

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**Barriers for Cyclists With Disabilities And Individuals Who Use Adaptive Cycles**

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**KIN 464**

**Themes: Transportation, Community, Wellbeing**

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## **Barriers for Cyclists With Disabilities And Individuals Who Use Adaptive Cycles**

**Kin 464 - Health Promotion & Physical Activity**

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## **EXECUTIVE SUMMARY**

Cycling is a widely used form of transportation and recreation. For the purposes of this project we focused on cyclists with disabilities and their individual experiences. The goal of this research project was to identify and determine the barriers that prevent individuals with disabilities from cycling to and around the University of British Columbia's (UBC) Vancouver campus. Much of the literature currently available successfully highlights the multitude of physical, social, and mental benefits of cycling, yet it seems it is not often that research is focusing on the barriers surrounding cycling, specifically for those with disabilities.

In order to gather the necessary data, we utilized the method of an online survey to gain insight on individuals personal experiences regarding topics surrounding cycling with disabilities. Our targeted population was any individual tied to UBC (i.e. faculty, staff, students) that has a disability or engages in the use of an adaptive cycle. The survey distributed, consisted of basic demographic questions followed by open-ended questions encouraging deeper, more personal responses. The survey was dispensed to a couple of UBC organizations focused on people with disabilities (UBC's Centre for Accessibility and CiTR radio station's All Access Pass), though neither was confirmed to have sent out our survey. Due to difficulties finding viable participants willing to take part in this study, a limited amount of responses were received and therefore our analysis is quite limited.

Few responses were ultimately collected, ending in six viable surveys that were then analysed for patterns and compared to previous research regarding the barriers of cycling. This data was then further examined for precise answers that were common or uncommon within the survey responses.

Though we did not gather enough information to draw conclusions, we did find the responses to be of interest in terms of the topic. Overall, all participants have at some time considered cycling to and around campus. It seems that the majority of respondents feel that UBC has not done enough to facilitate cycling to campus, though, majority also feels UBC has done enough in terms of cycling on campus. Throughout the survey, responses varied greatly between each participant, only overlapping on a few specific topics. In general, respondents detailed that the barriers they face while cycling to and around UBC's Vancouver campus include weather conditions, road conditions, safety/security issues, and lack of storage facilities.

After analysing our survey responses, we recommended that UBC increase the amount of safe storage options available for cyclists use. By creating cycle lockers and cages that are inclusive to all cycles (not just bicycles), cyclists can feel more comfortable cycling to and around campus knowing they will have a safe storage option once they reach their destination. We also recommended that UBC create a greater number of areas with 'cycle only' paths. Currently UBC is very cycle friendly but by creating 'cycle only' paths they may be able to limit the traffic and stress surrounding cycling through large crowds. Adaptive cycles often need more room to manoeuvre and creating 'cycle only' paths can provide them with this. Our final recommendation was simply that further research be conducted on this topic. Many aspects of our research project did not go as expected, as such future research is recommended. In doing so, we recommend that a vast array of populations within UBC be reached out to (i.e. faculty, staff, students), as well as differing age groups and genders. By gaining responses from an array of groups, the results will be easier to accurately analyse and understand.

## **INTRODUCTION & LITERATURE REVIEW**

Studies show that cycling can improve fitness and mental wellbeing, and in turn, offer significant health benefits for individuals with disabilities (Clayton, Parkin, & Billington, 2017). These benefits show the importance of creating an inclusive cycling environment for those with mobility impairments along with able-bodied individuals (Clayton et al., 2017). The task at hand is to determine what is stopping individuals with disabilities from cycling, in order to effectively understand how cycling can better be encouraged as a transportation unit for the population. The term “cycle” refers to a unit with “two or more wheels [that] may be peddled with the hands or feet and transport one or more persons” (Inckle, 2019, para. 3), the term “bicycle” (or bike) refers to a “two wheeled vehicle for one person which is peddled by the feet” (Inckle, 2019, para. 3). Throughout this paper, these terms will be used accordingly and not interchangeably, seeing as cycle/cycling is an inclusive term that covers all forms of cycling/cyclists whereas bicycle/bike/biking is much more specific, being limited to a singular group within the cycling community.

