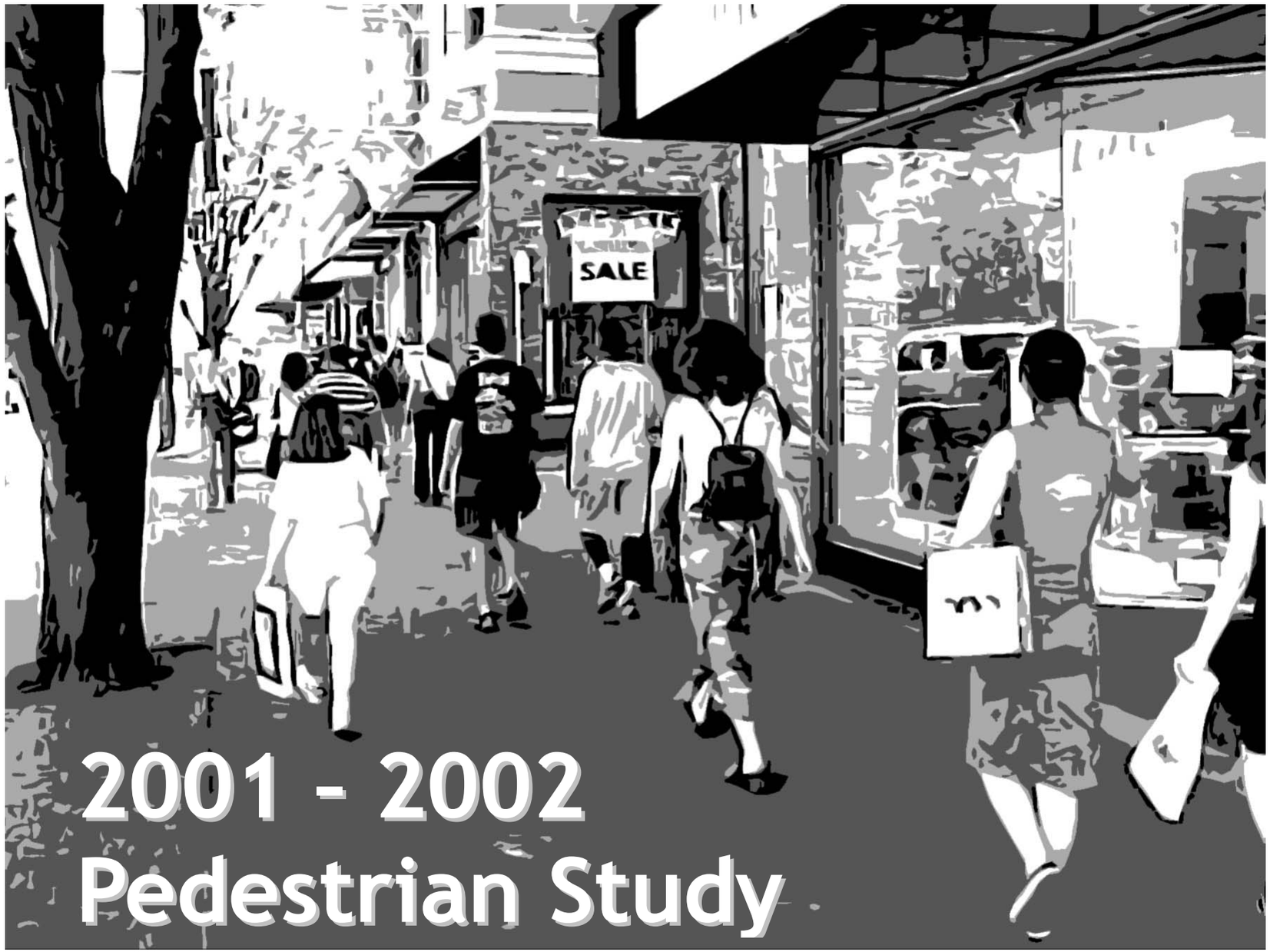

2001 - 2002 Pedestrian Study

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1. SUMMARY

The 2001/2002 Pedestrian Study counted pedestrian volumes on Vancouver's commercial streets and surveyed pedestrians on their opinions regarding pedestrian facilities. The body of this report contains analysis of the results, while the appendices contain the data that was compiled – Appendix A. provides count volume data for each block side, while Appendix B. provides data for the opinion survey.

PEDESTRIAN VOLUMES

Volume counts were carried out on downtown commercial streets that were counted in 1991, and expanded to include additional downtown streets as well as Business Improvement Areas and Neighbourhood Centres outside the downtown. A total of approximately 250 blocks (500 block sides) were counted on weekdays between the hours of 10am and 6pm. No data was collected for the hour starting at 2pm, when counting staff took their lunch break. During the count period, there were typically two peak hours for pedestrian volumes, one near noon and the other near 4pm to 5pm.

2002 counts, repeated on the downtown streets counted in 1991, showed a significant increase in pedestrian activity. On the approximately 100 blocks counted, pedestrian volume increased by over 100,000. The average annual rate of growth for 1991 to 2002, is almost triple the annual rate of growth that occurred from 1977 to 1991 (previous study period). These results help verify the 1999 Trip Diary results that were reported by TransLink earlier this year – the Trip Diary showed a significant increase in walking for Vancouver between 1994 and 1999. This suggests that Vancouver's Transportation Plan targets need to be updated, since the Trip Diary indicates that the targets for walking have already been exceeded.

Although overall volumes were up from 1991, results varied for individual blocks and Business Improvement Areas, with some increasing at rates above average, while some experienced declines. The busiest pedestrian blocks in Vancouver are still concentrated on Robson Street and Granville Mall - however, other streets such as Seymour experienced very strong growth. On several of the busiest streets downtown, the number of pedestrians exceeded the number of people being moved by automobile, in the peak pedestrian hour. In general, the busiest pedestrian streets outside downtown, had lower volumes than the busiest streets downtown. However,

several locations outside downtown still ranked highly compared to many downtown streets.

Analysis of extra counts carried out to examine variations in count data, found that Saturdays are generally busier than weekdays, and Sundays are generally less busy than weekdays. Weather effects increase the variability of volumes, and this needs to be taken into consideration when comparing results for individual blocks. Although some general conclusions can be drawn from these extra counts, more work is required to fully understand all the sources of variability.

The volume data collected, will be used by staff for a number of engineering and planning applications. A new analysis tool (Level of Service), that assesses pedestrian congestion, has been developed as part of the study.

PEDESTRIAN OPINIONS

The Opinion Survey was carried out on streets in the Central Area (Downtown and West Broadway) during week days. Approximately 1400 pedestrians were asked for information on their origins and destinations, their opinions on pedestrian facilities and concerns. Results show that 74% of pedestrians surveyed started their trips in Vancouver, including 48% who started their trips downtown. 58% of trips were business related (work, shopping or restaurants and other services) and just over 50% of pedestrians walked the entire distance. These results show that the high pedestrian volumes in the Central Area can be attributed to a combination of its high-density mixed land use, and its status as a regional commercial destination.

The results of the opinion study suggest that areas needing the most attention are crossings at unsignalized intersections, the amount of sidewalk amenities, the behaviour of drivers and cyclists, and concerns about personal security.

2. PURPOSE

This study was carried out to obtain updated information on pedestrian travel habits on commercial streets. It builds on previous Pedestrian Studies that were carried out by the City in 1973, 1977, and 1991 that counted mid-block pedestrian volumes. The 2001/2002 Pedestrian Study significantly expands the number of streets where pedestrian volumes were counted, including commercial streets in business areas and Neighbourhood Centres outside downtown.

By comparing the total volumes for all streets counted from one study year to the next, it is possible to see whether City transportation and land use polices are achieving desired results. Counts on individual blocks are used for engineering and planning applications, such as prioritizing pedestrian improvements, designing pedestrian, transit, traffic and parking facilities, as well as for reviewing view corridors and access points for new buildings. Volume counts can also be used for monitoring the results of public realm and land use initiatives by the City, and marketing efforts by businesses. The additional count locations added in 2002 will provide new benchmark data for future studies. Extra counting was done at two control locations in the downtown to examine the impacts of weather, as well as evening, weekly and monthly variations. Also included in this report are summaries of pedestrian volumes in the Downtown during the 2001 transit strike, and on recreational routes on a holiday Monday in 2002.

In addition to the counts, pedestrians were interviewed at a number of locations in the downtown and West Broadway, to determine their origins and destinations and opinions on City pedestrian facilities. The opinion survey results help provide a better idea of how pedestrians are using sidewalks and where there are opportunities to improve facilities and services.

