GATEway project
Sentiment mapping analysis

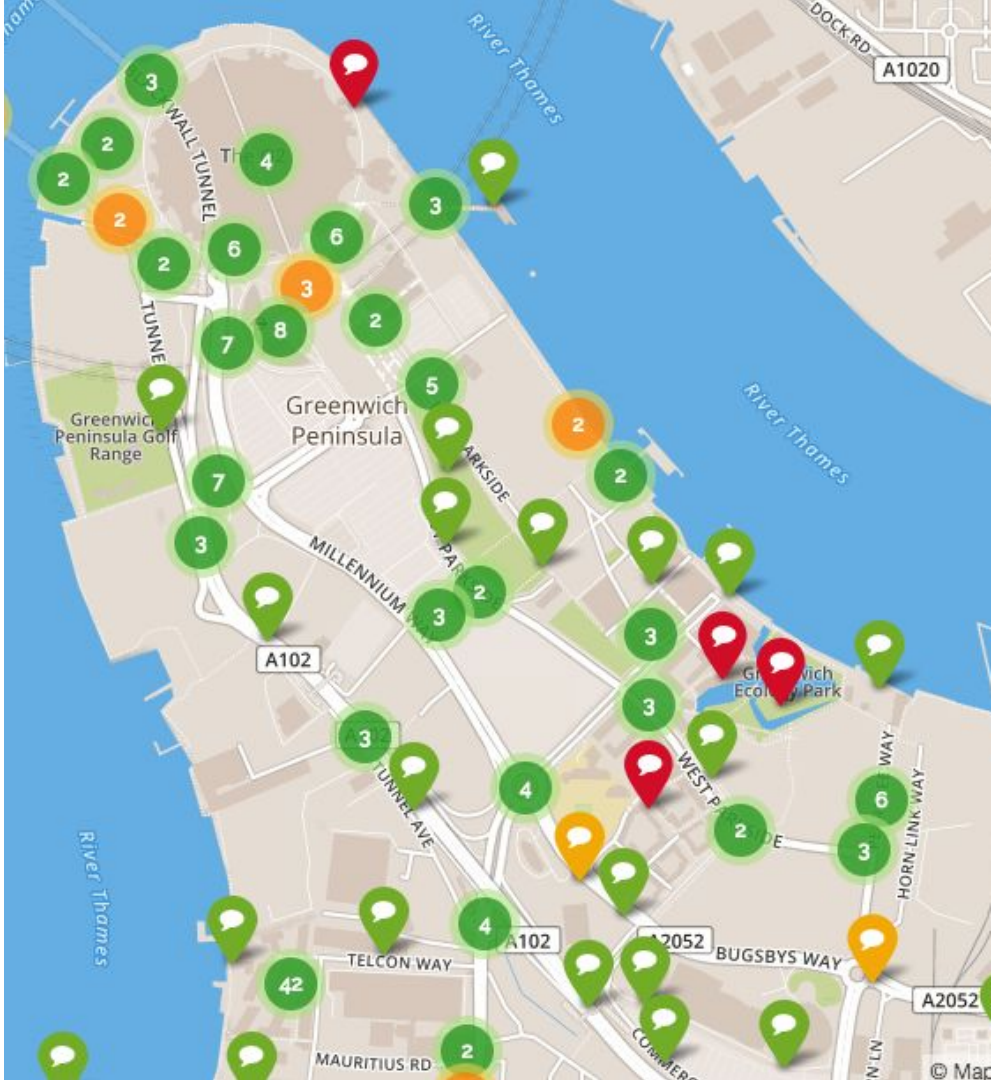
We are pleased to present analysis of the sentiment mapping project that consisted of:

- Pre-trial sentiment map
- Trial sentiment map ('Rate my drive')
- Riders ('Rate my ride')

Overview reach and responses

Total visitors to websites	**21,279**
Visitors who were highly engaged	**3,253**
Comments from participants	**746**

powered by
Commonplace



Report contents

1. Introduction

Background

The GATEway project ran between 2016 and 2018, and included trials of different driverless technologies in Greenwich, London.

The project objectives were to:

- Demonstrate the safe and efficient integration of sophisticated automated transport systems into complex real world smart city environments.
- Understand the technical, cultural, societal and legal challenges and barriers to adoption surrounding automated vehicles.
- Inspire industry, public bodies and the wider public to engage with autonomous transport technology.
- Generate valuable, exploitable knowledge of the systems required for the effective validation, deployment, management and integration of automated transport within a smart city environment.
- Create a validated test bed in the heart of London for the evaluation of next generation automated transport systems, including the detailed testing protocols and benchmark data for independent verification of automated systems.
- Position UK PLC at the forefront of the global connected and autonomous vehicle marketplace, encouraging inward investment and job creation.

The sentiment mapping research covered in this report was conducted on Trial 1, using public driverless pods on the Greenwich Peninsula.

The pods in Trail 1 travelled an approximately 10 minute route along between the Intercontinental hotel along the north-east side of the peninsula and returned to the hotel via the same route. People could book in advance or request a ride as they passed. The pods were available to the public in March 2018.

Executive Summary

The role of Commonplace in the GATEway project was to communicate and gather views from the public about autonomous vehicles before, during and after the trials. We have done this using part of the Commonplace online toolset, which is a tool for sentiment mapping. This work has been conducted as part of Work Package 3 of GATEway.

The main Commonplace project outputs were:

1. Sentiment Map 1: Public perceptions about autonomous vehicles collected before any vehicles were operating
2. Sentiment Map 2: 'Rate my drive': A sentiment map of people's observations of vehicles during Trials 1 and 3
3. Views collected from riders in the driverless vehicles: 'Rate my ride'
4. Online systems for people to register and then book for their trip on the public pods
5. An interactive website to accompany the RCA exhibition at the Transport Museum

The headline observations from the work are:

- There were 746 comments made by members of the public and over 21,000 total visitors to the seniment mapping websites
- The public were overwhelmingly positive about the opportunities and experience of driverless vehicles in the trial
- Although still very positive, respondents to Rate my drive were slightly less positive about the experience of observing the vehicles than those commenting on the potential of driverless vehicles before the trials commenced
- Key themes are that the public perceive the vehicles as safe, convenient and accessible, and that they have the potential to be better for the environment.
- There was some surprise and frustration at the very low speed of the vehicles during the trail.
- Those who expressed concerns focused on the ability of driverless vehicles to read the behaviour of other road users and to navigate complex junctions or road situations. They would like to see more testing in their local context.

Methodology (1 of 2)

The project methodology was designed in partnership with other members of the consortium working on work packages 3 and 5. The group attempted to make sure that the interactions with the public were complimentary in terms of message, mechanism and research goals. The Commonplace methodology had five main components:

1. Researching where the local conversations about transport in Greenwich were happening online, and designing a plan to intersect with these conversations in the form of the sentiment map

2. Setting up the sentiment maps to collect the correct information, and to be sufficiently interesting to attract participants. Sentiment maps were used for Trial 1 (public pods) and Trial 3 (autonomous delivery). Two sentiment maps were used:

    - Sentiment Map 1: to collect views of people living, working or using the Greenwich area, about how helpful driverless vehicles would be in their daily lives. They were asked to mark a location on the map, and say how helpful they thought driverless vehicles would be in that place, why they thought that way, and whether they had any other thoughts about driverless vehicles.

    - Sentiment Map 2 ('Rate my drive'): to collect insights from people who spotted a driverless vehicle. People were asked to say where they spotted the vehicle and to describe how they felt about what they had experienced. This was used for Trial 3 (autonomous delivery) and Trial 1 (public pods).

    - Sentiment Map 3: ('Rate my ride'). People who rode in the Trial 1 pods were given the opportunity to rate their experience.

3. Promoting the maps. The Commonplace team worked closely with the Royal Borough of Greenwich and TRL to promote the opportunities to contribute to the maps via stakeholder networks, social media and local press.

Methodology (2 of 2)

4. Reviewing and analysing responses from the public

5. Designing and producing supporting activities for other activities and partners in the consortium. These included:

    - Producing an interactive website to accompany the RCA exhibition at the Transport Museum

    - Constructing and managing the sign-up process for people who wanted to take part in the trials. 5,631 people signed up for this

    - Constructing and managing the booking system for people to book a particular place in the public trial pods for Trial 1

    - Designing and creating the in-pod signage for the public, and promotional flyers for the local community

Sentiment mapping uses an open commenting methodology which is by its nature self-selecting. However by collecting a few demographic data points, it is easy to establish how representative the sample is of the local population.

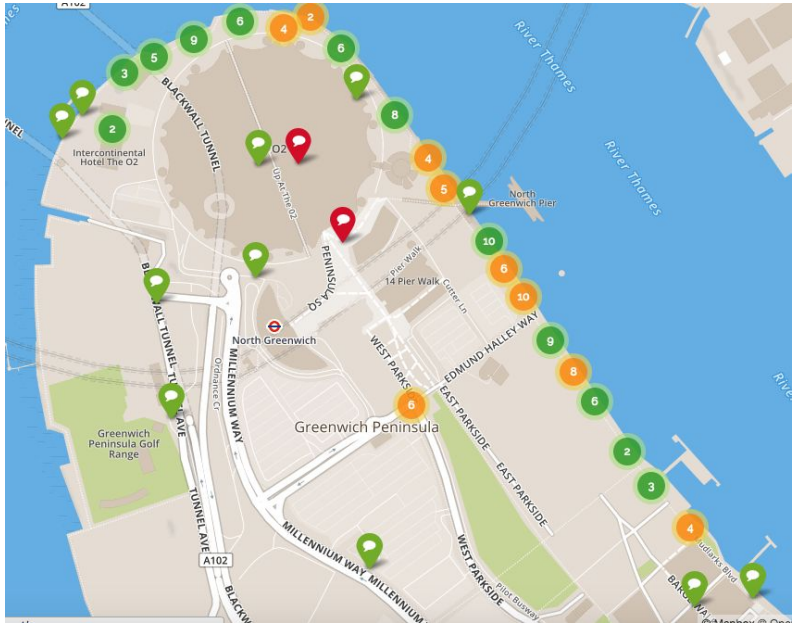
The benefit of this approach is that it is a ground-up, open way to capture people's perceptions and responses in the moment.

The analysis of the data collected is qualitative. We haven't taken a statistically rigorous approach to the analysis. Where numbers or percentages are used, they should be viewed indicatively.

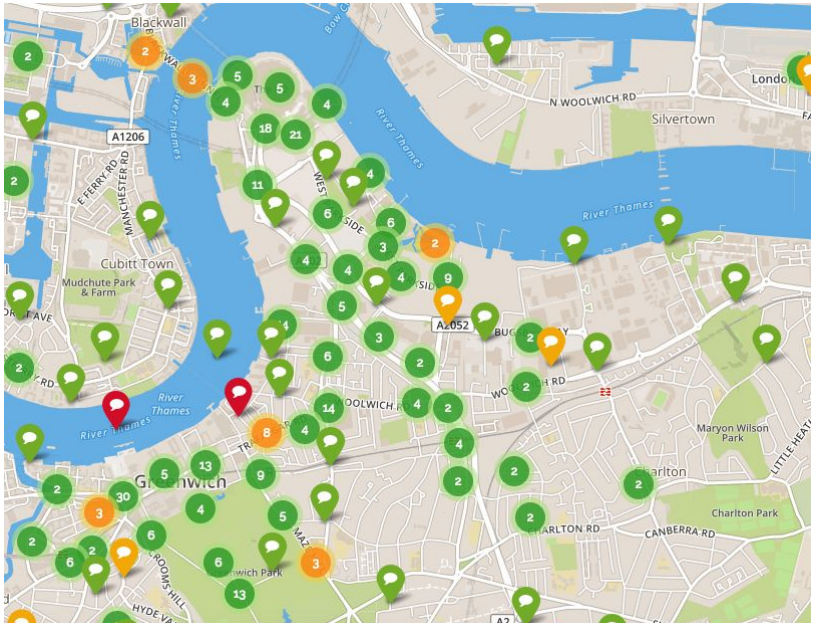
The size of the dataset for Rate my drive is significantly smaller than we hoped to achieve, because of the shorter time period for Trial 1.

During the GATEway project, as well as collecting data about people's perceptions, the sentiment mapping activities also contributed to dissemination of the project, with over 21,000 people viewing the Commonplace websites and learning about the project.

The sentiment maps



‘Rate my drive’ captured observations from people who saw the pods as they operated on the peninsula. People were asked ‘How did the vehicle do?’ and ‘Why was that?’ The location of the comments map out the route of the pods during the trial. Red indicates negative comments; amber neutral; and green positive.



The pre-trial sentiment map comments were collected before the trials started, and captured views from people about the potential for driverless vehicles. People were asked to mark a spot on the map and rate: ‘Would driverless vehicles be useful to you there?’ and ‘Why do you feel this way?’ Red indicates negative comments; amber neutral; and green positive.

2. Summary of findings

Who contributed?

