UBC Social Ecological Economic Development Studies (SEEDS) Student Report

MAIN MALL WALK-BIKE STUDY

Noah Rosen
University of British Columbia

GEOG 447
DECEMBER 2011

NOTE: This document has been scanned to reduce its size. If you would like an original, please contact UBC Campus Sustainability Office.

Disclaimer: *"UBC SEEDS provides students with the opportunity to share the findings of their studies, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this is a student project/report and is not an official document of UBC. Furthermore readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Coordinator about the current status of the subject matter of a project/report".*

MAIN MALL

WALK-BIKE STUDY

Noah Rosen
Department of Geography
University of British Columbia
December 2011

Core Recommendations

- A bicycle path on Main Mall in place of the existing sidewalk on the Mall's east side—Figures 5-7
- A series of small pocket parks along Main Mall, south of University Boulevard—Figures 8-10
- Benches, tables, and moveable chairs lining the Mall

Thanks to:

Kay Teschke, Adam Cooper, Brenda Sawada, Gerry McGeough,

Dean Gregory, Angie Weddell, and Ian McKendry

Table of Contents

Abstract

The University of British Columbia (UBC) Public Realm Plan for the Vancouver Campus defines the public realm as "the collection of outdoor spaces between buildings shared by the university community."[1] It allows for the "movement of people, information and ideas."[2] An assessment of UBC's public realm revealed the campus' "bleak"[3] landscape. As such, the University allocated $10 million to redesign Main Mall. September 2011 marked the completion of first stage of the redesign of Main Mall, from University Blvd (U Blvd) to Agronomy Road (Figure 1). This study, consisting of an intercept survey of users of Main Mall and randomized traffic counts on the space, evaluates the effects of the redesign on user experience and bicycle-pedestrian interaction. A discussion of the results and treatment of similar university spaces leads to concrete recommendations that will transform Main Mall into a safe and efficient transportation corridor for all users *and* a vibrant public space.

[1] "UBC Public Realm Plan for the Vancouver Campus", Campus and Community Planning, May 2009, 4.
[2] "Public Realm Plan", 4.
[3] "Public Realm Plan," 5.

1.0 Introduction

The University of British Columbia's Public Realm Plan for the Vancouver Campus[4] defines the public realm as "the collection of outdoor spaces between buildings shared by the university community."[5] It allows for the "movement of people, information and ideas."[6] UBC Campus and Community Planning (C+CP) studies found the campus public realm in disrepair.[7] C+CP produced the plan to rebuild UBC public spaces to create a memorable and sustainable campus that reflects UBC's ranking as a top-40 academic institution.

The plan identifies Main Mall, along with University Boulevard (U Blvd.), as an "organizing spine…[the] symbolic centre of campus".[8] As such, Main Mall receives top priority, both in terms of completion date—a 'Phase 1 Project'—and dollars spent—$9.4 million, 25% of the entire Public Realm Plan budget of $37.5 million.[9] Ten million dollars is a lot to spend on just over one kilometre. We need to know if the design works.

September 2011 marked the completion of first stage of the redesign of Main Mall, from U Blvd. to Agronomy Road (Figure 1). The simultaneous existence of the 'new' and 'old' sections of Main Mall allows for evaluation of the redesign by comparing user experience on the 'old' south section of Main Mall to that on the redesigned north section. The study considers cycling on Main Mall for several reasons: the potential for conflict between pedestrians and cyclists on the shared space of Main Mall, its popularity as a transportation alternative, its potential as a sustainable transportation alternative, and the potential for increased ridership should the UBC Bike Share program be implemented.[10]

In an ideal situation, the study would have employed a pre-post format, surveying users before and after the redesign of the north section of Main Mall. This would allow for more confident conclusions with regard to the effects of the redesign of Main Mall.

---

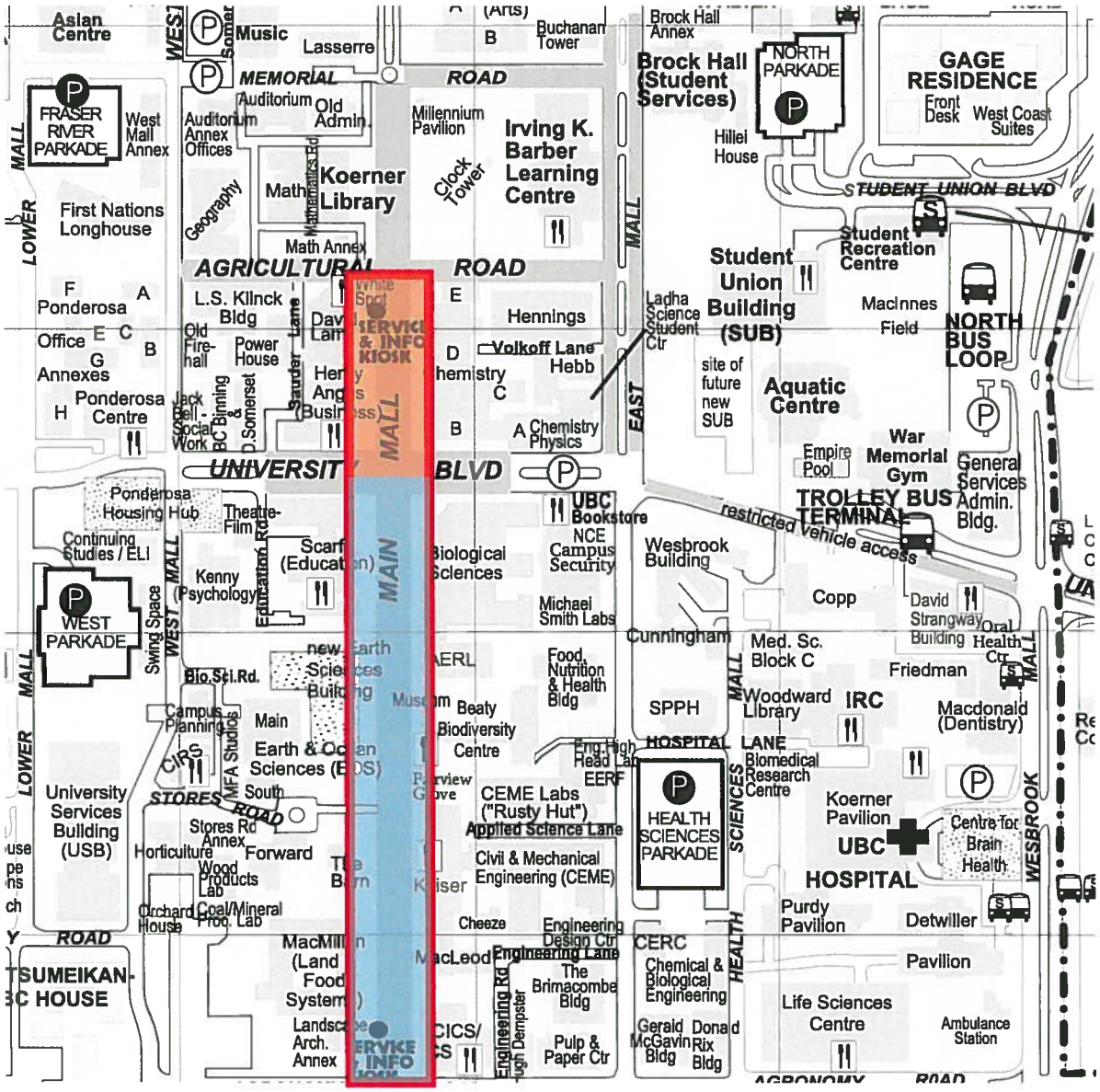
[4] This report refers only to UBC Vancouver, not to UBC Okanagan. 'Campus' refers to the UBC Vancouver campus.
[5] "UBC Public Realm Plan for the Vancouver Campus", Campus and Community Planning, May 2009, 4.
[6] "Public Realm Plan", 4.
[7] "Public Realm Plan", 5.
[8] "Public Realm Plan", 8.
[9] "Public Realm Plan", 20, 31.
[10] At the time of writing, a feasibility study of a public bike share was under review.

However, the scope and timeframe of this study did not allow for such a format. Even with this limitation, as well as those discussed later, the results of this study inform UBC's planning of Main Mall and recommends changes to its design.

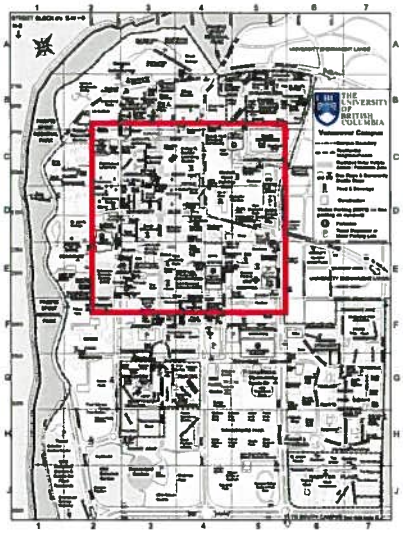
The study area (Figure 1) for the Main Mall Walk Bike Survey is defined as Main Mall, from Thunderbird Road to Agronomy Road. The orange rectangle outlines the redesigned north section, while the blue rectangle outlines the south section, to be redesign in the summer of 2012.