3. BACKGROUND

Compared to other areas in the region, Vancouver, and the downtown in particular, have shown considerably higher levels of travel by walking (based on regional trip diary studies and census results). Walking activity is highest in the downtown, where high employment and residential densities, regional shopping and educational destinations, and an efficient street grid, help make walking an attractive mode. Increasing walking is a key strategy for both City and regional transportation plans, as a desired mode in itself, and because most transit tips begin and end on foot. Recent City transportation initiatives relevant to this study are summarized below.

3.1 VANCOUVER TRANSPORTATION PLAN (1997)

Key elements of the Vancouver Transportation Plan included creating pedestrian priority areas in commercial centres, providing additional facilities to improve pedestrian comfort and safety, providing a better transportation balance downtown and improving monitoring. Major Initiative NP8 states that "Pedestrian Space will be given a high priority when analyzing the impacts of roadway changes".

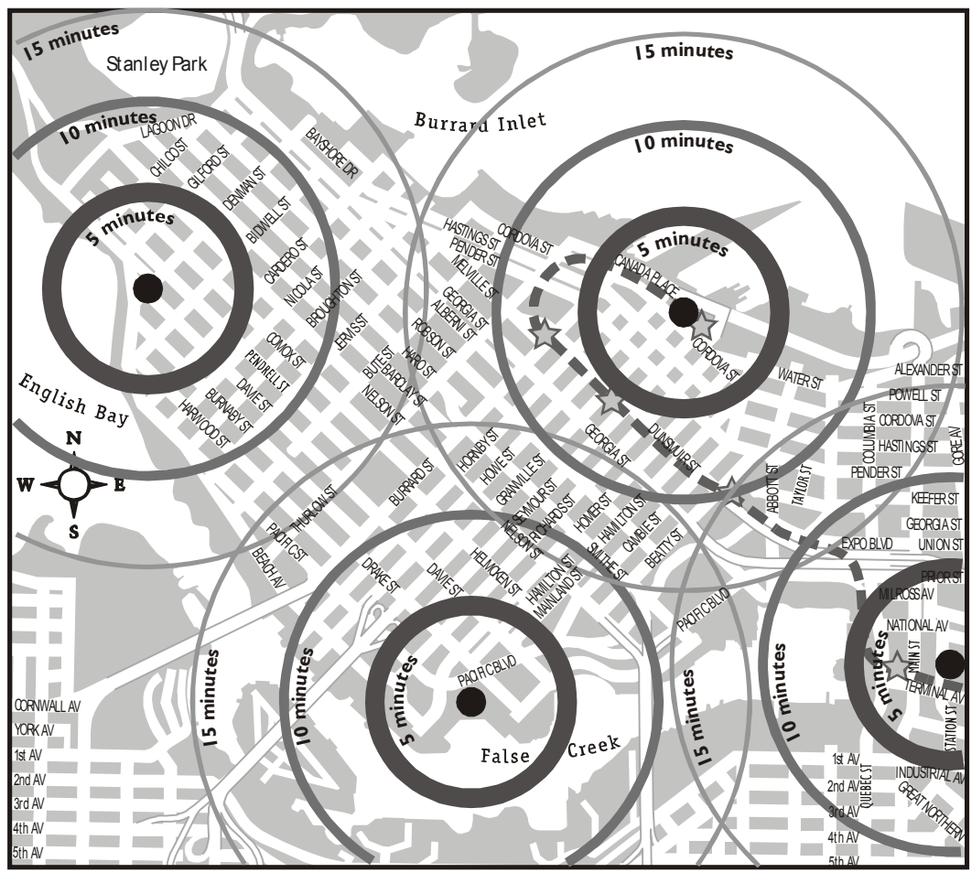
3.2 DOWNTOWN TRANSPORTATION PLAN (2002)

The recently approved Downtown Transportation Plan provides further details for the framework that was proposed in the Vancouver Transportation Plan. One of its main recommendations was to promote a walkable downtown. The main measures for accomplishing this are to:

- Recognize ceremonial streets (Burrard and Georgia) and identify streets that are high retail focus streets or special streets with historical or scenic attributes.
- Develop Granville, Carrall and Helmcken/Comox Streets as the main north-south and east-west greenway routes through the downtown peninsula.
- Establish a network of pedestrian connector routes which would receive higher priority for maintenance and amenities.
- Provide way-finding signs, curb ramps, weather protection, wider pedestrian crossings, pedestrian shortcuts through long blocks, mid-block crossings and pedestrian bulges where required.
- Eliminate pedestrian impediments such as physical barriers or pedestrian holds at traffic signals where possible.
- Improve connections to Central Waterfront, Coal Harbour Waterfront and the Vancouver Convention and Exhibition Centre.
- Widen sidewalks on Davie Street between Burrard and Jervis through future setbacks of new developments.
- Pursue a future comprehensive public realm study for the downtown.

Details on the Pedestrian Plan for downtown are contained in Section 4.3 of the Downtown Transportation Plan. Figure 1 below shows 5-10 minute walking distances from various Downtown activity centres. It illustrates how most Downtown destinations are within a relatively easy walking distance for most people.

Figure 1. - Distances for 5, 10 and 15 Minute Walks from Various Downtown Activity Centres (Source: Downtown Transportation Plan)



3.3 OTHER CITY PEDESTRIAN INITIATIVES

Some other recent City initiatives that are also aimed at benefiting pedestrians are noted below.

3.3.1. SIDEWALK TASK FORCE

City Council created the Sidewalk Task Force to address specific issues around provision of street furniture and amenities, practices for sidewalk construction and maintenance, and regulating encroachments of 'sandwich board' signage, outdoor café seating and tables that can obstruct pedestrian flow and undermine safety and comfort.

3.3.2. STREETSCAPE DESIGN GUIDELINES

A draft Streetscape Design Standards Manual proposes guidelines for sidewalk paving design and materials, street furniture, street trees and landscaping, lighting, public amenities, public signs ('way finding') and other streetscape elements within the public street right-of-way. The manual proposes a classification of streets based on their role and function within the public realm.

3.3.3. STREET FURNITURE AND AMENITIES STUDY

In 1999, the City initiated a study to explore opportunities for private sector delivery and maintenance of improved street furniture. The Downtown Transportation Plan supports the provision of increased pedestrian amenities that help to enhance the pedestrian realm with benches, public toilets, litter receptacles, bus shelters, signage for way finding, consolidates newspaper vending boxes, and which help to animate streets with kiosks and public art.

3.3.4. FALSE CREEK PEDESTRIAN AND CYCLING CROSSINGS STUDY

The City is currently investigating options for providing safe and effective pedestrian and cycling connections across False Creek. Existing facilities allow pedestrians and cyclists to cross False Creek by private ferry systems and three high-level bridges: Burrard, Granville, and Cambie. While these existing facilities are functional, enhancements to the existing False Creek crossings would improve access, increase convenience for pedestrians and cyclists, and attract new pedestrians and cyclists.

4. PEDESTRIAN VOLUMES

4.1 METHODOLOGY

To track changes in pedestrian activity, the counting carried out in 2002 followed the same general methodology used in the City's 1991 "Downtown Vancouver Pedestrian Survey". This survey consisted of counting mid-block pedestrian volumes on sidewalks on commercial streets within Downtown. Volume counts were undertaken on week days in May and June 1991. Since the focus of the study was base level pedestrian volumes, the July to August period was intentionally avoided so as to miss the peak tourist season. Counts were made on each side of the blocks, generally between the hours of 10am and 6pm (excepting 2pm to 3pm when the counting staff took their lunch break). A limited number of evening counts and extra counts for tracking monthly variations were made at two "control locations" on Robson St. and Water St. Although the majority of counting for the current study was carried out in May and June 2002, some additional counts were also carried out in September 2002. Rainfall information for each day was tabulated, so that its impact on count volumes could be considered.

Counting staff recorded counts for each pedestrian that passed an imaginary line in front of them. If pedestrians made a return trip on the same route during the count period, they would have been counted twice. Accordingly, the count volumes are not an accurate summary of the actual number of individuals that were present at a particular location. However, this method of counting overall activity, rather than individual travelers, is consistent with data collection methods used for other transportation counts, such as vehicle and bicycle volumes.

