate of 14.6% as that of the total daily trip rate.

(b) Suburban Share of Trips Increasing

This indicator is based on the number of trips originating from each subarea in a 24-hour period and indicates the travel activity in a particular subarea. Vancouver had the highest origin of trips at just under a third of all regional trip origins in 1999, followed by Surrey/Delta/White Rock, with 20.6% of regional trip origins.

However, Vancouver shows the greatest relative decline in the proportion of regional trip origins. This declining pattern is also prevalent in most of the subareas, except for increases in the North East Sector and Surrey/Delta/White Rock, showing an increase in travelling outside of Vancouver (Exhibit 3).

Exhibit 2: Total Trips by Time Period, 1994 - 1999 (GVRD residents)

Time Period	1994 Total Trips	1994 Daily Split	1999 Total Trips	1999 Daily Split	1994-1999 % Change
Early Morning (12 A.M. - 6 A.M.)	68,600	1.4%	69,300	1.3%	1.0%
AM Peak Period (6 A.M. - 9 A.M.)	988,000	20.7%	1,153,800	21.1%	16.8%
Mid-Day (9 A.M. - 3 P.M.)	1,540,400	32.2%	1,765,000	32.2%	14.6%
PM Peak Period (3 P.M. - 6 P.M.)	1,259,800	26.4%	1,468,300	26.8%	16.6%
Evening (6 P.M. - 12 A.M.)	923,300	19.3%	1,022,000	18.7%	10.7%
24 Hour	**4,780,100**	100.0%	**5,478,400**	100.0%	**14.6%**

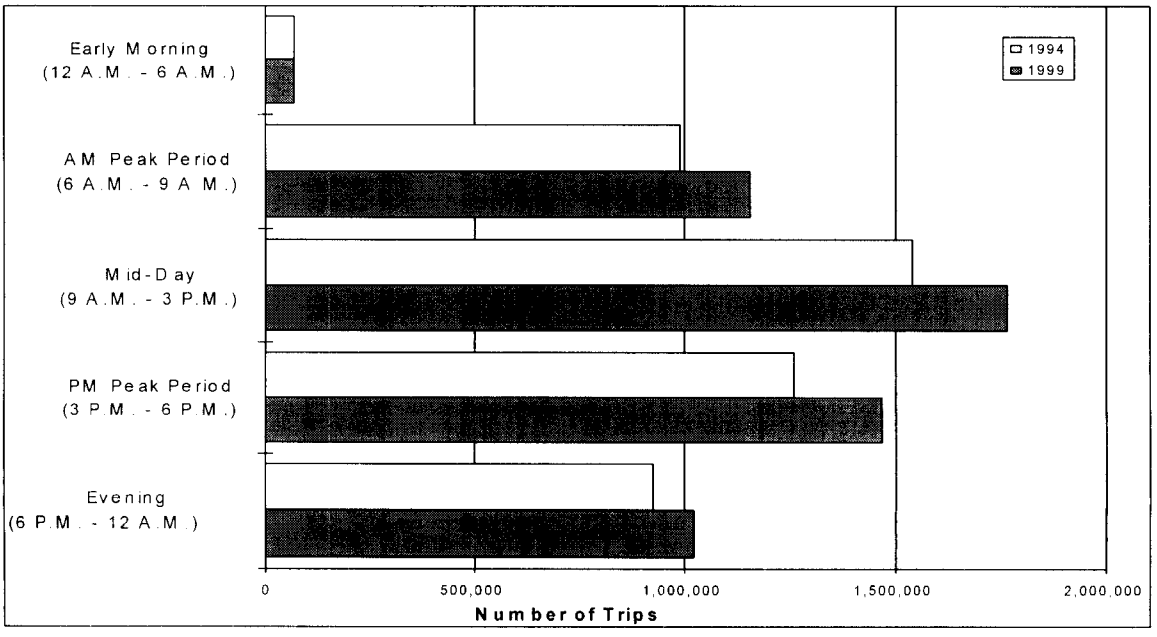
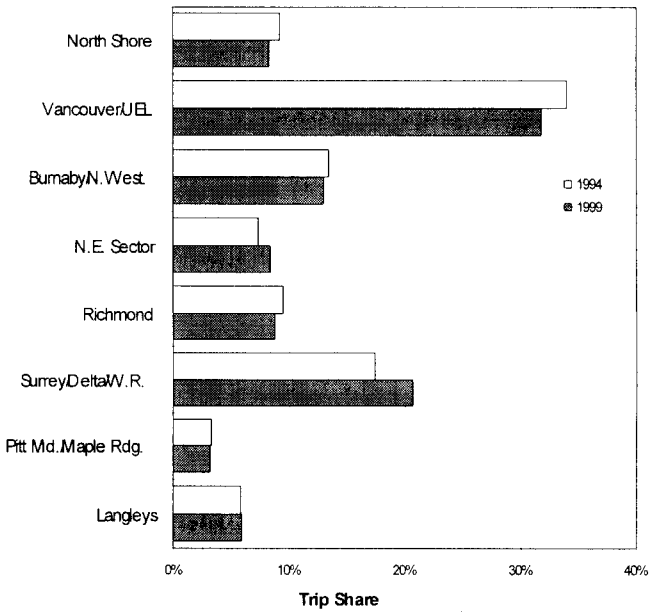


