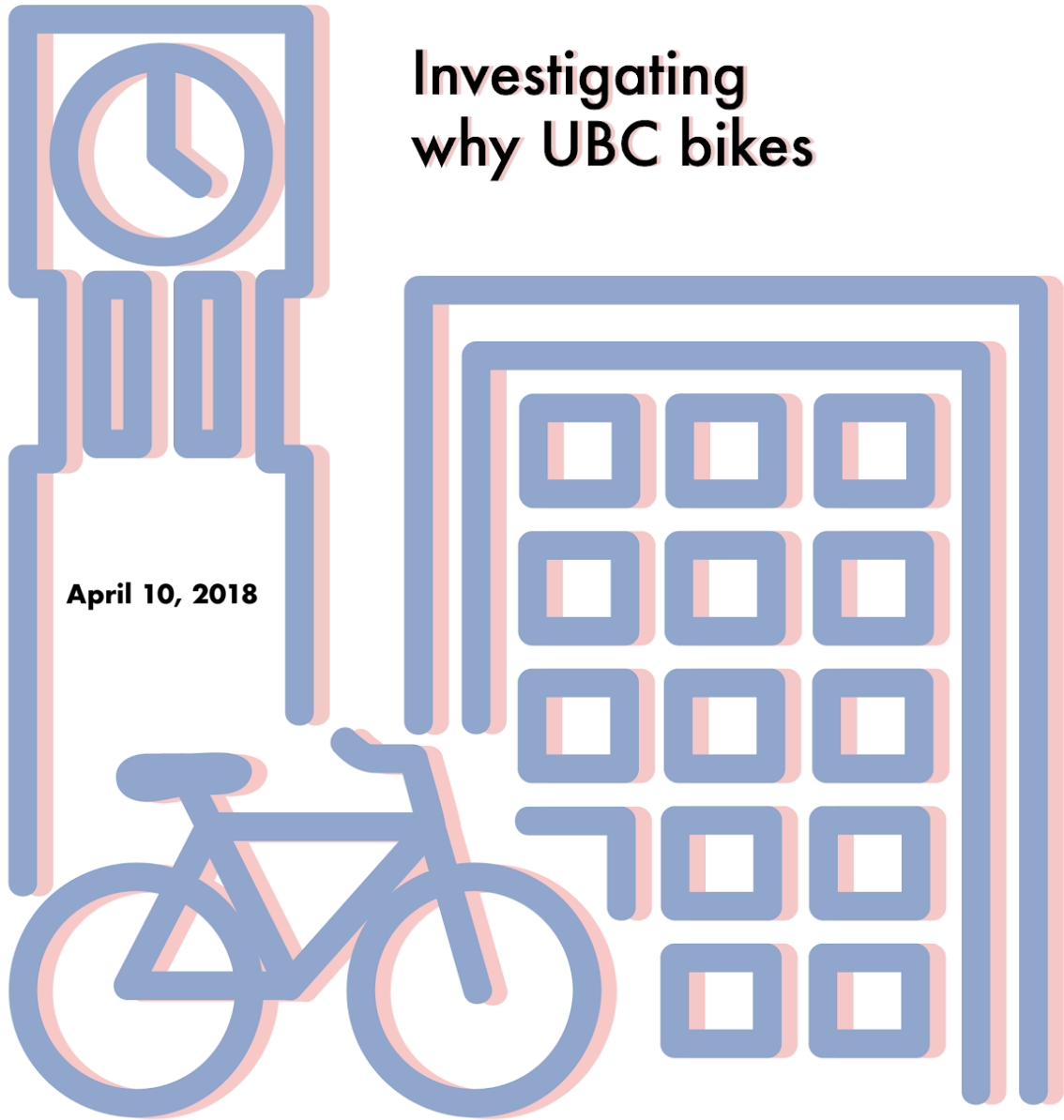# CYCLE CITY

Investigating why UBC bikes

April 10, 2018

ENVR 400

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Advisor: Michael Lipsen

TABLE OF CONTENTS

Executive Summary

Introduction

Vancouver has seen a surge in bicycle ridership under the Vision Vancouver Party-led municipal government over the past decade. Working towards the ideas of sustainability and livability in our urban environment, Vancouver has approved multiple cycling infrastructure projects throughout the city. These projects, however, have often met criticism from the communities they were intended to serve. Recent examples including the Kitsilano Beach Park bike path (in development since 2013), where a February 2018 proposal to pave over green space is being met with fierce opposition from community members, who disapprove of the proposed location of the path, highlight the need for more community involvement throughout the process of adding to the city's cycling infrastructure.

While the total number of trips made around the city by bicycle has maintained a pattern of increase over the past decade, due in part to city initiatives promoting biking through the development of new infrastructure and amenities for cyclists, the proportion of all trips in Vancouver made by bike has actually plateaued in the past 2-3 years. At just 7%, biking is still overshadowed by other modes of transportation such as driving, and even walking. This slowing of progress regarding biking has occurred despite the completion of several projects across the city, including the Arbutus Greenway (opened in 2017). Possibly caused by inconsistencies between the wants and needs of the communities and the cycling infrastructure aimed to serve them, this warrants the question that this study seeks to answer, being:

- Why is it that people bike into and around UBC?

This project focuses on UBC as a pilot community for a survey aiming to investigate the factors affecting people's decisions to bike. By using a smaller subset of the population in this preliminary survey, this project is able, in addition to finding the root causes keeping people from biking, providing some context for the recent plateau in ridership proportions in Vancouver, to act as a testing ground for questions and provide the groundwork for future studies concentrating on specific factors regarding biking.

Methods

Survey Development and Distribution

We developed our survey using online survey tools and distributed it to people who reside within/near UBC. We chose to use UBC survey tool, which is provided by Qualtrics. Amidst the various attempt to get UBC Bike Kitchen and ESSA on-board to help us with survey distribution through their mailing systems, we mainly distributed our survey through page sharing on social media and asking friends to participate. Fortunately, we have successfully distributed our survey towards our audience, and eventually achieved a total of 60 responses although only 48 responses completed the survey in its entirety.