Some key differences with the 2002 count program compared to 1991 program were:

- The number of blocks counted was expanded from approximately 100 to 250; new count locations included additional downtown commercial streets, bridges across False Creek and some commercial blocks outside the downtown, in Business Improvement Areas and Neighbourhood Centres.
- More in-depth counting was carried out at control locations, including additional weekends counts.
- Direction of travel on each sidewalk was recorded (as opposed to just the total volume).
- Data on average sidewalk widths was collected for each block side.
- Additional data was collected during the transit strike in 2001, as well as from a study done by the Parks Board for recreational routes on a holiday Monday during the summer.
- Data processing was automated through the use of handheld computers (PDAs).
- Extra data collection (beyond that funded by the City) was made available to business associations, on a cost-recovery basis.

Blocks counted in 2002 are shown in Appendix A. Map 1 shows Count Locations in Business Areas and Neighbourhood Centres, while Map 2 shows Count Locations in the Downtown. A more detailed description of the methodology used will be developed as part of a technical appendix.

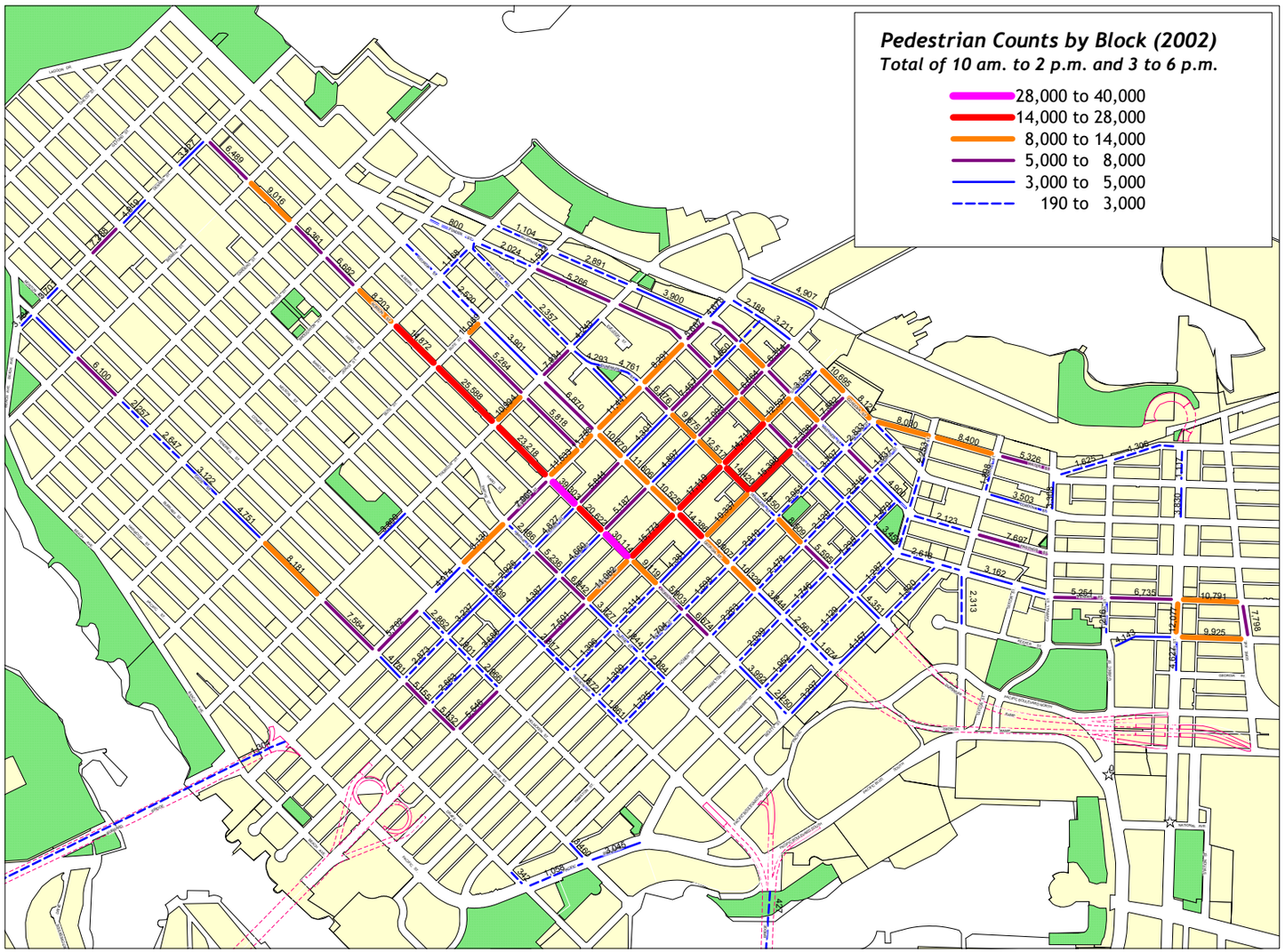
4.2 REVIEW OF RESULTS

4.2.1. DOWNTOWN

DAYTIME, MONDAY TO FRIDAY

Daytime pedestrian volumes on weekdays, during the periods of 10am to 2pm, and 3pm to 6pm, are shown in Appendix A. Section A of Appendix A provides maps showing the count locations, while the data is shown in Section B. In 1991, the total number of pedestrians counted on downtown streets during this period was about 676,000. For the same Downtown streets in 2002 (total of 101 blocks), the total was about 779,000 (an increase of about 103,000 or 15%). This works out to an annual pedestrian growth rate between 1991 and 2002 of 1.4% or about 9,400 pedestrians per year. This rate is almost triple the annual growth rate of 0.5% for the previous study period (1977 to 1991). Although the annual pedestrian growth rate has increased significantly, it is still less than the Downtown's annual population growth rate, which has been about 5% over the last 10 years. Total volumes, on a block by block basis, are summarized on Figure 2. on the following page.

Figure 2. – Summary of Downtown 2002 Pedestrian Volume, 10am to 6pm



Data from a Trip Diary Survey carried out by TransLink in 1999 showed that there had been a significant increase in pedestrian activity in Vancouver between 1994 and 1999. The Trip Diary results for Vancouver (as a whole) over 24 hours, showed walking mode share increasing from about 15% to 19%, and the number of walking trips increasing from 223,100 to 292,300. This increase in trips represents an annual average growth of 13,800 trips, between 1994 and 1999. As shown below, this rate is comparable to the Pedestrian Study Growth rate between 1991 and 2002:

TransLink Trip Diary Annual Growth Rate (24 hours, All of Downtown)	Pedestrian Study Annual Growth Rate (10am-6pm, 101 blocks)
13,800 pedestrian trips per year, 1994-1999	9,400 pedestrians per year, 1991-2002

Given the results of the Trip Diary Surveys from 1994 and 1999, there would appear to be a need to update the "Walk" targets in the City of Vancouver Transportation Plan (1997). Although the Plan calls for a target Walk plus Bike mode shares in the Downtown of 18% in 2021, the 1999 Trip Diary results showed these mode shares to already be at 21.5% (18.8% Walk and 2.7% Bike) for the entire city, and 33.2% for Downtown.

Changes Since 1991 – Individual Blocks and Business Improvement Areas (BIAs)

Although the general trend since 1991 is up, there was considerable differences between individual blocks and between business areas. For example, the largest increase, during the 7-hour count period, was 201% on Robson Street east of Howe (see Table 1. below for the 25 highest growth blocks). The largest decrease was 67% on Hastings Street east of Cambie (west 100 block). In interpreting changes on individual blocks, it is important to recognize that variations due to weather and other variables, can sometimes be greater than the recorded change in count volumes. For this reason, changes on an individual block, either up or down by less than 25%, should not be considered to be significant, unless the data for the day being compared was collected under similar weather conditions (see Section 4.2.4. - Control Locations, for further information).

Table 1. – 25 Highest Growth Blocks in Downtown

	Block	2002	1991	Change 02 to 91
1	Robson, E of Howe	30,114	10,018	201%
2	Seymour, S of Cordova	7,582	2,971	155%
3	Robson, E of Burrard	39,303	18,058	118%
4	Seymour, S of Pender	15,398	7,142	116%
5	Seymour, S of Dunsmuir	10,337	4,943	109%
6	Seymour, S of Hastings	7,338	3,510	109%
7	Dunsmuir, E of Granville	14,420	6,944	108%
8	Hastings, E of Hornby	10,799	5,345	102%
9	Pender, E of Homer	3,553	1,817	96%
10	Burrard, S of Cordova	4,678	2,487	88%
11	Hastings, E of Jervis	1,104	606	82%
12	Cordova, E of Granville	10,695	5,887	82%
13	Denman, S of Nelson	7,288	4,171	75%

	Block	2002	1991	Change 02 to 91
14	Cambie, S of Water	2,253	1,367	65%
15	Howe, S of Pender	7,093	4,310	65%
16	Pender, E of Bute	5,266	3,361	57%
17	Hornby, S of Georgia	5,844	3,806	54%
18	Robson, E of Hornby	20,622	13,512	53%
19	Pender, E of Seymour	4,991	3,424	46%
20	Hornby, S of Hastings	4,650	3,253	43%
21	Howe, S of Georgia	5,187	3,699	40%
22	Thurlow, S of Melville	7,934	5,663	40%
23	Dunsmuir, E of Howe	12,517	8,943	40%
24	Thurlow, S of Alberni	10,994	7,907	39%
25	Hastings, E of Homer	4,900	3,530	39%

Changes for BIAs in the downtown that were counted in 1991 are shown in Section E of Appendix A, and summarized below.