Exhibit 3: 24-Hour Trip Shares by Subarea, 1994 - 1999

Subareas (Origin)	Regional Share 1994	Regional Share 1999	1994-1999 Difference
North Shore	9.3%	8.3%	-1.0%
Vancouver/UEL	33.9%	31.8%	-2.1%
Burnaby/N.West.	13.4%	13.0%	-0.4%
N.E. Sector	7.4%	8.4%	1.0%
Richmond	9.5%	8.8%	-0.7%
Surrey/Delta/W.R.	17.3%	20.6%	3.3%
Pitt Md.Maple Rdg.	3.3%	3.2%	-0.1%
Langleys	5.9%	5.9%	0.1%
Total	100.0%	100.0%	



(c) Daily Mode Shares Hold Steady

The understanding of how people travel in the region is of great importance to the planning and delivery of transportation services. In general, the method of travel can be summarized into five basic modes:

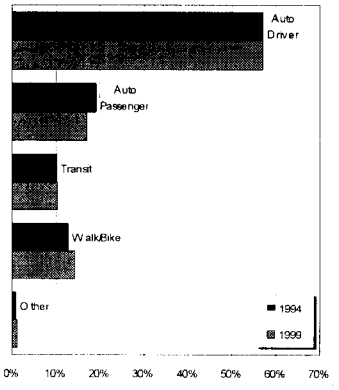
- auto driver
- auto passenger
- transit
- walk or bike
- other (i.e. taxi, motorcycle, school bus, etc.)

As shown in Exhibit 4, GVRD residents drove (as auto drivers) for 57.1% of all trips in both 1994 and 1999. This was due to the growth in auto driver trips of 14.6% in the 5-year period – the same growth rate as that of total trips in the region. Auto passenger trips grew only by 2.3% between 1994 and 1999, resulting in a drop in auto passenger mode shares from 19.1% to 17.1%. This caused a drop in the regional daily auto occupancy rate from 1.33 passengers per automobile in 1994 to 1.30 passengers per automobile in 1999. The reason for the decrease in auto passenger mode shares is unknown and further investigation would be required to determine the cause of this trend.

Transit trip totals grew by 16% from 1994 to 1999, slightly increasing the transit mode share from 10.2% to 10.3%. A significant increase was observed in walk and bike trips, with this mode share up from 12.7% in 1994 to 14.3% in 1999 due to an increase in walk and bike trip totals of 28.8% within this period.

Exhibit 4: 24-Hour Mode of Travel Trip Totals and Shares, 1994 - 1999

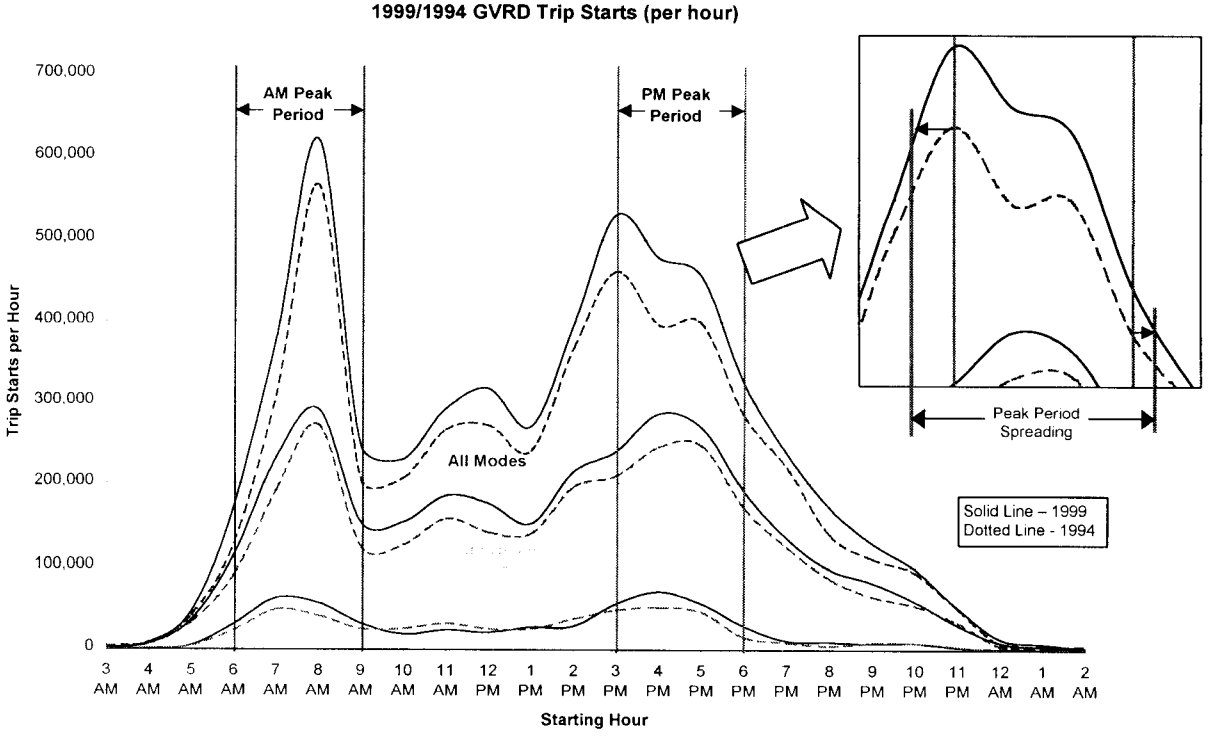
Mode of Travel	1994	1999	94-99 % Chg.	Modal Shares 1994	Modal Shares 1999	94-99 Difference
Auto Driver	2,728,500	3,127,600	14.6%	57.1%	57.1%	0.0%
Auto Passenger	914,100	935,300	2.3%	19.1%	17.1%	-2.1%
Transit	488,200	566,200	16.0%	10.2%	10.3%	0.1%
WalkBike	608,300	783,500	28.8%	12.7%	14.3%	1.6%
Other	40,900	65,800	60.9%	0.9%	1.2%	0.3%