Data Analysis

After achieving 60 responses, we split the survey questions among the group and analyzed the results in terms of its data options and final conclusions. The data is in various forms including rankings, yes/no options, open ended questions, and one/more choice that applies. When data analysis from all survey questions were completed, we combined all the analysis was put together to produce a flow chart, demonstrating the major findings.
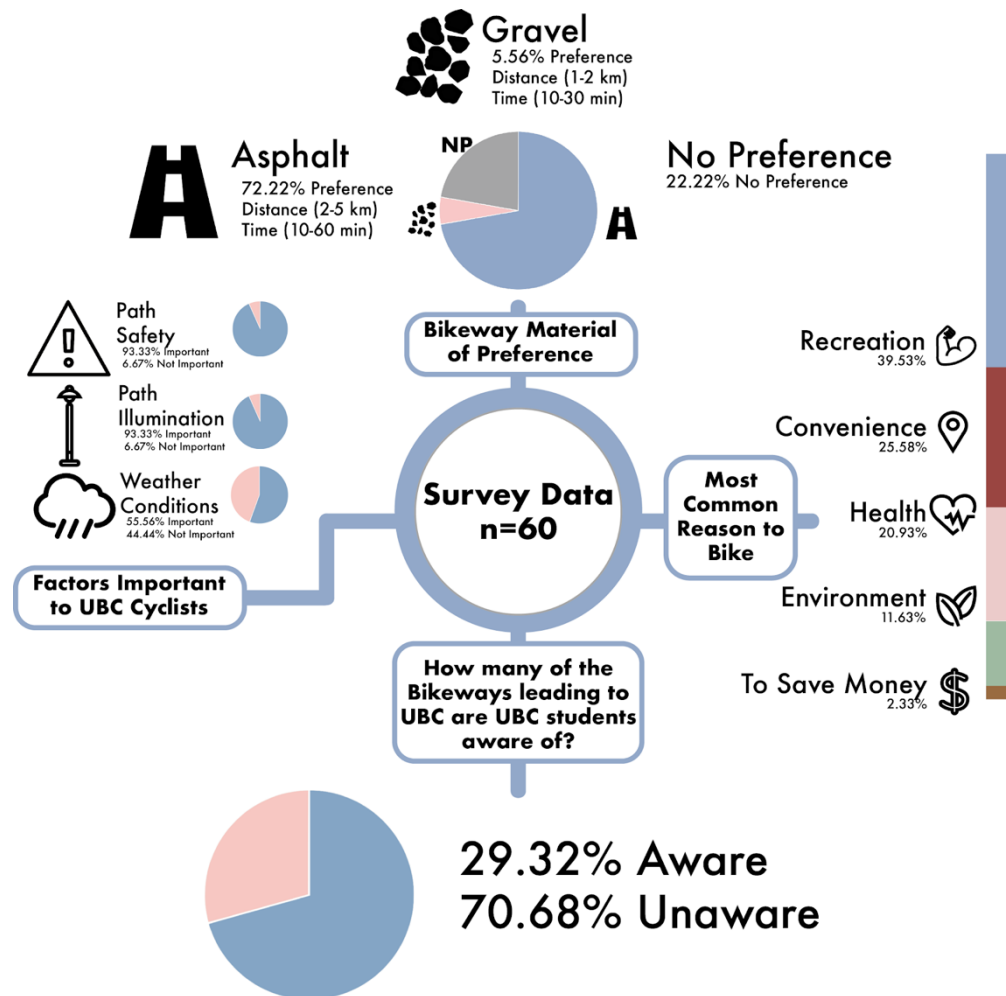
Results

A total number of 60 survey responses from the UBC community were received throughout the one-month period of survey distribution.

In terms of bikeway frequency, data suggests that undergraduate students rarely bike to campus (<1 time per week), with 60% of undergraduates walking as main mode of transportation. It was also found that a slightly larger number of UBC students live on campus, 56.52% versus 43.47%, which reported living outside UBC and endowment lands. Additionally, the undergraduate community is only aware of about two out of the seven closest and connecting pathways to UBC (Northwest Marine Drive & Spanish Banks, Southwest

Marine Drive & Southlands, 8th Avenue & Chancellor Boulevard, 16th Avenue, Wesbrook Mall, University Boulevard, and 29th Avenue & Forest Path). The lack of pathway awareness could explain the low frequency of biking as mode of transportation.

In terms of bikeway safety, data suggests that bikeways Northwest Marine Drive, 16th Avenue, and 29th Avenue were ranked as the safest. These same bikeways were also used by a larger proportion of undergraduates, highlighting the importance of safety for bike ridership.

In terms of bikeway material, 72.22% of undergraduates prefer asphalt over gravel (5.56%), with 22.22% having no preference. Additionally, the average distance that students are willing to bike is 1-2 km on gravel and 2-5 km on asphalt, while the average time is 10-30 min and 30-60 min, respectively. The inclusion of factors such as rainy weather and lack of path illumination resulting in an overall decrease in biking interest. Data suggests that weather and path illumination have a greater impact than trail material in influencing student's decision to bike.

In terms of biking purpose, data suggests that most of undergraduates bike for recreation purposes.

Conclusions

The data obtained from the survey are the result of a preliminary study of cycling ridership among undergraduates in the UBC community. Given the nature of the study, the results are not representative of the UBC community and not statistically significant. Realizing the implication of the limited sample size of the survey, we learned more from the survey itself as opposed to the results produced. However, we can still use the results to answer the research questions. Additionally, the findings provide valuable insights and a baseline for future work investigating biking preferences.

Having been able to surmise that on average, over 70% of participants are unaware of any given bikeway, we can conclude that, while increasing the amount of cycling infrastructure linking Vancouver to UBC may prove useful in promoting bike commutes to UBC, efforts must also be made to increase awareness and improve current infrastructure. However, we identified a significant limitation in that not a single question aimed to answer this question directly. Therefore, survey questions on this objective could be modified to be more specific for future applications. Additional factors to consider are sufficient time allocated to survey distribution and awareness, use of a quantitative method for qualitative data analysis for statistical significance, and incorporation of an in-person component apart from electronic survey distribution.

 Factors that affect bicycle ridership and potentially keep undergraduate students from biking includes isolation from motorized vehicle traffic, bikeway lighting, weather, awareness of existing bikeways, and trail surface material. Safety, path illumination, and weather appear to be the most important factors participants used when deciding not only whether or not to bike, but the distance and duration of their trips as well. Given preliminary results, if we were to propose the biggest factor to address and the most cost effective one to improve ridership, these would be bikeway safety and bikeway awareness, respectively.

AUTHOR BIOGRAPHIES

María Alejandra is a 4th year Environmental Sciences student focusing on Ecology and Conservation. She has excellent technical, written and oral communication skills. She used applications like Excel and Powerpoint for bar graph generation, data analysis and presentation preparation. She contributed to the writing and editing of every project related document. Her biggest strength is organization. She used Google Spreadsheets to organize team related deadlines and member's contributions. She was responsible for writing the most important points discussed during team consultations and minute submission. She also completed the BREB application for ethics approval necessary for survey distribution.

Sunny Liao is a 4th year Environmental Sciences student with a specialization in Ecology and Conservation. He has dedication, loyalty, and a plethora of knowledge regarding Vancouver's infrastructure due to his active involvement with real estate projects as well as personal investments. Sunny strongly believes that cycling as a mode of transportation, is an integral aspect of any 'global city' with ambitions of becoming a major hub of economic activity. Thus, he advocates for the improvement of cycling pathways and logistics on a city-wide scale.

Angelina Wang is a 4th year undergraduate in the Environmental Sciences major. She has many group experiences in school clubs and community-based volunteering, which builds up her confidence in working with different types of people. She has strong manipulative skills and has contributed to the quantitative analysis regarding the current ratio of bike route material in regions within/near University of British Columbia. She is also responsible for group work and knows the importance of cooperation when working as a team.

Russell Chiong is in the 4th year of the Environmental Sciences program, with an area of concentration of Conservation and Ecology. Having been involved with community groups in Vancouver's Chinatown and the Downtown Eastside, he brings practical knowledge and first-hand experience both in canvassing to the community and in the communication of results to policy-makers and the wider public. Furthermore, his freelance experience and passion for illustration and graphic design have uniquely prepared him for this project.

