

Task 1

Our primary stakeholders are hobby cyclists - people who train and cycle as more than just a means for transport. Specifically, our stakeholders are those within Cambridge as we have the ability to include them in our data gathering process as well as then having a more targeted primary stakeholder whom we can show more interest in.

We have chosen our primary stakeholders to be these so-called 'hobby cyclists', i.e. cyclists who choose to regularly train with some given schedule as opposed to those who cycle merely to commute for work or study. This is because they can't necessarily reschedule their cycling time due to punctuality requirements associated with their place of work or study. The purpose is to see how currently available weather applications impact their lives and training regimes and how a proprietary application targeted specifically for them could bring about improvements to their livelihoods.

In our current location, there is no shortage of active cyclists available which corresponds to lots of potential data points as well as lots of potential beneficiaries. Having questioned a sample of our primary stakeholders, it appears likely that cycling would be more appealing if the weather is subjectively 'better' throughout the duration of their cycling activity. We believe that most cyclists would prefer relatively warmer and dryer weather. However, it is entirely possible that some cyclists will prefer to cycle in the rain instead, as is observable in our data, because it could be seen as more refreshing, or perhaps because it is the weather they have grown used to given the geographical location.

It is clear in our quantitative data that the primary stakeholder spans a large age demographic, with the cycling appealing to young and old alike, and therefore it would be important to consider all of these age groups when collecting data and designing the solution. Additionally, people could have different preferences based on the region in which they live, as this will affect your cycling in terms of journey and common weather. One other major factor could be the design of their bikes such as whether or not it has mudguards whose need is determined by the conditions of the terrain which is dependant on the weather, or wheels appropriate for off-road cycling. We also have justifiable reason to believe that certain types of weather are safer than others. For example, wet and icy weather conditions could potentially greatly increase the chances of an accident and thus cyclists may prefer to avoid it in concern of their safety.

Along with having discovered the contextual data regarding cyclists' routines, we found out through meeting the primary stakeholders that with current weather applications, it is difficult to plan a route that corresponds with ideal weather and then not need to use their phone during a journey. This leads to a level of disorganization which some have found to be stressful in their lives, and gives us enough cause for a proprietary interactive weather application, suitable across the desired demographic, whose general requirement is to give our primary stakeholders the organization they need to go about planning training routines around the weather with much more ease to promote a safe and stress free journey.

The primary stakeholders are the cyclists who choose to use our proprietary weather app. They may consist of people of many age groups and they will be directly interacting with the application in the form of being able to build up their training schedule around weather predictions and perhaps even immediate history, as knowing it snowed recently can indicate icy terrain, and this can help them maximize their training, safety and organization which leads to managing and minimizing stress. This still allows the basic demands to be met - they are able to view the weather and weather predictions/history in and around their location. Instead of being disappointed by having their training schedule coincide with undesirable weather, they can view the future weather predictions and build up their schedule, choosing ideal routes, giving them peace of mind and a stress free present.

The secondary stakeholders are those who add to the weather database behind our chosen API which provides the data which is shown in our application. While they do not directly interact with our application unless they happen to be a cyclist who fits under the primary stakeholders, they do still provide input in the form of weather data which is displayed in our app. The output from our application, the weather readings, is targeted towards the primary stakeholders.

Tertiary stakeholders may consist of the people our cyclists could potentially meet on their journeys, such as car drivers and other road users. Our application has indirect impact on them through the cyclists as they do not then have to be weary of disorganised cyclists on the road who could lose control due to cycling in undesired weather conditions and nasty terrain or display signs of frustration which results from the undesired conditions. Given the additional levels of organisation this would provide, different cycling routes could be taken that also minimizes interruptions to other road users and promotes safer road environments.

Our facilitating stakeholders include cycling organisations who may encourage their members to use the application to promote safe cycling and an organized fitness plan, which is beneficial to the members in terms of health and safety, and also aids in the development of our application in terms of continuation, further developments and releases, and its increase in popularity. There is also us, the developers, who build, implement and develop the weather application and as the legal owners, have the responsibility of maintaining it.