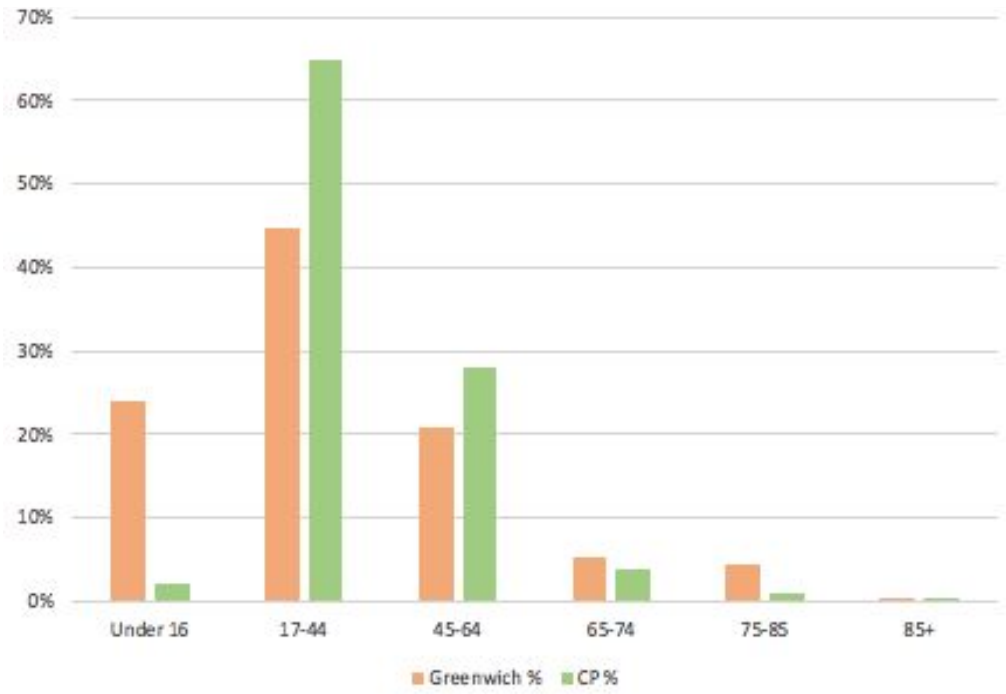
The majority of respondents were in the 17-44 age category. However this maps broadly to the age demographics of the borough.

Responses were significantly under represented in the under 16 age group, which accounts for just over 20% of the borough.

With these exceptions, the responses broadly reflected the age makeup of the borough

(Source: ONS Census (2011) Table QS103EW Age by Single Year)

Greenwich age distribution vs Commonplace age sample

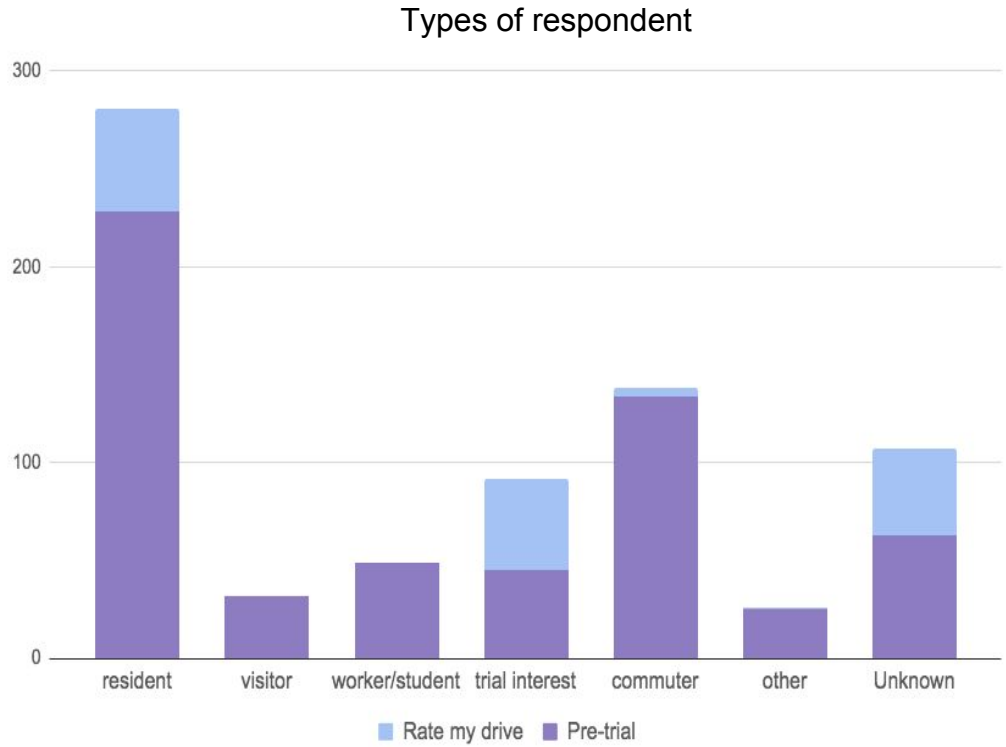


Who contributed?

The largest group of respondents were Greenwich residents.

During the pre-trial stage, a significant number of respondents had no local connection to Greenwich, but were just interested in the trial.

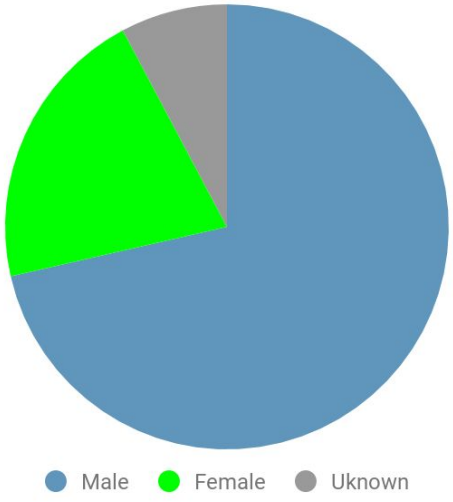
During the ‘Rate my drive’ stage, respondents were either residents, visitors or local workers / students.



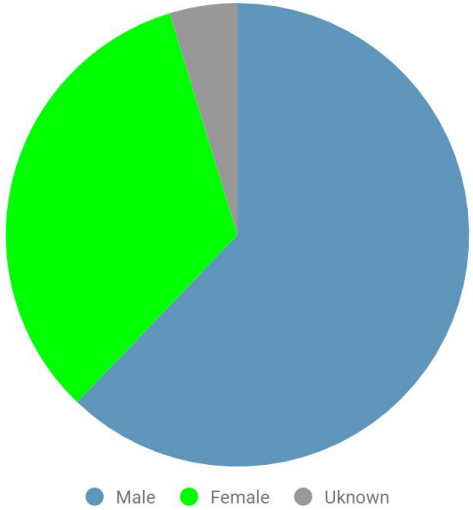
Who contributed?

The sample across the two sentiment maps was predominantly male (70% male, 23% female, 7% didn't say).

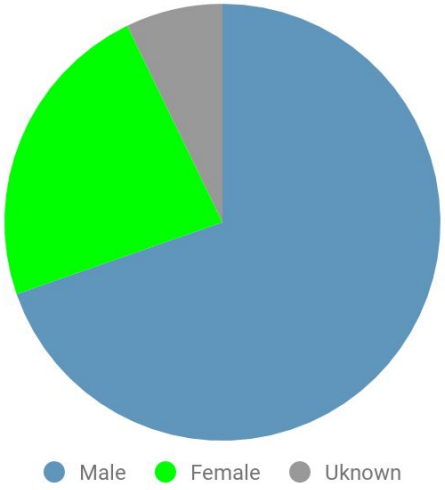
Gender - pre-trial



Gender - 'Rate my drive'



Aggregated gender of respondents



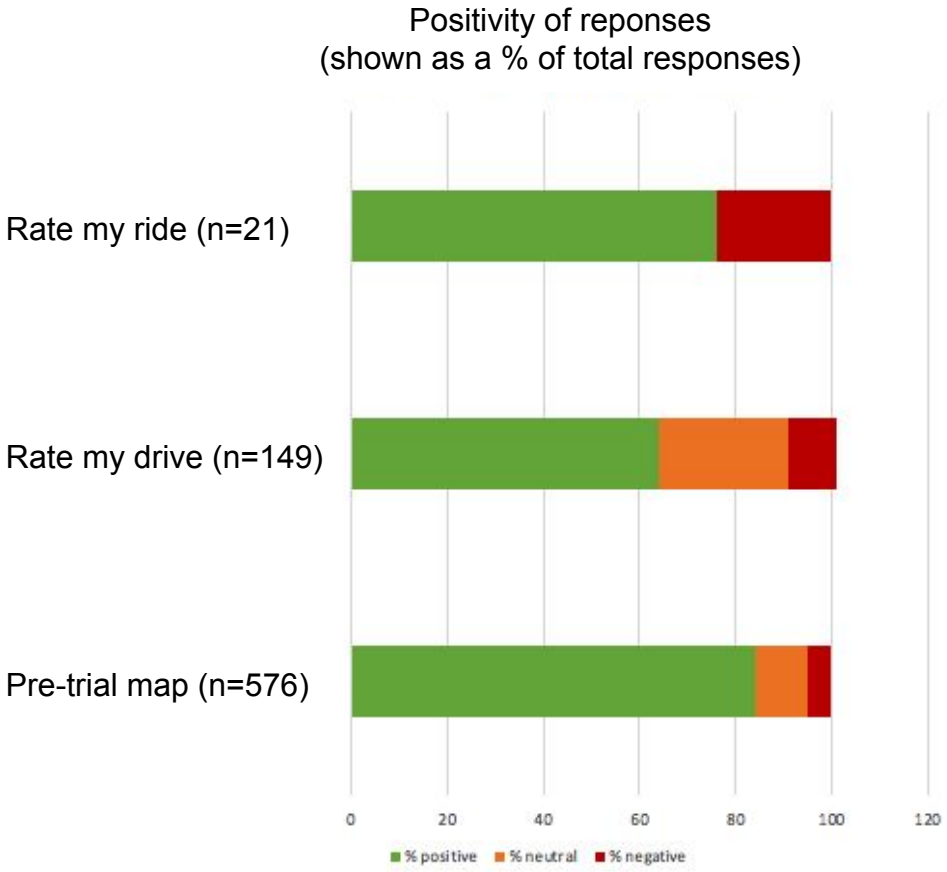
How positive were respondents about driverless vehicles?

Respondents were very positive across all of the three main research elements.

84% of people who responded before the trials indicated that they were positive about driverless vehicles.

64% of people who observed vehicles during trials 1 and 3, and added a comment to the site indicated they were positive.

76% of responders who had ridden on a trial vehicle indicted they were positive.



3. The top themes:

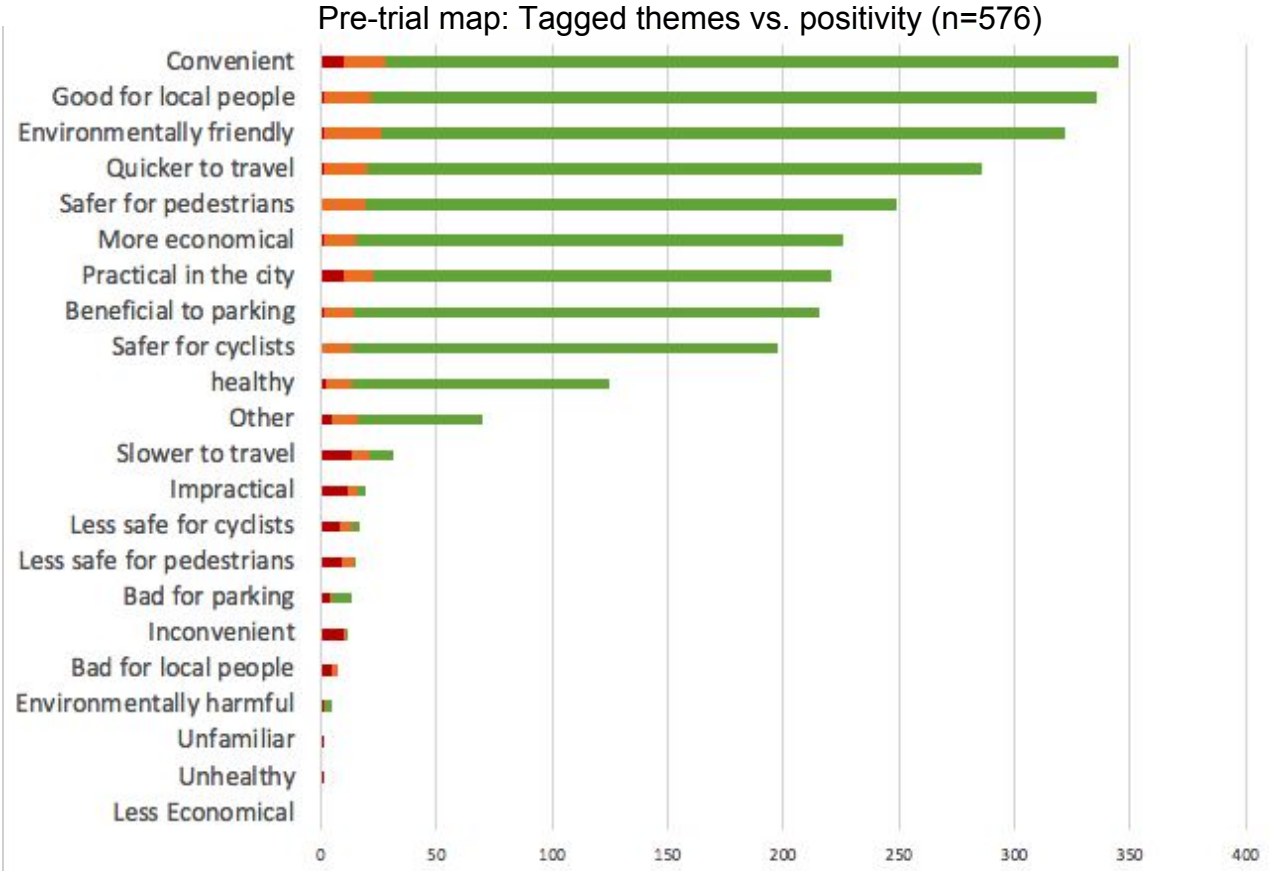
- Convenience
- Safety
- Environmental benefits
- Design
- Effects on cyclists and pedestrians

Pre-trial sentiment map: main themes

The main themes of convenience, practicality, safety and environmental benefits are evident from this chart. There was a strong belief that local people will directly benefit from driverless vehicles.