I. INTRODUCTION
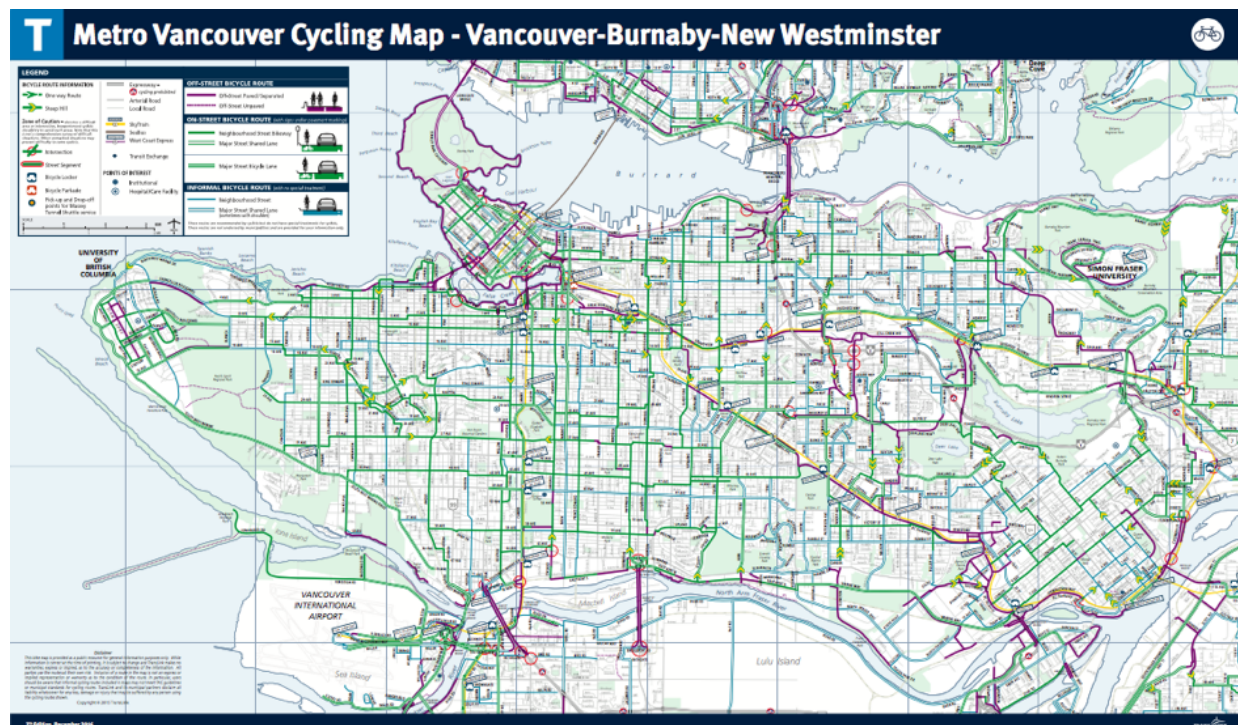
Map of cycling infrastructure in Vancouver, British Columbia, provided by Translink.

Bicycle ridership has seen a surge over the past two decades across North America, with cities like Vancouver at the forefront. Vancouver's municipal government has been aiming to improve sustainability for the better part of a decade now. In 2011, the Vancouver City Council approved the Greenest City Action Plan, or GCAP, with the intention of making Vancouver the 'greenest' city in the world by the year 2020 . Already, Vancouver has made steps towards the goals set forth in the GCAP, including increased investment in both public transit and cycling infrastructure. With approximately 7% of all trips being made by bicycle in 2015 and 2016 , our city looks to lead the way in cycling trips as a proportion of all trips, at least in North America.

Despite being a world leader in cycling ridership , cycling in Vancouver remains well behind other modes of transport including walking, transit, and driving. In addition, the recent plateau in the proportion of trips made by bicycle, despite development of infrastructure and amenities for cyclists, suggests that said infrastructure may not be capable of adequately serving the surrounding communities. According to our hand-done measurements and calculations involving the map above, approximately 63% of all bikeways in Vancouver are paved, while the other 37% is unpaved or without any special treatment. Looking solely at on-street bikeways, the proportion that are paved goes up to 67% or approximately two-thirds. While anecdotal evidence suggests that cyclists prefer paved paths over gravel, this study seeks to investigate this, along with other factors that could influence decisions to bike.

Aside from issues such as bikeway surface material, that affect rider experience, issues of public reception and community input often arise when discussing cycling and the associated infrastructure in Vancouver. A proposal to pave a bike path through Kitsilano Beach Park, in development since 2013, has recently faced fierce opposition from community members and residents, including protests organized, in part, by the community group "Wake Up Vancouver" on March 16, 2018[4]. Fueled by acceleration to the processing of the plan that lacked a platform for public input, the negative response from the community, with the potential of further delaying the project, highlights the importance of testing developments in the court of public opinion before full approval. Traditional "Open-House" style events have been criticized in the past for being inefficient and having inadequate accessibility. While online surveys, on paper, seem to be a welcome alternative, as a cheap and accessible manner of collecting public input on specific infrastructure projects. In the case of bikeways, community members would not only be able to provide feedback on specific projects, but also be able to communicate how bikeways could better serve them, heeding the way for the development of new bikeways with increased ridership.

Issues such as those outlined above, provide a basis for our research, with the objective to encourage more people to bike more. In collaboration with the BC Cycling Coalition, our goal is to find out what factors are considered prohibitive to potential cyclists, using a survey aimed at UBC as the pilot community to answer the following research questions:

1. Would people bike more if bikeways were surfaced with asphalt over gravel?
2. Would more connecting bike infrastructure to UBC encourage people to bike commute to campus more often?
3. What are the root reasons that are preventing people to bike to UBC campus? How much do trail safety, light, health, environmental connection and weather influence people´s making to bike?

These three research questions help us answer the ultimate question of this project, being: What keeps people from biking? By finding the root causes or prohibitive factors that keep people from biking, we hope to provide context for the recent plateau in the proportion of trips taken by bicycle in Vancouver, and determine possible strategies for future bike infrastructure development that can encourage people to bike.

II. METHODS

Survey Development and Distribution
We developed our survey using online survey tools and distributed it to people who reside within/near UBC. We chose to use UBC survey tool, which is provided by Qualtrics. Amidst the various attempt to get UBC Bike Kitchen and ESSA on-board to help us with survey distribution through their mailing systems, we mainly distributed our survey through page sharing on social media and asking friends to participate. We achieved a total of 60 responses although only 48 responses completed the survey in its entirety.