Chinatown BIA – down 25%

Total pedestrian volumes, recorded on 5 blocks, decreased from 48,318 in 1991 to 36,073 in 2002 (-25%).

Downtown Vancouver BIA – up 24%

Total pedestrian volumes, recorded on 72 blocks, increased from 471,541 in 1991 to 582,989 in 2002 (+24%). On Granville Mall (400 to 700 blocks of Granville), total pedestrian volumes increased from 57,888 in 1991 to 60,200 in 2002 (+4%).

Gastown BIA – up 4%

Total pedestrian volumes, recorded on 6 blocks, increased from 26,468 in 1991 to 27,659 in 2002 (+4%).

Robson BIA – up 1%

Total pedestrian volumes, recorded on 5 blocks, increased from 75,141 in 1991 to 75,789 in 2002 (+1%).

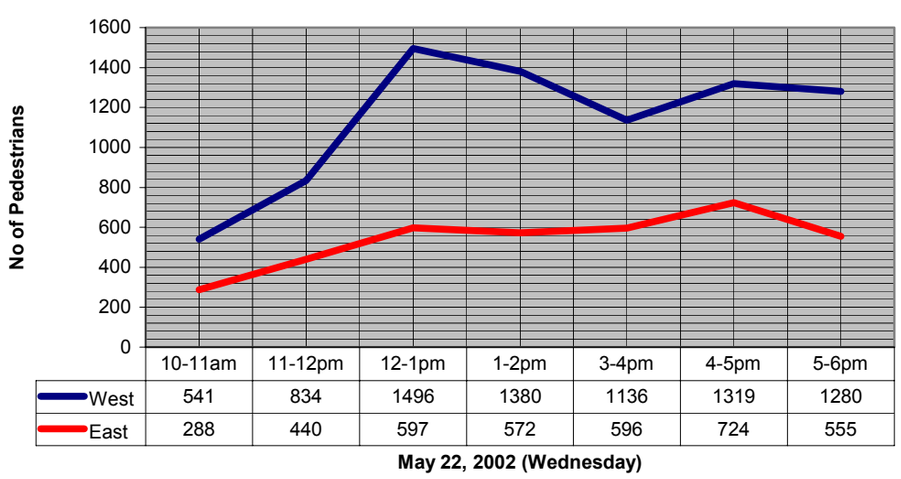
Comparisons for the Davie Village BIA and Yaletown BIA are not available at this time, since there were no counts conducted in these areas in 1991.

General Comments on Count Data

Pedestrian counts generally show two hourly peaks - one around noon and another between 4 pm and 5pm. However, there were some locations that only experienced only one of these peaks. Figure 3. on the following page shows sample graphs of a location with two peaks, and a location with just one peak. Figure 4. provides photographs which give a visual indication of what different hourly volumes look like on the street.

Figure 3. – Sample Graphs Showing Hourly Volumes, 10am-6pm

Two Peaks



Single Peak

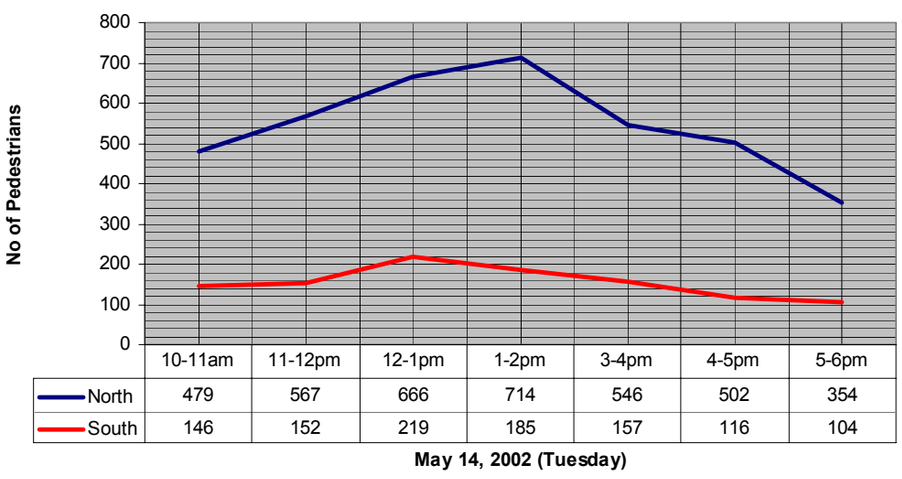


Figure 4. - Photographs of a Range of Hourly Pedestrian Volumes

500 pedestrians/hour

1000 pedestrians/hour

1500 pedestrians/hour

2000 pedestrians/hour

3000 pedestrians/hour

Although some sidewalks such as 700 and 900 blocks of Robson experienced peaks of around 6000 pedestrians per hour, these volumes were exceptionally high. More typical peak hourly volumes where in the range of 200 to 2500.

Busiest Locations

Based on volumes for each block (i.e. data from both block sides in Appendix A.), the three busiest pedestrian locations counted in 2002 were Robson Street (Jervis to Granville), Granville Mall (Hastings to Robson), and Dunsmuir Street (Howe to Seymour). The 500 block of Seymour (north of Dunsmuir at BCIT) was also one of the busiest blocks. Total counts, for the 25 busiest blocks in the Downtown (and the city) are shown in the table below:

Table 2. – 25 Busiest Blocks in Downtown

Block Rank	Total (10am-6pm)	Block	Block Rank	Total (10am-6pm)	Block
1	39,303	Robson E of Burrard (900 block)	14	12,517	Dunsmuir E of Howe (700 block)
2	30,114	Robson E of Howe (700 block)	15	12,077	Main S of Pender (500 block)
3	25,588	Robson E of Bute (1100 block)	16	11,758	Burrard S of Georgia (700 block)
4	23,218	Robson E of Thurlow (1000 block)	17	11,633	Burrard S of Alberni (750 block)
5	20,622	Robson E of Hornby (800 block)	18	11,606	Georgia E of Hornby (800W block)
6	17,119	Granville S of Dunsmuir (600 block)	19	11,441	Burrard N of Georgia (600 block)
7	15,773	Granville S of Georgia (700 block)	20	11,082	Granville S of Robson (800 block)
8	15,398	Seymour S of Pender (500 block)	21	11,069	Bute S of Alberni (700 block)
9	14,872	Robson E of Jervis (1200 block)	22	10,994	Thurlow S of Alberni (750 block)
10	14,711	Granville S of Pender (500 block)	23	10,799	Hastings E of Hornby (800W block)
11	14,420	Dunsmuir E of Granville (600 block)	24	10,791	Pender E of Main (200E block)
12	14,386	Georgia E of Granville (600W block)	25	10,695	Cordova E of Granville (600W block)
13	12,597	Granville S of Hastings (400 block)			

Looking further at a sample of these busiest locations, it can be seen in the following table the significant role that sidewalks play in moving people on these streets. This table provides a comparison of the number of people walking on the block, to the total estimated number of people traveling in vehicles, in the peak pedestrian hour. An average auto occupancy of 1.25 is assumed for calculating the number of people traveling in vehicles.

Table 3. Downtown Walking and Auto Volumes, Peak Pedestrian Hour

Block Rank	Block	Ped. Peak Hour	Walking	In Automobiles (Driver & Passengers)		Ratio - Ped /Auto
1	Robson E of Burrard	4-5 pm	7,546	1,660	(2000 data)	4.5
11	Dunsmuir E of Granville	1-2 pm	3,640	1,590	(1998 data)	2.3
12	Georgia E of Granville	1-2 pm	2,592	3,230	(1998-2001 data)	0.8
15	Main S of Pender	12-1 pm	2,222	1,380	(2001 data)	1.6
21	Bute S of Alberni	3-4 pm	2,427	340	(2000 data)	7.0

The "Ratio - Ped/Auto" column above, provides an estimate of street users who are walking compared to those using automobiles (drivers and passengers). This shows that on some downtown streets, the predominate transportation mode is walking, and that even on some major roads such as Georgia Street, a significant proportion of the street use can be attributable to walking.