Figure 1. Study Area

Study Area



Main Mall North (redesigned)
Main Mall South



N

Basemap Source: http://www.maps.ubc.ca/PROD/printMaps.php

2.0 Methods

The study consisted of two parts, randomized traffic counts and an intercept survey of users of Main Mall.

The traffic counts, performed manually, recorded the number of pedestrians, cyclists riding their bikes, cyclists walking their bikes, skateboarders, vehicles, rollerbladers, and wheelchair users[11] who crossed a defined line on Main Mall.

The first half of the survey split Main Mall into two parts with U Blvd as the dividing line: Main Mall South and Main Mall North (Figure 1). In December of 2011, Main Mall South existed as Main Mall North did before its redesign. Therefore, I used Main Mall South as a baseline for user experience on the north section of Main Mall before its redesign. Respondents answered the same questions twice—once for Main Mall South, and once for Main Mall North. I compared respondent's answers for the two sections to determine the effect of the redesign. The second half of the survey included questions about Main Mall in general, as well as demographic questions.

2.1 Survey Design

The first step to design the Main Mall Walk Bike Survey was brainstorming potential questions based on the project's stated goal: To gauge the effects of the redesign of Main Mall North on bicycle and pedestrian interaction and overall user experience. Various parties reviewed an initial list of questions: Gerry McGeough—the UBC architect, Dean Gregory—the UBC landscape architect, Adam Cooper—a transportation planner at UBC, and Kay Teschke, my advisor in the School of Population and Public Health.

After revising the preliminary list of questions, I designed a first draft of the survey. I sent the survey to my peers and asked for input on the clarity of the questions and formatting of the survey. I revised the questions and survey format with this input from my peers and my advisors. I pretested the survey in the field to determine:

[11] No wheelchair users were recorded. This category is not included in the summary tables of traffic counts.

- The time required for completion
- Response rate
- How to ensure a random sample
- Where on Main Mall to administer the survey
- The feasibility of a traffic count
- And the survey's clarity.

With the information from the pretests, I made the final adjustments to the intercept survey technique, the questions, and the format. See Appendix A for the final survey form.

I developed a Site Observation Form to record data on the time, weather, and other variables, for each survey period. See Appendix B for the final site observation form.

2.2 Survey Administration

I surveyed users of Main Mall at the intersection of Main Mall and University for two reasons: 1. To ensure that respondents had experienced both sections of Main Mall, and 2. To ease the explanation of the survey's concept (which section is north, which is south). I surveyed between the hours of 9AM and 5PM at times that suited my schedule, until I obtained the desired sample size. Initially, I aimed for a sample size of 200: 100 pedestrians and 100 cyclists. The actual response rate was marginally higher than pretesting suggested, resulting in a final sample size of 265: 170 pedestrians, and 95 cyclists (the vast majority of whom also walked on Main Mall). Ideally, the survey times would have been randomized throughout the day, however, my class schedule and other commitments precluded this.

Pretests suggested a low response rate. To combat this, I set up some combination of a table, pop up tent, and hot chocolate dispenser, depending on the weather, to add legitimacy and incentive to my survey and respondents, respectively.

Two volunteers, Kay Teschke and Angie Weddell assisted in administering the survey. To ensure consistency, both received an identical orientation to the survey format, and best practices for implementation.

To ensure a random sample of user of Main Mall, survey administrators approached every third passerby who crossed an imaginary line with defined boundaries,

and asked him or her to complete the survey. I included the number of people in groups passing by in the count total. For example, if a group of two people crossed the traffic count line, they counted as the first and second passersby. I asked the next passerby to complete my survey. If a group of three or more people crossed my imaginary line, they were the first, second, and third passersby. I then approached the whole group and asked them to complete the survey.

People talking on their cell phone counted as either the first or second passersby, but were disregarded as the third passerby. I waited to approach the next passerby not talking on their cell phone.

I did not turn away those who approached me about the survey, though this was uncommon.

Once a passerby stopped, I explained the concept of the survey. I mentioned the redesign of the north section of Main Mall and the planned redesign of the south section of Main Mall. I ensured they had experienced both the south section of Main Mall, as well as the redesigned north section of Main Mall. I told the respondent that their feedback would help evaluate the success of the redesign of Main Mall and inform the Mall's future development.

I then explained the format of the survey. On the front: two answers for each question—one answer for the south section of Main Mall, and one answer for the redesigned north section of Main Mall. On the back: questions, some open-ended, about Main Mall in general. I encouraged respondents to approach me if anything was unclear.

Throughout the whole process, I took care not to refer to the north section as "new", "upgraded", or with a similarly loaded word that could influence the respondent's answers. Finding a completely neutral word to describe the north section proved difficult, and I settled on 'redesigned', an imperfect solution. I also took care to repeatedly refer and gesture to the north and south sections of Main Mall to ingrain the difference between the two in the respondent's mind.

While the respondent filled out the survey, I resumed administering surveys. When the respondent had finished, I ensured they filled out both sides of the survey in an intelligible manner, and thanked them for their time.

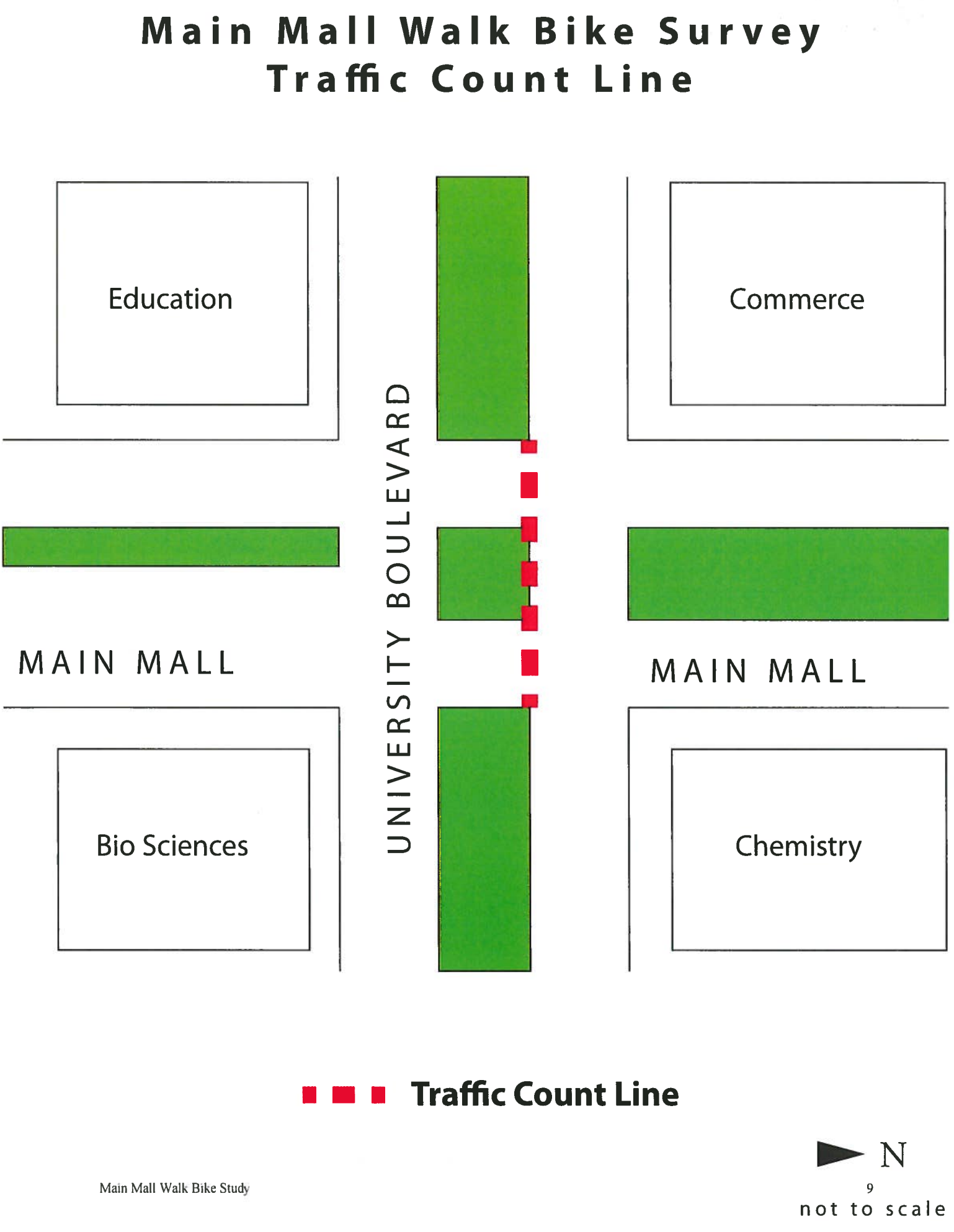
We needed a relatively large sample of cyclists in order to make statistically sound comparisons between pedestrians' and cyclists' answers. However, It proved difficult to stop cyclists on Main Mall. To reach the desired cyclist sample (100), I surveyed cyclists at the Bike to Work Week station on November 2, 2011 on University Boulevard, between Wesbrook Mall and East Mall. During this survey period, I confirmed several times that the respondent had actually cycled or walked on both sections of Main Mall, including the north section since its redesign. This was imperative for the responses collected that day to be of any use.

