# Client Summary

Date: 15th of January 2023

Client: Justine Boudreau ([jboudre2@uottawa.ca](mailto:jboudre2@uottawa.ca))

Note: No background on the client was provided. During the interview, the client mentioned that they have a background in mechanical engineering at the University of Ottawa, and that they completed their Masters degree in Electronic Business Technologies at the University of Ottawa. Justine also helps run the makerspace (she is the Makerlab Manager at Centre for Entrepreneurship and Engineering Design) and is familiar with the equipment available to students.

# Things to Learn about the Client

We would like to learn the following about the client:

* We would like to know what the client invisions for the project and we would like to hear a little more about their background.
* We would like to hear about what the client believe the user experience should be like fro the final product.
* We would like to ask the client about their thoughts regarding project requirements, constraints, and about the project’s feasibility.
* We would like to talk to the client about their preferred means of communication.
* We want to establish an overview of their thoughts on problems related to ethics and safety in the project's context.

# Interview Technique

When interviewing the client, we will try to do the following:

* The interviewer will look for inconsistencies in what the client is saying they want and what they do. We will try to engage with those inconsistencies.
* The interviewer won’t interrupt the client unless it is clear they are done talking. That way we allow the client time to be silent and think.
* The interviewer will try to reframe, when possible, our questions in such a way that:
  + It allows the client to tell us a story.
  + They are not binary.
  + They are neutral
* The interviewer will interview in pairs: one person will note take and another person will take notes.
* The interviewer will ask the client “W*hy?”* so as to not make incorrect assumptions about the reasoning behind their actions and thoughts.
* The interviewer will not suggest answers to the client or provide examples (unless the client is very confused about the questions and needs additional context.)

# Introduction [5 minutes]

The members of the group will present themselves and briefly discuss their background with the client.

Interviewer: Jonathan Horton

Note taker: Sachin Sameer Kasbekar

# Questions for Client

## Client’s Vision [15 minutes]

1. Why is this project important to you? How did you come up with the idea?
   * Justine: To benefit users as handicap people do not get opportunity of biking and hence we want to make then the leisure to enjoy the biking experience
   * Justine: There was a video online and the user approached and we want to make it
2. What is the primary purpose of the inclusive bike attachment? Is it for leisure, exercise, commuting, or something else?
   1. Justine: People with wheelchair can come on use this. It is generally for sunny days with dry asphalt in a bike lane.
3. What are your expectations in terms of:
   1. Aestehtics?
      1. Justine: No specific requirement
   2. Physical experience? (Shock absorbtion?)
      1. Justine: Safety must be given a thought
      2. Accessibility must be Easy
      3. Braking
      4. Indicators for everything
      5. Signals from the wheelchair person to the rider
   3. Cost?
      1. Justine: Cost must be not compromise the safety
   4. Durability?
      1. Justine: Can we worked on
   5. Mounting? (Side by side like motorcyle cart, behind)?
      1. Justine: Improvement on the older variant
      2. Floor to be updates
      3. Locking mechanism to safely lock the wheelchairr
4. Do you have access to past CAD documents?
   1. Justine: said that she would send us links.
5. What are the key features the we must include in the design (e.g. safety features, adjustability)
   1. Justine: The design needs to be safe and must secure the user. It should be able to transport the wheelchair.
6. What is your expectations in terms of the user’s experience? (e.g. should the user be able to mount the device by themselves, or is assistance acceptable?)
   1. Justine: The user is expected to be able to mount with assistance. Additional features, like being able to communicate with the biker using a remote control would be nice.
7. What kinds of metrics would you use to define the project as a success? (e.g. feedback from prospective users)
   1. Justine: Very much dependent on where we decide to take the project. Being able to test whatever it is we create would be an important milestone to indicate success.
8. Are there any skills that you think a team would need to be successuful at this project?
   1. Justine: List of skills that would be a good idea for us to develop:
      1. Welding.
      2. CAD
      3. Analysis
      4. Microcontroller