With regards to volumes on individual block sides (sidewalks) that are contained in Appendix A., the sidewalk on the north side of the 900 block Robson Street was the busiest sidewalk in the City, with a count of almost 30,000 pedestrians in the seven hour period counted between 10am and 6pm. Volumes on the south sidewalk were about one-third, but still ranked very high (8th busiest in the City). Although there were many locations where the volumes on the two sides of a block varied significantly, there does not appear to be any general trend where pedestrians have a preference for one side compared to the other.

Pedestrian Flow Rates and Level of Service

In addition to volumes, Appendix A. also includes a calculation called "2002 Rate" for each block side. "2002 Rate" represents the peak hour pedestrian flow rate, in pedestrians per minute per meter. It is intended to give an indication of the maximum pedestrian volume relative to the effective width of the sidewalk (width of sidewalk that is clear of obstructions to pedestrians). The widths noted in Appendix A. already exclude the width of the corridor occupied by trees and tree grates (if present). To calculate the effective average width of the sidewalk, an additional 0.6m was deducted from the sidewalk width, to correct for the unusable sidewalk space directly adjacent to buildings. The higher the number of the flow rate, the more congested a sidewalk is. On Downtown streets, peak hour flow rates varied from a low of 0.4 on the east side of Pacific Boulevard south of Davie, to a high of 30.6 on the east side of Bute St. south of Alberni.

A method of using flow rates to determine the Level of Service (LOS) for pedestrians has been developed in the latest version of the Highway Capacity Manual published by the National Research Council (HCM 2000). The Level of Service is intended to provide a measure of the freedom to choose a walking speed and pass other pedestrians without conflicts or delays. The Manual recognizes that similar to vehicle flows, as volume and density increases, pedestrian speeds decline. An adjustment is made to reduce Level of Service criteria where platooning occurs (smooth pedestrian flow is interrupted due to influences such as traffic signals, transit stops, constrictions, etc.). The tables below, from Section 18 of HCM 2000, show Level of Service for both the average flow and platoon-adjusted criteria:

Table 4. – Pedestrian Level of Service

Average Flow LOS Criteria for Walkways and Sidewalks		
LOS	Flow Rate (ped/min/m)	Speed (m/s)
A	< or = 16.4	>1.30
B	16.4-23.0	1.27-1.30
C	23.0-32.8	1.22-1.27
D	32.8-49.2	1.14-1.22
E	49.2-75.4	0.76-1.14
F	variable	<0.76

Platoon Adjusted LOS Criteria for Walkways and Sidewalks	
LOS	Flow Rate (ped/min/m)
A	< or = 1.64
B	1.64-9.84
C	9.84-19.67
D	19.67-36.07
E	36.07-59.02
F	>59.02

For the majority of downtown streets, where pedestrian flows are constrained by traffic signals, it is felt that the Platoon Adjusted LOS Criteria would be the most applicable. There were 7 sidewalk locations (on Robson, Bute, Dunsmuir and Keefer) where flow rates during the peak hour were between 20 and 30 ped/min/m, which falls under LOS D (Platoon Adjusted). The vast majority of sidewalks counted were less congested than these locations, and operated at LOS A through C in the peak hour. These results appear to support the results of the Opinion Survey (Appendix B.), in which pedestrians expressed general satisfaction in regard to the amount of sidewalk space available for walking. It should be noted that this LOS is an average for the entire block side, and that at any locations where there were local constrictions such as newspaper vending boxes or produce displays, the LOS would be lower. Also, pedestrians may not always interpret LOS A as being desirable (street may appear too desolate), or LOS D as being undesirable (street seen as vibrant).

It is recommended that the Platoon Adjusted LOS criteria be used as a guide for monitoring the performance of sidewalks, including decisions on prioritizing and implementing public realm changes.

2001 TRANSIT STRIKE

A limited number of pedestrian counts were carried during the 2001 transit strike (April 1st to August 6th, 2001), to try and determine what impacts the strike was having on downtown pedestrian volumes. Counting on 22 blocks was carried out in May and June 2001. These results were then compared to results from 1991 for the same streets, as well as an estimate of what the counts should have been, based on the annual growth rate between 1977 and 1991 (Past Trend). As shown in the table to the right, in 2001 it was estimated that pedestrian volumes were down by 19% over what they should have been, based on the Past Trend.

Based on the actual growth rate between 1991 and 2002, the updated estimate for what the 2001 counts should have been on these streets is about 184,000, which corresponds to a drop in pedestrian volume of about 25% due to the transit strike. Additional pedestrian counts on False Creek bridges during the transit strike showed increases of 382% (Cambie Bridge) to 677% (Granville Bridge) for AM peak hour pedestrian volumes (see section below for further details). Accordingly, many Vancouver commuters found walking to downtown to be a viable alternative during the transit strike. This large increase in pedestrian activity on False Creek bridges may appear at first to be contradictory to the decreased counts for downtown streets. However, it can be explained in that while bridge use was up significantly, overall there were fewer people traveling to downtown during the transit strike, and some of those who did go downtown likely spent less time there than normal, due to inconveniences experienced such as longer commute times and difficulties in accessing busy alternative transportation services (e.g. taxis, West Vancouver Blue Bus, etc.).

Table 5. - Downtown Volumes During 2001 Transit Strike
(Totals,10am-2pm and 3pm-6pm)

				2001 vs. 1991		2001 vs. 2001 Past Trend	
Street	location	Blk	1991 Total	2001 Total Counted	% Change Counted	2001 Total Past Trend	% Change Past Trend
Alberni	E of Bute	1100W	5,858	5,059	-14%	6,209	-19%
Burrard	S of Pender	500	8,147	7,023	-14%	8,636	-19%
Cordova	E of Seymour	500W	6,180	7,446	20%	6,551	14%
Denman	S of Barclay	900	4,018	6,624	65%	4,259	56%
Dunsmuir	E of Seymour	500W	8,186	5,917	-28%	8,677	-32%
Dunsmuir	E of Granville	600W	6,944	7,688	11%	7,361	4%
Granville	S of Pender	500	16,134	9,649	-40%	17,102	-44%
Hastings	E of Abbott	00W	6,972	4,751	-32%	7,390	-36%
Hastings	E of Seymour	500W	5,468	6,100	12%	5,796	5%
Hastings	E of Bute	1100W	2,115	3,002	42%	2,242	34%
Hornby	S of Pender	500	6,308	5,427	-14%	6,686	-19%
Howe	S of Pender	500	4,310	7,577	76%	4,569	66%
Main	S of Hastings	400	16,210	8,257	-49%	17,183	-52%
Melville	E of Bute	1100W	2,543	2,660	5%	2,696	-1%
Pender	E of Columbia	100E	9,145	6,102	-33%	9,694	-37%
Pender	E of Seymour	500W	3,424	4,916	44%	3,629	35%
Pender	E of Bute	1100W	3,361	4,607	37%	3,563	29%
Robson	E of Bute	1100W	27,188	19,496	-28%	28,819	-32%
Seymour	S of Pender	500	7,142	8,149	14%	7,571	8%
Thurlow	S of Pender	500	2,929	3,298	13%	3,105	6%
Water	E of Abbott	00W	8,539	4,784	-44%	9,051	-47%
	Total		161,121	138,532	-14%	170,788	-19%

4.2.2. FALSE CREEK BRIDGES

The table below shows the results of some additional data that was collected for the False Creek Pedestrian and Cyclist Crossing Study, compared to data collected in 1996. All counts were done on sunny weekdays. Although peak hourly pedestrian volumes on the bridges are lower than on many downtown streets, the rate of increase over the last 5 years has been significant. For example, daily volumes (7am to 6pm) increased between 28% and 41% across False Creek Bridges between 1996 and 2001/2002. When comparing the count data for the bridges to other locations, it should also be kept in mind that sidewalks on the Burrard and Cambie bridges play a different role in that they are shared with cyclists. The Transit Strike data gives an indication of what the potential latent demand could be for pedestrians on the bridge crossings (i.e. how many pedestrians might use the bridges if walking was made more attractive).