We have decided that questionnaires and focus group interviews with a use case would be the best methods to gather data. Questionnaires allow us to gather statistics such as preferred weather for training and interest in our product which would allow for a quantitative analysis that aids in refining our functional and non-functional requirements. As an example, questions will allow us to get a measure for the age demographics and quantitative opinion regarding the impact weather has on their cycling schedules. These figures can be compounded into graphical representations which will allow us to draw quantitative conclusions and finally refine some requirements. The points in the requirements developments process that are met using this are aims, sources of satisfaction, knowledge and skills and attitude to work. There is more support for quantitative measures as there is a limit to the open endedness offered which is covered in the focus group. In terms of aims and measure of success we can compare the figures for preferred to actual weather that coincides with training regimes. Sources of satisfaction is partially covered in the open answer question but satisfaction can be measured by numerical ratings. Knowledge and skills is calculated as a measure in terms of cyclists' feelings regarding current services. Work attitude is also determined open endedly but is gone through in more detail in the focus group which is used to determine the usefulness of our applications, and how it can appeal to a majority of our primary stakeholders.

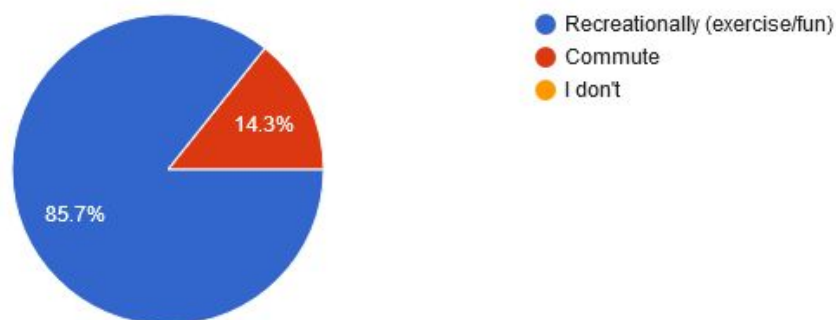
Focus groups allow us to do group interviews to gather insight from our primary stakeholders in the form of qualitative measures which can be analysed to gather their opinions. In terms of developing requirements, we are covering the open ended answers mentioned above as well as responsibilities held, work-group attributes, the nature of their work and their conditions. By work here we are referring to their main activity which is cycling. We can find out about their issues with current available services in detail and the possible impact our weather app would have on these cyclists. This allows us to analyse their current situation and see how they would have it compare to a theoretical situation involving our product, which is the use case we would provide. Here we can measure the general satisfaction and use it to refine the requirements of our application so that the overall consensus is positive and meets the needs such as adhering to cycling safety, which is an example of responsibility in action.

Other methods such as one-on-one interviews were discarded as they can be combined within our focus groups to save time which is a limited resource, but still gather the essential data that interviews are useful for. Focus groups, in our case, have the advantage of allowing us to see our primary stakeholders interact with each other and viewing the impact this has on groups of people rather than individuals, as our product is targeted at a group. Card sorting and web analytics were also discarded due to time implications and because the quantity of unique data that these methods can contribute to our overall data gathered already is low since the questionnaires and focus groups provide most of the essential data which helps in defining and refining requirements.

Our questionnaire contained a variety of questions in order to fulfill several purposes, the majority of which are for quantitative data. Firstly we have reason for cycling, of which 85.7% said was recreational i.e. hobby cyclists, and 14.3% use it for commuting. In our limited time, our questionnaire returned a 35% hit rate which is within acceptable bounds to allow us to draw conclusions from our data. These percentages support what we said above about there existing lots of cyclists locally who would be impacted. More importantly, we have a plentiful number of hobby cyclists who would be affected by the introduction of a new product in their favour, which further data gathered highlights as shown below.

Why do you cycle?