Data Analysis

        After achieving 60 responses, we split the survey questions among the group and analyzed the results in terms of its data options and final conclusions. The data is in various forms including rankings, yes/no options, open ended questions, and one/more choice that applies. When data analysis from all survey questions were completed, we combined all the analysis was put together to produce a flow chart, demonstrating the major findings.
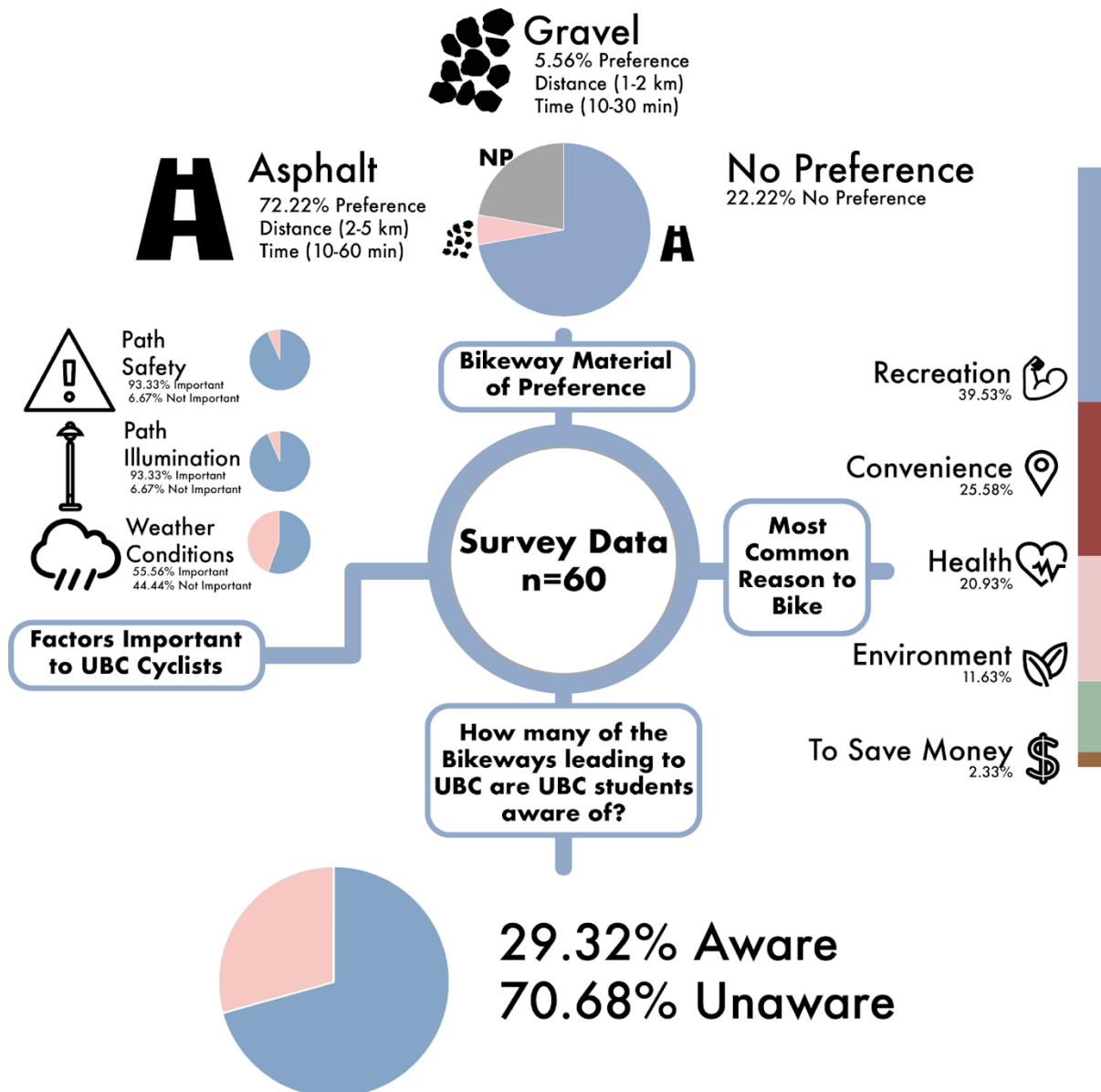
III. FIGURES

Figure 1. Flow Chart summarizing main findings regarding UBC undergraduate community biking preferences.

IV: Results and Discussion

Cycling Frequency

       A total number of 60 survey responses were received throughout the one-month period of survey distribution. The initial idea was to group biking preferences by occupation (undergraduate student, graduate student, and staff/faculty member) in the UBC community. However, given the low number of responses for the latter two categories, 5 out of 60, data analysis was based solely on the data obtained from the undergraduate UBC community. Figure 2 below shows that UBC undergraduate students rarely bike to campus (< 1 time per week), with 60% of undergraduates walking as main mode of transportation.

Frequency of Use for Modes of Transport among UBC Undergraduates
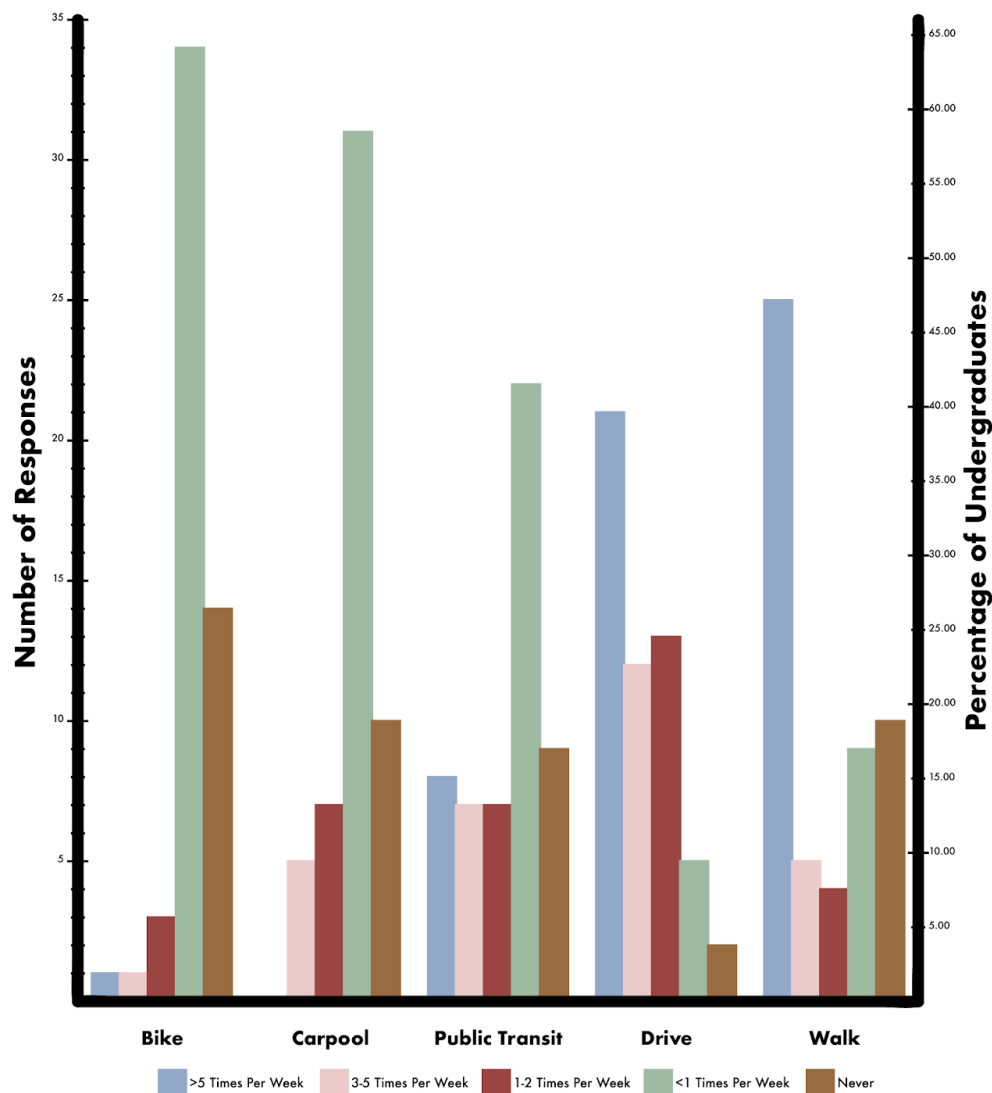
Figure 2. Represents the frequency of usage of various modes of transportation (bike, carpool, drive, public transit, and walk) among UBC undergraduate community members. Data is not statistically significant given the low number of responses, n <500 (1% UBC community).