Table 6. – Pedestrian Counts on False Creek Bridges

		1996 May	2001 October	2002 June	Average % Growth (1996 vs. 2001/2002)	Transit Strike	% Growth Strike
Burrard Bridge							
AM Peak Hour	7:45 to 8:45 AM	115	190	155	50%	880	665%
PM Peak Hour	5:00 to 6:00 PM	220	265	295	27%	925	320%
Daily Total (11 hours)	7:00 AM to 6:00 PM	1190	1583	1765	41%	n/a	
Granville Bridge							
AM Peak Hour	7:45 to 8:45 AM	65	120	115	81%	505	677%
PM Peak Hour	5:00 to 6:00 PM	120	215	205	75%	560	367%
Daily Total (11 hours)	7:00 AM to 6:00 PM	794	1141	1168	45%	n/a	
Cambie Bridge							
AM Peak Hour	7:45 to 8:45 AM	120	200	*200**	67%	578	382%
PM Peak Hour	5:00 to 6:00 PM	205	295	280	40%	640	212%
Daily Total (11 hours)	7:00 AM to 6:00 PM	1186	1495	1552	28%	n/a	

* June 2002 data for Cambie Bridge was incomplete from 7:00 to 10:00 AM ; same data as for October 2001 assumed

Two additional counts were carried out on a holiday Monday in August 2002 (BC Day) for the Burrard and Cambie Street Bridges, to examine the recreational demands. These results, along with data collected by the Park Board on other recreational routes, are reviewed in Section 4.2.5.

4.2.3. LOCATIONS OUTSIDE DOWNTOWN

Busiest Locations, Total Volumes

Locations counted outside of Downtown Vancouver in 2002 are shown in Map 1 of Appendix A. Additional counts, on the 2100 to 3100 blocks of Granville Street, were funded by the South Granville BIA. Since there were no counts done outside of the Downtown in previous studies, there is no data available at this time to examine general trends. Regarding the results for individual blocks, both peak hour volumes and total volumes from 10am to 6pm, were lower on the busiest streets outside Downtown compared to the busiest locations Downtown. However, as shown in the rankings in Appendix A., there were a number of streets outside Downtown that were busier than many Downtown streets. Total counts, for the 10 busiest blocks outside Downtown are shown in the table below.

Table 7. – 10 Busiest Blocks Outside Downtown

Block Rank	Total (10am-6pm)	Block	Area	Block Rank	Total (10am-6pm)	Block	Area
1	7,839	Commercial, S. of Broadway	Cedar Cottage NC	6	5,880	Granville, S. of 10th	S. Granville BIA
2	7,724	Broadway, E. of Laurel	Cent. Broadway NC	7	5,546	Kingsway, E. of Joyce	Collingwood BIA
3	6,671	Granville, S. of Broadway	S. Granville BIA	8	5,271	Commercial, S. of 8th	Cedar Cottage NC
4	6,666	Broadway, E. of Oak	Cent. Broadway NC	9	5,199	Granville, S. of 11th	S. Granville BIA
5	6,491	Broadway, E. of Granville	Cent. Broadway NC	10	4,897	Granville, S. of 13th	S. Granville BIA

As can be seen from the list, the majority of busiest locations were located on or near Broadway, which reflects the higher densities along this corridor, and the important role it plays for public transit (98 B-Line and Skytrain Station at Broadway and Commercial). Blocks which were also busy, but did not make the list of 10 busiest, included 41st, E. of Yew (Kerrisdale BIA), Granville S. of 12th (S. Granville BIA), Victoria S. of 42nd (Victoria/Fraserview Neighbourhood Centre), Broadway E. of Commercial (Cedar Cottage Neighbourhood Centre), and Fraser S. of 46th (Fraser St. BIA).

Table 8. - Outside Downtown Walking and Auto Volumes, Peak Pedestrian Hour

Block Rank	Block	Ped. Peak Hour	Walking	In Automobiles (Driver & Passengers)	Ratio - Ped /Auto
1	Commercial, S. of Broadway	4-5pm	1,389	1,946 (1996 data)	0.7
5	Broadway, E. of Granville	1-2pm	1,302	2,426 (1999-2000 data)	0.5
9	Granville, S. of 11th	1-2pm	930	2,403 (1999 data)	0.4

The above data shows that while on some of the busiest pedestrian locations outside Downtown, pedestrians can make up a significant portion of the street users, they do not overtake the automobile mode the way some of the busiest pedestrian streets in the Downtown do.

Pedestrian Flow Rates and Level of Service

Pedestrian flow rates and Level of Service were described in detail in the earlier section on Downtown count results. The busiest locations noted above had peak hour flow rates in the range of 4-9 pedestrians per minute per meter of sidewalk, which falls under Level of Service B (Platoon Adjusted Criteria). Accordingly, locations outside Downtown are also less congested than the busiest locations Downtown.

4.2.4. CONTROL LOCATIONS

The 800 block of Robson Street and West 100 block of Water Street were chosen as control locations, where about 50 additional counts were carried out to try and gain a better understanding of variation by day of week, by month, and due to weather. As well, some additional counting was done to examine volumes in the evening period of 6pm to 9pm. Data for the control locations is tabulated in Section C of Appendix A. In addition, the South Granville BIA funded some extra counts on weekdays and Saturdays for blocks in their area (Section D of Appendix A).

Daily and Weather Variations

Information in Appendix A includes a calculation of a count's percentage deviation from the average of the counts for weekdays in that month ("Dev From 10-6 Avg"). The percentage deviation from weekday averages are summarized in Tables 9. and 10. below.

Table 9. - Deviations from Average, 800 Robson

MAY					JUNE							JULY						
MON	TUES	WED	THUR	FRI	MON	TUES	WED	THUR	FRI	SAT	SUN	MON	TUES	WED	THUR	FRI	SAT	SUN
-4%	-7%	-8%	-13%	+4%	-27%	+2%	-6%	+9%	+23%	+8%	-32%	+25%	+16%		-21%	-8%	+41%	+7%
-19%	-19%	-14%	+71%	+13%						-18%	-33%							
-5%																		
Adjusted For Weather																		
1%	-2%	-2%	-8%	+10%	-4%	-12%	+2%	+15%	+1%	-37%		+21%	+12%		-22%	-11%	36%	3%
									-23%	-37%								

The last row in the table above only includes data for days in which there was no rain. It also excludes a 71% increase (Thursday) which occurred on the first rain free day, after several successive days of rain. This spike may have been the result of latent demand, where pedestrians decided to make up for deferred trips on the first day of good weather.

Table 10. – Deviations from Average, 100 Water

MAY			JUNE							JULY							SEPTEMBER						
TUES	WED	FRI	MON	TUES	WED	THUR	FRI	SAT	SUN	MON	TUES	WED	THUR	FRI	SAT	SUN	MON	TUES	WED	THUR	FRI	SAT	SUN
-12%	+45%	-33%	-1%	-5%	-4%	+2%	+9%	+34%	-14%	-3%	-12%	+8%	-3%	+9%	+13%	-30%	+13%	-9%	-1%	-2%	-1%	+26%	-12%
Adjusted For Weather																							
			-1%	-5%	-4%	+2%	+9%	+34%	-14%	-3%	-12%	+8%	-3%	+9%	+13%	-30%		-6%	+3%		+3%	+31%	-9%

The last row in the table above excludes days when it rained, including the 45% increase that occurred on the Wednesday in May. This increase might be explained by the fact that although it rained that day, there was no rain during the 10am to 6pm period that was counted. Similar to what may have happened on Robson Street after several days of rain, higher volumes may have been induced in the 10 am to 6 pm period, if pedestrians modified their plans to avoid forecast rain.

Additional data for the South Granville BIA (2100-3100 blocks of Granville St.) is shown in Table 11. below. Unlike the data for the control locations, which involved counting the same two blocks on a number of different days, this data involved counting a number of blocks, once on a weekday and once on a Saturday, during the same week. The percentage change for volumes on the Saturday, are compared to the volumes on the weekday.

Table 11. - Deviations for Saturday Compared to Weekday, South Granville (2100-3100 blocks)

JUNE							JULY	SEPTEMBER			
+37%	+36%	+20%	+14%	+45%	+125%	+35%	-24%	+18%	+53%	+52%	-67%

Some preliminary conclusions, based on the data summarized in Tables 9.- 11., are as follows:

- Although rainy weather is generally believed to reduce volumes, there was no clear trend based on the Control Location samples that were taken. It appears that weather increases variability in volumes, with average deviations in the order of +/- 25% on individual blocks when weather is not screened out. Part of the difficulty in analyzing the weather impacts is not knowing whether the differences were from other influences such as construction activities or sporadic pedestrian generators (unloading tour buses/cruise ships, sports/cultural events, conventions, sales or promotion events at individual businesses, etc.).
- When weather impacts are removed, the average deviation in weekday counts in May, June and September is in the order of +/- 10%, with Fridays usually being slightly busier than other weekdays
- Week day variability increases in July, when there are increases driven by tourism at the same time that there are decreases due to downtown residents and employees taking vacations.
- In general, Saturday volumes are higher than the average weekday volumes, while volumes on Sundays are less busy.

