Enjoyment of differing bicycle infrastructure in Christchurch: A pilot study

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New Zealand's specialist land-based university

National Science Challenges

BUILDING BETTER HOMES, TOWNS AND CITIES

Ko Ngā wā Kainga hei whakamāhorahora

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Overall research question

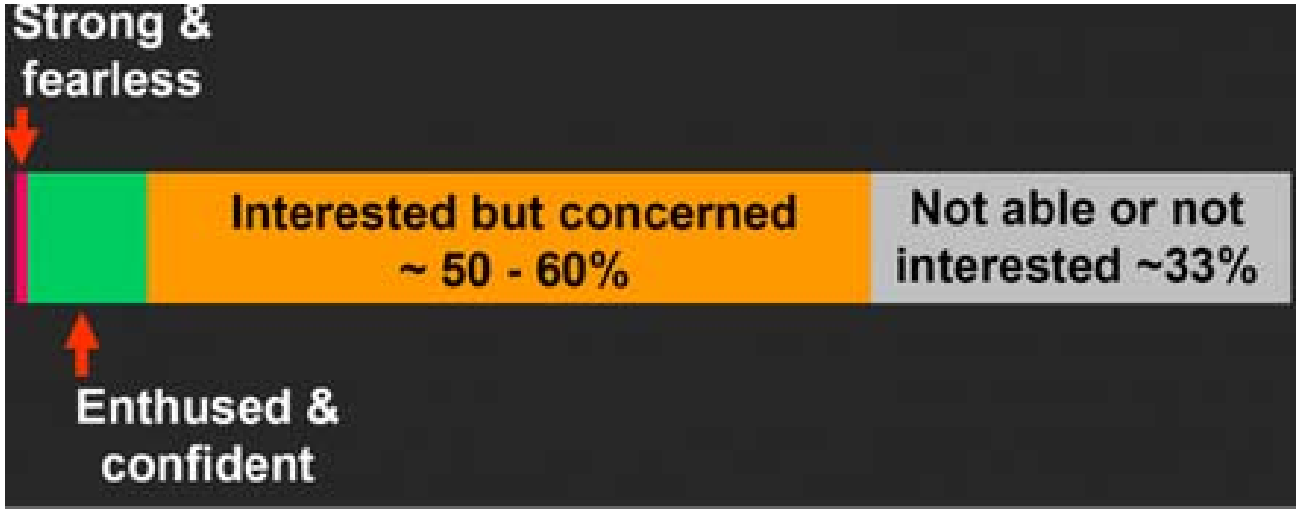
What is the relationship between the quality of the physical environment (of the Major Cycle Routes in Christchurch) and users' perceptions of satisfaction and comfort?

13 Major Cycle Routes

$252 million to be spent by CCC

50-66% of cost refunded by Central Govt through NZTA and Urban Cycleways Programme

13 Major Cycle Routes
Aimed at Interested but Concerned



https://www.portlandoregon.gov/transportation/article/158497

Assumption

That positive cycling experiences result in more people cycling.

https://momentummag.com/the-secrets-to-cycling-like-an-amsterdammer/

http://www.stuff.co.nz/the-press

Pilot study - research questions

1. Can data about the performance of infrastructure and cyclists' experiences be effectively collected using low budget technology (<$2,000) ?
2. What is the best way to analyse and present the combination of quantitative (numerical) and qualitative (non-numerical) data produced?

Method

- 12 mobile apps were tested in February 2018 that could measure and export data about speed, acceleration and location.
- Tested over varying distances; road conditions; speeds and trying different orientation of the smartphone.

Equipment: Mobile phone and 360° camera attached to bicycle

Camera also recorded voice of cyclist about the quality of their experience.

Some initial hardware issues



Attaching the camera, battery life; phone connectivity and compatibility; data storage limits.