2.3 Traffic Count

In order to determine who uses Main Mall when, I counted traffic for ten minutes, using a stopwatch, for every hour in the field (50 minutes surveying, ten minutes counting traffic). I randomized the time of the traffic counts to ensure a random sample. I recorded the start and end time of each traffic count.

I counted the major users of main mall: pedestrians, bicyclists riding their bike, bicyclists walking their bike, skateboarders, vehicle, rollerbladers, and people in wheelchairs. I counted traffic using a similarly constructed imaginary line as used when surveying. The line bisected Main Mall at the intersection of Main Mall and University Boulevard (Image 2: Traffic Count Line). Traffic that crossed the line was counted; traffic that did not cross the line was not counted. The same line was used to count traffic every time. The traffic was tallied on the back of the Site Observation Form and totaled on the front of the same form for data entry purposes.

Figure 2. Traffic Count Line



Before sending the completed surveys to data entry, I reviewed every survey to check for completeness and legibility. I discarded any incomplete or illegible surveys.

2.4 Data Analysis

Express Data Ltd. compiled the completed surveys in an Excel spreadsheet.

2.4.1 Demographics

I totaled the demographic data collected for three groups: the complete sample (265 respondents), a 'Never Cycle' sample (170 respondents), and an 'Ever Cycle' sample (95 respondents) [12]. Table 2 summarizes the demographic data.

2.4.2 Traffic Counts

I performed survey counts for 10, 15, or 20 minutes, based on the length of the survey period that day. I extrapolated the raw counts to reflect hourly totals. For example, if I counted 50 pedestrians in 20 minutes, I multiplied that total by three to obtain a value of 150 pedestrians per hour. I then averaged the hourly counts. Tables 3 and 4 summarize the traffic counts.

2.4.3 Survey

I split the survey responses into the same three samples as for the demographic data: the complete sample, the ever cycle sample, and the never cycle sample. I compared answers for the north and south section, and between the complete, never cycle, and ever cycle samples. Tables 4 and 5 summarize these data.

I used a differences in proportions test, available online at http://www.answersresearch.com/proportions.php, to determine the statistical significance, at a 95% confidence level, of any differences between the samples regarding the two sections of Main Mall.

---

[12] For simplicity, the 'Never Cycle' sample and the 'Ever Cycle' sample may from here be referred to as 'pedestrians' and 'cyclists', respectively. However, do keep in mind that the vast majority of respondents who ever cycle on Main Mall also walk on Main Mall.

3.0 Results

Tables one through six summarize 95% confidence intervals and the results for demographics, traffics counts, and the survey.

3.1 Demographics

The complete sample had an almost equal gender split. The Never Cycle sample had a higher percentage of females, while the Ever Cycle sample had a higher percentage of males. The mean and median ages were very similar for all three samples, at 22 and 27 years old, respectively. English was the dominant first language of respondents, with Chinese/Cantonese/Mandarin as the next most common. Less than five respondents spoke a variety of other languages. The great majority of respondents were students, followed by faculty, staff, and residents of the UBC campus. Arts and Sciences were the two most common faculties of the respondents, followed by Commerce. Small numbers of students represented a wider range of faculties at UBC. The majority of respondents indicated were associated with faculties whose main buildings are north of U Blvd. However, this does not take into account the Faculty of Sciences, which has buildings both north and south of U Blvd.

3.2 Traffic Counts

Pedestrians represented the majority of traffic, followed by cyclists. An almost negligible number of cyclists walked their bikes on Main Mall. According to the traffic counts, more vehicles crossed University Boulevard at Main Mall than did skateboarders.

Traffic counts were subject to temporal variation. Counts were significantly lower on the weekends, and significantly higher during the week, most notably between classes when many students move from one class to another. Consequently, potential inaccuracy of the extrapolated average traffic counts per hour, shown in Table 4, must be considered.

3.3 Survey

Significantly[13] less people indicated that they spent time on the south section of Main Mall than did on the north section. Similar proportions of pedestrians and cyclists indicated spending time on the south section, while a lower proportion of cyclists indicated spending time on the north section. Pedestrians and cyclists consistently indicated little recreational use of both sections of Main Mall. The complete sample indicated that Main Mall is an efficient transportation corridor. Pedestrians and cyclists answered similarly for the south section. Cyclists saw the north section of Main Mall as significantly less efficient than do pedestrians.

There was no significant difference between pedestrians' and cyclists' answers with regards to pedestrian and cyclists safety. For pedestrians, the north section of Main Mall is significantly safer than the south section. There is no significant difference in cyclist safety on the two sections of Main Mall. There is no significant difference between pedestrian safety and cyclist safety on the south section of Main Mall. However, the north section is significantly safer for pedestrians than for cyclists. See Figure 3.

[13] 'Significant' in this section refers to statistical significance, as determined by the difference of proportions test described in section 2.4.3

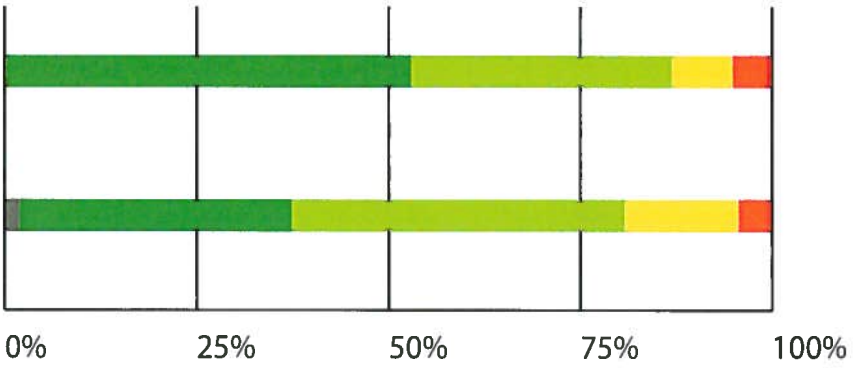
Figure 3. Pedestrian and Cyclist Safety

Safety of Main Mall

Pedestrian Safety

How safe is the north section of Main Mall for pedestrians?

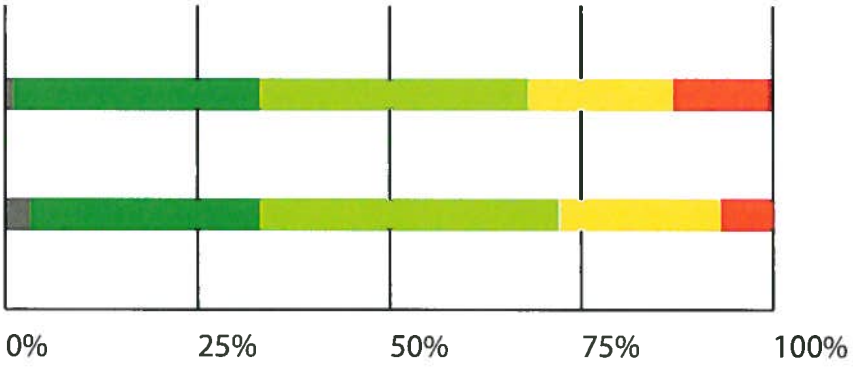
How safe is the south section of Main Mall for pedestrians?



Cyclist Safety

How safe is the north section of Main Mall for cyclists?

How safe is the south section of Main Mall for cyclists?



Did not respond

Very Safe
Somewhat Safe
Neither Safe nor Dangerous
Somewhat Dangerous
Very Dangerous

The complete sample indicated significantly more problems between pedestrians and cyclists on the north section as compared to the south section. However, the pedestrian sample indicated no significant difference between the two sections of Main Mall in terms of pedestrian-cyclist conflict. The cyclist sample, on the other hand, indicated significantly more conflict on the north section of Main Mall than on the south section.

With regards to problems with vehicles, the complete sample indicated no significant difference between the north and south sections. For the north section, pedestrians' and cyclists' answers for question eight were identical. However, significantly more cyclists experience problems with vehicles on the south section than do pedestrians.

For the complete sample, significantly more respondents indicated that nothing is missing on Main Mall that would improve their comfort and/or safety. However, significantly more cyclists indicated that something is missing on the space.

The vast majority of respondents use Main Mall primarily as a way to move across campus. More cyclists use the space as a transportation corridor than do pedestrians. A negligible number of respondents indicated that they use Main Mall primarily as a social destination. Significantly less cyclists than pedestrians use Main Mall as both a transportation corridor and a social space.

For the complete sample, a significant proportion of respondents believed priority on Main Mall should lie with some combination of pedestrians and cyclists. A significant proportion of pedestrians believe priority should lie with pedestrians. No pedestrians believe cyclists should have priority, whereas a small proportion of cyclists believe they should have sole priority. However, the significant majority of cyclists believe the space should be shared between pedestrians and cyclists. No respondents indicated vehicle priority. A small percentage indicated 'other'. For these responses, see Table 6.

A significant percentage of pedestrians and cyclists believe that a bicycle path should be added to Main Mall.