## User Needs [15 minutes]

1. What do you expect the user’s physical capabilities and limitations to be? (Specifically, how do you think this would impact the controls we should add to the bike, if any (e.g. ramp controls))
   1. Justine: Users will have varying levels of physical capabilities. We are expected to be as accommodating as possible.
2. What sort of safety features should the user have? (e.g. Harness, Braking system, break lights)
   1. Answer: Adding a braking system, break lights, and a harness were all mentioned without being read as examples.
   2. Note: there are two users: the wheelchair user and the rider of the bike.
3. How easy should it be to use the attachment? (e.g. amount of time to mount, how should instructions be communicated)
   1. Justine: Time to use the attachment needs to be fairly reasonable. At most 15 minutes.
4. How important is it for the user to use the attachment independently?
   1. Justine: Dependent of the person’s mobility. Some users may need to be pushed.
5. Do you think it’s important for the user to be able to easily interact with the person on the bike? (e.g. should we prioritize easy communication)?
   1. Justine: It would be nice to have good communication, but it may not be realistic. It would be a nice to have to provide the wheelchair person with some means of communication.
6. Do you know of any prospective user’s that we could communicate with to help test our bike and obtain feedback from the point of view of a wheelchair user? (Have you already spoken to users about challenges with existing solutions?)
   1. Answer: Justine may be able to put us in touch with prospective users.
   2. Are there any personal user preferences or dislikes that you are aware of?
      1. Answer: Users need to be properly secured when using the device.
7. How easily should users be able to replace parts?
   1. Justine: It would be better to have more repairability.
8. Who should we think of as the owner of the product (e.g. a rental service, the handicap person, the person who’s bike the device is being attached to)?
   1. Justine: The person in the wheelchair or a rental service. Depends on cost.

## Project Requirements, Constraints and Feasibility [15 minutes]

1. Are there any key functionalities that the bike must have?
   1. Justine: Users need to be secured using a belt.
2. Are you aware of any standards or regulations (e.g. ISO, bike lane size) that you would like us to follow?
   1. Justine: We cannot modify the wheelchair do to inssurance
3. Are there any specific materials that should be used/avoided in the bike attachment's construction?
   1. Justine: Use materials that will not flex over time. Requires analysis on our part.
4. Are there any size or weight limitations for the bike attachment? How much distance would you like between the two users (min and max)?
   1. Justine: Size: fit in a bike lane
   2. Weight: an average human needs to be
5. Are there any environmental conditions (e.g. weather, terrain) that the attachment should withstand?
   1. Justine: Summer, dry, no rain
6. Are their any specific tools/technologies that you would like to used or avoided during construction? (e.g. welding over using bolts & pressure locks)
   1. Justine: Not particularly. This is a design decision for us to make.
   2. Welding tools?
      1. Justine: MIG, TIG tools are available to us.

## Communication Preferences [2 minutes]

1. How would you like us to communicate with you?
   1. Justine: Email
2. How often would you like updates on the state of the project?
   1. Justine: Whenever we hit a milestone.

## Ethics and Safety [15 minutes]

1. Are there any specific safety standards or regulations that you are aware of that the bike attachment must comply with?
   1. Justine: There may or may not be a standard for securing wheelchairs. We should look at previous team’s work.
2. Did you have any ideas on how to safely test the bike attachment?
   1. Answer: Justine may put us in touch with a prospective user. We can work with them on how to approach it safely.
3. If we add electronics, do you have specific concerns on how data is collected from the bike’s sensors?
   1. Answer: we should comply to the best of our capacity with existing regulations.
4. How would you like user consent to be obtained if we test the bike with someone outside the design group?
   1. Justine: would need to ask for the user consent. The main client used to be a wheelchair user.
5. How should the bike function in emergency situations? Should either user be able to detach themselves from the attachment if necessary?
   1. Justine: maybe if their were breaks. If it detatches, design would tip and may result ina n injury.
6. Do you think we should do a risk assessment (or does one already exist) before designing the device? (i.e. identify hazards, determine who might be harmed, evaluate risks and decide on precautions, record findings and discuss how to implement precautions)
   1. Justine: Yes this would be a nice to have.

# Past experience / attempts

Inclusive bike designs that require new bike models:

* <https://www.cyclinguk.org/article/cycling-guide/inclusive-cycling-wheelchair-tandem-cycle-hire>
* <https://fb.watch/dRu0AIoFSV/?fs=e&s=cl>