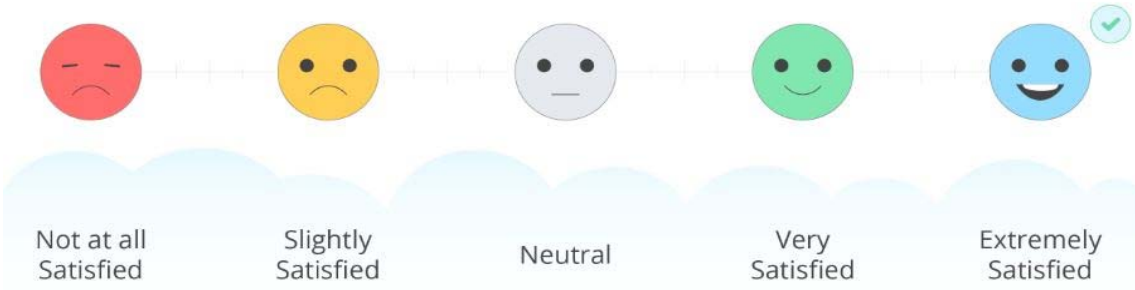
Qualitative data produced using 360 degree camera recording

https://youtu.be/k9oULuYspqM

Additional qualitative data

- *After the ride, the cyclist rated their experience (assisted by the video) using a 5-point Likert-Scale*

  (1 = very unsatisfied, 5 = very satisfied)



Results

Andro Sensor identified as most suitable App for the job.

Produces a detailed Microsoft Excel file sheet (in csv format) giving speed and acceleration, and GPS location.

Devised three different ways to visually present the data collected by:

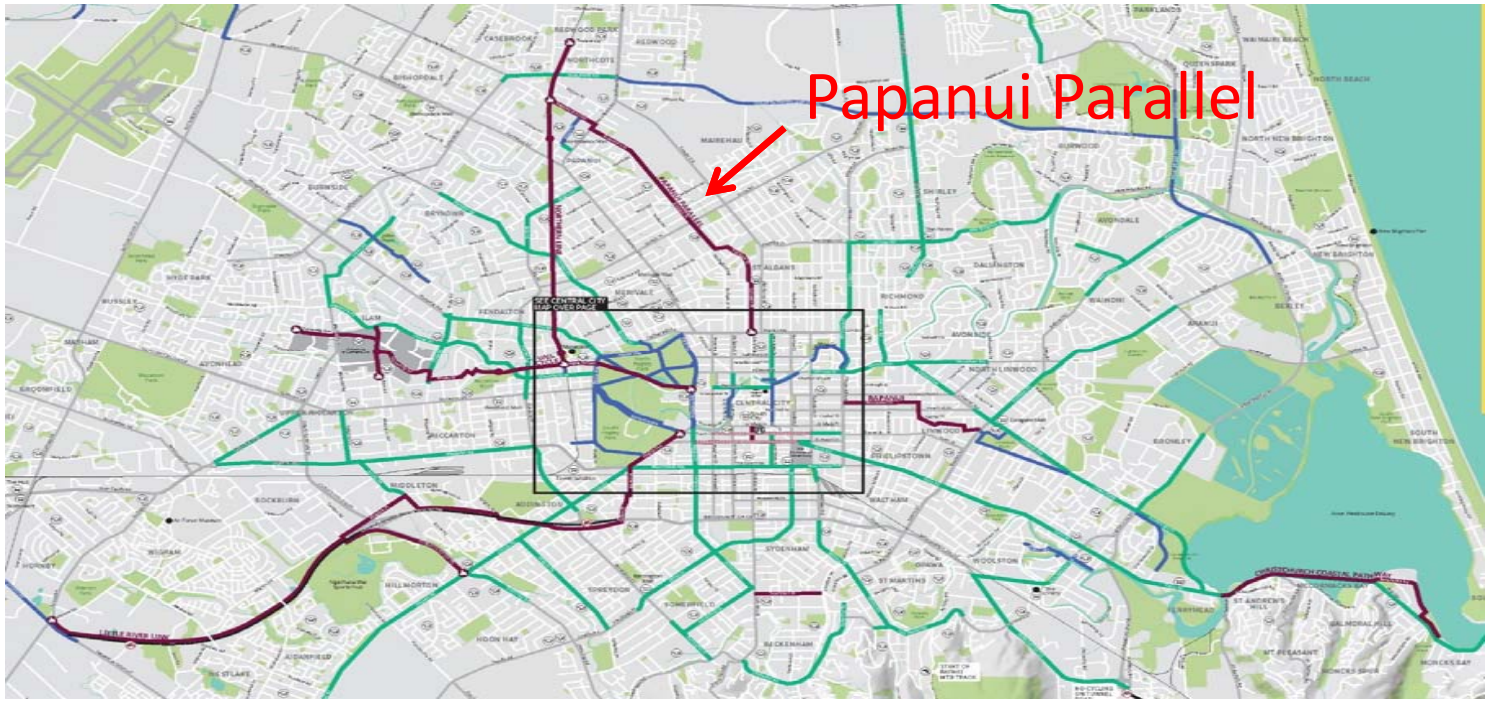
Lincoln University
Te Whare Wānaka o Aoraki
AOTEAROA · NEW ZEALAND