Respondents had high hopes for the technology, and could see few down sides or risks.

Particularly interesting is the 'Good for local people' theme: there appears to be little evidence from these respondents of a fear that autonomous technology could have a negative impact on jobs or the local economy.



‘Rate my drive’ sentiment map: main themes

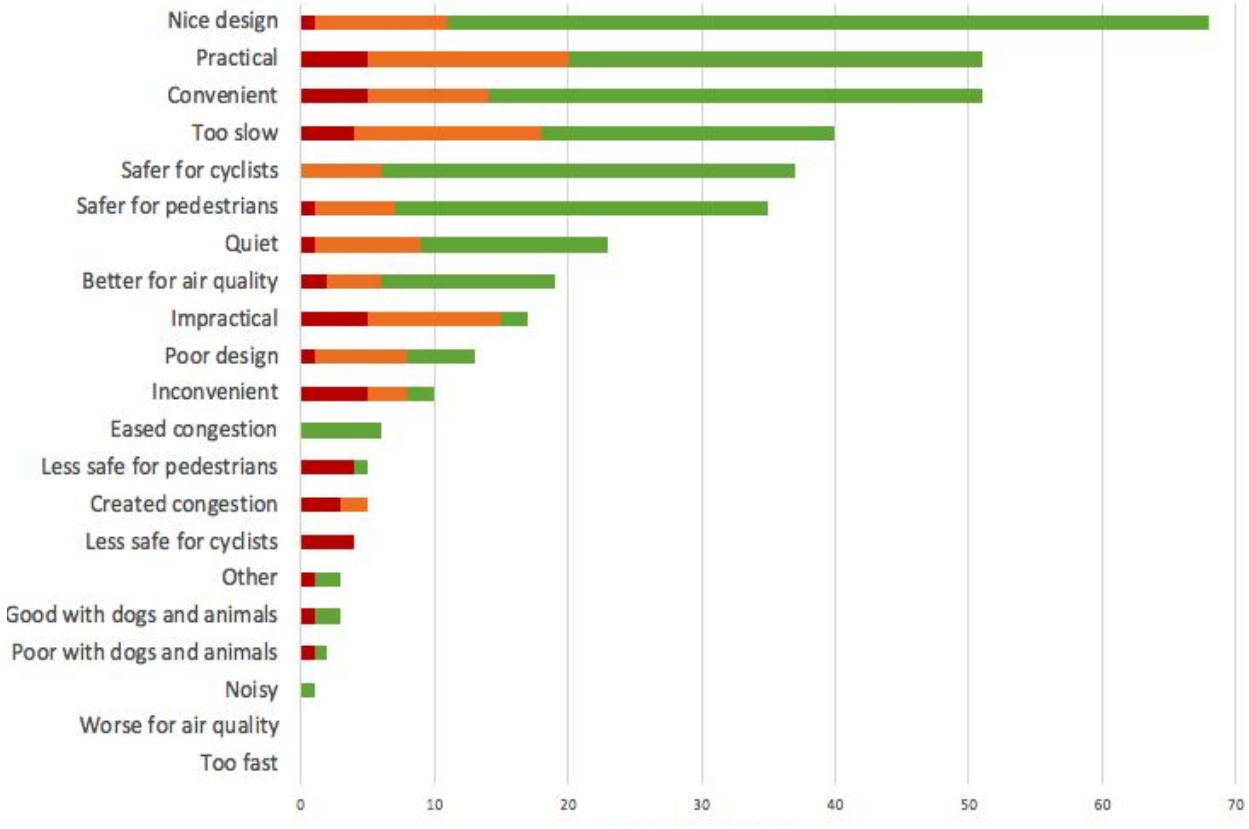
On the ‘Rate my drive map’, there are similar themes of convenience, practicality and safety evident.

Most people responded well to the design of the vehicles.

The low noise of the vehicles is another perceived benefit that is interesting to note.

However there are a significantly larger proportion of comments that have included negative themes such as ‘too slow’, ‘poor design’ and ‘impractical’.

‘Rate my drive’ map: Tagged themes vs. positivity (n=149)

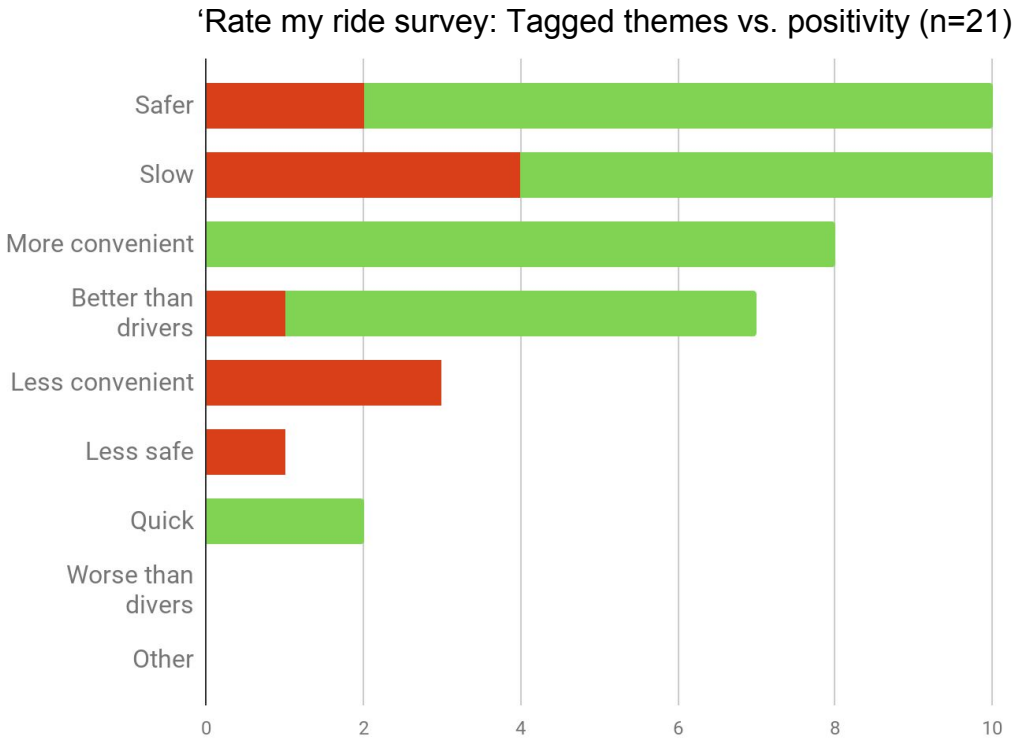


‘Rate my ride’: main themes (n=21)

When asked how the driverless vehicles compared with their expectations, those who rode in the pods tagged safety and slowness most frequently.

There were varying views about convenience. Whilst many tagged them as convenient, many also indicated that they saw the potential for convenience, but that the trial itself didn’t demonstrate this convenience.

And whilst people chose ‘better than drivers’, there were also several comments about the jolting and over-sensitivity of the pods.



Why do people think driverless vehicles are convenient?

Overall, convenience is the theme that people talk about most. They believe that whether to improve coverage of public transport, to aid accessibility for older people, or to remove traffic congestion, these vehicles will change their daily lives for the better.

There is no easy route from Greenwich Town Centre to the top of the Park and the Heath at Blackheath. This is a very steep hill for pedestrians, and a hop-on-hop-off environmentally friendly vehicle would be very useful here.

With the new shopping parks opening in Charlton, but limited bus services serving these areas, driverless cars would make it easier for residents without cars to shop and access these areas.

There is heavy congestion on this route towards Blackwall Tunnel, blocking the route to North Greenwich station. Driverless vehicles could help improve the route to North Greenwich.

It's the future and will enable you to do something else such as, reading, studying, working, and why not even sleeping!

Will address current poor, irregular and slow transfer link between Greenwich and Blackheath

my mum needs to go to london hospital alot and the parking is so bad i get a cab instead as i have to be their with her

Commute to and from Greenwich Park, O2, Greenwich centre and Blackheath village. Beneficial for parking, allow users to drink without driving (more likely to spend more in local restaurants etc), use parts of Greenwich which are just a little bit too far to walk (especially with kids)

would like to use them in the future instead of cars. I like the idea of being able to do other things instead of driving.

Technology of the future, reducing traffic and making roads which are only accessible by foot usable. Also helps get between large blocks of apartments.

Allow more convenient commutes for drinkers between Greenwich Town Centre and Meantime Brewery

Why do people think about safety?

Although safety was a key theme for both the Pre-trial and 'Rate my drive' maps, and in both cases people were generally positive about the impact on safety, there was a difference in emphasis between the two.

On the Pre-trial map, many people commented very contextually about safety - talking about a particular junction or situation that they experience daily.

On the 'Rate my drive' map, people focused primarily on the speed of the vehicles and on their personal interaction with them. It is interesting to note that the much publicised death in the USA during the trial does not seem to have impacted people's views.

It it likely that both aspects will be important public perceptions when introducing driverless vehicles to an area.

Several people talked about their trust for technology, and the ability of technology to deliver safer decisions that people.

However a number of people did talk about concerns relating to the way that people read behaviour to anticipate driver decisions (such as eye contact), and whether driverless vehicles can achieve this.

There were only 5 people out of 149 who expressed specific concern about safety from 'Rate my drive', and 21 out of 576 from the Pre-trial map.

Those who expressed specific concern about safety, didn't appear to be any particular groups of age, gender or any other grouping (although the sample size is very small).

Why do people think about safety?

Woolwich road is a disaster. It is extremely crowded, loud, polluting, dangerous for the cyclists and it ruins the experience of everyone living or having a business facing the road. It should be massively switched to self driving cars, but it will probably be hard to implement

They need thorough research first to confirm they are safe with unpredictable situations like kids chasing a ball. Also, please use teenage hacking experts to prevent this happening to the vehicles.

Difficult corner turning right onto Trafalgar Road from Trafalgar Grove. Traffic often don't notice you and let you in when they are queuing I'd be interested to see how a driverless car goes about doing it.

I trust technology more than I trust people. This has got to be a safer option!

Would be a huge benefit to London. Definitely worth it for the safety alone, before considering all the other benefits.

One time I was walking and didn't realise a pod had come up behind me. When I realised it tried to go round me and got in the way of a cyclist.
Because it's a new project people seem uncertain of what to do. Also it isn't obvious what the pod itself is going to do.

...[they] seem to be very safe. Prefer to see smaller av's operating pavements rather than larger avs on roads where there is larger opportunity for incident.

I think roads are chaotic and so the technology would struggle there but they seem to work fine here.

Will be more comfortable using the technology once it's is completely ratified.

It's the future - exciting. My kids jumped out in front of it because they knew it should stop! I feel relaxed about it in terms of safety. I don't drive - so could help a lot. Will it create job losses?

They were slow enough to feel comfortable that they are safe.

Did not like how the machine stopped as I cycled by. Would be better if it maintained speed.

They will be the safest option in the future because human drivers are unreliable. I think one of the most challenging phases of their development will be mixing normal and autonomous cars in the same in the same environment.

Comments from Pre-trial

Comments from 'Rate my drive'

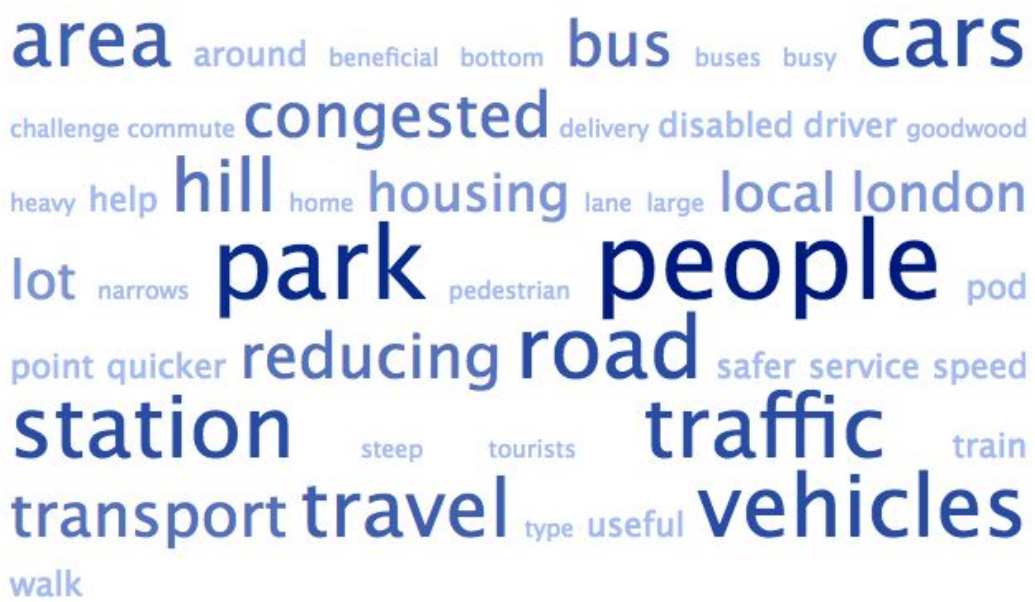
Why did people think they would be environmentally beneficial?

We found that perceptions of the environmental benefits of driverless cars fall into two main categories:

1. People expect them to be electric rather than petrol or diesel powered, which has noise, air quality and potentially carbon emission benefits

2. People expect them to solve other environmental problems caused by traffic congestion or inefficient use of private vehicles.

The visualisation opposite shows the most commonly used words in people's comments.



Why did people think they would be environmentally beneficial?