(d) Rush-Hour Periods Spreading

Exhibit 5 illustrates the trips starts of transit, automobile driver, and total trips by the hour. The trip start profiles of 1994 and 1999 are generally similar in shape, indicating an even growth of travel throughout the day. Growth in trip starts is more prominent during the mid-day and afternoon rush-hour period. The high peaks during both the morning and afternoon rush-hour periods graphically show the demand for travel during these times. The increase in demand has caused the peak period of travel to increase by almost an hour in the afternoon rush.

Exhibit 5: Trip Starts by Hour, 1994 – 1999

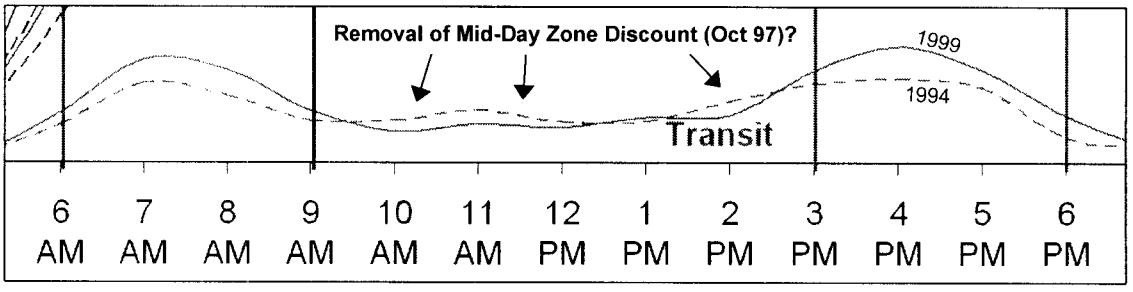


(e) Mid-Day Transit Trips Declining: Change in Fare Policy May Have Contributed

Transit mode shares in the mid-day time period have decreased since 1994 and this occurrence is graphically displayed in Exhibit 6 for transit trip starts between 9AM and 3PM. The reduction in transit mode share during the mid-day period is likely due, in part, to the decision by BC Transit to remove the mid-day discount for 2 and 3 zone fares in October 1997.

Conversely, the peak period ridership increased substantially. This was due to natural growth, as well as to travellers (e.g. shoppers) who previously had an incentive to travel outside the peak periods now travelling within the peak periods. In turn, this requires more transit resources in peak periods, leading to some system inefficiencies.