Research has been conducted regarding the barriers faced by able-bodied cyclists, which can include a range of factors from weather conditions and logistical constraints, all the way to safety and comfort (Rerat, 2019). The majority of able-bodied cyclists listed weather as their number one constraint (Rerat, 2019). While weather constraints are a barrier faced by cyclists with disabilities as well, cyclists with disabilities also tend to face barriers that would not necessarily affect an able-bodied individual. There is a significant gap in our understanding of the experiences of cyclists with disabilities; what they need, what they look for, and what is stopping them from cycling, and how this relates to their likelihood of commuting to work/school. The proposed study will explore and collect data on the barriers faced by cyclists with disabilities and their current experiences, in an attempt to improve and increase their involvement in the cycling community.

While not all individuals with disabilities use adapted or specialized cycles, those that do, often face difficulties such as the cost of adaptive cycles as well as storing them once they arrive at their location (O’Riordan, 2019). The cost of non-standard cycles is “high on the list of disabled cyclists’ grievances” (Andrews, 2017, para. 9). An adaptive cycle, such as a tricycle, handcycle or tandem, can often be significantly more expensive than an average bicycle (Clayton et al., 2017), and can range anywhere from “2x-10x the cost of an ordinary bike” (Corriveau, 2019). While an able-bodied person is able to use a bike-sharing company to rent a bike when needed, that is not the case for an individual who needs an adaptive cycle, which is not available through bike-sharing, and often needs to be customized to the person and their disability (Corriveau, 2019). The lack of access to ‘on-demand’ adaptive cycles often means that in order to cycle, individuals with disabilities must purchase their own customized unit. These customized cycles lead into yet another commonly faced barrier, high cost. With high cost comes high value and along with that, the subsequent risk of theft which is highlighted by the lack of available storage for non-standard cycles (Clayton et al., 2017). Adaptive cycles “are often wider, longer & heavier than a typical bike” (Corriveau, 2019, para. 4) making them difficult to lock in a standard city rack (Galatan, 2019). Typically, it is only possible to lock an adaptive cycle at the end of most standard racks because they are designed for bikes that are only wide at the handlebars (Corriveau, 2019). This means that the chances of having somewhere to lock a cycle is purely based on luck, resulting in many people choosing to drive instead of cycling (O’Riordan, 2019). Due to the inaccessibility of outdoor racks to a variety of cycles, and the thefts that often occur, indoor lockers are useful. However, getting in and out of buildings is incredibly difficult with an adaptive cycle which often has dimensions that make it hard to turn down hallways (Corriveau, 2019). Therefore, spaces which allow for wider, adaptive cycles and are clearly signposted, step free, and located next to a ramp should be implemented (O’Riordan, 2019).

These are just a few of the barriers that get in the way of people with disabilities from fully experiencing the benefits of cycling. Another large issue that has stood out over the years is the fact that cycles are not legally known as a mobility aid (Andrews, 2017). In a national survey conducted in the United States of America, “one in three disabled cyclists have been asked to dismount and walk their cycle, even though they were using it as a mobility aid” (Andrews, 2017, para. 4). This comes from the same survey group that stated 69% of cyclists with disabilities find cycling easier than walking and use it as a mobility aid (Andrews, 2017). This legal barrier restricting the use of a cycle as a mobility aid can be solved with a needed and deserved change in our written laws. To most, a mobility aid is a wheelchair, mobility scooter, or a guide dog which is why, legally, cycles are not considered a mobility aid (Andrews, 2017). Groups representative of cyclists with disabilities such as Wheels for Wellbeing, have even advocated that people should use a cycle as a mobility aid, noting that it can be easier than walking. Therefore cycles deserve the recognition and protection officially granted to other mobility aids and their users (Andrews, Clement, & Aldred, 2018)