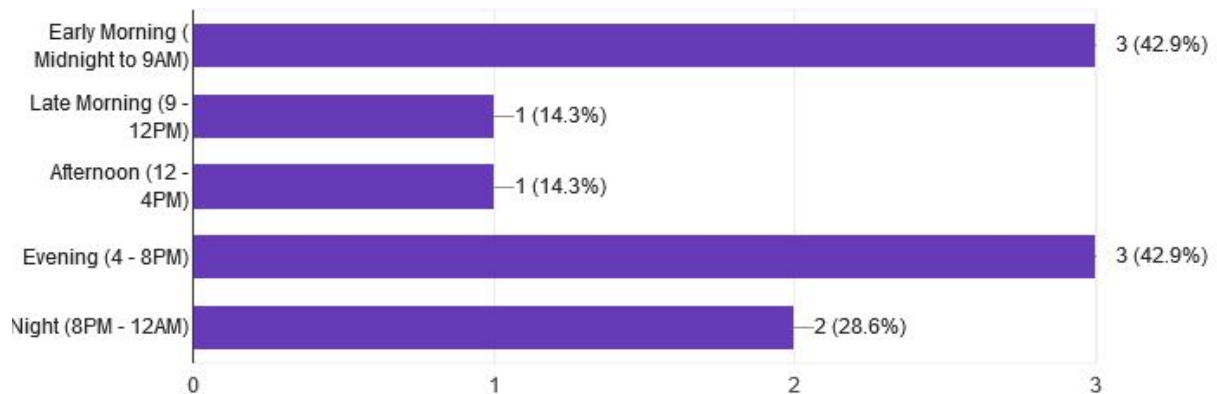
7 responses



Next we present a graph showing the frequency of people against what time of day they cycle (we would like to add that where there is overlap in the times, the decision was made to take the times one had started and ended in and choose which period they spent most time in, favouring the earlier ones in case of ties). By analysing the frequency at times of day we can see the impact that is had on other road users. Since there is a spread of frequencies throughout the day, with 28.6% spread of throughout the centre of the day (9 - 4), we can conclude that these cyclists are impacting other road users at all times. This supports our decision to assist in boosting organisation and planning in order to reduce negative impact, which is supported by qualitative measures as will be shown. We can draw some conclusions with respect to the weather, which will be discussed below when we analyze the conditions cyclists said they mostly rode in and would like to ride in, which as we will see is a depiction of the conditions the large 85.8% group who rode very early in the day, and at night, and it is by combining these datas where we see correlation, emerging properties and potential requirements (Note that percentages do not add to 100 as people may cycle at multiple times).

At what time do you most often choose to cycle?

7 responses

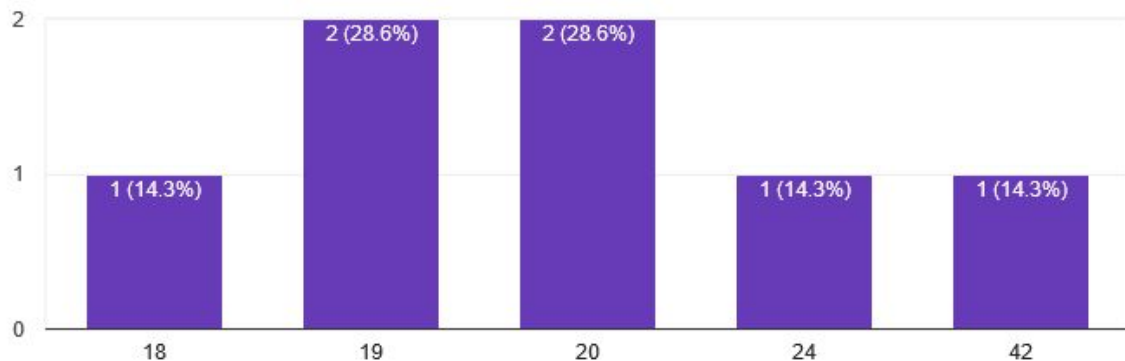


It should be added here that while it is not too surprising or unexpected, it is still with low expectations that we found people who cycle late. Reasons for this could be the clearer roads which leads to a safer and less stressing journey which further supports the idea of having an application to aid in this endeavour.

Another factor we chose to consider is age. This is important when it comes to designing our interactive interfaces because there are certain elements that attract to differing age demographics, such as flashy and entertaining for teens so as to not bore them, and simple to use for the elderly so it is a convenience and not a burden. Below we can see that the majority of our user-base are teenagers - early twenties who generally want more in the form of excitement and helpfulness. This is in fact 85.7% of the people we questioned, and 57.2% are aged 19-20. However there are signs of older people who have shown an interest that can be found in our data which is visible in the graph below. This means that in terms of the usability requirements of our interface we need to pay attention to simplistic ease of use but nothing too boring or lacking in excitement either.