Great for getting to and from each side of both parks, help reduce fumes in the area and would add to the tourist experience went traveling between royal landmarks.

Ban petrol and diesel vehicles in all London parks and encourage driverless vehicles to use the less congested routes through London parks.

More efficient, reducing congestion

Reduce environmentally harmful emissions to nearby school and local wildlife. Safer for pedestrians by reducing fast traffic outside Windrush school.

Might cut down on traffic fumes here

Less polluting, more convenient than point to point public transport like buses, cheaper than taxis etc

Congestion, pollution and accidents can only be reduced if we automate to eliminate the human factor from traffic control…. Traffic automation is the next big innovation that is required to maintain the growth of metropolitan areas such as London. Without that, the system will crumble and cities will enter a downcycle.

The use of shared driverless cars could greatly reduce resource consumption.

I think that robots are always more efficient than humans.

Helpful to cover routes around Greenwich - maybe it will cut down on congestion and frustration.

This is still an area of London that suffers from relatively poor public transport links, high levels of air pollution and parts of Greenwich feel disconnected. Autonomous vehicles would allow Charlton residents to take a greater stake in the development of Maritime and North Greenwich. It would also mitigate the need for individual car ownership for the 15k homes being built on the peninsula.

Comments from Pre-trial

Comments from ‘Rate my drive’

What did people think of the vehicle design?

On the 'Rate my drive' map, the design of the vehicle was the most popular theme. The vast majority of people responded positively to the pod design, mentioning it looked 'cool' or 'futuristic'.

A few people talked about the design in relation to perceptions about safety.

I think it would be cramped and dark inside. (I saw a bit inside at the Intercontinental, though I couldn't get a ride in one.) External appearance pleasing and distinctive. The vehicle is non-threatening to anyone because of its current slow speed. I appreciate that the research is progressing in small and measurable ways but the real test will be with the pods moving faster than what seemed to be walking pace.

Cool technology. Ugly design. look forward to being able to not focus on driving whilst in a car .

Would like to see the pods as being more tactile in their design. If we are not using the interior space for driving and focusing on the road we should design them to suit the activities we will be doing in them.

They look cool and perfectly safe in this environment.

Really cool design and concept. The first autonomous car I have seen.

Like the pods a lot think they are a really cool and interesting thing to have along the Thames path.

Look cool and are fine for this environment. I think they would need to be redesigned for use on public roads to be faster and I would want to have some crumple zone.

Really like the idea and the design as I think they look cool.

Nice looking and futuristic.

Look futuristic, would like to see how they develop and can see potential for further application throughout Greenwich

I think they look really cool and a good attraction to see here.

Why did people think of the effects on cyclists and pedestrians?

Many more people thought that driverless vehicles would be safer for pedestrians and cyclists than less safe (516 comments tagged safer vs. 55 comments tagged less safe).

However there were a significant number of comments that either gave a proviso to this, or offered a different view - that driverless vehicles could either make it less safe or less convenient for cyclists and pedestrians.

This is a lovely safe path for cyclists and pedestrians. These vehicles would take up the cycle path forcing cyclists on to the pedestrian path. These vehicles belong on roads with cars.

More efficient, reducing congestion

Electric cars still cause problems for pedestrians - being quiet they aren't obvious when coming around a corner for instance. Maybe there is a place for education for driver controlled vehicles, pedestrians and cyclists too.

Would be nice to use them to go along Thames Path to places like Thames Flood Barrier, away from slow stinky roads. Good for accessibility too, though perhaps bad for other users of Thames path (pedestrians, cyclists).

I think there is not enough room for pods, bikes and pedestrians. if the pods had their own lane it would be better.

Their slow speed should improve the quality and safety of the public realm for pedestrians.
I would hope that people with limited mobility or young kids could still book a driver delivery for help with carrying shopping upstairs though.

I'm enthusiastic about the technology and the gateway project. I think the pods would work better if they had their own space separated from other pedestrians and cyclist.

Comments from Pre-trial

Comments from 'Rate my drive'

Main themes - conclusions:

- Public perception of driverless vehicles is heavily based on them being able to improve convenience for local people
- There are a range of views on safety. A lot of people are ready to trust technology but want evidence of it being tested locally or in similar circumstances. Some also want official approval of the technology.
- People expect environmental benefits from the use of electric vehicles, decreased congestion and more efficient use of resources.
- Vehicle design is important to people and may therefore have an impact on early adoption.
- Those who rode the vehicles saw the potential, and despite the slow ride, found the experience better than expected. Many indicated they thought there is a long way to go before they are ready for public use.

4. Other important themes

- Is the trial a realistic test of the technology?
- Accessibility and disability
- Vehicle speed

Is the trial a realistic test of the technology?

On the 'Rate my drive' map, many people questioned how well the trial provided realistic conditions in which to test the technology, and questioned whether the pods would be able to cope in 'real' environments. Some who rode in the vehicles made similar comments.

Others saw the potential benefit on the Greenwich Peninsula - talking about the option of taking people to and from the 02.

Several people talked about wanting the technology to be certified or verified by an official body before they would feel comfortable that it had been.

Didn't really have any expectations as we came upon the pods by chance. Difficult to evaluate when only doing 8mph. Hard to see what the benefits are if there needs to be a steward.

Bit of a novelty and perhaps too small to be a useful form of public transport. Nice to see the technology

Would not be comfortable sitting in one on public roads. Think they are appropriate for this environment.

Impractical route going around the peninsular. Not very useful other than just a novelty.

Technology is obviously very basic but I do you see great potential especially for maybe ferrying events goers at the 02.

This an easy environment for them to operate in. Much for concerned if they had more freedom to go anywhere including the open road.

Nice idea and nice to see the technology, but the route isn't that useful.

This technology seems quite basic and is a long way off being good enough to use public domain.

I would be comfortable using the technology here but not on roads. I will use the technology on roads in the future once legislators and policymakers say it's okay.

Comments from riders

Comments from 'Rate my drive'

Accessibility and disability

Comments shown on the following page illustrate a widespread view that driverless vehicles will be beneficial for those with disabilities or accessibility need.

On both the Pre-trial and 'Rate my drive' maps, many thought that older people would benefit significantly from driverless vehicles by:

- Making things that are currently very difficult for them much easier (such as shopping); and

- Enabling to do things that they can't currently do (such as visiting different parts of the borough or beyond)

The number of people who self-identified as having accessibility needs was small. Four people who identified themselves as using a mobility scooter were very positive about the benefits. There were around fifteen other people who stated or implied that they had particular accessibility needs based on what they said in the comments. They were also all positive about the opportunities.

One person pointed out that there may be a downsite: driverless vehicles would not have a driver that can provide help on demand - for example to help solve a problem about getting a wheelchair into a vehicle.

Accessibility and disability

For older people or people with disabilities or even sightseeing

I'm deafblind unable to drive. Needed as soon as possible to further enable independence.

The vehicle could be run in a loop between the nearest bus stop at Westferry Road or Barkantine medical centre, the Docklands GP surgery and the Mudchute Station. Old and ill people would benefit.

Good for older people/those with mobility issues as this is particularly steep

Many people say "good for people with a disability" but will it actually be accessible for (say) a person using an electric wheelchair, alone. Will it have an automatic ramp, or flat access?

Social inclusion should be a major advantage for visitors to the observatory from Greenwich station - particularly for older people; parents with babies / toddlers; tourists who do not know the way; and people with walking difficulties.

It's an exciting technology to be use by the elderly , disabled people or those with poor health. One of the reasons I would like to get involved is health wise. I suffer bad lupus which comes with bad arthritis and extremely bad fatigue. This technology would greatly assist me in getting around

Will be very beneficial for the elderly and the less mobile in society.

I think that robots are always more efficient than humans.

Like it being here. Interested in the development of the project. Can imagine it will be very useful for the less mobile and the elderly.

This is still an area of London that suffers from relatively poor public transport links, high levels of air pollution and parts of Greenwich feel disconnected. Autonomous vehicles would allow Charlton residents to take a greater stake in the development of Maritime and North Greenwich. It would also mitigate the need for individual car ownership for the 15k homes being built on the peninsula.

Comments from Pre-trial

Comments from ‘Rate my drive’

What did people think about the vehicles' speed?

On the 'Rate my drive' map, many people commented on the unexpected low speed of the vehicles.

Many thought that the low speed meant that the tests did not reflect the reality of operating on a road.

Others thought that the low speed reduced the benefits of using the vehicle.

However there were a number of people who found the low speed reassuring.

Some of these views are illustrated by a selection of comments opposite.

I'm comfortable with this setup but for on-road-use and for vehicles travelling at higher speeds I think we will need human intervention for a long time in the future. As we've seen in America these systems are not 100% reliable.

Slow and frequent pauses and stops. These are fun early trials but the longer terms benefits of this technology are what's really exciting. At the moment it's a slow uncomfortable experience but I will be interested to see where this technology leads in five years or so.

They were slow enough to feel comfortable that they are safe.

Too slow and would need to have their route redesigned to be more useful. Apart from those two reasons there is no reason I would not ride in them.

Although they quite slow they operate at a good speed to ensure they are safe.

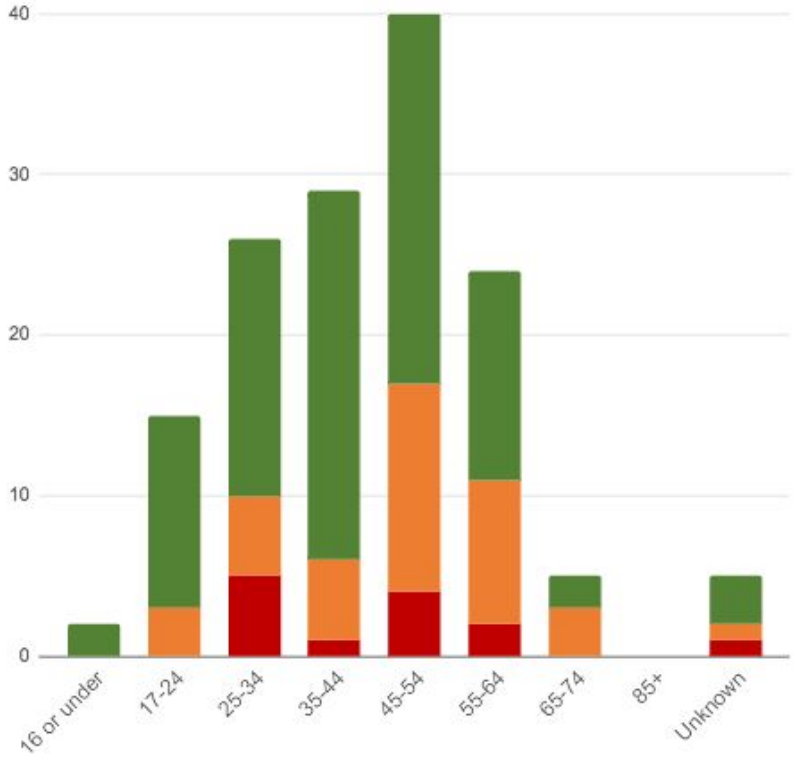
Their slow speed should improve the quality and safety of the public realm for pedestrians.
I would hope that people with limited mobility or young kids could still book a driver delivery for help with carrying shopping upstairs though.

Not sure how practical they are as a means of transport because they are a bit too slow.

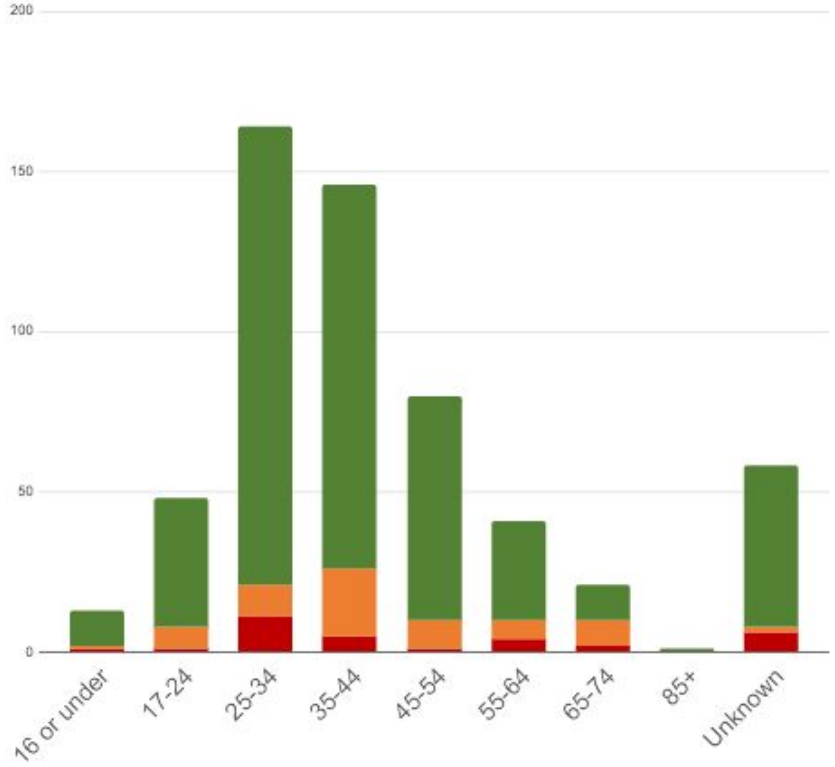
5. Views of different groups of respondents

Were there any trends in the positivity of different age groups?