In turn, since people with disabilities are generally not known to cycle and cycles are not seen as a mobility aid, people with disabilities have been minimally discussed in relation to cycling policy and planning of infrastructure (Andrews et al., 2018). The lack of inclusion of cyclists with disabilities needs when planning results in cycling infrastructure and its lack of accessibility being the biggest difficulty encountered by cyclists with disabilities (Corriveau, 2019). Just a few of the infrastructure barriers that may exclude cyclists with disabilities include cycle routes which require dismounting (Andrews et al., 2018), curbs and stairs (Corriveau, 2019), and bike lanes which are too narrow or have anti-vehicle barriers that can impede access to adaptive cycles (Andrews, 2017). These infrastructural barriers are accompanied by the vulnerability that cyclists feel riding so close to cars on the road (Rerat,

2019). Those with disabilities were found to be five times more likely to have been hit by a motor vehicle (Clayton, & Parkin, 2016). Cyclists often need to adopt highly vigilant behaviours in order to stay safe among motor vehicles, and many cyclists with disabilities agree that the risk of accidents coupled with the lack of safety discourages them from commuting by cycle (Rerat, 2019). If there was an accident and their cycle were to break down, a person with restricted mobility might find themselves in a difficult situation if they were unable to move without the cycle as their mobility aid (Clayton et al., 2017). On top of this, the pressure of having other cyclists yell at them to speed up or even move out of the way can be overwhelming (Clayton et al., 2017) and make cycling a negative experience. These transport barriers faced by people with disabilities cause a disparity in their likelihood to be physically active in comparison to an able-bodied individual (Clayton et al., 2017).

Despite these barriers, it is important that people with disabilities are not excluded from the cycling community, seeing as cycling offers significant health benefits to people with disabilities (Clayton et al., 2017). People with disabilities are found to be susceptible to developing serious health issues, often linking to obesity (Clayton et al., 2016). Cycling assists in providing a healthy mode of exercise for people with disabilities, and can mitigate secondary diseases (Clayton et al., 2016). It also “reduces strain on joints, aids balance, and alleviates breathing difficulties” (Andrews, 2017, para. 3), and is therefore easier than walking for some. Cycling can also provide freedom and flexibility to be independent when commuting to work, by allowing the individual to choose their own start and end points of the journey (Rerat, 2019). Many able-bodied individuals found cycling to be a good way to incorporate exercise into their daily routine by cycling to work (Rerat, 2019) and while that is great, there should be a focus on extending that privilege to individuals with disabilities as well. Cycling has the potential to be very beneficial to individuals with disabilities and if the barriers associated with it were minimized and it was made more accessible, it truly could be.

## **METHODS**

The aim of this research project was to identify the barriers that prevent individuals with disabilities from cycling to the University of British Columbia (UBC) Vancouver campus. An online survey was created and circulated which allowed individuals to detail their experiences with cycling to and around the UBC campus.

The survey began with basic demographic questions such as age, role at UBC, and current disability, so as to get an understanding of the populations that were providing responses. After the initial questions, the focus was on questions that were more open-ended in an attempt to facilitate detailed and in-depth answers that can be further examined and interpreted. The questions were centred around a variety of areas, all encompassed within the theme of cycling with a disability (see Appendix A for the survey questions that were asked). These areas included: general cycling experiences, barriers faced when cycling, reasons for partaking in cycling (or not), potential improvements that could be made on UBC's Vancouver campus, and potential interest in future cycling programs aimed at a more inclusive approach.

In order to find willing participants to take part in this survey, we reached out to Professor Bundon and requested that she share our survey with UBC's Centre for Accessibility. The "Centre for Accessibility provides leadership on issues of accessibility for people with disabilities at UBC Vancouver" (Centre for Accessibility, 2020). Our hope is that the Centre for Accessibility sent out an email detailing the purpose of our research to all students and staff registered within the centre and asked anyone willing to partake to respond with their interest. Due to survey responses being anonymous we are unsure if this email was sent out; being that we received very few responses on our survey it is unlikely that it was.