It is recommended that when comparing changes on individual blocks and rankings between blocks, changes in volumes of +/- 25% or less should not be considered to be significant, because of weather and random variations. Comparison of data for groups of blocks will be less variable, since variations would be averaged out.

For the next Pedestrian Study it is recommended that Control Data collection be expanded to provide for a more thorough analysis of weekday and weather variations. For the 25 busiest locations in 2002, it is suggested that Saturday counts be carried out to ensure that the peak hour pedestrian flows for those blocks have been determined. It would also be helpful to include a specific question in the next Opinion Survey, on what influences pedestrian's choices to schedule or postpone a walking trip.

Monthly Variations

For the two control locations, the weekday volumes (10am-6pm) for the months of May, June, July and September, and the percent variation from the average for all 4 months, are noted in the following table.

Table 12. – Deviation of Monthly Volumes Compared to Average Volumes for All Months

	MAY	JUNE	JULY	SEPTEMBER	AVERAGE, ALL MONTHS
800 Robson	19,393 (-10%)	22,915 (+7%)	22,023 (+3%)	N/A	21,444
100W Water	8,832 (-3%)	8,901 (-2%)	10,999 (+21%)	7,634 (-16%)	9,092
Both	28,225 (-9%)	31,816 (+3%)	33,022 (+7%)	N/A	31,021

Based on this small sample, it appears that July volumes are slightly higher than those taken during the regular counting months (primarily May, June, and September). It also appears that September volumes may be somewhat lower than May and June, although further data collection would be required to confirm this. It is recommended that in the next Pedestrian Study, that additional data collection be considered, to gain a better understanding of monthly variations.

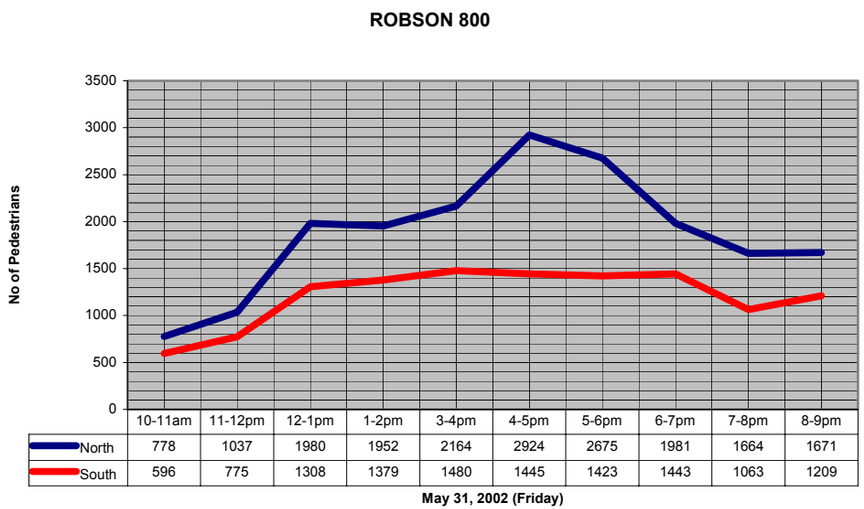
Evening Volumes

A limited number of evening counts, for a three-hour period from 6 pm to 9pm, were carried out in May on Robson Street and in June on Water Street. The table below provides a summary of the evening data, including a comparison of the volumes in the three-hour period from 10am - 1pm (morning / noon hour). For Robson Street, evening volumes were heavier than volumes in the morning / noon hour period. For Water St., the evening volumes were slightly lower.

Table 13. – Evening Counts Comparison, Robson and Water

	10am-6pm (7 hours)	10am - 1pm Total	6pm - 9m Total	Difference Morning/Noon vs. Evening
Robson (May)	19,393	5,760	8,349	- 2,589
Water (June)	8,901	3,388	2,505	+ 883
Both	28,294	9,148	10,854	-1,706

Figure 5. – Sample Graph Showing Hourly Volumes, 10am-9pm



Although the above graph represents the most common results for days when evening counts were carried out on Robson Street, there were several counts that also showed daily peak volumes occurring between 6pm and 8pm. Further study is needed to determine whether these evening peaks only occur seasonally, when the hours of daylight are longer, or whether they occur year round. Based on the above data, it is expected that evening volumes will vary considerably from block to block on commercial streets, depending on the type and intensity of land use on them. For example, blocks in the entertainment district might be expected to have high evening counts when movies or concerts finish and pedestrians fill the street.

4.2.5. RECREATIONAL ROUTES

For a holiday Monday in August 2002 (BC Day), the Park Board in consultation with Engineering Services, arranged for counts to be made on a number of recreational routes in Vancouver. Engineering staff compiled extra counts that day on the Burrard and Cambie bridges, and Seaside Walk east of Spyglass Place, to see how their use compared. The results are summarized in the table below, including data for two of the busiest recreational routes in parks.

Table 14. – Pedestrian Volumes on Holiday Monday – False Creek Bridges and Recreational Routes

Location	Peak Hour	Peak Hour Count	Total, 10am-6pm Time
Burrard Bridge	248	4-5pm	1,304*
Cambie Bridge	74	4-5pm	427*
Seaside Walk, E of Spyglass	228	5-6pm	767*
Stanley Park Seawall @ Devonian Harbour*	718	1:30-2:30pm	3,707
Stanley Park Seawall @ English Bay*	1174	2:30-3:30pm	6,176

* Estimate for 8 hour period (estimated volumes between 2pm and 3pm included)

The Stanley Park seawall at the English Bay entrance was the busiest location counted by the Park Board. Although pedestrian use of the seawall is high, volumes were not as large as those recorded on the busiest Downtown commercial streets on weekdays. For example, the 10 am to 6pm count for the Seawall at English Bay is comparable to weekday count for the 36th busiest sidewalk on a commercial street (East side of Granville, South of Hastings).

5. OPINION SURVEY

Results of the Opinion Survey are contained in Appendix B, including tables and graphs showing the results for each question.

5.1 METHODOLOGY

A total of about 1400 pedestrians were surveyed on various streets in the central area of Vancouver (downtown and West Broadway). The surveys took place during the weekdays in November 2001 and July 2002, between 9am and 6pm. Pedestrians were asked to provide information on their origins and destinations, trip purpose, travel modes used, route choice and their opinions on sidewalk and crossing issues. They were also given the opportunity to state any specific additional concerns they had about walking conditions. More detailed documentation of the method used will be contained in a technical appendix to this report.

5.2 REVIEW OF RESULTS

5.2.1. Origins and Destinations

The main purpose of this question was to determine where pedestrians on Vancouver's busiest streets were from, and where they were going. For example, were the majority of pedestrians local people walking in their neighbourhood, or were they people from other municipalities who had started their journey by another mode such as transit or driving? Results showed that 74% of those interviewed started their trip within Vancouver, and 90% had Vancouver as their destination. For those starting or ending their trips within Vancouver, 65% started their trip Downtown and 84% had Downtown as their destination. Overall, 48% of pedestrians surveyed started their trip Downtown.

5.2.2. Purpose of Trip

When asked the purpose of the trip that they were making, the five highest responses were:

#1- Work (29.1%), #2 - Shopping (17.3%), #3 - Restaurants and other services (11.8%), #4 - Recreation (11.6%) and #5 - Visiting or socializing (9.3%).

The top three responses all related to commerce and account for a majority of pedestrian activity (58%). Combined with the results from the question above, this helps confirm that the high pedestrian volumes Downtown are influenced by not just its status as a regional business destination, but also because of the location of jobs and services close to where people live (i.e. high density residential neighbourhoods located close to the central business district).

5.2.3. Mode of Travel

When responses were corrected for interviews conducted at transit stops (to provide a more random sampling), it was found that just over half the respondents (50.6%) walked the entire distance. The next highest modes were drove vehicle and walked (19.8%) and took transit and walked (10.5% - bus and 8.3% - other transit). This result also supports the importance of coordinating land use with transportation (i.e. the high density mixed land uses Downtown and along West Broadway make walking the most viable mode for many people).