Exhibit 6: Trip Starts by Hour, 1994 - 1999



(f) Share of Automobile Use Increasing in the Suburbs

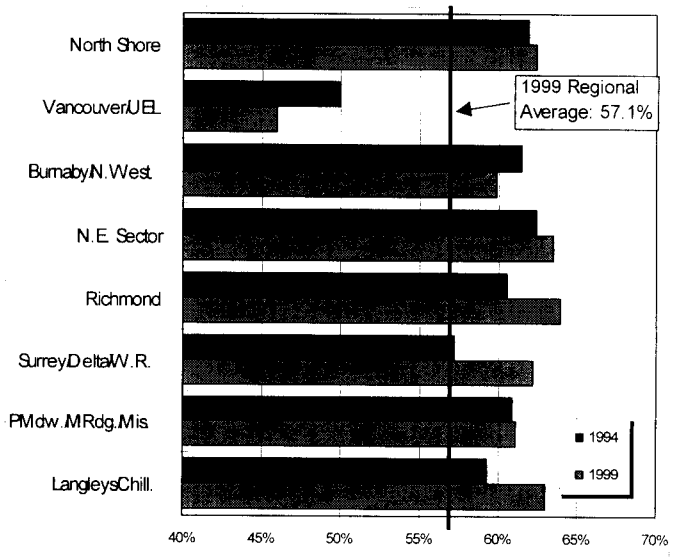
Observing each subarea separately, auto driver mode shares of trips originating from each subarea have generally increased. The average auto driver mode share per subarea has gone up from 59.2% to 60.2%, as shown in Exhibit 7. This is above the region's (as a whole) auto driver mode share of 57.1%, which conversely has held steady since 1994. This is in part due to the decrease in auto driver shares in the Vancouver and Burnaby/New Westminster subareas.

(g) Transit Use Holding Steady

As previously identified, the 24-hour transit mode share in the region as a whole has increased slightly from 10.2% in 1994 to 10.3% in 1999. This is reflected in the transit mode shares of trips originating from most of the subareas. With the exception of the North East Sector and Surrey/Delta/White Rock subareas, there have been slight increases in the share of transit use resulting in the transit mode share average (by subarea), rising from 7.1% in 1994 to 7.6% in 1999. This is still well below the regional average as a whole of 10.3% in 1999. The regional average is at this higher level due in part by the heavy use of transit in Vancouver and Burnaby/New Westminster subareas. Exhibit 8 details these changes.

Exhibit 7: Daily Automobile Driver Shares by Subarea, 1994 – 1999

Subareas (Origin)	1994	1999	Difference
North Shore	61.9%	62.4%	*0.5%*
VancouverUEL	50.0%	45.9%	*-4.1%*
BurnabyN.West.	61.5%	59.9%	*-1.6%*
N.E. Sector	62.4%	63.5%	*1.1%*
Richmond	60.5%	63.9%	*3.4%*
SurreyDeltaW.R.	57.2%	62.2%	*5.0%*
PMdw.MRdg.Mis.	60.9%	61.1%	*0.2%*
LangleysChill.	59.3%	63.0%	*3.7%*
Average by Subarea	59.2%	60.2%	*1.0%*



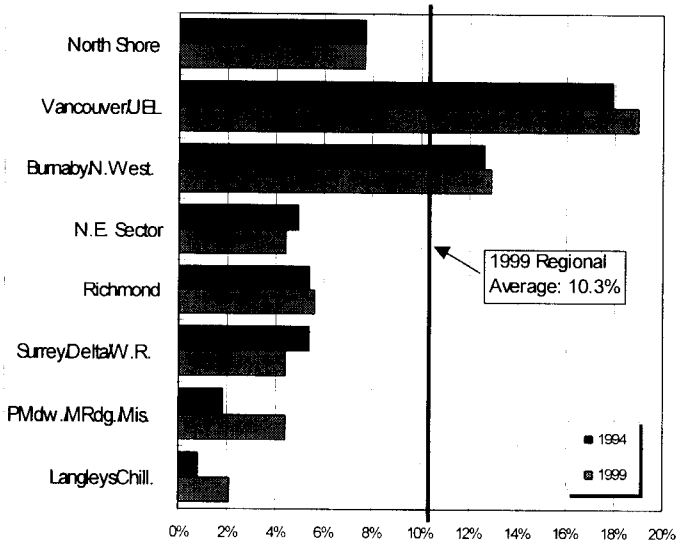
(h) Commuter Trips Increasing in Share

Understanding the reason for why people travel can give an indication to where travel demands are moving towards, as well as providing insight to trends that may be supporting or going against regional objectives. Travel purposes can be summarized under four basic trip purpose categories:

- to and from work & post secondary school trips
- during work trips
- to and from grade school trips (kindergarten to grade 12)
- social / recreational /personal business trips

Exhibit 8: Daily Transit Shares by Subarea, 1994 - 1999

Subareas (Origin)	1994	1999	Difference
North Shore	7.7%	7.7%	*0.0%*
VancouverUEL	17.9%	19.0%	*1.1%*
BurnabyN.West.	12.6%	12.9%	*0.3%*
N.E. Sector	4.9%	4.4%	*-0.5%*
Richmond	5.4%	5.6%	*0.2%*
SurreyDeltaW.R.	5.4%	4.4%	*-1.0%*
PMdw.MRdg.Mis.	1.8%	4.4%	*2.6%*
LangleysChill.	0.8%	2.1%	*1.3%*
Average by Subarea	7.1%	7.6%	*0.5%*