AndroSensor

360° camera

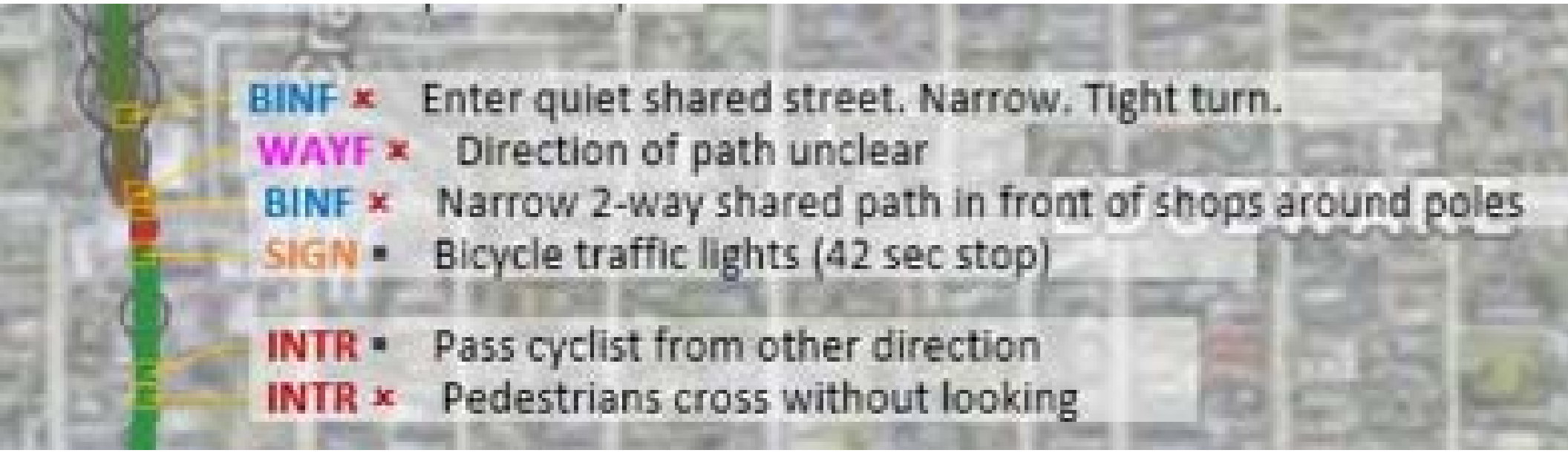
Likert Scale

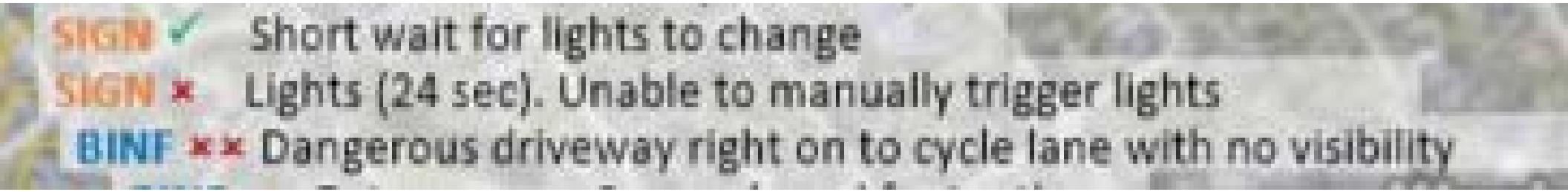
How to present visually?