We also reached out to the CiTR, a radio station owned by UBC and run by the UBC community, via Facebook messenger. CiTR has a radio show every second Wednesday called



“All Access Pass”. This is a show where equity, inclusion and accessibility for people with disabilities, on and beyond campus, is discussed (“All Access Pass”, n.d.). We asked the individuals running “All Access Pass” to spread awareness about our survey during their broadcast and consider filling it out themselves. While they responded saying they would keep the survey in mind there was no confirmation given on whether they would broadcast the survey or partake in the study. Therefore, we can not say with certainty that they distributed our survey.

Unfortunately, due to an underwhelmingly small amount of responses, we were unable to group our results based on demographic categories seeing as most respondents fell under similar demographic groups. Instead, upon receiving our data, we attempted to find patterns in the responses we received and correlate these patterns to previous research that had been done on the barriers of cycling for individuals with disabilities. However, it is important to note that none of the conclusions drawn throughout this research paper are conclusive due to our insufficient number of responses.

## **RESULTS/FINDINGS**

A total of thirteen survey responses were recorded, but due to a number of them being incomplete or being completed by individuals without disabilities, we will be placing our focus on six of the responses throughout this paper. There were five males and one female who completed the survey, all of which reported their role at the UBC Vancouver campus to be “student” and reported their age as between 18-25. In terms of their disabilities, three participants reported that they are visually impaired, one participant reported having Attention Deficit Hyperactivity Disorder (ADHD), one participant reported having asthma and a short right leg and the final participant reported having Lymphedema and Epidermolysis Bullosa. Due to the differing disabilities represented through our research it is

hard for us to discern whether any changes suggested based on these findings would benefit the greater community of all the individuals with disabilities at UBC. As well, there seems to be a lack of representation from individuals with partial or complete paralysis. This affects our findings because these individuals are the ones most likely to have an adaptive cycle and require the transportation of a chair to campus. Without this perspective it is unlikely that we will have an accurate idea of what adjustments need to be made to be inclusive of all individuals.

When asked if the participants cycled in their everyday life only half of the participants responded that they do; with only two of those participants cycling at least 2-3 times a week, one of which cycles over 5 times a week. When the remaining three participants were asked why they do not cycle in their everyday life responses regarding time constraints, other preferred transport, and personal motivation were noticed. The theme of personal motivation seemed to flow throughout the survey for one participant who often answered that they did not cycle because they are “lazy”. It should be noted that these responses are personal factors that are not necessarily changeable from an outside party, which in this case would be UBC.

Throughout the entire survey the barrier of weather was mentioned multiple times. Once when participants were asked why they do not cycle to campus, again when asked what prevents them from cycling to campus, and once more regarding recreational cycling. Weather was also mentioned by half of the participants as their biggest barrier when faced with biking to campus and multiple participants listed it as something UBC could change to entice them to cycle more. However, weather is an external factor that is also uncontrollable and UBC would not have an ability to change this.

Out of the six participants, only one participant uses a form of adaptive cycle. The cycle she uses is a tandem cycle, which is a two-wheeled cycle, typically with one seat

behind the other, allowing two cyclists of differing abilities to cycle together while only the front rider (or pilot) is in charge of the controls (Joyce, 2017). The participant expressed that due to her disability, which is a visual impairment, she requires someone to pilot the tandem cycle in order for her to use it. In one survey response she stated: “I cycle when I can. It is usually near campus and dependent on finding a pilot for my tandem”. This participant mentioned that they found it hard to find a good spot to cycle for recreation near the UBC campus, mentioning that cars and traffic were the most challenging obstacles for her. This participant also mentioned that due to requiring an adaptive cycle and pilot for their cycle, finding a loop where it is safe to ride can be difficult near the UBC Vancouver campus. Only one other individual mentioned improper road conditions as a barrier that they faced. It is hard to discern whether feeling unsafe, and sometimes scared, on the road is an effect of having an adaptive cycle or if it’s experienced by most individuals with disabilities, as only one participant reported these feelings directly.