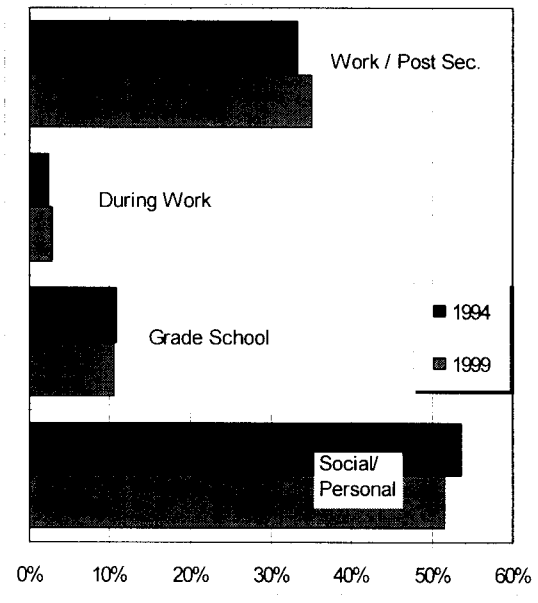


Throughout the day, work/post secondary school related trips have historically held shares of one third of all regional trips. In 1999, share of these trips has slightly increased to 35.0%, from 33.2% in 1994. Social, recreational and personal business trips generally account for over half of all trips during the day. Since 1994, the trend for this trip purpose has been declining from 53.6%, to 51.6% in 1999. Grade school trips have generally accounted for just over 10% of all trips, with this trip purpose slightly decreasing in share, from 10.8% in 1994, to 10.5% in 1999 (Exhibit 9).

Exhibit 9: 24-Hour Purpose and Share of Travel Trip Totals, 1994 - 1999

Trip Purpose	Total Trips			Purpose Share		
	1994	1999	94-99 % Chg.	1994	1999	94-99 Diff.
Work/Post Sec.	1,587,000	1,918,300	20.9%	33.2%	35.0%	1.8%
During Work	114,700	157,900	37.7%	2.4%	2.9%	0.5%
Grade School	516,200	575,300	11.4%	10.8%	10.5%	-0.3%
Social/Rec./Personal	2,562,100	2,827,000	10.3%	53.6%	51.6%	-2.0%