Rate my ride map (n=149)

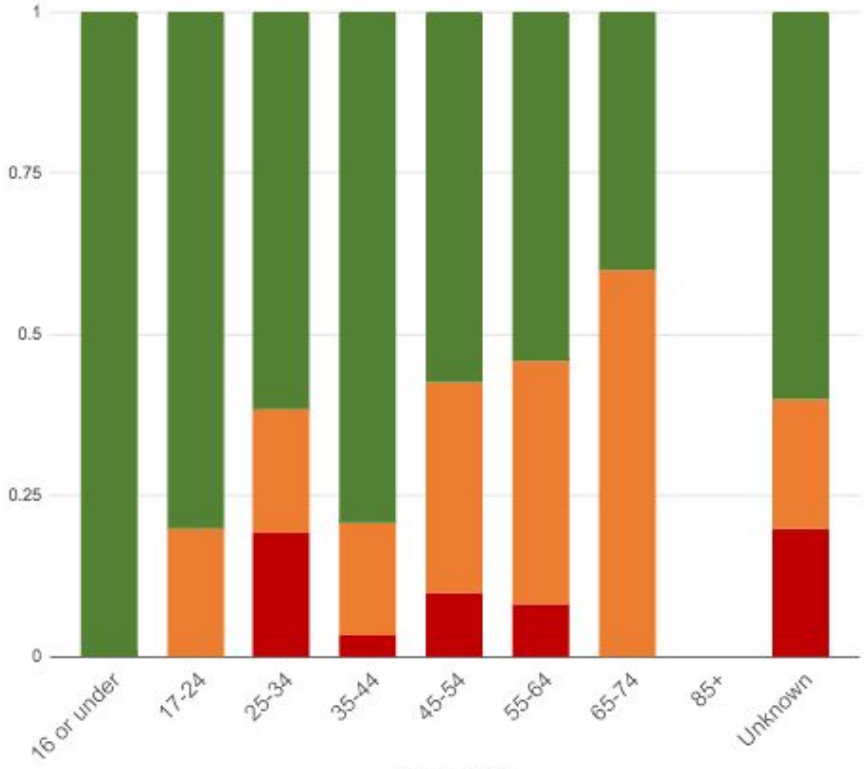


Pre-trial sentiment map (n=576)

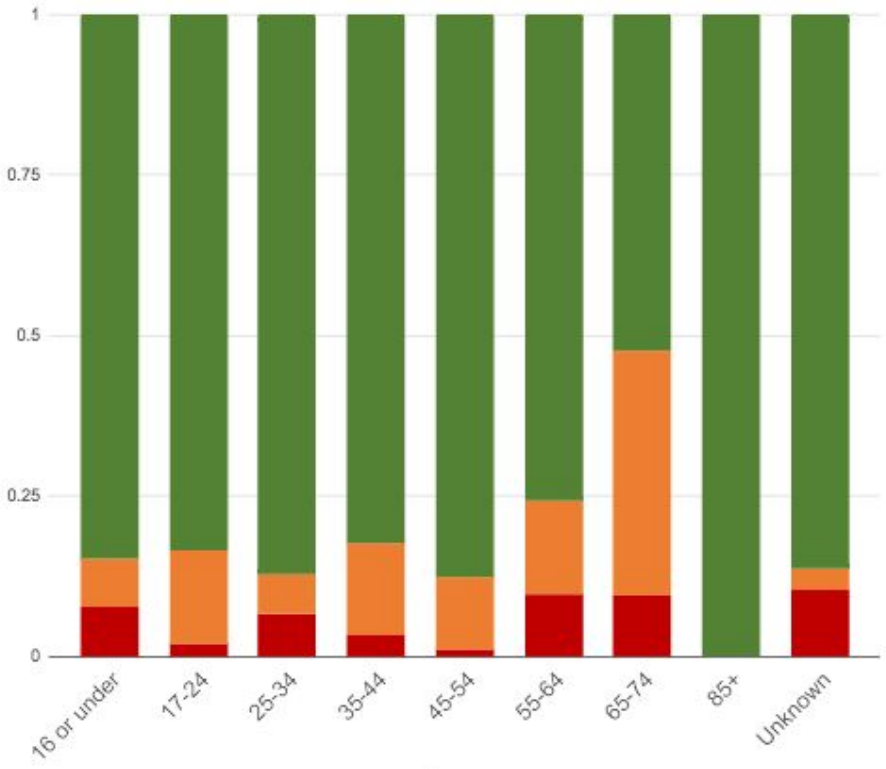


Were there any trends in the positivity of different age groups?

Rate my ride map (n=149)



Pre-trial sentiment map (n=576)



Were there any trends in the positivity of different age groups?

For both the pre-trial sentiment map and 'Rate my drive', there was a surprisingly high level of negativity from the 25-34 age group, relative to the expectations from this age-group, and to responses from other groups.

This is particularly marked for 'Rate my drive', where there are more negative responses in this age group than from any other age group.

The content of these comments suggests that this age group may have particularly high expectations of the technology, and are therefore most easily disappointed. Further research would need to be carried out to verify if this is the case in a larger sample size.

There were also lower levels of positivity in the older age groups.

> Not suitable for roads because interfere with other traffic. First need to get electric cars then eventually self driving - but in 20 years.

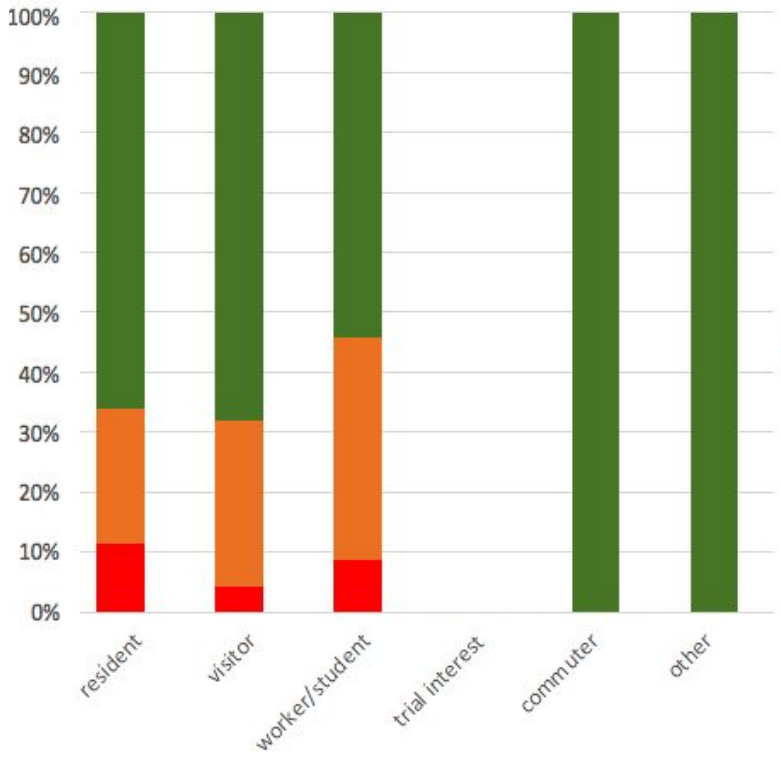
> Quite jolty, stop start

> Worried about when driverless vehicles and normal cars share the road. Generally the drivers in London are very poor. Would the technology be able to cope?

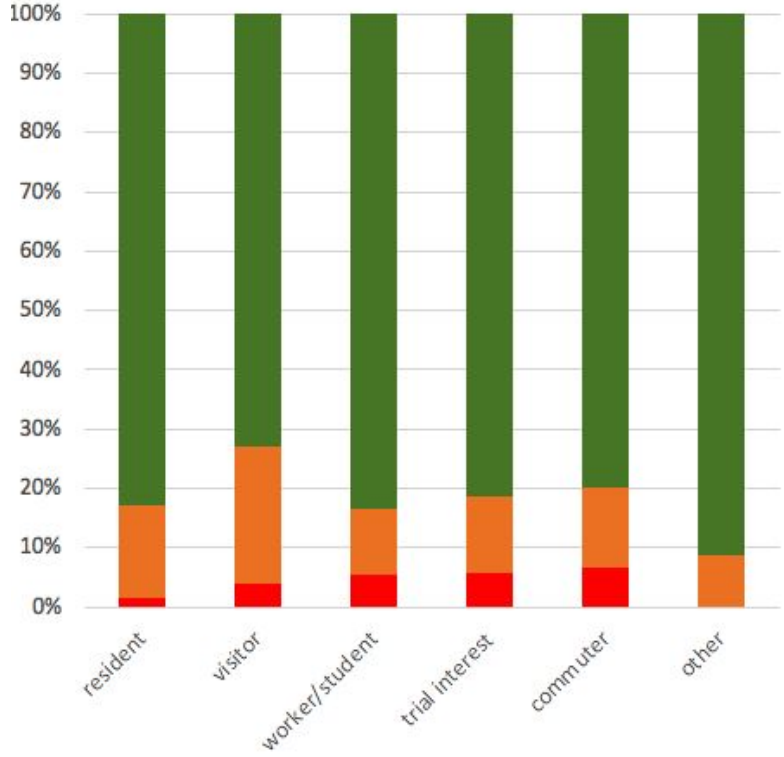
Example comments from people in the 25-34 age group

Were there any trends in the positivity of different respondent types?

Rate my ride map (n=149)
Shown as 100% chart



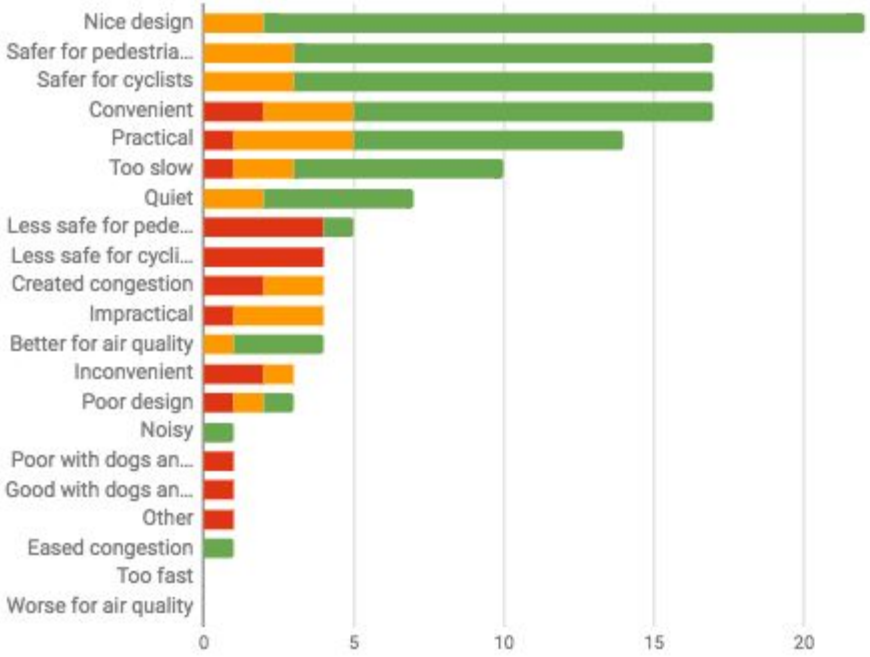
Pre-trial sentiment map (n=576)
Shown as 100% chart



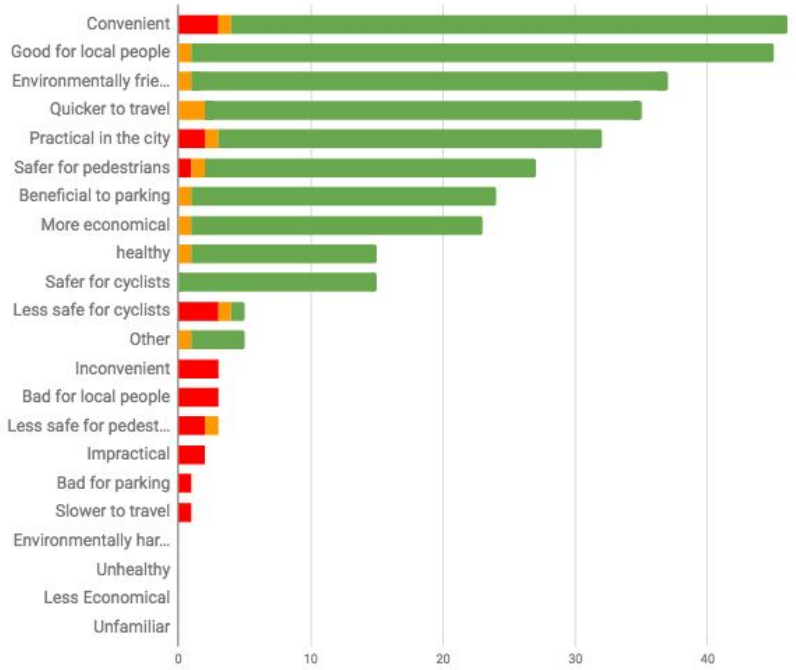
Why were residents positive?

Residents of the Greenwich area were the largest group of respondents. They were extremely positive in the pre-trial phase, and although slightly less so for 'Rate my drive', their positive thoughts still significantly outweighed their criticism or anxieties.

'Rate my drive' sentiment map
Themes from residents



Pre-trial sentiment map
Themes from residents



Why were residents positive?

Residents tended to view the benefits of driverless vehicles as considerably outweighing the challenges. The top themes raised by residents in the two trials were:

'Rate my drive'	**Pre-trial**
Nice design Safer for pedestrians Safer for cyclists Convenient Practical	Convenient Good for local people Environmentally friendly Quicker to travel Practical in the city

These views are illustrated by some of the comments opposite.

Convenience seems to be a particularly strong theme, with people imagining the way that these vehicles could benefit them every day.

Safer alternative to buses

Might cut down on traffic fumes here

Leave me free to do other things

Saves carrying heavy shopping up Vanbrugh Hill.