The same participant also reported that the width of the bike lanes leading to the UBC campus seemed to make her pilot nervous. Having a visual impairment, she is unsure if this is because of the pilot’s own anxiety or if the bike lanes are actually not very wide. Bike lanes were also mentioned by other individuals in the survey but they seemed content with the bike lanes in their current state, discussing them in a positive way as one of the accommodations that UBC has already made to support cycling. Due to very few responses and mixed views it is overall difficult to understand if adjusting bike lanes would assist individuals with disabilities with biking around campus. However, due to the only negative feedback coming from the only individual with an adaptive cycle it is likely that this barrier pertains closely to the necessity of an adaptive cycle.

In contrast, the UBC campus itself was praised highly for its open spaces and lack of vehicles, allowing cyclists to feel safe on the paths. Both the participant with the adapted

cycle and participants without said they feel comfortable on the areas of campus with minimal cars and suggested that an increase to more cycle only areas would be beneficial in increasing cycling on campus.

Another main barrier represented in the results was the issue of cycle safety and storage. Throughout the whole survey individuals mentioned they have a fear of their cycle being stolen or have previously had their cycle stolen. As well, it was reported that individuals have difficulty finding places to park their cycles on campus. There was also an overwhelming majority of individuals who mentioned additional, and safer, cycle storage options as a way for UBC to entice them to cycle more often and improve their experiences cycling to and around campus. This finding shows that the fear of having their cycle stolen is a large barrier faced by many individuals with disabilities when cycling. However, it is important to keep in mind that these individuals did not report using an adaptive cycle so this barrier is likely also faced by able-bodied individuals who would have a similar cycle and therefore a similar worry.

On a more positive aspect, it was noted that individuals found cycling to be a more affordable and faster way to get to campus than busing or driving. Participants also described cycling as being more fun and a nice way to get some fresh air on the way to campus. This finding shows that individuals with disabilities do enjoy cycling and it can be a better form of transportation, but some external barriers are likely affecting their ability to cycle more often.

When asked about UBC's involvement in making cycling to campus accessible, the majority of individuals responded that UBC had not done anything to make cycling to campus accessible for individuals with disabilities. However, the majority thought that UBC had done a good job of making cycling on campus accessible for individuals with disabilities but were unsure what specifically had been done. This response is important because it signifies that there is a lack of education being presented to UBC students, and potentially

staff and professors, about the resources available to them in regards to cycling to and on campus.

Four out of the six participants stated that they would be interested in cycling to campus if UBC partnered with a third party to provide adaptive cycles. However, only two of the individuals were interested in attending a workshop where you could test adaptive cycles and learn to use them from a professional. This finding, coupled with the response from one individual who no longer cycles because their cycle was stolen, suggests that having cycles, including adaptive cycles, available would be a great resource in enticing people to cycle on campus. A potential idea would be to have cycles for rent overnight so individuals could cycle home from campus and back the next day.

## **DISCUSSION**

The purpose of this study was to identify the barriers faced by individuals with disabilities when cycling to and on the UBC Vancouver campus. We received six valid responses to our survey, all with similar demographics, half of which stated that they currently cycle in everyday life. The results of our research show that the major issues preventing individuals with disabilities from cycling to and around campus are road conditions/space, lack of cycle storage, and weather.

In terms of road conditions/space, one of the biggest issues that was presented by the results was feeling unsafe in high traffic areas. Participants stated that they felt more comfortable riding on campus where there is big open spaces and minimal access for vehicles. Although, despite this, not all of these respondents feel as though the cycle lanes leading to UBC's Vancouver campus are user friendly. The width of the cycle lanes, or lack of cycle lanes in general, makes it difficult for users with adaptive cycles to feel safe riding in high traffic areas, particularly when they must rely on someone else to help guide their cycle.

This is consistent with past research that found road conditions, specifically high traffic areas, to be one of the factors that made cyclists with disabilities feel most vulnerable when cycling (Rerat, 2019). This finding suggests that the current cycle lanes and their relationship with adaptive cycles should be given a closer look and re-evaluated to include wider cycle lanes with potential separations from traffic to allow cyclists to feel more comfortable cycling in high traffic areas.