Cycle Route

Papanui Parallel – option 1

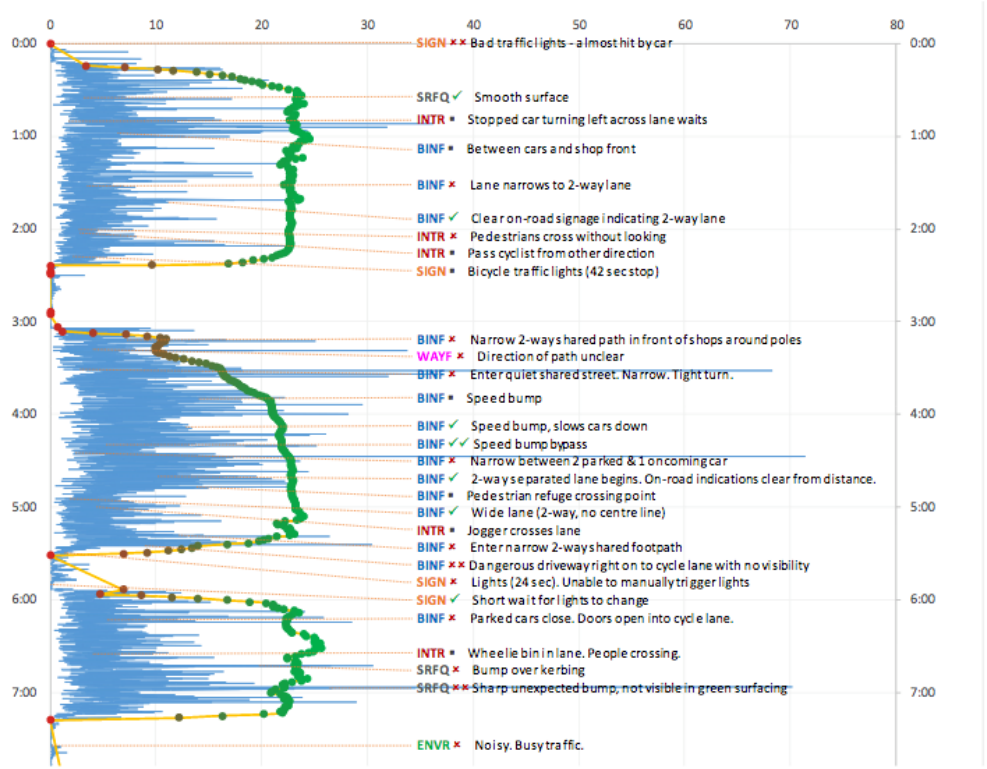




BINF – Bike infrastructure WAYF - Wayfinding SIGN – Signals INTR – Interaction

Papanui Parallel – option 2

Time in minutes
0-7 mins

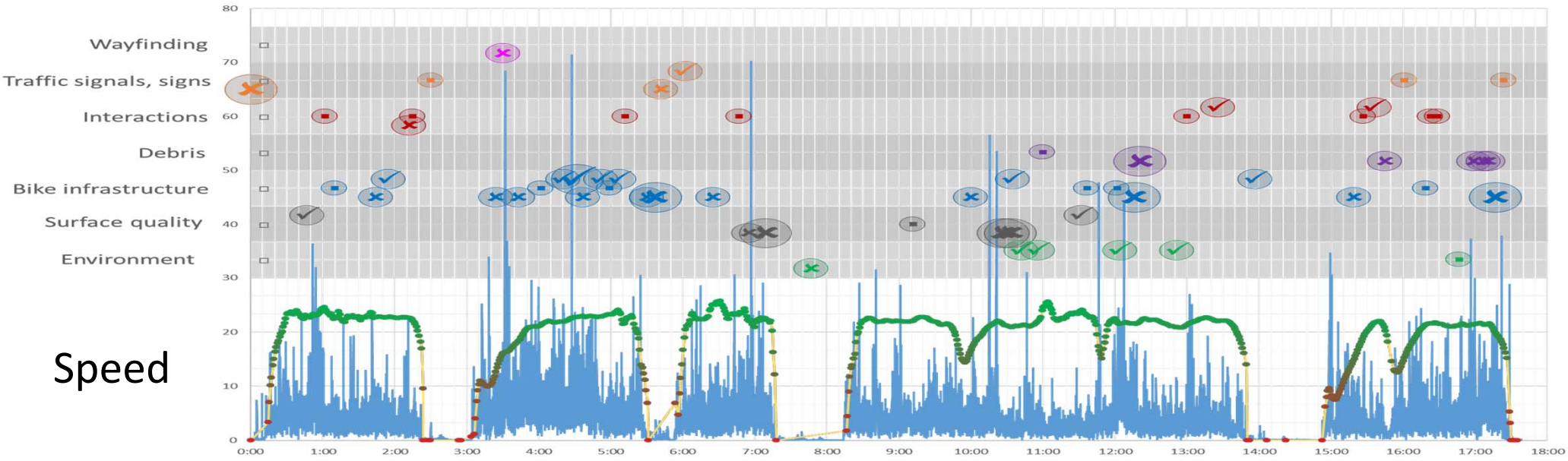


Speed

Minutes

Speed

Papanui Parallel – option 3



Speed

Time in minutes – 0-18 min

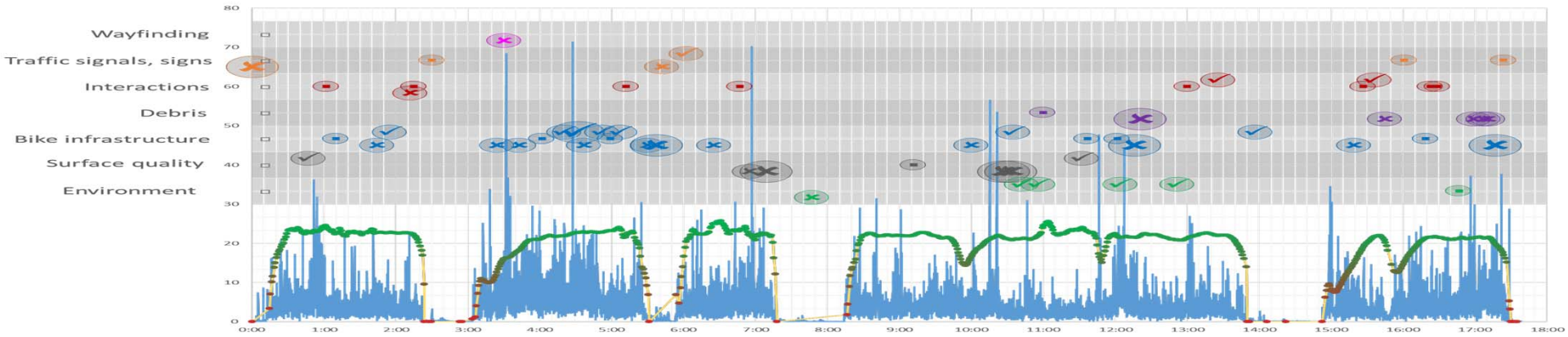
=very bad = bad = neutral = good =very good

Unique features of this research

- As it is part of the National Science Challenge, the stakeholder, i.e. Christchurch City Council, has been engaged from an early stage in the research process.
- Research done using low cost equipment to analyse users' experiences of the cycleways.
- Allows quantitative and qualitative data to be combined.

Conclusions

- Use of low cost equipment was successful
- Collecting data was relatively easy, but the analysis was very time consuming (software could be developed).
- Option 3 was preferred to visually show the data



Ideas for the future

- Could repeat on annually to see change over time.
- Could get lots of peoples' perceptions and overlay them
- Could look at whether structural features (other than bumps) such as landscape, social opportunities alter riders' perceptions – e.g make a trip seem shorter.
- Could include a greater range of cyclists e.g. ask experienced cyclists.


Feedback