Safe for everyone, less parking

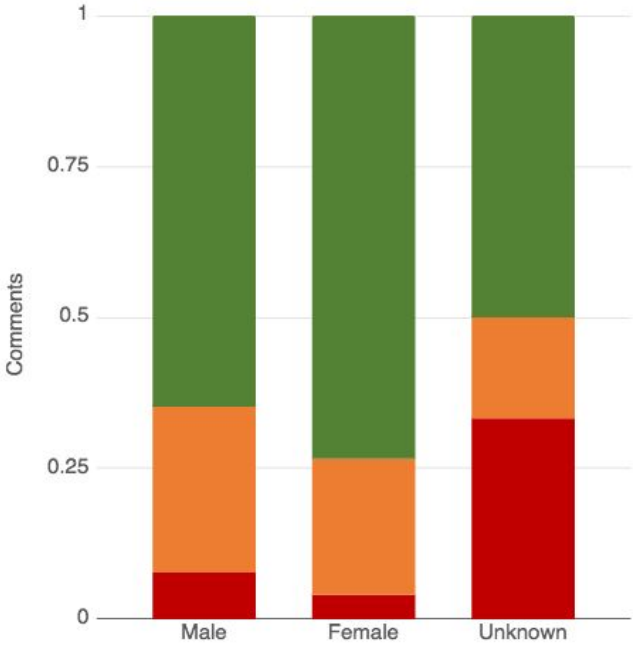
Although they quite slow they operate at a good speed to ensure they are safe.

They are definitely the future and I will be comfortable Using them in the future

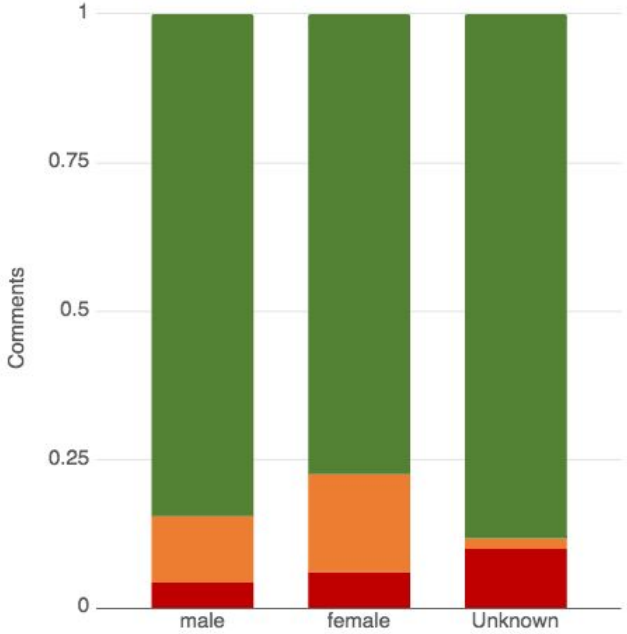
Reduce environmentally harmful emissions to nearby school and local wildlife. Safer for pedestrians by reducing fast traffic outside Windrush school.

Were there any trends in the positivity of different genders?

Rate my ride map (n=149)
Shown as 100% chart



Pre-trial sentiment map (n=576)
Shown as 100% chart



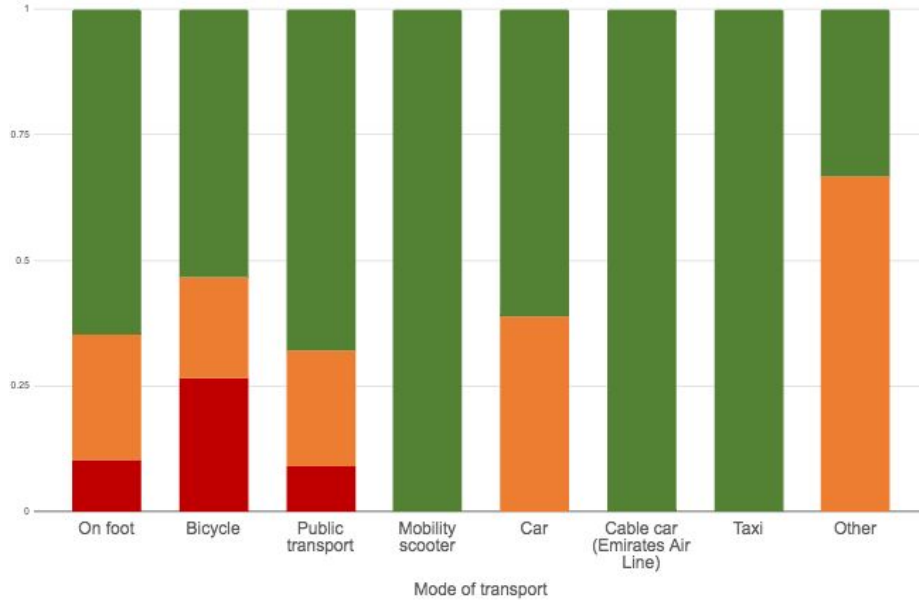
Were there any trends in the positivity of different genders?

There was no significant differences between the views of men and women on the Pre-trial map. On the 'Rate my drive' map, men appeared to talk more about the practicalities, whereas women seemed to be more likely to talk about safety. It should be noted that there were roughly three times as many men as women who responded.

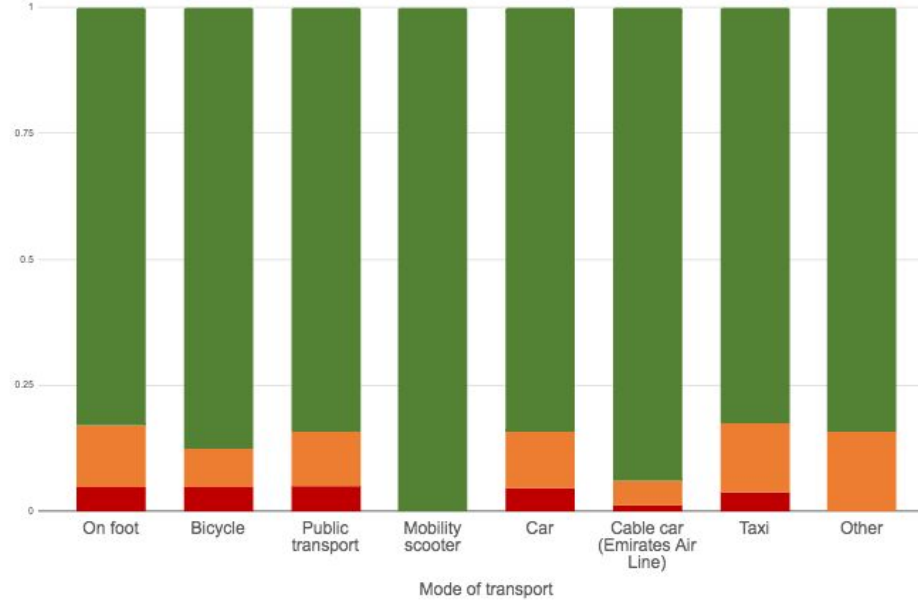
Top 5 themes from 'Rate my drive'		Top 5 themes from Pre-trial	
Male	**Female**	**Male**	**Female**
Nice design	Nice design	Convenient	Convenient
Practical	Safer for pedestrians	Good for local people	Good for local people
Convenient	Safer for cyclists	Environmentally friendly	Environmentally friendly
Too slow	Convenient	Quicker to travel	Quicker to travel
Safer for cyclists	Practical	Safer for pedestrians	Safer for pedestrians

Were there any trends in the responses of respondent transport types?

Rate my ride map (n=149)
Shown as 100% chart



Pre-trial sentiment map (n=576)
Shown as 100% chart



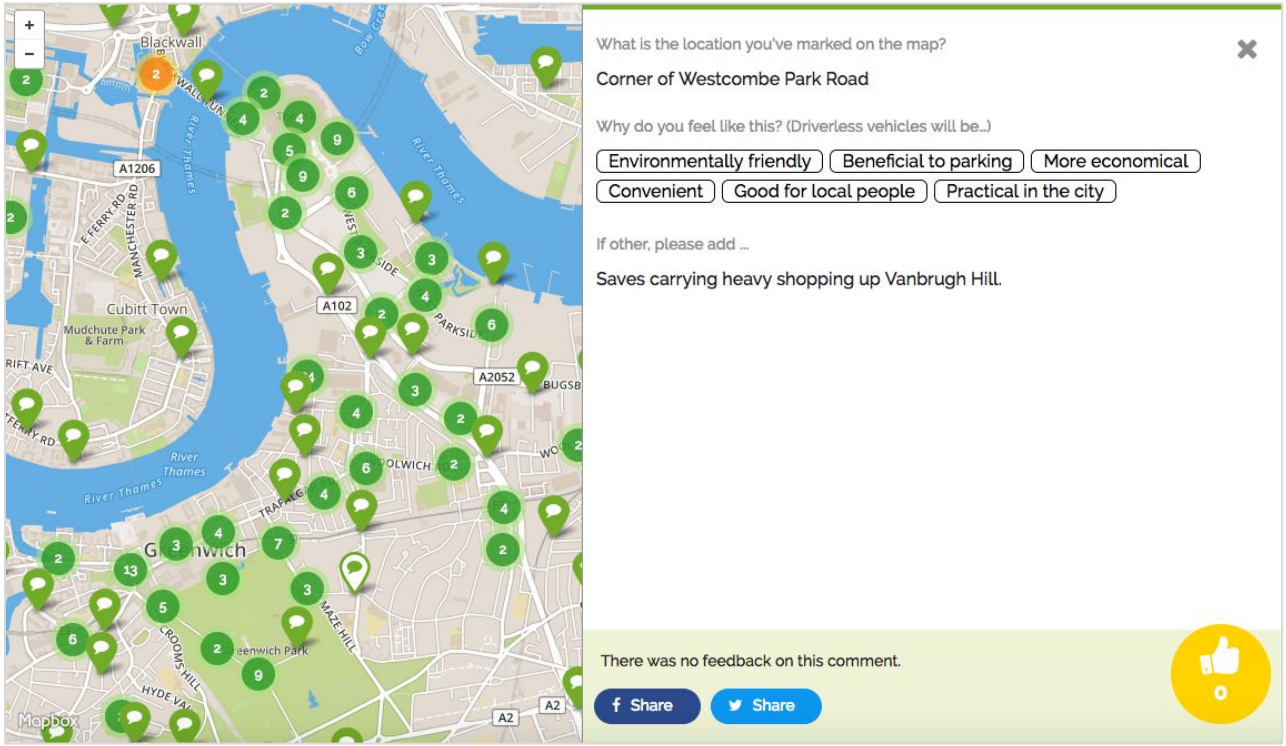
Were there any trends in the responses of respondent transport types?

On the ‘Rate my drive’ map, cyclists were less positive and more negative. This appears to have been largely down to the perceived unpredictability of the vehicle, and a couple of direct interactions between a pod and cyclist which felt uncomfortable.

Views in relation to cyclists are explored on p.23.

6. Map-based analysis

Pre-trial map: Comments tagged with ‘Convenient’



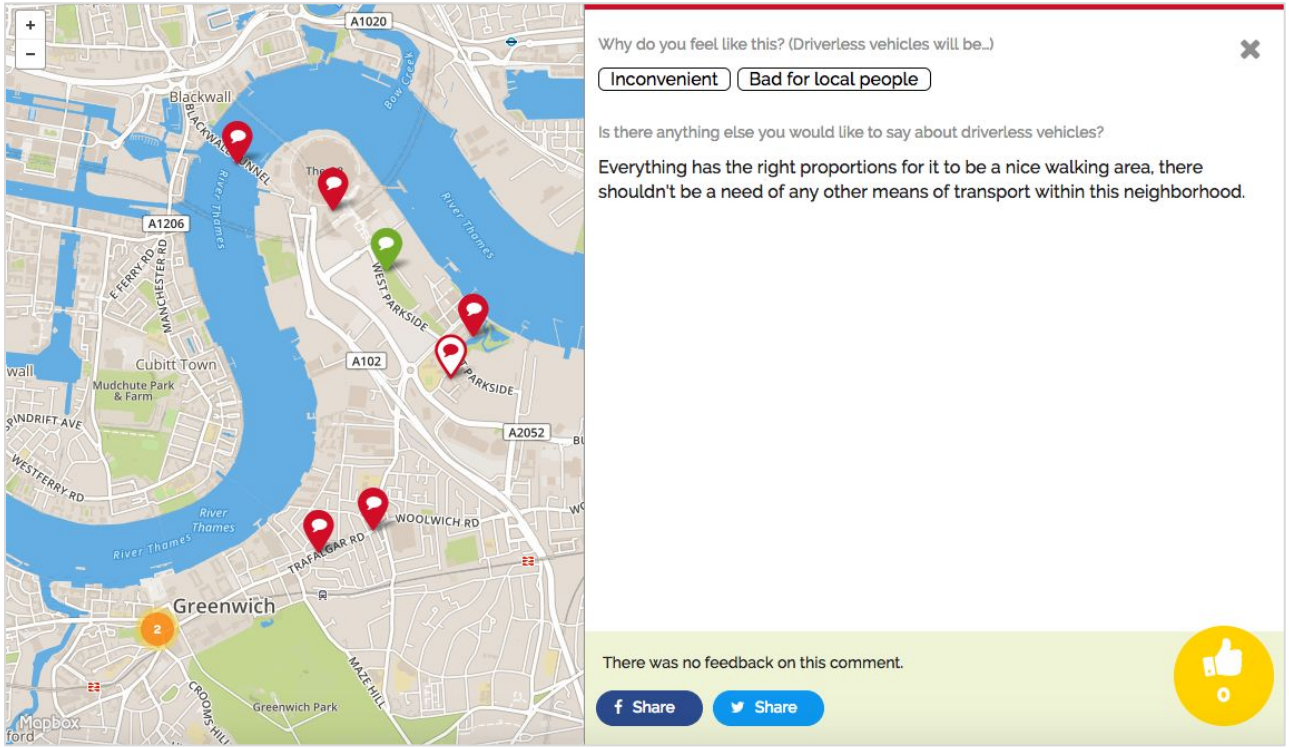
Convenient

Convenient was the most frequently used tag, and comments cover most of Greenwich, particularly on main transit routes.