Cycle storage and theft appeared to be an issue for half of our participants, who stated that an increase in storage cages or safer storage options for their cycles would entice them to cycle more often. Many participants were concerned about the safety of their cycles on campus, and one participant even mentioned the theft of their cycle as the reason they can not currently cycle to campus. This finding aligns with previous research where it was mentioned that adaptive cycles can often be more expensive than a typical bicycle and many individuals do not feel comfortable riding their cycles to work due to the potential risks of having them stolen (Clayton et al., 2017). By increasing the amount of safe and secure cycle storage areas, this barrier could begin to deflate and cycling could be more widely used. This barrier was mentioned consistently throughout the survey and could easily be deflated, if not eliminated. Due to its seeming importance it is possible that deflation of this barrier could result in a large increase in individuals not only willing to, but actually cycling to campus.

A common barrier presented by the study was weather, specifically the rain. Participants detailed that they were far less willing to cycle to or around UBC when the weather was poor. Previous research found weather to also be the main barrier faced by able-bodied individuals (Rerat, 2019). While this is an issue that may be a large barrier for some individuals, it unfortunately cannot be controlled. Considering weather is both an issue for able-bodied individuals and individuals with disabilities, it is hard to discern if this barrier relates to our research question. In any case, due to weather being an uncontrollable barrier, it

is not considered to be an issue that UBC should be directing their attention to or focusing on closely.

Throughout our study, the biggest issue that we faced was the lack of response to our survey. UBC's community of individuals with disabilities is quite a small demographic that can be difficult to find without assistance. Due to not having easy access to this specific demographic, it was very difficult to distribute the survey to individuals who would aid our results with their completion of the survey. On top of this, having the school fully transition to the online delivery of courses, and by trying to support social distancing, we were prevented from promoting our survey in person around UBC's campus. We suspect that these are some of the reasons for the lack of response on our survey, and anticipate that something on a larger scale with more promotional opportunities would have been more successful.

Due to only receiving six valid responses, our findings may not accurately represent UBC's community of individuals with disabilities. Our participants only represented the specific demographic of students at UBC between the ages of 18-25, which completely disregards potential staff and professors that may have disabilities. The participants also had an uneven representation of gender with only one out of the six participants being female; this research study could benefit from a more equal representation of female and male participants, as it provides the opportunity to compare and contrast the results. As well, because only one of our participations uses an adaptive cycle, and the majority of concerns regarding road conditions and safety came from their response, it is difficult to discern whether this is actually a larger issue that is rarely discussed. It is also difficult to apprehend whether workshops or partnerships that focus on adaptive cycling would be beneficial for the UBC community with responses from only six individuals, most of which do not use adaptive cycles.

## **RECOMMENDATIONS**

### **Recommendation #1: Increase in safe storage facilities for cycles**

We recommend there be an increase in the number of available options for cyclists to safely store their cycles on campus. Based on the responses we received during our research period, it seems that the safety of personal cycles is one of the greatest barriers stopping individuals from cycling to and around UBC. Although UBC has set up bike lockers and cages throughout various locations on campus, theft remains to be a large issue experienced by many members of the UBC community. It has been noted by UBC that the theft of cycles and cycle parts is the most common type of theft seen at the school (UBC Vancouver, 2019). It has been stated that “38% of stolen bikes were stolen from residential areas most likely due to exposure overnight and on the weekends” (UBC Vancouver, 2019). With this knowledge, we recommend that UBC increases the security specifically around these hotspot areas (i.e. residential areas). Provided with greater security patrolling of high theft areas, cyclists can feel more at ease knowing that their personal cycles may be safer. On top of this, adding a greater abundance of cycle lockers and secure cycle cages can provide cyclists the opportunity to freely cycle to and around campus, confident that they will have a place to safely store their cycles. As it was reported in our research that oftentimes it can be difficult to find space for cycles, an increase in secure storage units would aid both the issue of space and the issue of safety. It is also important that cycle lockers/cages be made in such a way that they facilitate the use of adaptive cycles. Cyclists with disabilities often use different forms of an adaptive cycle (i.e. hand cycle, tandem cycle, recumbent cycles, etc.) that may require more space to store/properly lock up, these spaces need to be provided. Cycle lockers/cages allow for a space where individuals can personally lock away their cycles and ensure a greater amount of protection while they are away, this privilege should not just be given to those who use a traditional bicycle. According to the UBC Vancouver Campus



Security Annual Report for the 2018 year, the number of thefts has continued to increase over the past year (2019). Given this information, increasing the safety and security options people have to protect their individual property is something we recommend in order to ensure people feel better about cycling to and around the UBC campus.