The results above could be due to the slightly larger number of UBC students that live on campus, 56.52% versus 43.47% which reported living outside UBC and endowment lands. Additionally, a couple of participants mentioned that UBC is too crowded for biking. The concept map (figure 1) shows that of the seven closest and connecting bikeways to UBC (Northwest Marine Drive & Spanish Banks, Southwest Marine Drive & Southlands, 8th Avenue & Chancellor Boulevard, 16th Avenue, Wesbrook Mall, University Boulevard, and 29th Avenue & Forest Path), the undergraduate community is aware of only 29.32% or about 2 out of 7 bikeways. The fact that most undergrads are not aware of the location of the bikeways could also explain the low frequency of biking as mode of transportation observed in figure 2.

Bikeway Safety

Figure 3 below shows that bikeways Northwest Marine Drive, 16th Avenue and 29th Avenue are ranked as the safest. Data shows that the former two paths were also known and used by a large proportion of the undergraduate community, suggesting that students would bike more in bikeways perceived as safe.

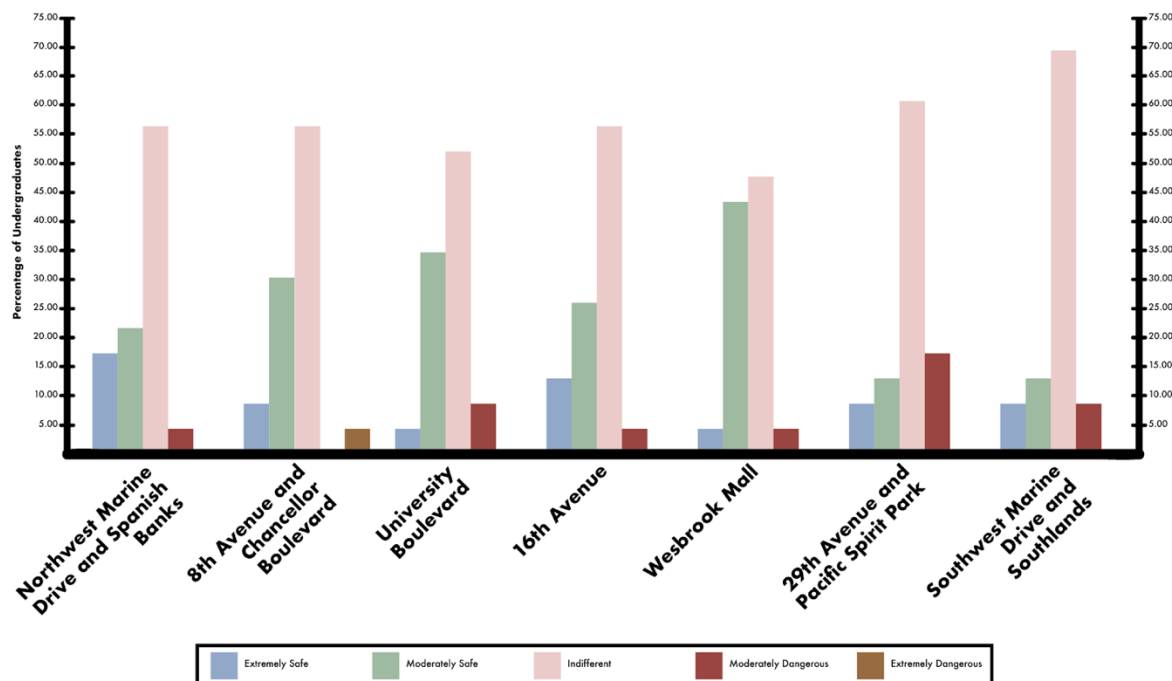# Undergraduate Students' Opinions on Bikeway Safety

Figure 3. Represents UBC undergraduate community opinion regarding bikeway safety. The bikeways shown in the x-axis are the seven bikeways closest to and connecting to UBC. The y axis shows the percentage of UBC undergraduate students that ranked the bikeways as extremely safe, moderately safe, indifferent, moderately dangerous, and extremely dangerous.

Data is not statistically significant given the low number of responses, n < 500 (1% UBC community).

Bikeway Material

Figure 4 below shows that 72.22% of undergraduates prefer asphalt over gravel (5.56%), with 22.22% having no preference. The no preference category included students the owed a hybrid bike or whose answer depended on the type of bike being used. Additionally, the average distance that students are willing to bike is 1-2 km on gravel and 2-5 km on asphalt, while the average time is 10-30 min and 30-60 min, respectively (Figure 1). The inclusion of factors such as rainy weather and lack of path illumination, resulted in an overall decrease in biking interest. It is interesting to note that the difference found in time and distance was much greater between sunny and rainy weather than between asphalt and gravel. This implies that weather has a greater impact than trail material in influencing people's decision to bike. Similar results were observed between trail material and light conditions. However, it was found that light is not often a big issue for participants. Common comments in the survey were:

" I won't bike if it is raining, or too cold ".

" Paved roads keep bikes clear and dust free ".

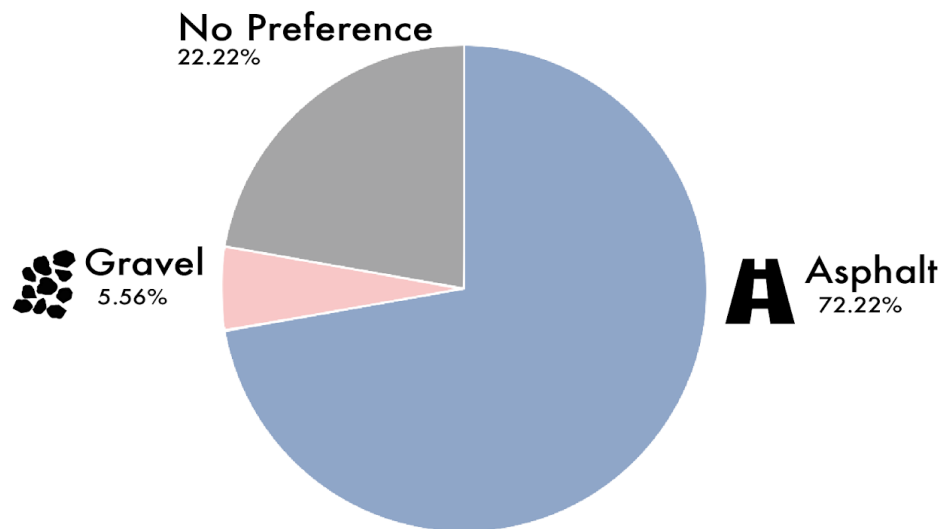# Bikeway Material of Preference among UBC Undergraduates

Figure 4. Represents the bikeway material of preference for the UBC undergraduate community. The y-axis shows the percentage of undergraduate students that prefer asphalt, gravel, or have no preference. Data is not statistically significant given the low number of responses, n <500 (1% UBC community) .