Table 1. Confidence Intervals

95% Confidence Intervals

Sample	10/90%	20/80%	30/70%	40/60%	50%
Complete Sample (265)	+/- 3.61%	+/- 4.82%	+/- 5.52%	+/- 5.9%	+/- 6.02%
Never Cycle (170)	+/- 4.51%	+/- 6%	+/- 6.89%	+/- 7.36%	+/- 7.52%
Ever Cycle (95)	+/- 6.03%	+/- 8.04%	+/- 9.22%	+/- 9.85%	+/- 10.05%

Table 2. Demographics

Demographics

		Complete Sample (265)	Never Cycle (170)	Ever Cycle (95)
Gender	Female	51%	55%	44%
	Male	48%	45%	56%
Age	Mean Age	22	21	22
	Median Age	27	27	27
First Language	English	70%	69%	75%
	Mandarin/Cantonese	7%	10%	3%
	Other	21%	21%	22%
Role at UBC	Faculty	4%	4%	3%
	Staff	9%	8%	12%
	Student	78%	78%	79%
	Visitor	3%	5%	0%
	Other	5%	5%	6%
Faculty	*North of U Blvd.*			
	Arts	27%	33%	20%
	Commerce	14%	19%	8%
	South of U Blvd.			
	Education	3%	4%	2%
	Engineering	11%	10%	14%
	Forestry	3%	3%	5%
	Land and Food Systems	3%	2%	5%
	Both South and North of U Blvd.			
	Science	25%	23%	34%
	Other	7%	7%	7%

Table 3. Raw Traffic Counts

Traffic Counts: Raw Totals

Date	Day of Week	Count Time	Count Length	Pedestrians	Cyclists Riding Bike	Cyclists Walking Bike/hr	Skate-boarders	Vehicles	Rollerbladers
10/18/2011	Tuesday	16:35 16:45	20 min.	61	13	0	2	1	0
10/20/2011	Thursday	12:35 12:50	15 min.	140	15	2	2	3	0
10/22/2011	Saturday	15:20 15:40	20 min.	23	4	0	0	2	0
10/23/2011	Sunday	16:29 16:49	20 min.	40	7	0	1	1	0
10/26/2011	Wednesday	15:25 15:35	10 min.	65	6	0	0	2	0
10/24/2011	Monday	15:55 16:15	20 min.	265	47	2	6	0	0
10/31/2011	Monday	16:41 17:01	20 min.	41	48	0	6	5	1
11/3/2011	Thursday	13:17 13:32	15 min.	133	16	0	2	6	0

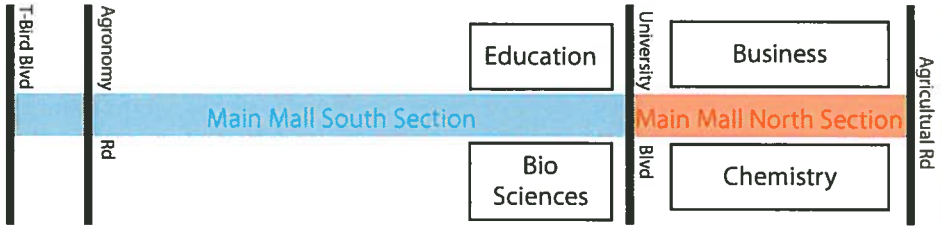
Table 4. Hourly Traffic Counts

Traffic Counts: Per Hour

Date	Day of Week	Count Time	Count Length	Pedestrians/hr	Cyclists Riding Bike/hr	Cyclists Walking Bike/hr	Skate-boarders/hr	Vehicles/hr	Rollerbladers/hr
10/18/11	Tuesday	16:35 16:45	20 min.	183	39	0	6	3	0
10/20/11	Thursday	12:35 12:50	15 min.	560	60	8	8	12	0
10/22/11	Saturday	15:20 15:40	20 min.	69	12	0	0	6	0
10/23/11	Sunday	16:29 16:49	20 min.	120	21	0	3	3	0
10/24/11	Monday	15:55 16:15	20 min.	795	141	6	18	0	0
10/26/11	Wednesday	15:25 15:35	10 min.	390	36	0	0	12	0
10/31/11	Monday	16:41 17:01	20 min.	123	144	0	18	15	3
11/3/11	Thursday	13:17 13:32	15 min.	532	64	0	8	24	0
Average/ Hour				**347**	**65**	**2**	**8**	**9**	**<1**

Table 5. Survey Results, Front Page

Main Mall Walk-Bike Survey: **Results**



Question	Answer	Complete Sample (265) South	Complete Sample (265) North	Never Cycle (170) South	Never Cycle (170) North	Ever Cycle (95) South	Ever Cycle (95) North
1. *Do you spend time with friends on this section of Main Mall?*	Yes	28%	48%	26%	52%	31%	39%
	No	72%	52%	73%	47%	67%	60%
2. *Do you use this section of Main Mall for recreation?*	Yes	19%	26%	17%	26%	23%	26%
	No	81%	73%	82%	73%	77%	73%
3. *Does this section of Main Mall get you across campus efficiently?*	Yes	80%	88%	78%	92%	82%	80%
	No	20%	10%	21%	6%	15%	16%
4. *How safe is this section of Main Mall for pedestrians?*	Very Safe	36%	53%	38%	54%	33%	52%
	Somewhat Safe	44%	34%	44%	34%	42%	34%
	Neither Safe nor Dangerous	15%	8%	12%	8%	19%	6%
	Somewhat Dangerous	4%	4%	4%	4%	5%	6%
	Very Dangerous	0.38%	0.38%	0.6%	0.6%	0.38%	0%
5. *How safe is this section of Main Mall for cyclists?*	Very Safe	31%	32%	31%	32%	27%	28%
	Somewhat Safe	40%	35%	36%	36%	43%	32%
	Neither Safe nor Dangerous	21%	19%	22%	18%	18%	19%
	Somewhat Dangerous	8%	12%	6%	9%	10%	17%
	Very Dangerous	0%	0.38%	0%	0%	0%	1%
6. *In the last month, have you experienced any problems between pedestrians and cyclists on this section of Main Mall?*	Yes	19%	30%	13%	18%	31%	51%
	No	81%	70%	87%	82%	69%	49%
7. *If **yes**, how serious was the problem(s)? (check all that apply)*	Route redirected/slowed	67%	52%	64%	45%	69%	58%
	One or more parties halted	41%	43%	41%	52%	41%	38%
	Minor Crash, no injury	4%	4%	1%	3%	0%	4%
	Major Crash, injury	0%	0%	0%	0%	0%	0%
8. *In the last month, have you experienced any problems with vehicles on this section of Main Mall?*	Yes	20%	14%	16%	14%	27%	14%
	No	80%	86%	84%	86%	73%	86%
9. *If yes, how serious was the problem(s)? (check all that apply)*	Route redirected/slowed	55%	58%	41%	52%	69%	69%
	One or more parties stopped	36%	28%	41%	26%	31%	31%
	Minor Crash, no injury	0%	0%	0%	0%	0%	0%
	Major Crash, injury	0%	0%	0%	0%	0%	0%

Table 6. Survey Results, Back Page

Question	Answer	Complete Sample (265)	Never Cycle (170)	Ever Cycle (95)
10. Is anything missing on either section of Main Mall that would improve your comfort and/or safety?	Yes, something is missing	43%	36%	57%
	No, nothing is missing	57%	61%	35%
'Yes' responses / *Frequency*: Bike Lanes 39; Lighting 23; Seating 14; Too Many Cars 14				
11. Do you use Main Mall primarily as a:	Way to move across campus	87%	80%	90%
	Place to meet and spend time with friends	0.38%	0%	1%
	A Combination of the above	15%	18%	8%
	Other	0.78%	1%	0%
'Other' responses / *Frequency*: Scenic place to sit/walk 6				
12. Who should have priority on Main Mall?	Pedestrians	46%	57%	21%
	Bicyclists	2.7%	0%	7%
	A combination of the above	52%	41%	65%
	Vehicles	0%	0%	0%
	Other	3%	2%	5%
'Other responses' / *Frequency*: Separate Peds/Cyclists 11; Everybody but vehicles 3; Skateboarders 2				
13. In the last week, how many days did you walk on Main Mall?		Mean: 5 days Median: 4.08 days	Mean: 5 days Median: 4.43 days	Mean: 3 days Median: 3.54 days
14. In the last week, how many days did you cycle on Main Mall?		Mean: 0 days Median: 1.35 days	Mean: 0 days Median: 0 days	Mean: 4 days Median: 3.75 days
15. What affects your decision to cycle on Main Mall? (check all that apply)	Distance to destination is close	28%	19%	43%
	Distance to destination is too far	14%	5%	29%
	Lack of cycling facilities	6%	6%	4%
	Lack of cycling experience/bicycle	11%	16%	2%
	Main Mall is unsafe for cycling	0.38%	0%	1%
	Too many people	22%	16%	34%
	Weather	14%	13%	17%
	Other	9%	4%	19%
'Other' responses / *Frequency*: Efficicent Route 8; Cycling is Inconvenient 3; Vehicles 2; Safe Route 2				
16. Should a bicycle path be added to Main Mall?	Yes	67%	62%	76%
	No	33%	33%	23%

4.0 Discussion

Ultimately, good design serves the user. Who uses Main Mall, how do they use it, and when do they use it?