How old are you? (In complete years)

7 responses

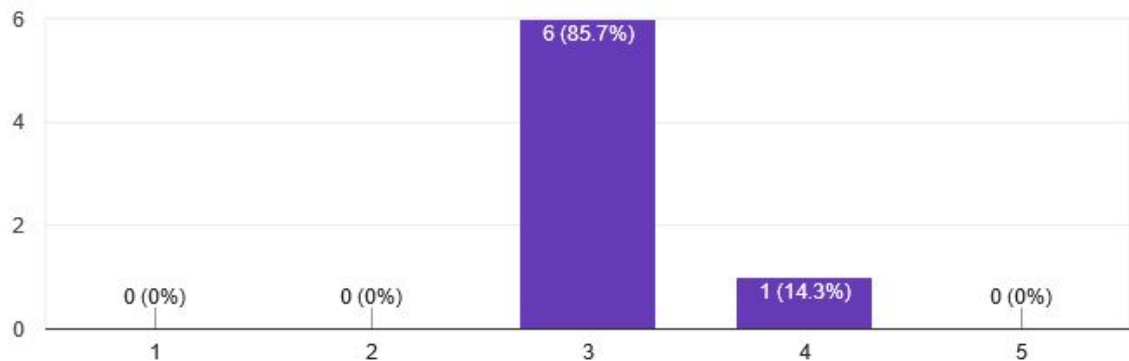


To get better insight into how weather played a role in our cyclists lives we asked them to rate on a scale of 1 to 5 the quality of the weather conditions they cycled in, where 1 represented heavy downpour and 5 represented bright, dry and sunny (The labellings were an arbitrary choice but enough to be able to accurately depict weather preferences on a visual scale). It can be seen that 86% of people were central in their decision, so perhaps not raining but the effects of rain are present and the temperature is still low. Coupled with the data above which showed that 86% of people chose to cycle in early mornings or late evenings/nights, this makes sense as at this time, the sun isn't entirely out and temperatures are naturally lower at this period of time during the day. It can also be argued that this is a geographical consequence of the natural state of the weather where we live. Nonetheless, it is when the majority of our primary stakeholders are on the roads. We also note that there are the 14% of our questioned stakeholders who ride when weather is around 4/5. Reasons for this could be not wanting to cycle in poor weather which are better explored in our qualitative section, but is enough for us to infer that it is necessary to help improve the journey people take in poorer weather, such as with our proposed application.

We further asked people to rate their ideal weather on a similar scale, of which 85.7% picked the perfect 5/5 weather option. While control of the weather is beyond us, it is enough incentive to want to provide an application to increase the satisfaction of our primary stakeholders through means such as improving organisation and reducing stress, so that the weather is the least of their worries.

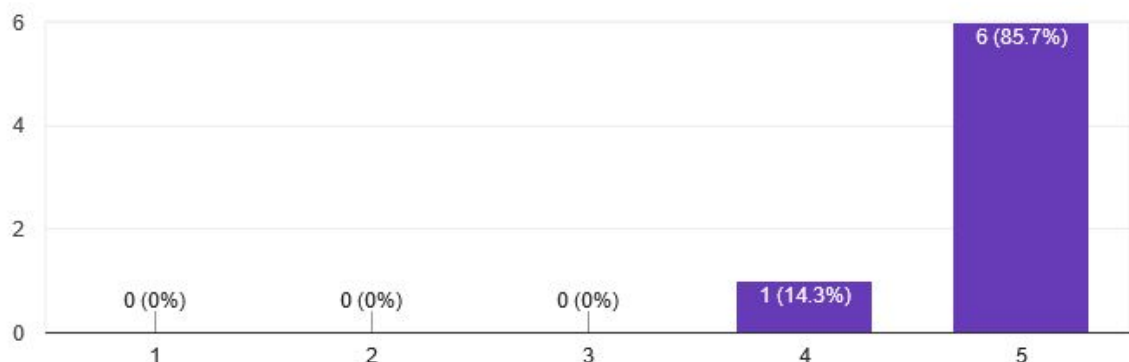
On a scale from 1 to 5, in what weather do you typically cycle in?

7 responses



On a scale from 1 to 5, what is your favourite weather to cycle in?