Biking Purpose

Figure 5 shows that 34.78% of undergrads bike for recreation purposes. It is interesting to note how, given the reference of Vancouver as a green city, very few students bike to reduce environmental impact. It is possible that students' contributions towards a greener environment are in alternative forms, for instance, responsible consumption (organic) and composting. The flow chart summarizes the findings showing that the most important factors influencing people's decision to bike are bikeway safety, isolation from road, and weather. Many participants particularly expressed their concern in avoiding interaction with cars.

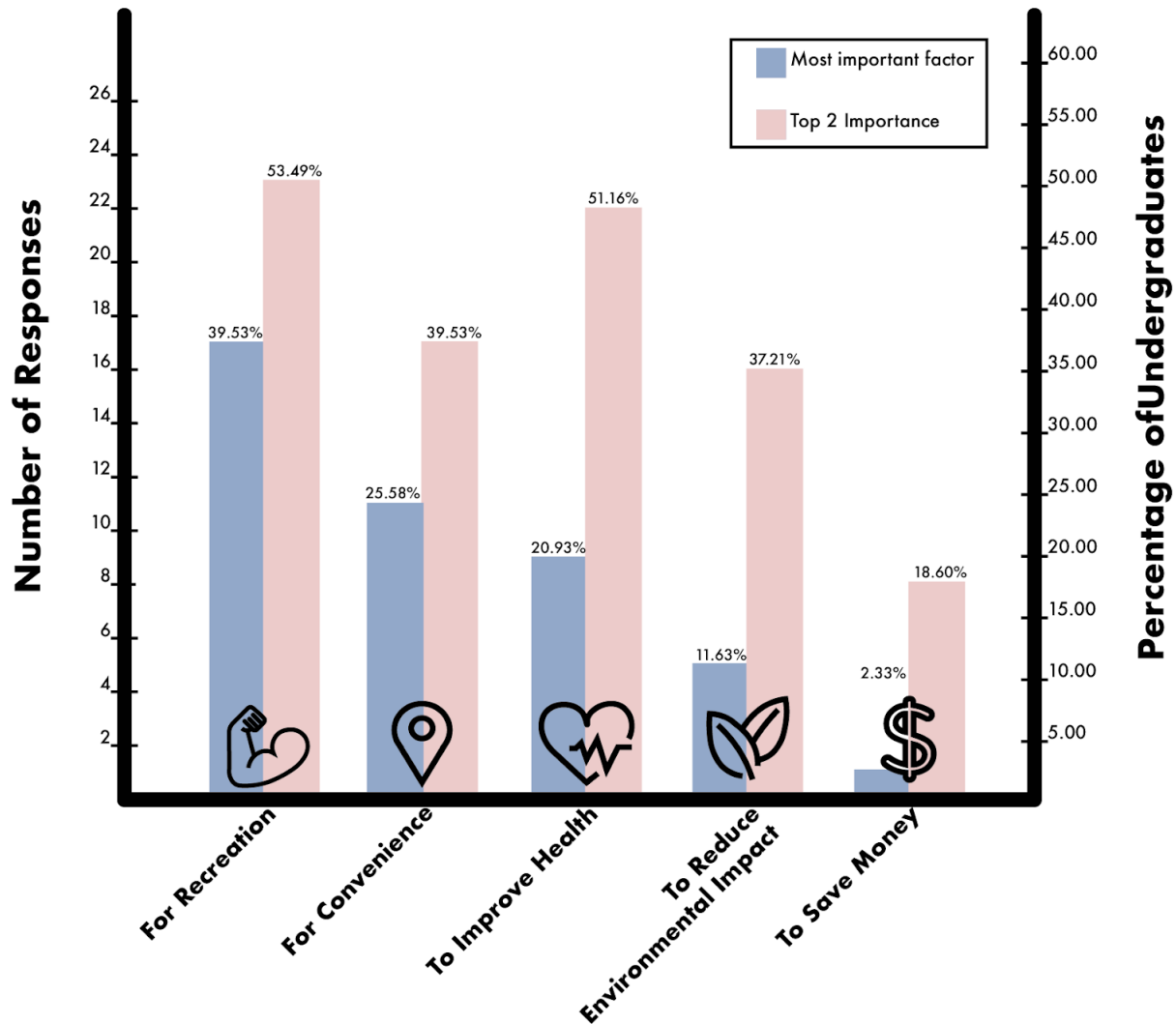# Main Reasons for Biking for UBC Undergraduates

Figure 5. Represents the main reasons the UBC undergraduate community uses bikes for. The y-axis shows the percentage of undergraduate students that bike for the reasons specified in the x-axis. Data is not statistically significance given low number of responses, n < 500 (1% UBC community).

Survey Data

The data obtained from the survey are the results of a preliminary study on the UBC community. Given that this was the team's first survey experience, we learned a lot regarding changes for future survey development and distribution. Firstly, more efficient ways need to be implemented for survey distribution. More time needs to be allocated for the survey distribution itself and collaborating parties need to be contacted well in advance. Distribution of survey through email is still believed to be the most efficient way of reaching a greater proportion of

the UBC community. However, in-person surveying could be incorporated as an additional component to survey distribution. Secondly, survey questions and answer options should be made for precise to better fit our objectives. Even though, our objective questions were addressed, some data points were hard to incorporate in analysis given the nature of the data (ranking system and long answers). Additionally, a quantitative method could be incorporated for qualitative data analysis, for instance cluster analysis, to make results significant provided enough number of responses. And lastly, new approaches need to be implemented to increase community involvement in the surveying process. Given the low number of responses and the number of incomplete surveys received, it is evident that the $25 UBC bookstore gift card incentive was not enough. Perhaps, better communication on project's objectives and implications would encourage UBC community members to be more involved.

V: CONCLUSION

Given the sample size of this survey, much of what we can learn from this project is from the survey itself as opposed to the results it produced. However, we can still use the results to answer the research questions laid out at the time of this project's conception.

It is apparent from the survey responses that not only do participants tend to prefer asphalt to gravel for general riding, but many are also willing to bike for greater periods of time over longer distances on asphalt when compared with gravel. Approximately 72.22% of participants rated asphalt as their preferred bikeway surface material, while approximately 5.56% of participants preferred gravel. In addition, the average distance participants stated that they were willing to bike was 1-2 km on gravel but 2-5 km on asphalt, while the average time is 10-30 minutes on gravel and 10-60 minutes on asphalt. There is, however, no statistically significant evidence to support this claim, despite a numerical difference between the two sets of distance and time. While we cannot conclude that more people would bike or that people would bike more if given asphalt paths in place of gravel, the data does show some trend in that direction, but lacks statistical significance.