Who? Unsurprisingly, pedestrians account for the majority of traffic on the space (347 per hour), followed by cyclists (65 per hour).

How? The vast majority of respondents use Main Mall primarily as a transportation corridor. Pedestrians are more likely to spend time on Main Mall, whereas cyclists are more likely to use Main Mall solely as a transportation corridor. Essentially no one uses Main Mall just as a place to spend time with friends.

When? The traffic counts and anecdotal observation reveal extreme variation in use of Main Mall over time, a difficult planning challenge. The most intense hourly use of the space lasts 15, maybe 20 minutes. So, how does one plan for the high traffic during those 15 minutes between classes and low volumes during classes and on the weekend? We come back to this question in the Recommendations section.

To summarize: mostly pedestrians use Main Mall as a way to move across campus, and their use of the space comes in concentrated bursts.

From a planning perspective, this data reveals two main takeaways. First, people use Main Mall to move, so its design should facilitate efficient and safe movement of a variety of modes of transportation. Second, Main Mall holds unrealized potential as a social destination and its design should facilitate social interaction. Both theories hold merit, and both satisfy various planning goals on campus.

The UBC Public Realm Plan calls for the strategic placement of "amenities, programming, and infrastructure to fully support the needs of users." Furthermore, as mentioned earlier, the Plan defines the Public Realm in part as facilitating the movement of people.[14] Given these goals, the support from both pedestrians *and* cyclists for a bicycle lane, and with rates of pedestrian cyclist conflict ranging from 13% to 51%,

[14] "Public Realm Plan", 4.

depending on the sample and section of Main Mall considered, there is a need for more active traffic management on Main Mall.

On the other hand, the same plan recommends "a variety of opportunities to sit and socialize" and a "network of outdoor public spaces that animates, invigorates, and brings life"[15] to UBC. The absence of benches, tables, and chairs on the redesigned north section of Main Mall, combined with the very low number of respondents who spend time on either section of Main Mall, demonstrates a serious shortcoming in the redesign of Main Mall.

I address these issues in the Recommendations section.

Given that Main Mall is supposedly closed to all vehicles, save necessary service trucks, landscape crews, and the like, a relatively high number of vehicles cross University Boulevard on Main Mall—more than one every ten minutes. I observed several groups of drivers who used Main Mall when they should not have: disoriented drivers (i.e. visitors), taxis and delivery vehicles, and drivers knowingly disobeying the vehicle restriction on Main Mall. Anecdotal observation revealed a higher number of vehicles using University Boulevard to traverse campus on the weekends than during the week. Soon, all vehicles, except small Plant Operations vehicles and landscape crews, will be physically barred from using Main Mall. This will greatly improve safety, most notably for cyclists on the south section of Main Mall.

However, the removal of the roadway on the south section will lead to the full integration of pedestrian and cyclist traffic. The survey revealed that cyclists experienced more problems with vehicles on the south section than did pedestrians. This demonstrates that traffic on the south section of Main Mall is separated, to an extent. Bicycles mostly use the roadway on the south section of Main Mall, while pedestrians mostly use the walkways on both sides of the stretch. Observation substantiates this statement. The plan for the south section eliminates the roadway, directing pedestrian traffic away from the

[15] "Public Realm Plan", 6.

peripheral sidewalks, and on to the main walkways down the centre of Main Mall, as is the case on the redesigned north section. While the removal of vehicles will certainly increase safety in one regard, the integration of pedestrian and cyclist traffic on the south section has the potential to increase incidences of pedestrian-cyclist conflict, as demonstrated by cyclists' lowered sense of safety and the higher incidence of pedestrian-cyclist conflict on the integrated north section. Monitoring how the integration of pedestrian and cyclist traffic on the south section of Main Mall affects user safety, and adjusting the design accordingly, is imperative.

Presumably, every incident of pedestrian-cyclist conflict involves, logically, at least one pedestrian and at least one cyclist. Theoretically, pedestrians and cyclists *should* have indicated the same amount of pedestrian-cyclist conflict. However, cyclists identified significantly higher rates of pedestrian-cyclist conflict, most notably on the redesigned north section of Main Mall. Cyclists then, must have a more sensitive definition of pedestrian-cyclist conflict. Cyclists also see the north section of Main Mall as significantly less efficient as a transportation corridor than do pedestrians. Furthermore, significantly more cyclists than pedestrians believe something is missing on Main Mall that would improve their comfort and/or safety.

Cyclists see problems where pedestrians do not.

This poses yet another planning challenge for the redesign of Main Mall. Pedestrians seem receptive to the new design, indicated by higher levels of perceived safety, while cyclists seem averse, indicated by lower levels of perceived safety. Is the redesign of Main Mall successful because the majority user group feels safe? Or, does the reduced safety of the space's second largest user group represent a shortcoming of the design? Given the commitment to universal access and appeal of various UBC planning documents, I argue the latter.

The survey results indicate that people spend time more on the north section than do on the south section. I am hesitant to attribute this to the redesign of Main Mall for several reasons. First: the sample may not be representative of all users of Main Mall. For

example, those who spend time only on the south section of Main Mall were not captured in the sample, as the survey was administered only at Main Mall and U Blvd. Second, the redesign of Main Mall did not include any street furniture that would facilitate social interaction on the space. This result likely comes from the survey location: Main Mall and U Blvd. This intersection is closer to the center of Main Mall north than to the center of Main Mall south. Those who do spend time on the south section are most likely excluded from the sample, as they do not venture to Main Mall and U Blvd in their daily interaction with campus.

4.1 Treatment of Similar University Spaces

Main Mall provides a unique planning environment, distinct from traditional urban planning: a space closed to vehicles, shared by pedestrians, cyclists, and other non-motorized transportation, with significant temporal and seasonal fluctuations in use. Other university campuses around the world share these same issues. Consequently, the treatment of other campus' pedestrian cores is the most useful 'literature' available for the purposes of planning Main Mall. This section explores the treatment of such spaces at the University California at Santa Cruz (UCSC), UC Berkeley (UCB), and the University of Texas (UT) at Austin. While UCB and UT did administer bicycle surveys on campus, to my knowledge, these plans are not substantiated by data comparing pedestrian and cyclist experience on campus.

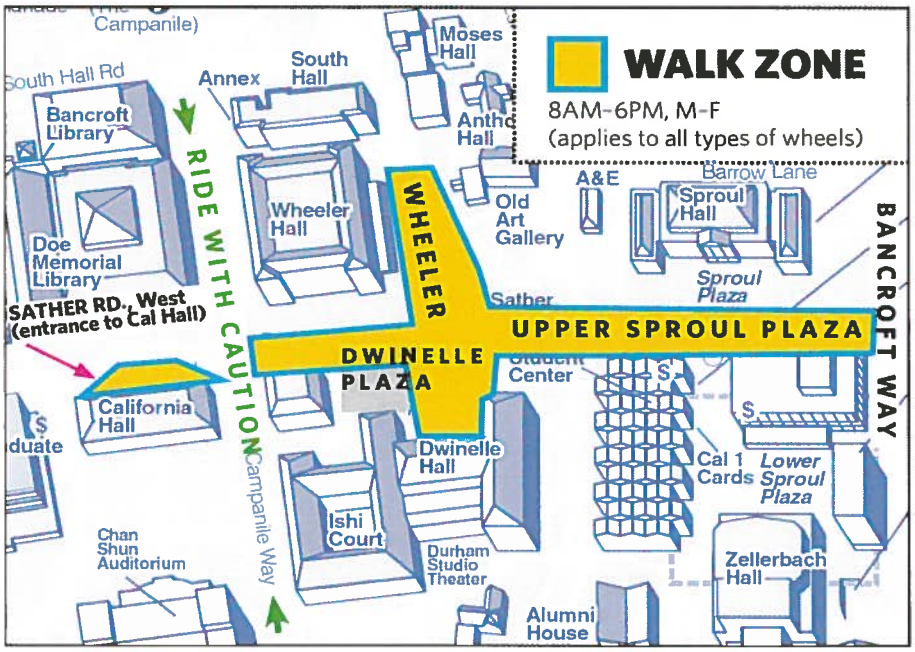
The three schools applied three different treatments of their pedestrian cores, similar to Main Mall at UBC, Vancouver. Along with some new bicycle paths, UCSC integrates bicycle traffic with vehicle traffic[16]. UC Berkeley employs a bicycle dismount zone at peak hours in its pedestrian core[17] (Figure 4), enforced by campus police. High ticket costs lead to student backlash[18]. UT discourages bicycle traffic on its central pedestrian corridor by limiting bicycle speeds through signage and providing alternate bicycle routes

---

[16] ""University of California, Santa Cruz 2008 Bicycle Plan", Transportation and Parking Services, November 2008, 11.
[17] University of California Berkeley Police Department, "What to Know about Bikes on Campus", http://police.berkeley.edu/prevention/bike.html (November 2011).
[18] SFGate, "UC Berkeley crackdown has bicyclists fuming," http://articles.sfgate.com/2010-12-13/bay-area/25188857_1_campus-police-bike-lanes-facebook-page

across campus. [19] UT does not employ police enforcement of it policy, with reasonable success.[20]

Figure 4. UC Berkeley Dismount Zone[21]



4.1.1 *Implications for UBC*

UCSC's integration of bicycle traffic with vehicle traffic does not apply to Main Mall, as it will soon be closed to all vehicular traffic, save small necessary landscaping and service vehicles. Furthermore, studies reveal that proximity to vehicle traffic acts as a one of the top deterrents for cyclists.[22] As such, UBC should remain wary of integrating bicycle and vehicle traffic on other parts of campus. Campus and Community Planning should favour separated bicycle lanes to increase cycling on campus as a sustainable alternative to vehicles.