5.2.4. Route Choice

In answer to the question about why they chose the route they were currently on, the majority of pedestrians (59.9%) responded that it was due to that route being the most direct or shortest. The next most frequent answers were it was a pleasant environment (14.1%) and provided access to shops and services (11.9%).

5.2.5 Opinions

A total of seven questions were asked, where pedestrians were asked to rate their satisfaction with various aspects of the sidewalk and street crossing environment. Although pedestrian were generally satisfied with crossing conditions at signalized crosswalks, they expressed greater concerns over conditions at marked crossings where there were no signals (27.1% rated as poor or very poor). Pedestrians were generally satisfied with the amount of space on sidewalks and their quality of maintenance, but were less satisfied with the amount of pedestrian amenities provided (24.5% rated as poor or very poor). The behavior of drivers and cyclists was also rated as being a more significant concern (29.6% poor or very poor for drivers, and 25% poor or very poor for cyclists).

5.2.6. Specific Concerns

By far the largest response to the open-ended question on specific concerns (22.2.% of responses) related to people pedestrians felt were threatening (e.g. panhandlers, homeless, etc.). Due to the high number of responses, it is recommended that the next Opinion Study include a specific opinion question on this topic. This concern was also highlighted in the Downtown Vancouver Business Improvement Association (DVBIA) 2002 membership survey, in which 38% of respondents rated "Panhandlers and street people" as the most serious challenge downtown. The next highest rated serious challenges in the DVBIA survey results were "Crime" (22%) and "Traffic" (18%). Generally, other Pedestrian Opinion Survey concerns were consistent with the concerns identified in responses to the Survey's opinion questions.

The specific concerns mentioned, were classified into four categories – Behaviour, Infrastructure, Maintenance/Operations and Multiple (combination of all three previous categories). About 38% of the concerns fell under the Behaviour category, and 12.3 % fell under the Multiple category. This indicates that although many concerns could be addressed by examining solutions related to pedestrian infrastructure and its maintenance, solutions such as addressing social problems and educating cyclists and drivers, are also important for improving the pedestrian environment.

6. ANNUAL INTERSECTION VOLUMES

Since 1995, pedestrian volume data at intersections has been collected as part of the City's annual manual count program. For main intersections throughout the city, the number of pedestrians, cyclists and vehicles are counted. About 200 intersections are counted annually, in the morning and afternoon rush periods (7am-9am and 3:30pm to 5:30pm) on weekdays, between May and October. Pedestrian movements are counted by providing the total number of pedestrians in each crosswalk of the intersection. During the last year, improvements made to the computer program for data has included the ability to summarize just the pedestrian data, either alphabetically by location or by volumes. A sample from the 2001 database is shown in the table below.

Table 15. – Sample of 2001 Pedestrian Volume Counts, Manual Counts Program

BUTE AND ROBSON (118602)		**Weather:**					
2001/07/30	07:00	Clear	**Crosswalk**				
	15:30	Clear					
			East	**North**	**South**	**West**	**Total**
	Maximum Hour	AM (07:55 - 08:55)	599	453	414	200	1,666
		PM (16:25 - 17:25)	1,192	1,515	1,752	805	5,264
		Total	**1,791**	**1,968**	**2,166**	**1,005**	**6,930**
	2 Hour	AM	923	692	617	315	2,547
		PM	2,216	3,215	3,275	1,391	10,097
		Total	**3,139**	**3,907**	**3,892**	**1,706**	**12,644**

In general, the locations of the busiest crosswalks correspond to the same locations that have been identified in the 2001/2002 Pedestrian Study. The Manual Counts data from various locations in commercial areas shows volumes in the morning rush period being consistently lower than the afternoon rush periods. This helps confirm that the data collection period in the 2002 Pedestrian Study (10am to 6pm) captured the period of highest pedestrian activity.

One limitation of the Manual Counts data is that it does not count pedestrians who turn corners at the cross street without crossing the intersection. Another limitation is that it is difficult to use for comparing trends, since fewer Manual Counts were collected before 2000, and the data collection period includes July and August (higher tourism volumes and variability). However, as more data is collected in the future, it should be possible to provide some analysis of trends. Also, with further analysis, it may be possible to use the intersection counts to estimate changes in mid-block counts, in between the years that the Pedestrian Study is carried out.

7. CONCLUSIONS

Following are the main conclusions coming out of the analysis of the volume counts and opinion surveys collected for the 2001/2002 Pedestrian Study:

A. Since 1991, there has been a significant growth in pedestrian volumes during weekdays (10am to 6pm, excluding the hour between 2pm and 3pm) on Downtown commercial streets. For the same blocks counted in 1991 (total of 101 blocks), there were an additional 103,000 pedestrians counted in 2002. The annual rate of pedestrian growth on downtown commercial streets between 1991 and 2002 was almost three times the rate between 1977 and 1991. Although overall pedestrian traffic increased, volumes on individual sidewalks and within Business Improvement Areas, experienced both higher than average growth and declines. Robson Street (between Jervis and Granville), and Granville Mall (between Hastings and Robson), continued to be the busiest pedestrian corridors in the downtown (and the city). However, there was also strong growth on other corridors such as Seymour and West Hastings.

B. In comparing peak hour pedestrian volumes to the volume of people in automobiles, it was found that for the busiest Downtown pedestrian streets, it was not unusual for the number of people walking to exceed the number of people traveling by automobile.

C. The increases in pedestrian volumes found in the Pedestrian Study are consistent with the results of the 1999 TransLink Trip Diary Survey, reported to Council for information earlier this year. With this collaboration of the Trip Diary results, it will be necessary to update the Walk and Bike mode targets in the City's 1997 Transportation Plan, since the mode shares in the Trip Diary results for 1999 already exceed the Plan's targets for Downtown in 2021.

D. When 2002 maximum hourly flow rates for pedestrians were calculated, and compared to Level of Service (LOS) criteria in the 2000 Highway Capacity Manual, the majority of sidewalks were found to be operating at LOS C or better, and only 7 sidewalks were operating at LOS D. These results appear to be consistent with the Opinion Survey results, which indicated general satisfaction with the amount of sidewalk space (see Conclusions I. and J. below, for further comments on the Opinion Survey).

E. Pedestrian counts on False Creek Bridges showed that although volumes were not as high as many Downtown commercial streets, there has been a high rate of growth in pedestrian volumes since 1996.

F. Many commercial streets outside downtown (counted for the first time in 2002) carried significant pedestrian volumes, although they were lower than the volumes on the busiest downtown streets. The busiest pedestrian corridors outside downtown were West Broadway, South Granville (south of Broadway) and Commercial (near Commercial Skytrain Station).

G. Although a number of extra counts were carried out to try and determine impacts on count volume due to weather, the day of the week, and month of the year, there was not a sufficient number of samples to draw firm conclusions. Although pedestrian volumes were generally lower on rainy days, there were some counts that showed higher than average volumes on rainy days. There was some evidence that pedestrian volumes may surge upwards on dry days, either immediately before or immediately after periods of rain. In general, volumes from Monday to Friday were relatively similar, with Saturdays being busier, and Sundays being less busy. Also, volumes in July were slightly higher than volumes in May, June or September – it appears variability may be higher in July, possibly due to off-setting influences of increased tourism versus local people taking vacations.

H. Extra counts carried out in the evening period of 6pm-9pm, showed that evening volumes varied depending on the use of the street. Robson Street was busier in the evening period compared to the first three hours counted (10am-1pm). However, Water St. was less busy during the evening period. Pedestrian data from the City's manual intersection counts program showed that in general, pedestrian volumes on commercial streets in the afternoon (3:30pm-5:30pm), were higher than in the morning (7am-9am).

I. Data collected as part of the study's Opinion Survey for the Central Area (Downtown and West Broadway), showed that a majority of pedestrians surveyed (74%) had their trip origins in Vancouver, almost 50% had trip origins in Downtown, and just over half walked the entire distance for their trip. Accordingly, this data supports that the high pedestrian volumes observed in the Downtown and West Broadway areas are atttributable to both City policies supporting mixed high-density land use, and the area's role a regional business and employment destination.

J. Reponses in the Opinion Survey, regarding pedestrian satisfaction with various aspects of the sidewalk and street crossing environment, indicated general satisfaction with crossing conditions at signalized crosswalks, the amount of sidewalk space, and sidewalk maintenance. There was less satisfaction with crossing conditions at unsignalized intersections, the amount of sidewalk amenities, and the behavior of both drivers and cyclists. In an open-ended question regarding specific concerns, the largest response was concern about people who were perceived to be threatening (pan handlers, street people, etc.).