7 responses



To build on our contextual knowledge we ask questions concerning the type of bikes our stakeholders rode and the type of brake, and whether they knew about the type of brake, to see if, for example, safety is a concern. It was found that only 14.3% of people weren't aware about the type of brake, but other than this, no meaningful or supportive conclusion was drawn that could be linked. The charts can be seen at the end of the document.

Our final question was open ended and was to inform us on how our stakeholders considered the weather on their journey. Around half of these qualitative results were simple statements stating that they either didn't check the weather or used the basic built in application on their phone. The other half however actually talked about the impact it had on their cycling and to quote a more descriptive response:

“Dark Sky (darksky.net) is what I generally use in order to get the data about the weather for the day - but I generally will not care about it too much and sort of just check in case the weather is very very bad - about to be a storm. I probably could look more frequently and use the weather to plan my training schedule - that'd probably be really nice, but it's quite a bit of effort.”

From this we can gather two things. The first is the expression that there could be better planning with respect to the weather, and the second is that to do it through current means is a hassle. This enforces the general theme of requiring a method of doing so easily with a new application.

The focus group sessions provided similar insights to our stakeholders opinions regarding cycling and the weather, and the most meaningful elements of the discussions will be discussed below in our further qualitative analysis.

We asked if the type of bike they owned affected the weather they cycled in, and one response was that cycling in rain with a racing bike is far too dangerous for that person and those around them, which builds on the idea of better safety for other road users. We also discovered it affected the route they took, and sometimes sudden route changes had to be taken to avoid nasty terrain. This is a good point in supporting better planning.

Further discussion occurred that helped in building our knowledge but what was discussed are the key points that we found from our data analysis. It was surprising that some people didn't check the weather when they planned their journey but when we discussed this topic, they realised it was an issue they weren't even aware of which highlights the need for a helpful and interactive application.

Requirements Development Model

Aim: The aim of our primary stakeholders is to be able to make cycling journeys, either for commuting in some cases or, in most cases, as part of a training schedule in their preferred weather conditions. (**See Appendix B**)

Job Satisfaction: Satisfaction for our primary stakeholders is achieved by having a stress free journey (**See Appendix B**). This is one which isn't negatively impacted by weather or other road users and can be achieved with a simplistic way to organise routes with regards to weather so that it is deemed a benefit and not a hassle to do.

Knowledge and Attitudes: We discovered that there is a varying age demographic among our primary stakeholders and this means there is a varying level of knowledge and skill regarding the use of modern technology and mobile applications. It is with this in mind where we decide to have both 'intuitive' and 'powerful' user interfaces..

Work Attitude: Since our primary stakeholders are hobby cyclists, their attitudes to their activity is positive in the sense that they want to do it and would like to further themselves with respect to doing it. In terms of technology, the general consensus is that having a tool in the form of an application which is easy to use and improves organisation will be well received. (**Focus Groups + Questionnaire**)

Work Group Attribute: In terms of who cyclists are which hasn't been discussed already is the fact that they do not cycle while on their phones as it is a safety hazard. Therefore by providing a tool for vastly improving organisation before a journey in the form of planned routes, we are supporting adhering to these work-group attributes which will favour acceptance of our product. (**See Appendix B**)

Nature of Activity: The task of scheduled cycling is regular (**QTN**), and generally isn't fragmented as there is a single goal, a single destination per journey, unless there are sudden route changes. These choices of action along with those of safety mentioned above will be catered for in our application by providing organisation. (**FG mentioned planning sessions**)

Responsibilities: Our primary stakeholders do have a fundamental responsibility in terms of safety regarding other road users and pedestrians while on the road. With this in consideration they would want to have planned ahead so as to avoid hazards and conflict as was found out in our research (**FG mentioned that weather knowledge could improve road safety**), and therefore being able to support this is a necessary functional requirement.

Work Conditions: Since our cyclists will be out on the road going at high speed, they can't afford to pull out their phone and check the weather to decide which route to take and when to head back. (**FG**) As this can occur quite frequently during a single journey, it is best to have a pre planned route which may only need to be altered very few times in exceptional circumstances during a ride.