---

19 "The University of British Columbia Vancouver Campus Plan Part 3: Design Guidelines", Campus and Community Planning, June 2010, 3.
20 "The UT Bike Plan: Integrating Bikes into a Pedestrian Campus," Bowmen, Melton, Alta Planning and Design, August 2007, 118.
21 UCBPD, "What to Know about Bikes on Campus".
22 "Motivators and Deterrents," Cycling in Cities, http://cyclingincities.spph.ubc.ca/opinion-survey/.

Survey results show that almost no one uses Main Mall exclusively as a social destination, and the vast majority of respondents use the stretch to move across campus. While such figures do not exist to my knowledge for the areas covered by the UCB dismount zone, my experience shows that the spaces are significantly more social than Main Mall. 90% of respondents who ever cycle on Main Mall use the space to move across campus. This implies that a dismount zone would not serve these users of Main Mall. Most likely, such a policy would infuriate cyclists on campus. Furthermore, "design for pedestrian *and bicycle* priority with universal physical access"[23] (emphasis added) is one of the UBC Public Realm design principles. A dismount zone would be a serious departure from this policy.

UT's plan for Speedway Mall might seem an attractive solution for Main Mall. However, alternate bicycle routes, by their very nature, will prove inefficient at UBC. As the Public Realm Plan states, Main Mall is one of the "the [two] organizational spines of UBC that form the symbolic centre of the campus" [24]. Discouraging cyclists' movement across this spine contradicts UBC's built environment and will result in inefficient cycling routes. The campus is planned with Main Mall its central corridor. All users deserve access to it.

[23] "Public Realm Plan", 6.
[24] "Public Realm Plan", 7.

5.0 Recommendations

Can Main Mall function both as an efficient and safe transportation corridor *and* a successful public space?

Yes.

5. 1 Transportation Recommendations

The following demonstrate *users'* desire for traffic separation on Main Mall:

- Main Mall's primary function as a transportation corridor
- The potential for increased pedestrian-cyclist conflict on Main Mall South with the integration of traffic
- The support for a bicycle lane in public consultation regarding the initial design plans for Main Mall
- The majority support for a bicycle lane by pedestrians
- The majority support for a bicycle lane by cyclists

As stated earlier, the current south section of Main Mall features peripheral sidewalks and a central roadway (Figures 5 and 6). Observation reveals that pedestrians tend to use the sidewalks, while cyclists tend to use the roadway. The fact that cyclists face more conflict with vehicles on south section corroborates this observation. The current plan for the redesign of the south section of Main Mall eliminates the sidewalks and funnels all modes of traffic onto one integrated space, similar to the redesigned north section of Main Mall. This integration of traffic has the potential to result in decreased levels of cyclist safety and increased levels of pedestrian-cyclist conflict, as indicated by data regarding the north section.

Given that UBC's public realm "facilitate[s] the movements of people"[25], UBC's commitment to pedestrian and bicycle priority[26], the support for traffic separation, and

[25] "Public Realm Plan", 4.
[26] "Public Realm Plan", 6.

Main Mall's physical size, an elegant solution presents itself that satisfies both user desires *and* maintains UBC's vision of Main Mall.

I recommend the creation of a peripheral bicycle path on Main Mall in place of the existing sidewalk on the Mall's east side. (Figure 7).

The proposed route, stretching from Agricultural Road to Agronomy Road, will separate pedestrian and wheeled traffic, resulting in a safer and more efficient transportation corridor for all users. Pedestrian traffic will receive priority, with the great majority of Main Mall closed to all wheeled traffic. However, cyclists, skateboarders, and rollerbladers will not be denied from using Main Mall as the "organizing spine"[27] UBC envisions it as. Signs will direct users.

Furthermore, because the bicycle route will be set off of Main Mall, it will not inhibit Main Mall's view corridor or its formal landscaping. The large oak trees will serve to further separate the route, both physically and visually, from the central pedestrianways of Main Mall.

The existing sidewalk already delineates the physical space of the proposed route. The lane would not require any large-scale infrastructural changes, only repaving and signage, resulting in a relatively low-cost solution to the central issue on UBC's central thoroughfare.

The proposed route could be widened, to better accommodate two-way wheeled traffic. Alternatively, the width of the current sidewalk could mitigate cyclists' speed, increasing pedestrian safety at crossings.

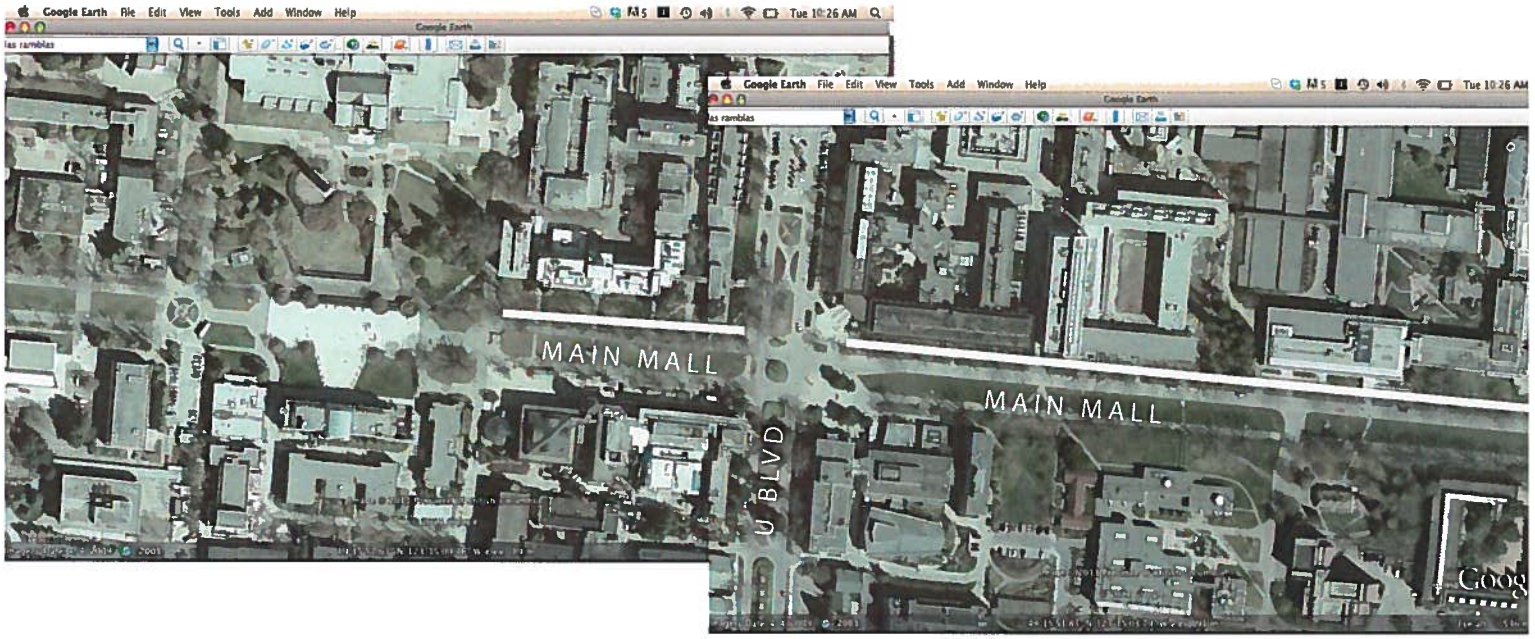
[27] "Public Realm Plan", 7.

Figure 5. Sidewalk on South Section at Time of Writing

Figure 6. Roadway on South Section at Time of Writing

Figure 7. Proposed Bike Path

Proposed Bike Path



Source: Google Earth

5.2 Public Space Recommendations

William Whyte studied New York's public spaces in the 1980s[28], and concluded that people sit where there are places to sit.[29] It seems like an absurdly obvious statement. However, it is a statement that has until now been neglected in the design of Main Mall.

Main Mall is a big space. It is used primarily between classes as a transportation corridor. This leaves long periods of time, and large amounts of space, open for socialization.

I recommend a series of pocket parks along Main Mall, south of University Boulevard.