Having been able to surmise that on average, over 70% of participants are unaware of any given bikeway, we can conclude that, while increasing the amount of cycling infrastructure linking Vancouver to UBC may prove useful in promoting bike commutes to UBC, efforts must also be made to increase awareness and improve current infrastructure. Our study had a significant limitation in that no single question in the survey aimed to answer this question directly; we can therefore draw the conclusion that this objective or the related questions would need to be modified for future applications of the survey as per the goal of surveying cyclists' preferences across BC.

Despite results indicating bikeway surface material as a factor affecting cycling ridership, further analysis showed that factors such as path safety (including the degree of isolation from motorized traffic, and light conditions on bikeways), and weather, play a more important role in participants' decisions regarding biking. Paths ranked as safer were not only ranked as more preferred by participants, but were also used by a greater proportion of participants than those that were deemed unsafe. The degree of isolation from cars and other motorized traffic was, on average, considered the most important component of bikeway safety, in agreement with text responses revealing that some participants are willing to bike

longer distances and for more time in order to avoid biking near cars. Bikeway lighting was also revealed to be a potentially prohibitive factor regarding decisions to bike for participants; while statistical significance could not be achieved, the variation in time and distance participants were willing to bike varied more between light and dark for the same surface materials than between surface materials for the same lighting situation, implying that light is more important of a factor affecting cycling trips than surface material. Just as with bikeway lighting, variation in potential trip duration and distance between weather conditions on the same bikeway trail material was greater in magnitude than variations between different surface materials under the same weather conditions. From these results, we can conclude that participants of this survey prefer lit paths to unlit paths, and sunny weather to rainy weather, and that they view these factors as of greater importance than trail material.

Because the participant population of this survey is not representative of the UBC community as a whole (with an overrepresentation of undergraduate students restricted to certain subsections of the student community), no significant conclusions can be extended to the UBC community as a whole; however, we are able to draw some conclusions regarding the sampled undergraduate community. Factors that affect bicycle ridership and potentially keep undergraduate students from biking include safety, including isolation from motorized vehicle traffic, and bikeway lighting; weather; awareness of existing bikeways; and trail surface material. Weather and safety appear to be the most important factors participants used when deciding not only whether or not to bike, but the distance and duration of their trips as well. Given preliminary results, if we were to propose the biggest factor to address and the most cost effective one to improve ridership, these would be bikeway safety and bikeway awareness, respectively.

VI: ACKNOWLEDGEMENTS

VII: REFERENCES

[1]City of Vancouver. Greenest City 2020 Action Plan. 2012,
http://vancouver.ca/files/cov/Greenest-city-action-plan.pdf

[2]City of Vancouver. Walking and cycling in Vancouver 2016 Report Card. 2016,
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[4]Gul, Monika. "Proposed bike lane through Kitsilano Beach Park met with opposition" *News 1130*, 11 March 2018, http://www.news1130.com/2018/03/11/proposed-bike-lane-kitsilano-beach-park-met-opposition/

VIII: APPENDIX
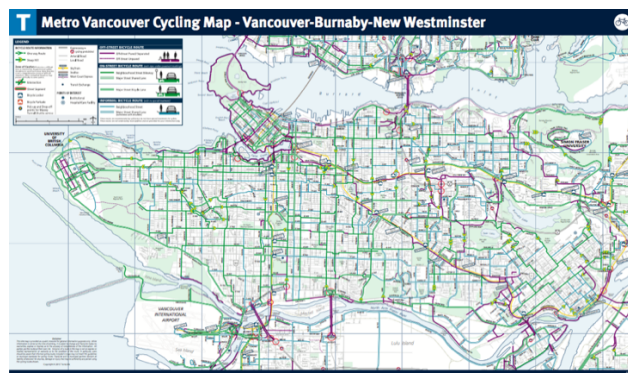
Map of cycling infrastructure in Vancouver, British Columbia, provided by Translink.

Graphically, using hand and ruler, our group has estimated the approximate percentage of paved and unpaved off-street bikeways in regions near The University of British Columbia. The results show that the off-street bikeways are 40% paved and 60% unpaved, which means that the length of unpaved off-street bikeway is 1.5 times more compared to that of the paved counterpart. Performing the same calculation with on-street bikeways, the results show that on-street bikeways are 67% paved and 33% unpaved or without special treatment. In other words, the length of on-street paved bikeway is about 2 times more that that unpaved. Combining both results, 63% of the bikeways are paved or have special treatment and 37% are unpaved.

Included on the following page is a copy of the complete survey, distributed to the UBC community via online platforms such as Facebook and email.

Cycle City: Investigating the effects of surface materials on cycling ridership in the UBC community

✳

University of British Columbia
 Survey Consent Cover Letter
 Investigating the effects of surface material, environment, and distance on cycling ridership in the UBC community
   You are being asked to participate in a research study. Before you give your consent to volunteer, it is important that you read the following information to be sure you understand what you will be asked to do. The survey will take 10-15 minutes to complete.

 Who is conducting the study? *Principal Investigator:* Dr. Tara Ivanochko, Earth, Ocean and Atmospheric Sciences, Senior Instructor Phone: (604) 827-3179 Email: tivanoch@eoas.ubc.ca *Primary Contact and Additional Study Members:* Undergraduate students in the Faculty of Science at The University of British Columbia (UBC): Russell Chiong, Sunny Liao, Angelina Wang, & María Alejandra Molina Phone: (604) 356-2023 The study is being conducted in conjunction with The British Columbia Cycling Coalition.

 Why are we doing this study? This study is being done as a requirement for a fourth year Environmental Science course and is designed to help us understand people´s bikeway material of choice, gravel vs. asphalt, and root factors (light, safety, weather, health) affecting people´s decision to bike. The data from this research will be used to help determine the biking preferences of UBC community members and could be expanded to influence decision-making and intervention regarding bikeway construction implementation in the Metro Vancouver area.

 How is the study done? The survey will be generated using UBC Qualtrics online survey tool. We will send you an email with the link to the survey. Data will be stored in a password protected, encrypted file and computer within UBC for five years and will be analyzed using Excel. No personal information will be asked and your responses will remain confidential and anonymous. Only project team members will have access to the data. There is no compensation for or obligation to complete this survey. Your participation in this survey is voluntary and you may refuse to participate or stop participating at any time.

 What will happen to the study results? The results of this study will be shared with classmates, course instructors, and the BC cycling coalition. It is also possible that this research could be published in community newsletters, journals, or other formats. There are no immediate

benefits to participating, but, in the future, others may benefit from what we learn. There are no physical foreseeable risks associated with this study; however, some questions could cause emotional stress.

Questions? If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598. Additionally, given that a couple of survey questions will ask you to identify a biking related situation where you felt your safety was at risk, if you feel you need to talk to someone after completion of the survey, please contact UBC Counselling services toll free at 1-800-387-4765, available 24 hours a day, seven days a week.