### **Recommendation #2: Increase in ‘cycle only’ spaces**

To help aid in decreasing the barriers faced by cyclists with disabilities, we recommend UBC look into providing a greater amount of ‘cycle only’ spaces throughout campus. During our research it was mentioned by respondents that UBC could be more accommodating with the space provided to cyclists. Oftentimes, cyclists with disabilities require a larger amount of space than those using a traditional bicycle. For example, one of the participants in our study indicated that she employs the use of a tandem cycle to aid in her visual impairment. With this type of cycle, visually impaired individuals are able to cycle with another person in the pilot position controlling the steering. This is a great option but it tends to take up more space than traditional bicycles do. Due to this, traditional bike lanes can be too small and traffic being so close can be scary for those using a tandem cycle or other adaptive cycle. UBC is a very cycle friendly campus already, allowing cyclists to use their cycles throughout almost all of campus. Although, to better combat this space problem, UBC could make spaces around campus that are dedicated specifically to cycling in order to give cyclists a space less crowded with walkers. Specifically in areas of campus that tend to be very busy (i.e. Main Mall), this traffic can make cycling much more stressful and therefore decrease the amount of people willing to cycle around campus. Declaring designated walking versus cycling spots around campus can aid in decongesting this traffic and improving the amount of people willing to cycle.

### **Recommendation #3: Further research**

While conducting this research study, the majority of trouble came while recruiting participants. Our subject pool ended up containing a minimal amount of participants and within that group there was little variation in demographic information. As such, we reached a subject pool that consisted solely of UBC students within the age group 18-25, with the vast majority being male (only one female participant). In the future we suggest that more time be dedicated to reaching a more diverse collection of populations. UBC holds a large array of people that should be taken into account while studying the topic of cyclists with disabilities. The opinions and experiences of teaching faculty, research faculty, university staff, etc. should all be investigated, as the campus affects all of these groups, not just students. Care should also be taken to study other age groups, as different age groups may experience differing barriers that should be taken into account. On top of this, a more equal representation of genders could provide us the ability to look at gender differences and how answers may differ as gender differs. Another issue we faced that could be addressed in future research is to specifically look at barriers within UBC's control. We did not specify some of the questions within our survey enough and we found that many of our questions were answered in ways that did not give us the opportunity to find resolutions to the issues presented. For example, many participants answered that "weather is the biggest factor" in whether or not they cycle. Answers such as: "weather/rain", "weather", "honestly it's just weather", and "more sunlight" were just a few of the responses provided when asking about cycling barriers and ways to fix them. Although weather can be a large barrier, for the purposes of this study it would have been more beneficial to study barriers that can be worked on and resolved. For future research, questions should be more direct in what they are looking for, therefore leading to answers that better pertain to the topic at hand.

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# Appendix A

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## Consent

### KIN 464: Health Promotion and Physical Activity

#### Participant Consent Form for Class-based Projects

#### Barriers for Cyclists with Disabilities Group #16

#### Principal Investigator:

Dr. Andrea Bundon (Assistant Professor, School of Kinesiology, Faculty of Education)

#### The purpose of the class project:

To gather knowledge and expertise from community members on the barriers faced by cyclists with disabilities when cycling to or on the University of British Columbia Vancouver Campus.

#### Study Procedures:

With your permission, we are asking you to participate in an online survey. With the information gathered, students will critically examine how different individuals understand or engage in health promoting activities or health promotion initiatives.

#### Project outcomes:

The information gathered will be part of a written report for the class project. The written report will be shared with campus partners involved with the project. Summaries of findings will also be posted on the following websites. *No personal information/information that could identify participants will be included in these reports or shared with campus partners.*

UBC SEEDS Program Library:

<https://sustain.ubc.ca/courses-degrees/alternative-credit-options/seeds-sustainability-program/seeds-sustainability-library>

#### Potential benefits of class project:

There are no explicit benefits to you by taking part in this class project. However, the interview will provide you with the opportunity to voice your opinion on your experiences with health promoting activities or initiatives in a broad sense and will provide the students with an opportunity to learn from your experiences.