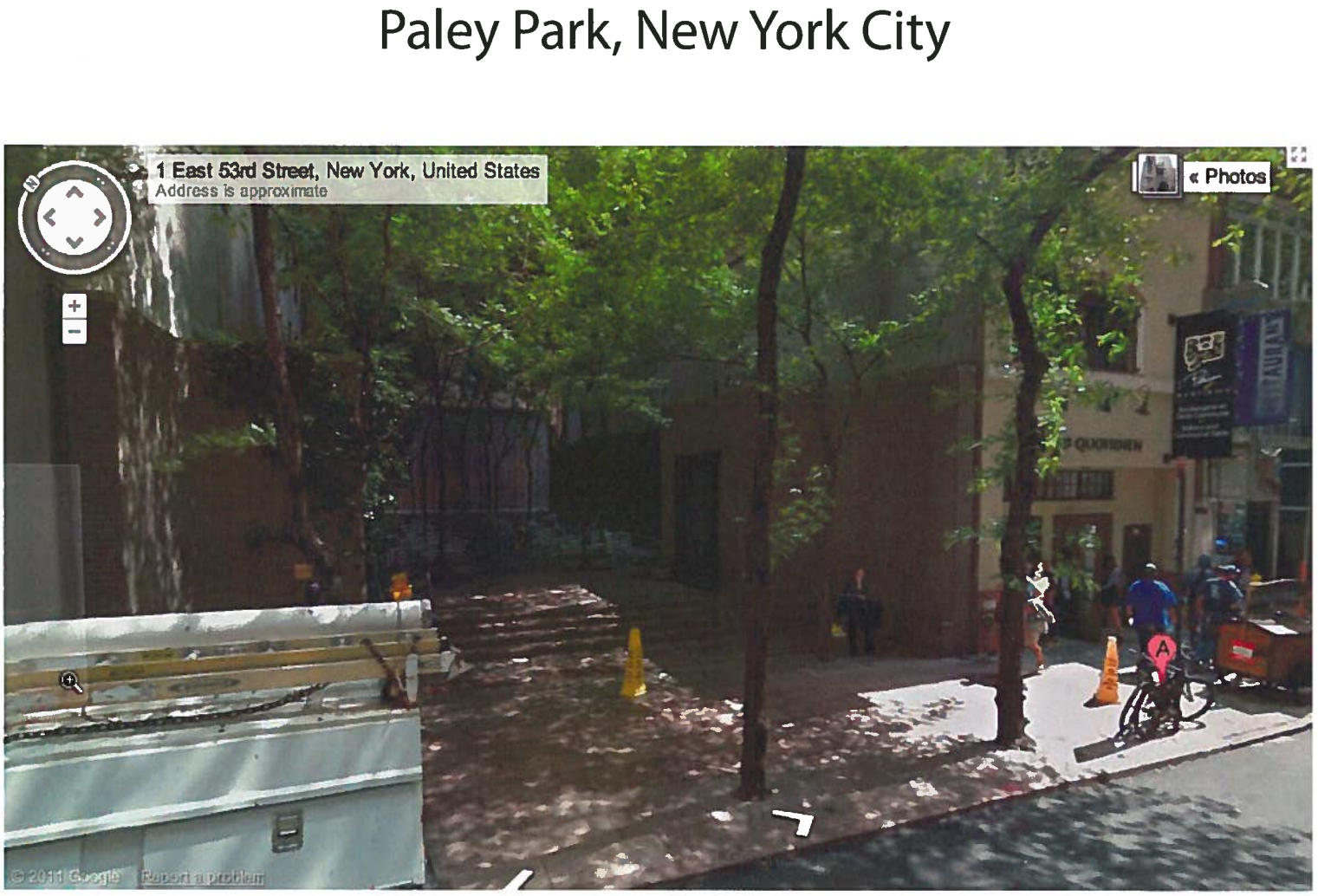
Set off to the side of the main pedestrianways, these small public spaces will not impede Main Mall's sightline, the formal landscaping of the space, or traffic flow between classes. They will provide a pleasant space to sit, read, eat, and people watch on the Mall—activities currently discouraged by the lack of street furniture. See Figure 8 for an example of a pocket park. See Figure 9 for a map of potential locations. See Figure 10 photographs of these locations as they existed in December 2011.

---

[28] Whyte used time-lapse photography to determine how people used spaces. I was interested in studying Main Mall in this way, but time and technical constraints prevented this research. I think a time lapse of Main Mall (say, pre/post redesign of Main Mall South) would provide great insight into the space, its use, and its design.

[29] Whyte, William H, "The social life of small urban spaces," Washington, D.C.: The Conservation Foundation (1980), 28.

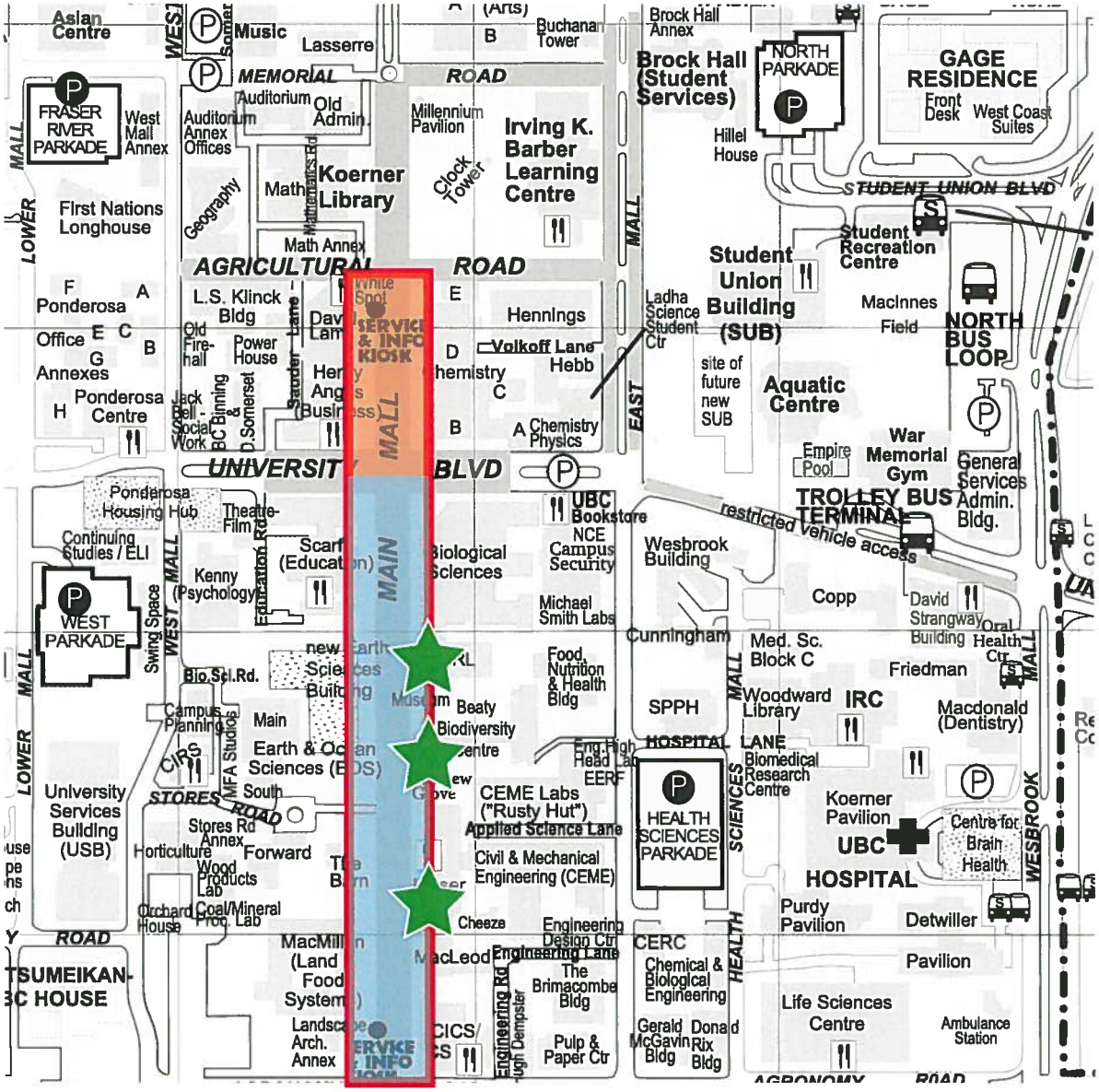
Figure 8. Example of a Pocket Park



Source: Google Maps

Figure 9. Potential Pocket Park Sites on Main Mall

Potential Sites for Pocket Parks on Main Mall

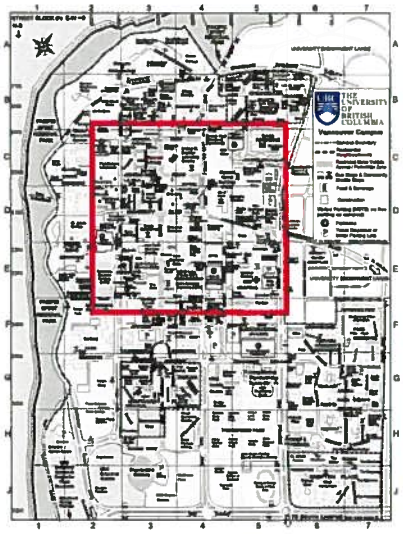


Main Mall North (redesigned)

Main Mall South

Potential Pocket Park Site

N



Basemap Source: http://www.maps.ubc.ca/PROD/printMaps.php

Figure 10. Sites for Potential Pocket Parks, Conditions at the Time of Writing

Conditions at Potential Sites for Pocket Parks

MacLeod Building

Beaty Biodiversity Centre

The blank facades and unused lawns fronting Main Mall offer several optimal sites on the sunny east side of Main Mall for these pocket parks: in front of the Fred Kaiser Building and the Beaty Biodiversity Centre. These sites will compliment the planned Fairview Commons just off Main Mall, beside the new Earth Systems Science Building, by providing a more intimate public space.