The most frequent tag accompanying the Convenient tag was ‘Good for local people’.

To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=%22whyFeel:Convenient%22

Pre-trial map: Comments tagged with ‘Inconvenient’



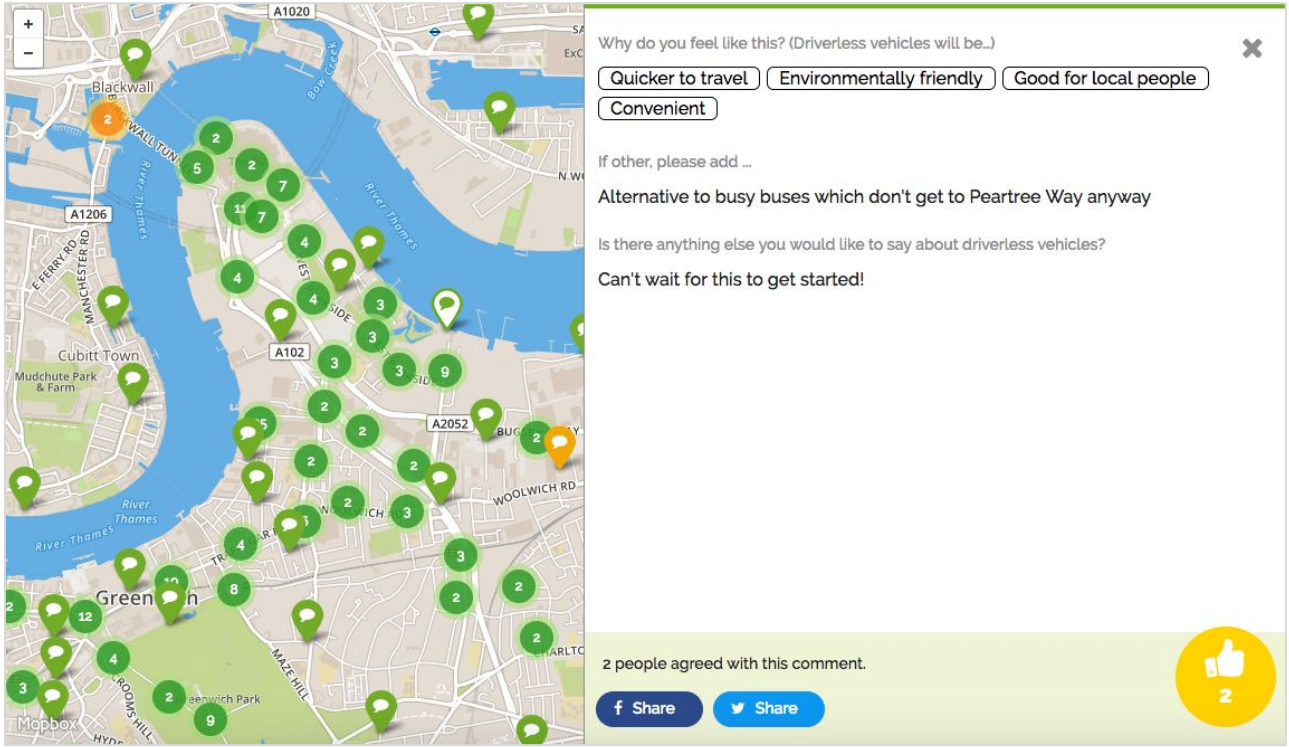
Inconvenient

Only a handful of comments were tagged with ‘Inconvenient’.

This example highlights the perception that walking should be the main mode of transport, and an implication that driverless vehicles might make walking less common locally.

To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=%22whyFeel:Inconvenient%22

Pre-trial map: Comments tagged with ‘Good for local people’



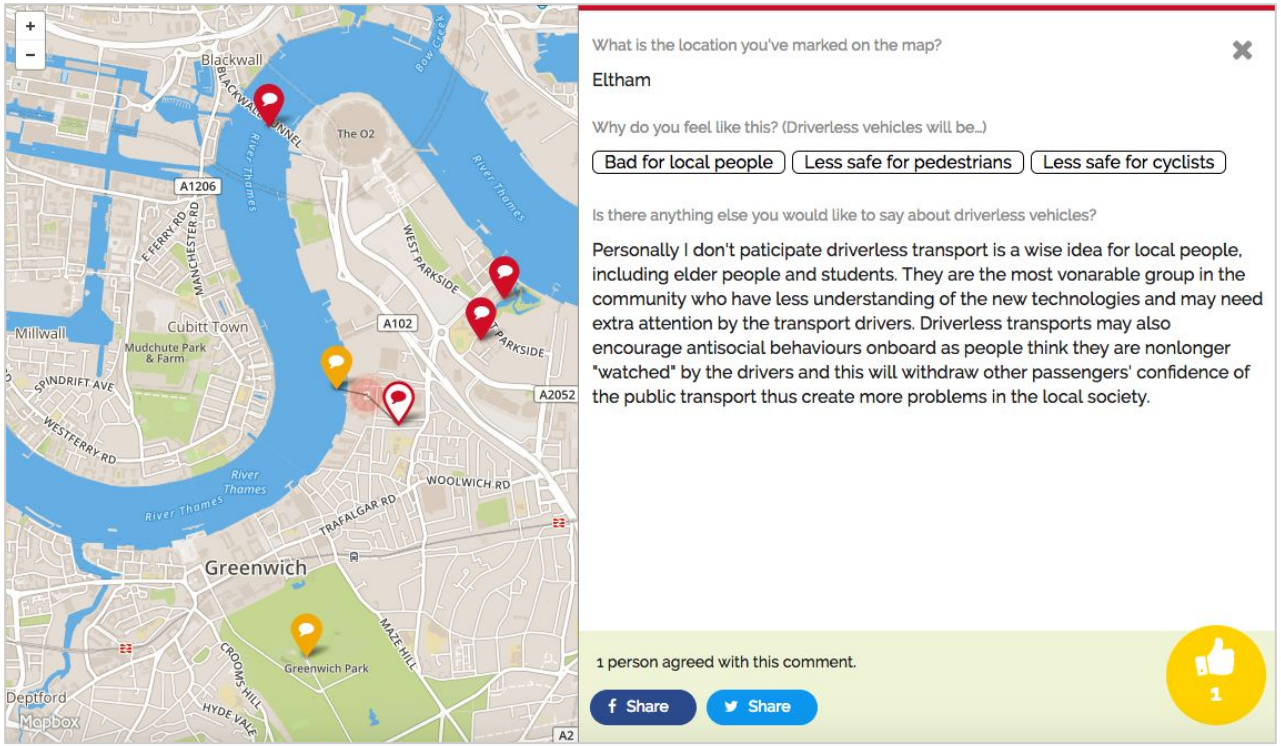
Good for local people

Comments tagged with ‘Good for local people’ followed more or less the same location pattern as those tagged ‘Convenient’.

This example talks about the potential for driverless vehicles to ‘fill in’ places not served by public transport.

To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=%22whyFeel:Good%20for%20local%20people%22

Pre-trial map: Comments tagged with ‘Bad for local people’



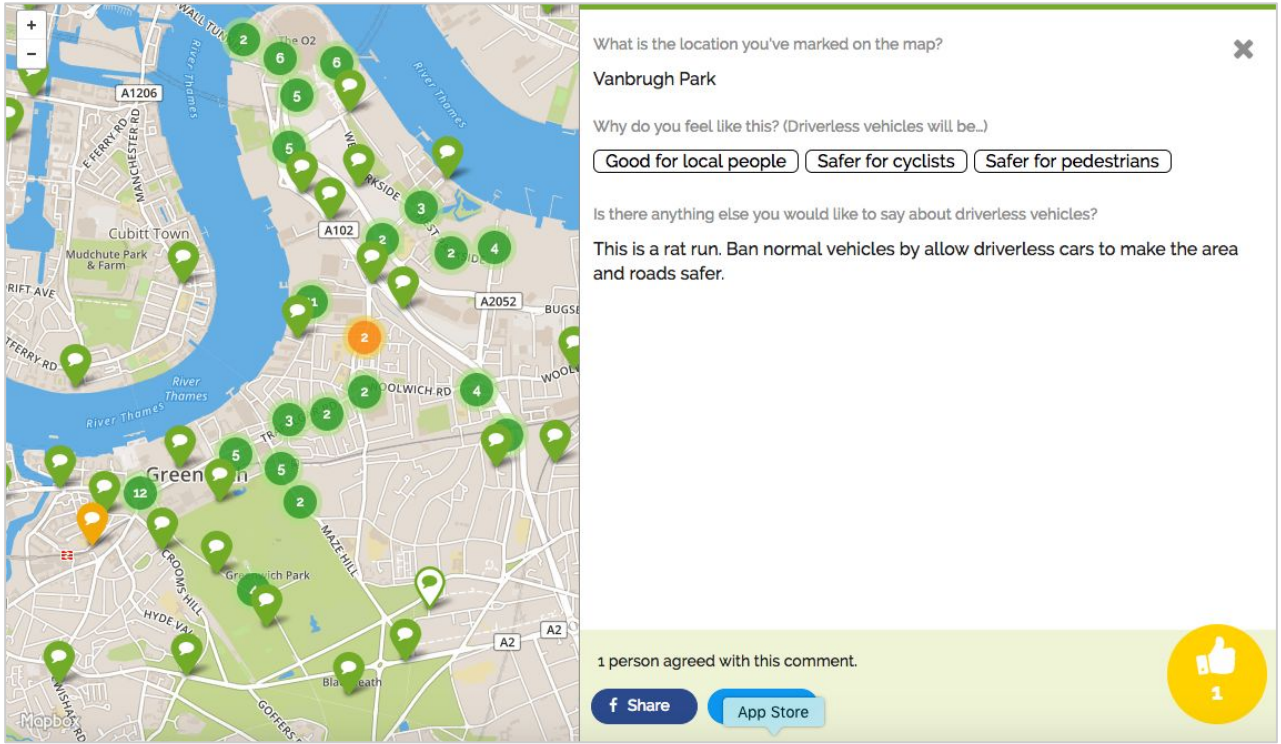
Bad for local people

Only a handful of comments were tagged with ‘Bad for local people’.

This example illustrates fears about whether vulnerable people will actually be served better by driverless vehicles.

To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=%22whyFeel:Bad%20for%20local%20people%22

Pre-trial map: Comments tagged with ‘Safer for cyclists’

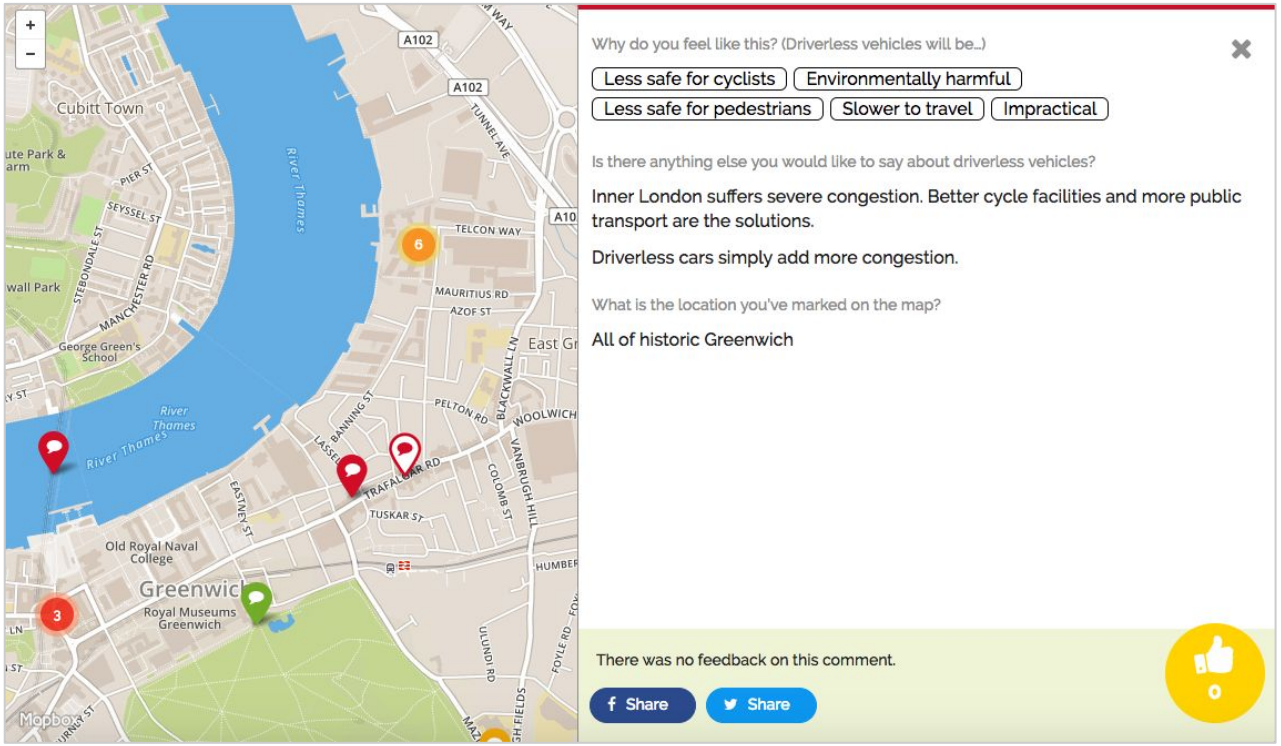


Safer for cyclists

A large number of people tagged their comment with ‘Safer for cyclists’, mostly with a comment about improving the safety on the roads more generally.