Lastly we consider the non-functional requirements i.e. constraints that will be placed on our system. Since a primary goal is to help our stakeholders improve organisation in a manner that is quick and hassle free, we don't want them waiting for weather to load and as such will need some immediate data pre-computed and cached to help with productivity. Another constraint is then on data and size such that when storing, for example, planned routes, we do not take up too much space, especially since mobile devices have far less storage than standard PCs. There are constraints on our interface design as we want to appeal to a wide demographic, so we won't include flashy or visually straining content. We also won't be able to monetize in terms of ads as our goal is to let our users reach their end goal quickly, which waiting for ads does not achieve.

With all of the above points taken into consideration we have a final set of both functional and non-functional requirements.

List of Requirements

1. Ability to schedule cycling sessions with specific weather - this is dry and not windy
 - a. Dry is shown by the questionnaire (q5), while the fact that people would prefer not to cycle in the wind can be shown by focus group transcripts
 - b. The ability to schedule the times as important was found through discussion with the focus groups as well as specific comments in the questionnaire about existing solutions and ideas - in particular, see the quotation.
 - c. (whether it is raining is more important than if it is windy was mentioned by a focus group member though)
2. Be able to enter preferences with preferred times
 - a. From the questionnaire, we can see that people train at various times, from early mornings to late evenings.
3. Be able to deal with varying lengths of times of cycling
 - a. This was found through focus groups. Durations ranged from 45 mins to 5 hours.
 - b. See appendix for the data that people would like to cycle for different lengths of time
4. Usable without internet connection
 - a. Focus groups mention that they want to be able to use systems when not in internet access - often can go cycling in rural areas where signal can be not very solid.
5. Reasonably quick to access data
 - a. This was backed up with new focus group data that said that the time in accessing data should be reasonably quick - therefore maybe consider caching data or utilising faster algorithms to ensure that there is not too long a delay between requesting schedule times and getting the data.
6. Ability to notify users about appropriate times
 - a. Ability to tell the user when they can go cycling - a member of the focus group mentioned that they would be more likely to go if they knew that they could go cycling without bad weather.

7. Ability to notify users about changing weather
 - a. Focus group users mention that they don't want to have their phone out when cycling - this is clearly a safety hazard - and therefore they should have a notification (potentially audible - this was mentioned by the focus group member) which tells them if the weather has changed.
8. Intuitive and Powerful interface
 - a. Comes from focus group.

Appendix A - Questionnaire

Stakeholder Questionnaire

*Required

Why do you cycle? *

- ☐ Recreationally (exercise/fun)
- ☐ Commute
- ☐ I don't

At what time do you most often choose to cycle? *

- ☐ Early Morning (Midnight to 9AM)
- ☐ Late Morning (9 - 12PM)
- ☐ Afternoon (12 - 4PM)
- ☐ Evening (4 - 8PM)
- ☐ Night (8PM - 12AM)

How old are you? (In complete years) *

Your answer _____

On a scale from 1 to 5, in what weather do you typically cycle in? *

	1	2	3	4	5	
Heavy Downpour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dry

On a scale from 1 to 5, what is your favourite weather to cycle in? *

	1	2	3	4	5	
Heavy Downpour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dry

Which style of bike do you use? *

- ☐ Mountain Bike
- ☐ Town Bike
- ☐ Racing Bike
- ☐ Other: _____

Which style of brakes do you use? *

☐ Disc Brakes

☐ V Brakes

☐ I don't know

☐ Other: _____

How do you currently get access to the weather? Do you consider it when choosing when to cycle? *

Your answer _____

Focus Group

The purpose is to get answers that sheds some light on our stakeholders in their contextual environment with a series of questions followed by answers which are recorded separately and anonymously. Below is an outline of the questions certainly asked, although conversation can veer off-topic and all significant occurrences are discussed in data analysis, but the important information is contained within answers to the following -

Questions:

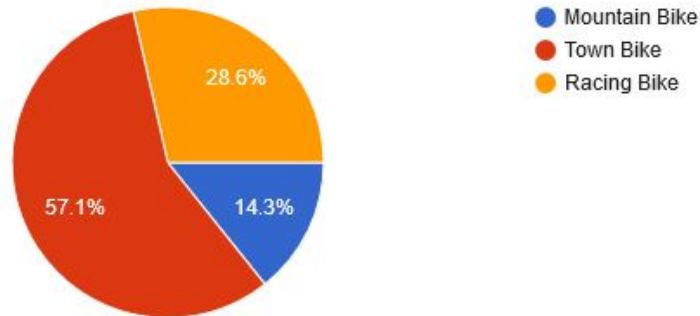
- What type of bike do you have?
- Would you choose to cycle in different weather if you had a different type of bike?
- Does your bike have a mudguard installed?
- How does it affect your weather-related cycling decisions?
- Do you often check the weather before you go cycling?
- How long do you cycle for?
- How does it influence your decision?
- How could your weather checking experience be improved?
- How does this make you feel in terms of stress and organisation?
- On long rides do you check the weather to decide when to turn back? (*)

* - The asterisked question was added after a meaningful comment was made during the first session.

Charts

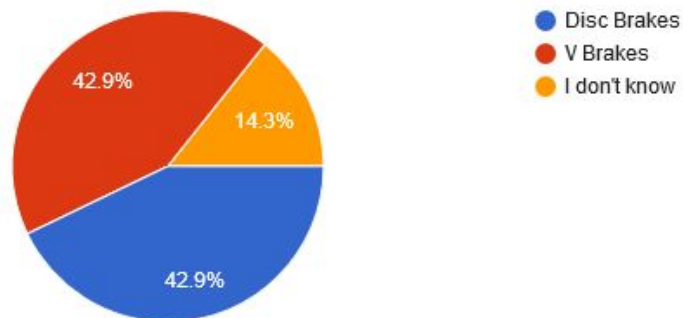
Which style of bike do you use?

7 responses



Which style of brakes do you use?

7 responses



Appendix B - Focus Group Session

Q: What type of bike do you have? Would you choose to cycle in different weather if you had a different type of bike?

A: City and hybrid bikes not same. Amend questionnaire. All 4 have hybrid bikes. Wouldn't cycle in rain with racing bike.

A: Road bikes.

A: Hybrid

Q: Does your bike have a mudguard installed? How does it affect your weather-related cycling decisions?

A: 0 mudguards. Prefer cycling over dry terrain.

A: Yes mudguards. Yes.

A: No. Affects route.

Q: Do you often check the weather before you go cycling? How does it influence your decision? How could your weather checking experience be improved? How does this make you feel in terms of stress and organisation?

A: Yes. No (10 years old).

A: Yes. Would be helpful to know if rained earlier - this would probably make things safer as well - with less crashes and much better visibility.

A: No. Would want to check for wind.

Q: On long rides do you check the weather to decide when to turn back?

A: Yes.

A: Yes

A: No. (But worried about thunder).

How long do you cycle for? (* Added after talking to focus group one)

A: Varied answers from 45 mins to 1h:30 minutes

A: Around 1 hour

A: 3-5 hours.

Q: Do you have any comments on what a weather app would require?

A: Wouldn't want to use it if it took too long.

A: Doesn't want to spend time looking for perfect weather. Would rather be notified a few days in advance and have suggestions when they open the app.

A: Doesn't have a 3G/4G internet connection. Thinks weather data should be precached.

Second iteration of focus groups

Q: Do you have any tech problems when cycling?

A: Well, I obviously can't use my phone when cycling, so that's a big problem.

A: I don't take my phone with me. I like to cycle to get away from distractions so it would be nice to know how long I have before I have to turn back.

A: Can't use phone w/ gloves

A: Sometimes I don't have much, if any network service. I usually cycle in rural areas e.g villages

A: Not really. I stop before taking my phone out because I'm afraid I might drop it.

A: My phone typically runs out of charge when I'm out for the whole day.

Q: What do you consider a successful bike ride?

A: Not crashing, ideally

A: Not many cars, Quiet road

A: Quiet, nice weather, stress-free

Interview Answers

Harry from Girton

Wants an intuitive, powerful interface. Would accept a greater learning curve for a more powerful interface.

Would like wind data.

Would prefer to see rain data first and foremost, then wind data second.

Typical duration is 20 minutes per session, with them being well planned in terms of destination and time.

Does take into wet roads when setting off, because affects his speed.

Mikey from Caius

Would prefer to see rain first, then wind data second.

25 minutes typical session

Would wait for roads to dry first