Dean Gregory, the UBC landscape architect, is interested in placing moveable chairs on the space. I fully support this idea, as it allows users to make their own space, based on weather, group size, and other factors. Traditional benches lining the space should accompany these chairs, especially on the north section of Main Mall, where limited space precludes any of the proposed pocket parks.

A separated cycling path on Main Mall and the creation of a series of pocket parks will create a safer transportation and more efficient transportation corridor for all users and transform Main Mall into the vibrant central public space that UBC and its population deserves.

6.0 Strengths and Limitations

6.1 Strengths

Initially, we aimed for a sample size of 200 respondents; 100 cyclists and 100 pedestrians. Users of Main Mall proved slightly more responsive to the survey than pre-testing suggested. We reached a sample size of 265, with 95 cyclists, and 170 pedestrians, resulting in a marginally more representative sample.

The survey also allows for the administration of a post-redesign survey on Main Mall South to more accurately gauge the effects of the redesign. Evaluation of a design in the real world is crucial: Is the design effective? Well received? These are necessary questions to ask on such a significant project. Ultimately, Main Mall is designed for its users—their experience *must* be evaluated when determining the success of a project.

Furthermore, the survey quantifies perceptions of Main Mall. More legitimate than anecdotal evidence, numbers inform effective policymaking. The priority given to Main Mall in the UBC general and public realm plans magnifies the importance of quantitative data pertaining to the space.

6.2 Limitations

The survey aims to gauge the effect of the redesign of Main Mall by using perceptions of Main Mall South as it existed at the time of writing as a proxy measure for the perceptions of Main Mall North *before* its redesign. We must be hesitant when attributing differences between the spaces as direct results of the redesign. The study makes an imperfect comparison as Main Mall north and south may serve different functions for users due to their inherent design and location on campus. As stated earlier, a pre-post test of Main Mall North would have been ideal in terms of analyzing the effects of the redesign. However, the scope of the project did not allow for such a format.

The sample may not be representative of campus as a whole. The survey was administered only at the intersection of Main Mall and U Blvd. Those administering the survey made certain that respondents experiences both Main Mall South, and Main Mall North, after its redesign. Thus, users of only one section are excluded from the survey.

Many potential respondents only used one section of Main Mall. As users of the space, their experience must be recorded as well.

Bibliography

"Difference in Proportions Test," Answers Research, accessed December 4, 2011, http://www.answersresearch.com/proportions.php.

"Motivators and Deterrents," Cycling in Cities, accessed December 4, 2011, http://cyclingincities.spph.ubc.ca/opinion-survey/.

2008 Bicycle Plan", Transportation and Parking Services, November 2008.

SFGate, "UC Berkeley crackdown has bicyclists fuming," accessed December 2, 2011, http://articles.sfgate.com/2010-12-13/bay-area/25188857_1_campus-police-bike-lanes-facebook-page

"The University of British Columbia Vancouver Campus Plan Part 3: Design Guidelines", Campus and Community Planning, June 2010.

"The University of Texas Bicycle Plan: Integrating Bikes into a Pedestrian Campus," Bowmen, Melton, Alta Planning and Design, August 2007.

"UBC Public Realm Plan for the Vancouver Campus", Campus and Community Planning, May 2009.

University of California Berkeley Police Department, "What to Know about Bikes on Campus", accessed December 1, 2011, http://police.berkeley.edu/prevention/bike.html.

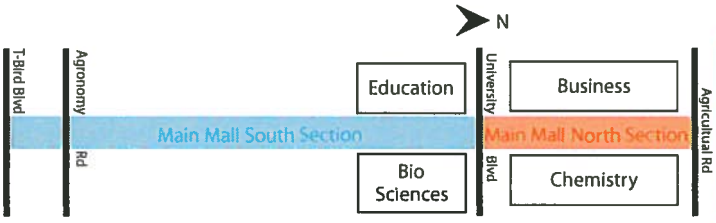
Whyte, William H, "The social life of small urban spaces," Washington, D.C.: The Conservation Foundation (1980).

Addendum

I presented this study on December 7, 2011 to a group of members of Campus and Community Planning and UBC Sustainability. After the discussion that followed my presentation, it is clear that an effective treatment of traffic circulation on Main Mall requires us to consider a broader view of cycling trends on campus than provided by the scope of this study. Where are cyclists coming from? Where are they going? What do users want? This study provides both the analytical framework and quantitative data with which we can begin to answer these questions. However, further study of campus cycling trends is required to develop an effective network of cycling routes on campus.

Appendix A

Main Mall Walk-Bike Survey



Please answer each question for both the south and north sections of Main Mall.

Question	Answer	South Section	North Section
1. Do you spend time with friends on this section of Main Mall?	Yes No	☐ ☐	☐ ☐
2. Do you use this section of Main Mall for recreation?	Yes No	☐ ☐	☐ ☐
3. Does this section of Main Mall get you across campus efficiently?	Yes No	☐ ☐	☐ ☐
4. How safe is this section of Main Mall for pedestrians?	Very Safe Somewhat Safe Neither Safe nor Dangerous Somewhat Dangerous Very Dangerous	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
5. How safe is this section of Main Mall for cyclists?	Very Safe Somewhat Safe Neither Safe nor Dangerous Somewhat Dangerous Very Dangerous	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
6. In the last month, have you experienced any problems between pedestrians and cyclists on this section of Main Mall?	Yes No	☐ ☐	☐ ☐
7. If yes, how serious was the problem(s)? *(check all that apply)*	Insignificant Route redirected/slowed One or more parties halted Minor Crash, no injury Major Crash, injury	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
8. In the last month, have you experienced any problems with vehicles on this section of Main Mall?	Yes No	☐ ☐	☐ ☐
9. If yes, how serious was the problem(s)? *(check all that apply)*	Insignificant Route redirected/slowed One or more parties stopped Minor Crash, no injury Major Crash, injury	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐

-Continued to next page-

10. Is anything missing on either section of Main Mall that would improve your comfort and/or safety?

If something is missing, please explain.

- ☐ Yes, something is missing (*please explain*) → _____
- ☐ No, nothing is missing

11. Do you use Main Mall primarily as a:

- ☐ Way to move across campus
- ☐ Place to meet and spend time with friends
- ☐ A Combination of the above
- ☐ Other (*please explain*) →

12. Who should have priority on Main Mall?

- ☐ Pedestrians
- ☐ Bicyclists
- ☐ A combination of the above
- ☐ Vehicles
- ☐ Other (*please explain*) →

13. In the last week, how many days did you walk on Main Mall?

_____

14. In the last week, how many days did you cycle on Main Mall?

_____

15. What affects your decision to cycle on Main Mall? (*check all that apply*)

- ☐ Distance to destination is close
- ☐ Distance to destination is too far
- ☐ Lack of cycling facilities
- ☐ Lack of cycling experience/bicycle
- ☐ Main Mall is unsafe for cycling
- ☐ Too many people
- ☐ Weather
- ☐ Other (*please specify*) → _____

16. Should a bicycle path be added to Main Mall?

- ☐ Yes
- ☐ No

17. Are you a female or a male?

- ☐ Female
- ☐ Male

18. What is your year of birth? ____ ____ ____ ____

19. What is your first language? _____

20. What is your role at UBC?

- ☐ Faculty
- ☐ Staff
- ☐ Student
- ☐ Visitor
- ☐ Other (*please specify*) → _____

21. With which faculty are you most associated? _____

Thank you for your time. Feel free to contact Noah Rosen at xxx-xxx-xxxx should you have any further comments or questions.

Appendix B

Site Oberservation Form
Main Mall Walk-Bike Survey

1. Site Observer _____

1.1 Phone (___) ___-____

1.2 Email _____

2. Observation Date ____ / ____ / _____
DD MM YYYY

3. Observation Day of Week _____

4. Observation Start ____:____ am pm
hr min

5. Weather (*check all that apply*)

- ☐ Clear Sky
- ☐ Partial Cloud Cover
- ☐ Complete Cloud Cover
- ☐ Fog/Mist
- ☐ Smog/Smoke
- ☐ Raining (*include light and heavy rainfall*)
- ☐ Snowing
- ☐ Hail
- ☐ Strong Winds

6. Features of Main Mall Redesign present (*check all that apply*)

- ☐ Test Benches
- ☐ Lighting
- ☐ Lighting Illuminated
- ☐ Construction Equipment Present (*please specify what and where below*)

_____

7. Count (*10 min counts/1 hr surveying, perform count on back, record totals here*)

_____ Pedestrians
_____ Bicyclists Riding Bike
_____ Bicyclists Walking Bike
_____ Skateboarders
_____ Vehicles
_____ Rollerbladers
_____ Wheelchairs

8. Count start time ____:____ am pm **Count end time** ____:____ am pm
hr min hr min

9. Observation End ____:____ am pm
hr min

Type of Traffic	Count *(10 min counts/1 hr surveying, record totals on front)*
Pedestrians	
Bicyclists Riding Bike	
Bicyclists Walking Bike	
Skateboarders	
Vehicles	
Rollerbladers	
Wheelchairs	