Exhibit 9 continued

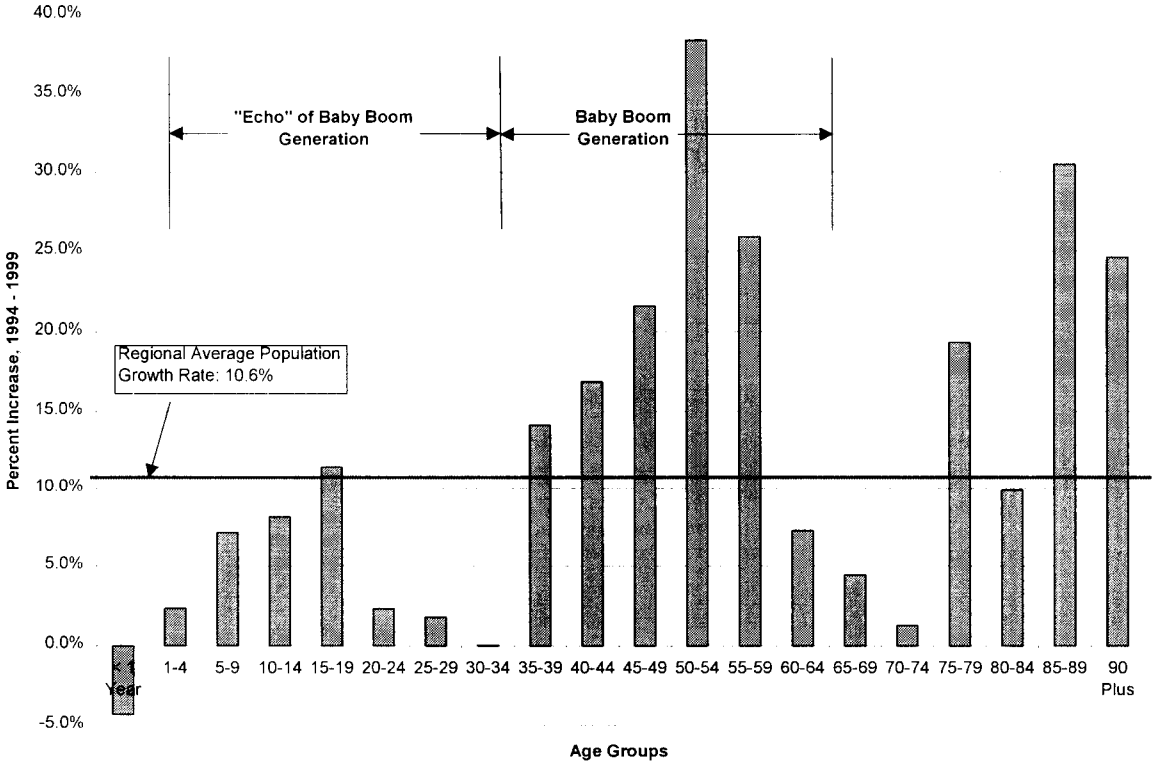


Trip purposes are highly correlated to age groups and changes in the growth rate of these age groups can influence the quantity of the types of travel made in the region. A look at the growth rates of the region's population by age groups shows a growth rate of just under 9% for the grade school aged population (5-19 years of age), which is lower than the regional average of 10.6%. Conversely, the working and post secondary school aged population (20-59 years of age) experienced an average growth rate of almost 13% (Exhibit 10).

These demographic undulations are due to the post-war "baby-boom" phenomenon and provide indications to the increase in work/post secondary school trip shares and decrease in grade school trip shares.

A look at how GVRD residents are travelling within some of the major trip purposes can give insight to travel trends and how they compare to regional objectives. The next three sub-sections will provide an in-depth look at the trends in the mode of travel within work/post secondary, social/personal business, and grade school trip purposes.

Exhibit 10: Growth Rate in Population by Age Group between 1994 and 1999



(i) Reliance of Automobiles Declining in Commuter Travel

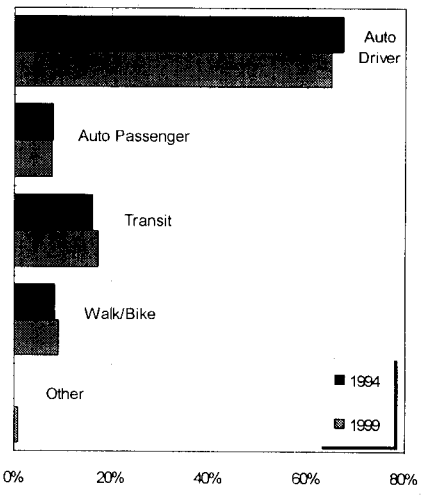
Commuter trips in the region have slowly reduced their reliance on the automobile since 1994. The shares of auto driver and auto passenger work and post secondary school trip modes has declined, with the auto driver share down from 67.4% in 1994 to 65% in 1999 (Exhibit 11). Although not as substantial, auto passenger commuter mode shares have reduced slightly from 7.9% in 1994 to 7.8% in 1999. This has kept the auto occupancy static at 1.12 passengers per automobile.

The drop in auto-related mode shares has resulted in an increase in all-day commuter transit mode shares, up from 16.1% in 1994 to 17.3% in 1999. Transit use in commuter trips continues to be higher than the regional daily average for all trip purposes of 10.3%.

Similarly, walk and bike shares increased, from 8.4% in 1994, up to 9.1% in 1999. The higher increase in use of non-automobile modes provides a positive indication to the effectiveness of the provision of alternative services to commuter trips.

Exhibit 11: 24-Hour Work/Post Secondary Trip Modal Shares, 1994 - 1999

Mode of Travel	1994	1999	94-99 Diff.
Auto Driver	67.4%	65.0%	-2.4%
Auto Passenger	7.9%	7.8%	-0.1%
Transit	16.1%	17.3%	1.2%
WalkBike	8.4%	9.1%	0.7%
Other	0.2%	0.8%	0.6%



(j) Increase in Walking/Biking for Social/Personal Business Travel

The use of the automobile in social and personal business trips has been historically high, with the majority (over 80%) of these trip types being taken in an automobile. Auto driver mode shares in social and personal business trips has increased slightly from 60.6% in 1994, to 61.3% in 1999 (Exhibit 12). Conversely, the auto passenger mode share has dropped from 21.5% in 1994 to 19.0% in 1999, resulting in a drop in auto occupancy from 1.35 to 1.31 passengers per automobile.

Transit use for this trip purpose has traditionally been low and appears to be dropping even lower. In 1994, the region's social/personal business transit mode share was 7.4%, and has dropped to 6.8% in 1999.

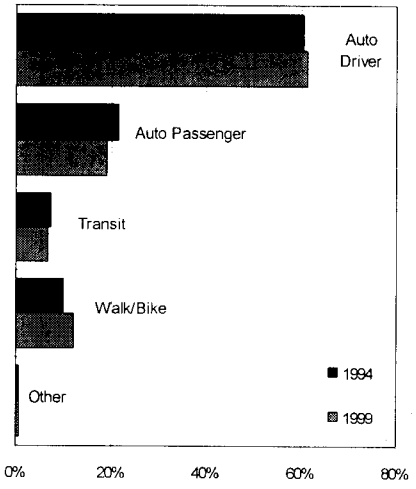
A positive statistic is the increase in walk and bike share, up from 9.9% in 1994 to 12.2% in 1999, indicating an increase in the choice of non-motorized modes of travel for recreational and social purposes.