#### Confidentiality:

Maintaining the confidentiality of the participants involved in the research is paramount, and no names of participants will be collected.

At the completion of the course, all data (i.e. notes) and signed consent forms will be kept in a locked filing cabinet in Dr. Andrea Bundon's research lab (1924 West Mall) at the University of British Columbia. All data and consent forms will be destroyed 1 year after completion of the course.

Risks:

The risks associated with participating in this research are minimal. There are no known physical, economic, or social risks associated with participation in this study. You should know that your participation is completely voluntary and you are free to **withdraw from the study** and there will not be negative impacts related to your withdrawal. If you withdraw from the study, all of the information you have shared up until that point will be destroyed.

**Contact for information about the study:**

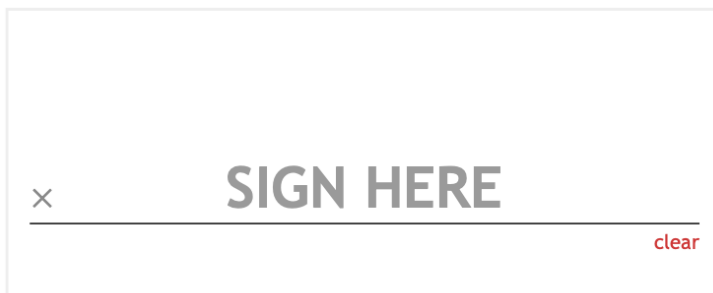
If you have any questions about this class project, you can contact Andrea Bundon by phone at 604-822-9168 or by email at [andrea.bundon@ubc.ca](mailto:andrea.bundon@ubc.ca)

**Research ethics complaints:**

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 e-mail [RSIL@ors.ubc.ca](mailto:RSIL@ors.ubc.ca) . or call toll free 1-877-822-8598.

**Consent:**

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time.



Date:

**Questions**

How old are you?

- 0 - 18
- 18 - 25
- 25 - 50
- 50 - 65
- 65+

What gender do you identify with?

- Male
- Female
- Other

What is your role on campus? (Select all that apply)

- Student
- Professor
- Staff

What is your current disability or impairment? Feel free to discuss physical, cognitive or psychological disabilities.

Do you cycle in your everyday life?

- Yes
- No

How often do you cycle?

- < 1 time a week
- 2 - 3 times a week
- 4 - 5 times a week
- > 5 times a week

Why don't you cycle in your everyday life?

Have you ever considered cycling to campus?

- Yes
- No

Did you follow through with cycling to campus? Why or why not?

Have you ever cycled for recreation or sport?

- Yes
- No

What was successful about it? What was not?

Do you require an adaptive cycle? If yes, please explain the adaptation required.

- Yes
- No

What stops you from cycling more frequently to UBC?

- Time constraint
- Parking my cycle
- Improper road conditions
- Other

What are some barriers you have experienced when cycling? Please provide details as to why these are barriers for you.

Do you feel UBC has made it accessible for disabled/adaptive cyclists to cycle TO Campus?

- Yes
- No

Please elaborate on your answer above.

Do you feel UBC has made it accessible for disabled/adaptive cyclists to cycle ON Campus?

- Yes
- No



Please elaborate on your answer above.

If you already cycle to campus, what could be done to improve your experience or encourage you to cycle to UBC more?

If you don't currently cycle to campus, what changes need to be made in order to allow you to cycle to campus?

What could UBC do to entice you to cycle as your means of transport when ON campus?

Would you be interested in cycling to campus or on campus, if UBC partnered with a third party to provide adaptive cycles?

- Yes
- No
- Other

Would you be interested in attending a workshop/program where you can test adaptive bikes, with professionals present to teach about them and how to use them?

- Yes
- No

Please provide any additional comments you may have on cycling to UBC.