I have read the information provided above. I understand that by completing this questionnaire, I am agreeing to participate in this research study. If the questionnaire is completed, it will be assumed that consent has been given.

◯ Yes, I consent.

◯ No, I do not consent.

What is your occupation?

◯ Undergraduate Student

◯ Graduate Student

◯ Faculty/Staff Member

Where do you reside?

◯ UBC Campus or Endowment Lands

◯ Other, please specify: _____

How often do you use the following modes of transportation?
If you don't use a mode of transportation, please leave it blank.

	>5 Times per Week	3-5 Times per Week	1-2 Times per Week	<1 Times per Week
Bike	○	○	○	○
Carpool	○	○	○	○
Drive	○	○	○	○
Public Transit	○	○	○	○
Walk	○	○	○	○

What type(s) of bikes have you used?
Please select all that apply (Leave blank if none).

☐ Road Bike

☐ Hybrid Bike

☐ Mountain Bike

☐ Electric Bike

Do you use any other wheeled devices?
 Please select all that apply.

☐ Wheelchair

☐ In-Line Skates

☐ Skateboard

☐ Other, please specify: _____

For what purposes do you cycle?
 Please select all that apply.

☐ Commute

☐ Leisure

☐ Exercise

☐ Transportation

☐ Other, please specify: _____

Rank the following based on your own reasons to cycle, with 1 being most important and 5 being least important.
_____ For Recreation
_____ To Save Money
_____ To Improve Health
_____ To Reduce Environmental Impact
_____ For Convenience

✱

What is the duration of your average bike ride?

  ◯ Time (Minutes) _____

  ◯ Distance (km) _____

What bikeways are you aware of leading to/within UBC?
  a) Northwest Marine Drive & Spanish banks Bike Lane
  b) 4th Avenue and Chancellor Boulevard Bike Route
  c) University Boulevard Bike Lane
  d) 16th Avenue Bike Lane
  e) 29th Avenue & Pacific Spirit Regional Park Bike Path
  f) Wesbrook Mall Bikeway
  g) SouthWest Marine Drive & Southlands Bike Route

	Off	On
Northwest Marine Drive & Spanish Banks Bike Route		
4th Avenue & Chancellor Boulevard Bike Route		
University Boulevard Bike Lane		
16th Avenue Bike Lane		
29th Avenue & Pacific Spirit Park Bike Route		
Wesbrook Mall Bikeway		
Southwest Marine Drive & Southlands Bike Lane		

Which of the above bikeways do you use often?
(≥1 per month)

☐   a) Northwest Marine Drive & Spanish Banks Bike Route

☐   b) 8th Avenue and Chancellor Boulevard Bike Route

☐   c) University Boulevard Bike Lane

☐   d) 16th Avenue Bike Lane

☐   e) 29th Avenue & Pacific Spirit Park Bike Route

☐   f) Wesbrook Mall Bikeway

☐   g) Southwest Marine Drive & Southlands Bike Path

- -

Please rank the following bikeways from 1 (Most preferred) to 7 (Least preferred).
_____ Northwest Marine Drive & Spanish Banks Bike Route
_____ 8th Avenue and Chancellor Boulevard Bike Route
_____ University Boulevard Bike Lane
_____ 16th Avenue Bike Lane
_____ Wesbrook Mall Bikeway
_____ 29th Avenue & Pacific Spirit Park Bike Route
_____ Southwest Marine Drive & Southlands Bike Path

- -

Please expand on your above rankings.

_____

End of Block: Block 3

Start of Block: Block 3

Given two bikeways of equal length and topography, one using gravel as the surface material and the other asphalt, which would you choose to use?

○ Asphalt

○ Gravel

○ No preference

Please elaborate on your above statement of preference.

_____

Given two paths of equal length and topography and sunny conditions, differing only in surface material, how long would you be willing to bike on each?

	Time (min)				Distance (km)				
	0-10	10-30	30-60	60+	0-0.5	0.5-1	1-2	2-5	5+
Gravel	○	○	○	○	○	○	○	○	○
Asphalt	○	○	○	○	○	○	○	○	○

Please elaborate on what factors you considered regarding the above choices.

_____

Does the weather change your trail preference?
 Please elaborate.

○ Yes _____

○ No _____

Given two paths of equal length and topography and rainy conditions, differing only in surface material, how long would you be willing to bike on each?

	Time (min)				Distance (km)				
	0-10	10-30	30-60	60+	0-0.5	0.5-1	1-2	2-5	5+
Gravel	○	○	○	○	○	○	○	○	○
Asphalt	○	○	○	○	○	○	○	○	○

Has trail surface material ever caused issues for you while cycling?
 Please elaborate.

_____

Have you experienced any of the following while cycling?

☐   Collision

☐   Wear & tear on the bike

☐   Flat tire

☐   Dirty Clothes

Is there a particular bikeway where you have experienced higher incidence of the above?
 Please specify trail name and condition.

_____

What is your opinion on the safety of the following bikeways?

	Click to write Column 1				
	Extremely Safe	Moderately Safe	Indifferent	Moderately Dangerous	Extremely Dangerous
Northwest Marine Drive & Spanish Banks Bike Route	○	○	○	○	○
8th Avenue and Chancellor Boulevard Bike Route	○	○	○	○	○
University Boulevard Bike Lane	○	○	○	○	○
16th Avenue Bike Lane	○	○	○	○	○
Wesbrook Mall Bikeway	○	○	○	○	○
29th Avenue & Pacific Spirit Park Bike Route	○	○	○	○	○
Southwest Marine Drive & Southlands Bike Path	○	○	○	○	○

What factors did you take into consideration when evaluating path safety?

	Extremely important	Important	Fairly Important	Slightly Important	Not at all Important
Trail Material	○	○	○	○	○
Isolation from road	○	○	○	○	○
Proximity to main street	○	○	○	○	○
Proximity to bike repair shops	○	○	○	○	○
Proximity to water or food stops	○	○	○	○	○
Path illumination	○	○	○	○	○
Usage Frequency	○	○	○	○	○

End of Block: Block 4

Start of Block: Block 5

What time(s) of day do you usually bike?

☐ Morning

☐ Afternoon

☐ Evening

☐ Night

How often is darkness an issue for you when cycling?

○ Very Often

○ Often

○ Fairly Often

○ Not Often

○ Never

Given two unlit/poorly-lit paths of equal length and topography, differing only in surface material, how long would you be willing to bike on each at night?

	Time (min)				Distance (km)				
	0-10	10-30	30-60	60+	0-0.5	0.5-1	1-2	2-5	5+
Gravel	○	○	○	○	○	○	○	○	○
Asphalt	○	○	○	○	○	○	○	○	○

Given two well-lit paths of equal length and topography, differing only in surface material, how long would you be willing to bike on each at night?

	Time (min)				Distance (km)				
	0-10	10-30	30-60	60+	0-0.5	0.5-1	1-2	2-5	5+
Gravel	○	○	○	○	○	○	○	○	○
Asphalt	○	○	○	○	○	○	○	○	○

✱

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