(k) Past Trend of Automobile Reliance in Grade School Slowly Reversing

In the previous 1994/85 survey trend analysis, a highlight was the increase in automobile use in grade school trips. In 1985, just under a third of grade school trips to and from school were made in an automobile. By 1994, use of automobiles for this trip purpose rose to 48.7% - accounting for almost half of all grade school trips. In 1999, it was found that this share had dropped to 44.4% (Exhibit 13). This is still relatively high, however progressing in a positive direction.

Exhibit 12: 24-Hour Social/Personal Business Trip Modal Shares, 1994 - 1999

Mode of Travel	1994	1999	94-99 Diff.
Auto Driver	60.6%	61.3%	0.7%
Auto Passenger	21.5%	19.0%	-2.5%
Transit	7.4%	6.8%	-0.6%
WalkBike	9.9%	12.2%	2.3%
Other	0.7%	0.7%	0.0%



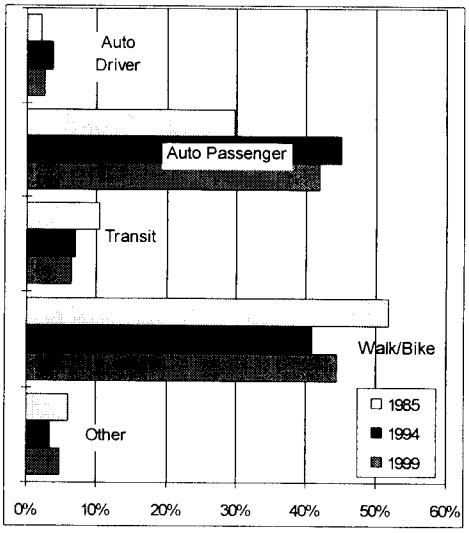
Similar to automobile use, a reverse trend was observed in grade school walk and bike modes. In 1985, over half of all grade school trips were made by walking or cycling. This dropped to 40.9% in 1994 and has increased upwards to 44.3% in 1999.

These positive trends may be an indication to the effectiveness of initiatives such as the "Way to Go" school program, which was initiated by the previous GVRD transportation planning staff (now TransLink Strategic Planning) as a result of the previous 1994/1985 trend analysis.

Transit shares in grade school trips has been declining since 1985, when transit trips accounted for 10.4% of all grade school trips. This has dropped to 7% in 1994 and even further down to 6.4% in 1999.

Exhibit 13: 24-Hour Grade School Trip Modal Shares, 1994 - 1999

Mode of Travel	1985	1994	1999	94-99 Diff.
Auto Driver	2.1%	3.7%	2.5%	-1.2%
Auto Passenger	29.7%	45.0%	41.9%	-3.1%
Transit	10.4%	7.0%	6.4%	-0.5%
WalkBike	51.8%	40.9%	44.3%	3.4%
Other	5.9%	3.4%	4.8%	1.4%



4) SUMMARY

The statistics complied from the 1999 Trip Diary survey represent the travel behaviour of GVRD residents on a typical late fall weekday. These statistics are used to monitor, plan, and administer the regional transportation system. The information is also used to analyse and update the Greater Vancouver transportation computer model which allows for the testing of various future planning scenarios.

The survey has revealed an increase in travelling throughout the region at a rate greater than that of the population growth rate, with the total number of trips just under 5.5 million per day. Trends in regional modal shares have generally held stable between 1994 and 1999, with auto driver trips accounting for almost 60% of all trips. Transit trips have held steady at 10-11% of all trips within the same period, while the share of walking and cycling has increased steadily from 12.7% to 14.3%.

Patterns for trips within the GVRD show an increase in the share of trips growing in the suburbs, with a higher increase in automobile use in most of the suburban areas, as compared to Vancouver and Burnaby/New Westminster.

Fuelled by population growth, the typical 3 hour morning and afternoon peak periods have seen a higher growth in trips. The same level of trips in 1994 is occurring approximately half an hour earlier and ending half an hour later in 1999 – an equivalent increase of 1 hour to the peak period as compared to 1994.

In terms of commuter trips, there has been a slight decline in automobile use. This decline was due in part to a steady increase in transit use, from 16.1% in 1994, to 17.3 in 1999, as well as an increase in walk/bike mode shares, from 8.4% in 1994, to 9.1% in 1999. Although the increase in transit trips in the peak periods is good news, some of this increase has been the result of the reduction of mid-day transit trips, possibly caused in part by the removal of the mid-day zone discount in October 1997.

A key indicator since the last trend analysis has been grade school trips. The auto-dependent trend observed in grade school trips between 1985 and 1994 seems to have curbed down with walking and cycling mode shares back on the rise in 1999. This may be an indication to the effectiveness of initiatives such as the "Way to Go" school program, which was initiated by the staff of this department as a result of the previous 1994/1985 trend analysis. An issue is the continued reduction of the share of transit use in grade school trips well into 1999.

As current grade school children will be the adult travellers of the future, how they travel today will greatly influence the travel behaviour of the region as a whole in the future. One of the most effective measures of producing a more efficient transportation system for the future is to educate and encourage today's children in the benefits of sustainable travel behaviour.

Appendix B
Summary, UBC Data Collection Summary Report (2001)

UBC TREK PROGRAM CENTRE
THE UNIVERSITY OF BRITISH COLUMBIA

Transportation Data Collection Summary

URBANSYSTEMS.

October 2001

Summary

As one of the commitments made in the *UBC Official Community* Plan and the *GVRD/UBC Memorandum of Understanding*, UBC has undertaken a comprehensive transportation data collection and monitoring program. The data collection program officially began in 1997 with the creation of the UBC TREK Program Centre. The data that is collected through this program is used to assess the effectiveness of the UBC TREK Program Centre in achieving its goals of reducing single-occupant and heavy truck travel to and from the University, increasing transit ridership, and implementing a U-TREK program at UBC.

In the last four years a large amount of data has amassed and the purpose of this document is to present the results of the data collection program and discuss any trends or significant changes in travel patterns at UBC.

Total Number of Person Trips at UBC

In 2000, the results of the data collection program indicated that approximately 107,000 person trips were made to and from UBC during a 24-hour period. For comparison, during the same time period 1.7 million person trips are made in the Vancouver/University Endowment Lands area, and 5.5 million person trips are made throughout the entire GVRD. Trips to and from UBC account for 2% of all trips in the GVRD.

The total number of person trips at UBC has increased by 1% between 1997 and 2000. During the same time, the population of UBC has increased 6%. This means that when the effects of growth are discounted, the number of person trips at UBC has decreased 5% since 1997.

Table A provides a summary of the number of trips at UBC by mode, in a 24-hour period.

* defined as staff, faculty and students

Table A: Total Person Trips at UBC by Mode (24hr period, 1997 vs. 2000)

	1997	2000	Change	
			Net	Growth-Adjusted
Single occupant vehicles (SOV)	46,000	47,200	3%	- 3%
High occupant vehicles (Carpools and Vanpools)	36,200	29,600	- 18%	- 22%
Transit	19,000	24,400	28%	22%
Bicycles	2,700	3,200	19%	13%
Pedestrians	1,400	1,600	12%	6%
Other	875	875	0%	- 6%
Total person trips	**106,100**	**106,775**	**1%**	**- 5%**

Significant observations regarding various travel modes include:

SOV Travel

- The total number of person trips made by SOV has grown by 3% since 1997.
- When the effects of growth in UBC's population are discounted, the number of trips made by SOV per 10,000 people at UBC has actually decreased by 3% since 1997.
- Traffic counts conducted during the first week of the transit strike (April 2001) show a 4% decrease in the number of trips made by SOV, suggesting that if given the proper incentive, commuters would be willing to shift their mode of travel from SOV.

HOV Travel

- The total number of person trips made by HOV decreased by 18% between the years 1997 and 2000.
- The corresponding increase in transit ridership suggests that many commuters have shifted their mode of travel from carpools and vanpools to public transit.
- During the first week of the transit strike in April, the number of HOV trips increased by 85%, again suggesting that commuters could be encouraged to shift modes with the proper incentives.

Transit

- The total number of person trips made by transit at UBC shows the largest change, at an increase of 28%.
- When the effects of growth in UBC's population are discounted, the number of trips made by transit per 10,000 people at UBC has increased by 21% since 1997.
- BC Transit, and subsequently TransLink, has increased their service to UBC by 30% in the same time period, indicating that transit ridership increases are driven by the available service. Current pass-ups suggest that there is still a latent demand for service to UBC.

Bicycles

- The number of trips made to and from UBC by bicycle has increased by 19% since 1997.
- The number of trips made by bicycle along University Boulevard has increased by almost 50% since 1997, mostly due to the conversion of this route from two lanes to 1 traffic lane and 1 bike lane in each direction.
- Bicycles now capture 7% of all trips made along University Boulevard.
- The bicycle mode share along University Boulevard is more than five times the average bicycle mode share for all trips to UBC.

Pedestrians

- The number of trips made daily to and from UBC by pedestrians has increased by 12%.
- Counts indicate that University Boulevard and W. 16th Avenue are the preferred routes to UBC for pedestrians. The latter is partially due to as many as 200 vehicle per day being parked on W. 16th Avenue by persons travelling to UBC, in order to avoid paying for parking on campus.

Heavy Truck Travel

- The total number of trips made in a 24hr period by heavy trucks has decreased by 20% since 1997.
- Reported decreases may be due to the varying amount of construction on the campus, and the TREK Program's efforts to encourage consolidation of truck trips.