To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=”whyFeel:Safer%20for%20cyclists”

Pre-trial map: Comments tagged with ‘Less safe for cyclists’



Less safe for cyclists

Although many more people tagged comments with ‘Safer for cyclists’, there were a significant number who thought that driverless vehicles would either simply make the road more congested and therefore more dangerous for cyclists, or would take up space on the road that has been reserved for cyclists (e.g. cycle lanes).

These tended to be busy congested streets or junctions

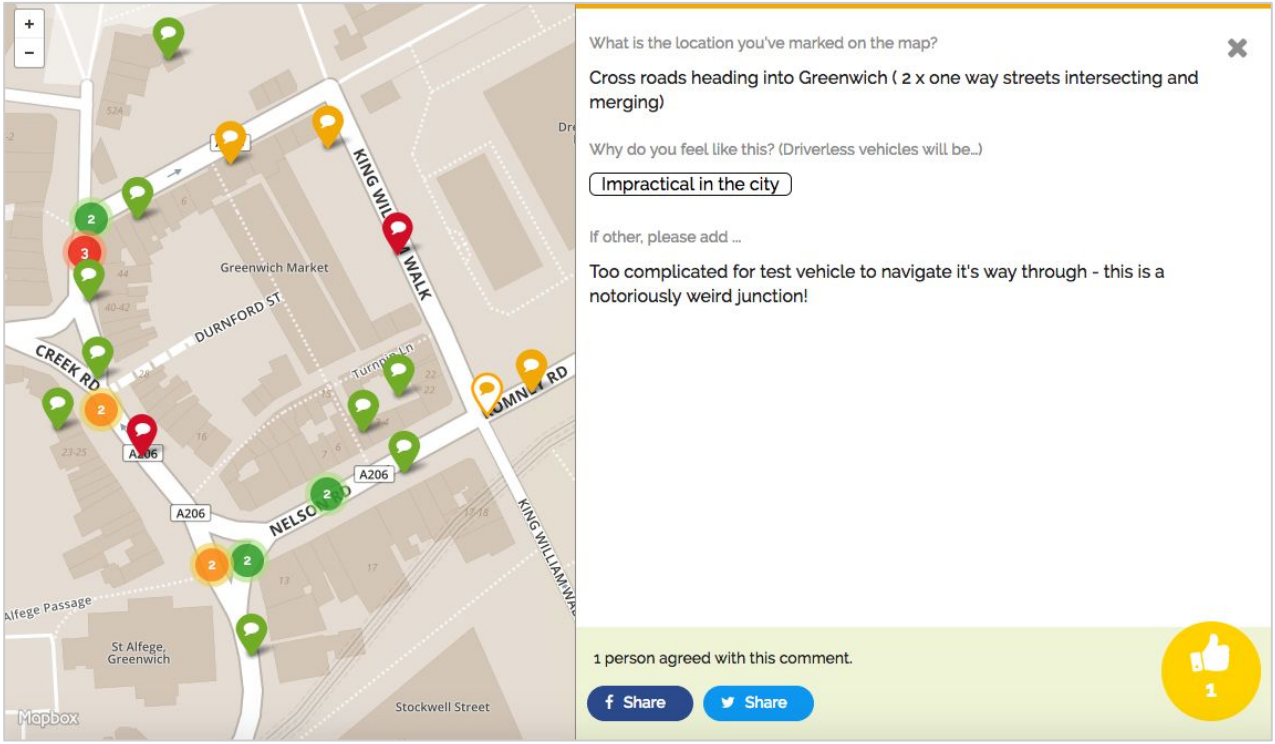
To see the full filtered map, please click below:
https://gateway.commonplace.is/comments?filter=%22whyFeel:Less%20safe%20for%20cyclists%22

Complex junctions and traffic systems

1. Nelson Road / Creek Road / Greenwich High Street and gyratory

2. Blackwall Road / Woolwich Road junction

Pre-trial map: Greenwich Market Gyratory

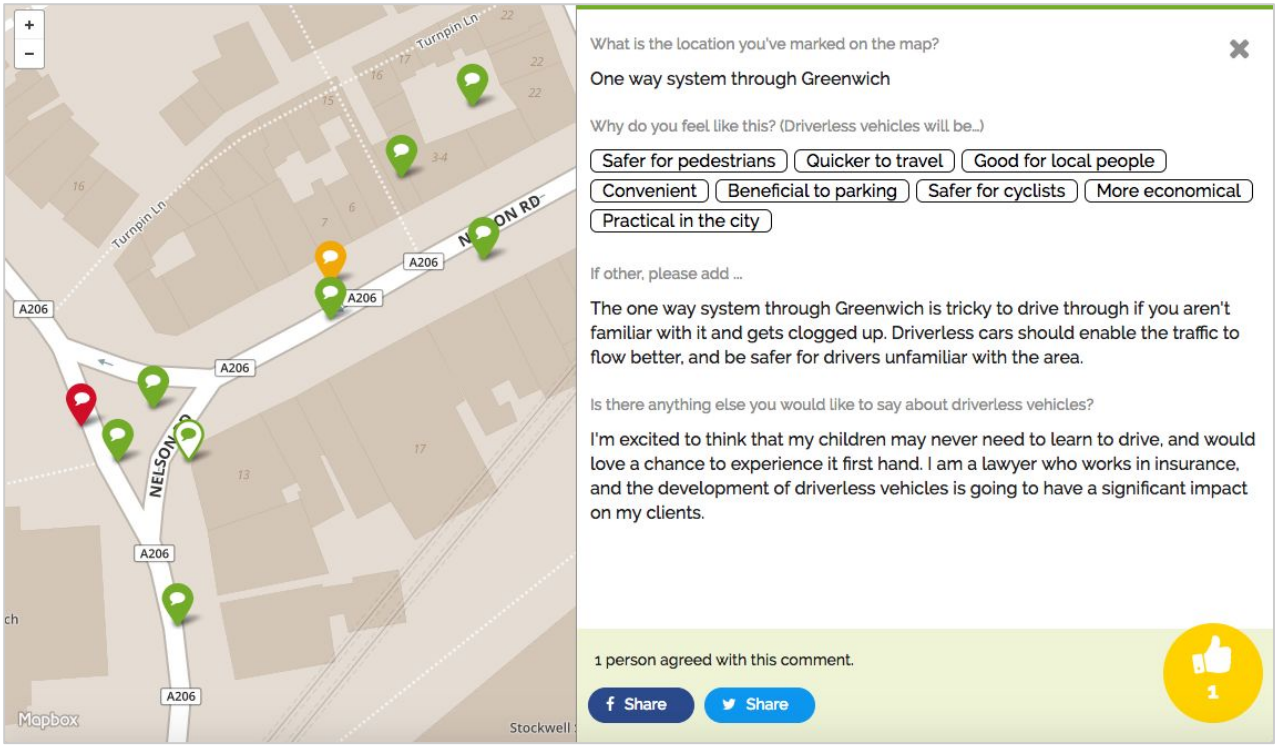


There was a high density of comments around complicated junctions.

These were also the places that the largest number of negative and neutral comments appeared.

Many people talked about an anxiety or perception that driverless vehicles would not be able to manage under these conditions.

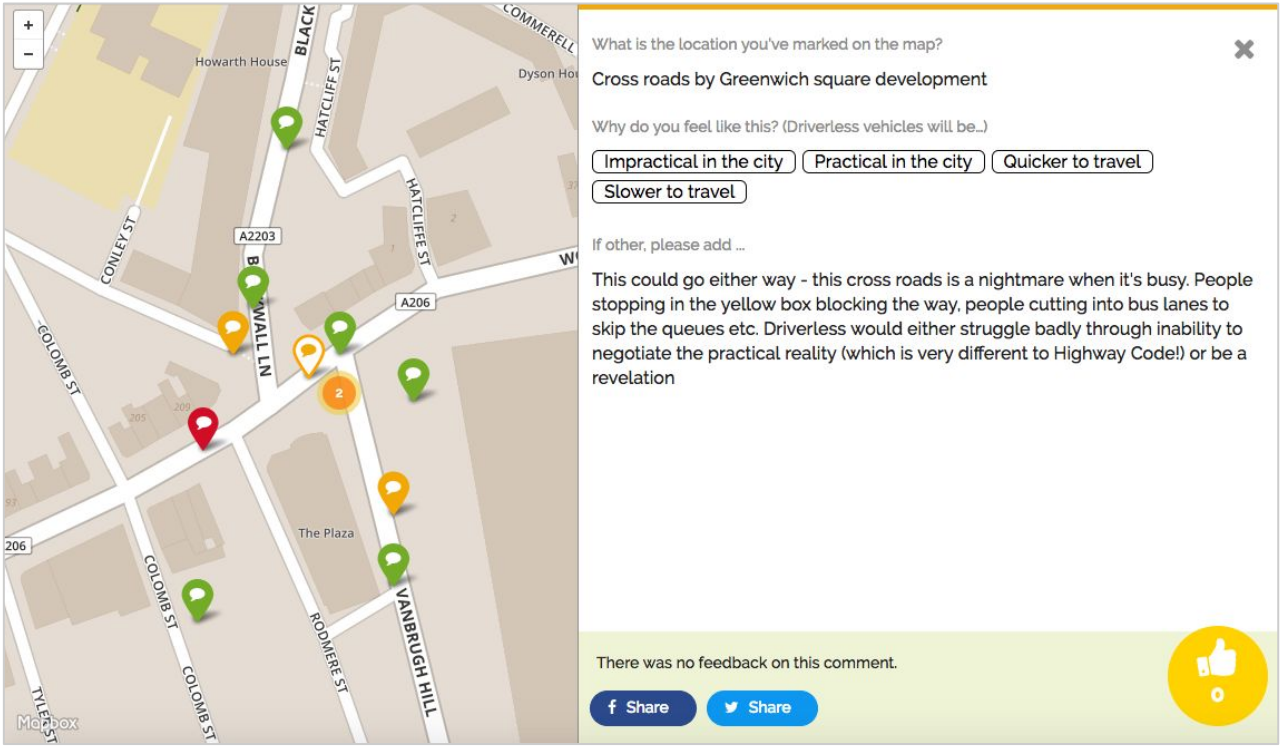
Pre-trial map: Nelson Rd / Creek Road junction



Others made a strong case for driverless vehicles to help solve the traffic management around these junctions, and help solve issues of traffic flow.

Local context seems to be important to people - they are interested in how driverless cars might work and the problems they might solve in their neighbourhood.

Pre-trial map: Blackwall Lane / Woolwich Road junction



And some thought that this complexity might create risks for implementation where driverless cars would either solve problems or could make them even worse.

Until they are tested in this complexity it is an unknown.

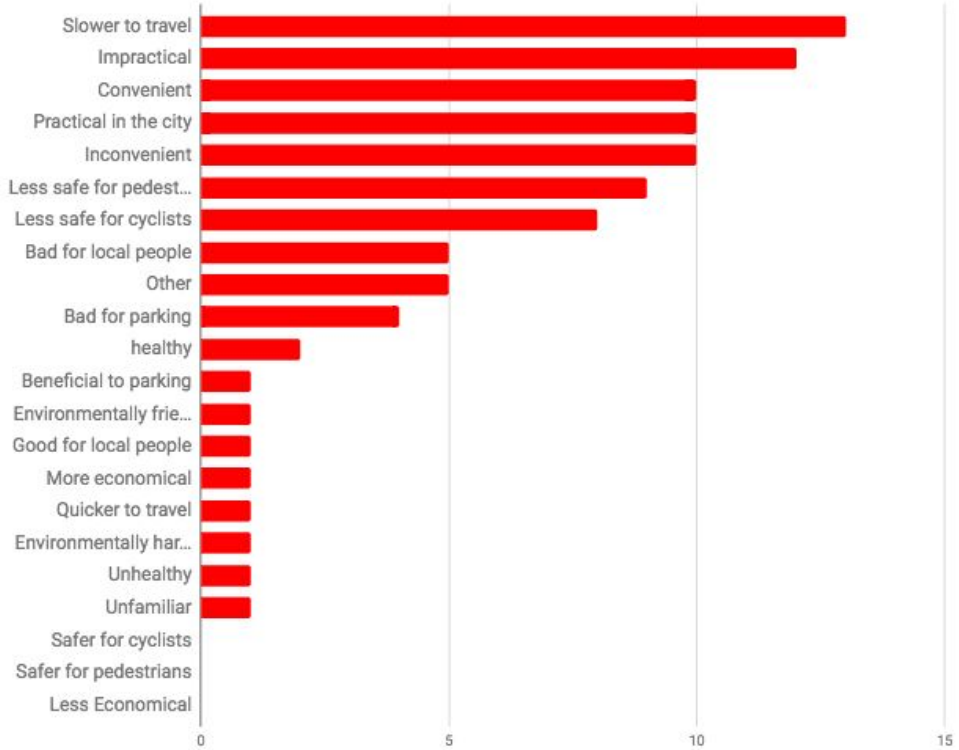
7. Negative comments

Pre-trial map: Negative feelings about driverless vehicles

Although proportionately a small number of negative comments, the negative trends are important to note.

There were three main themes of negative comments on the Pre-trial map. Some people believe that driverless vehicles will:

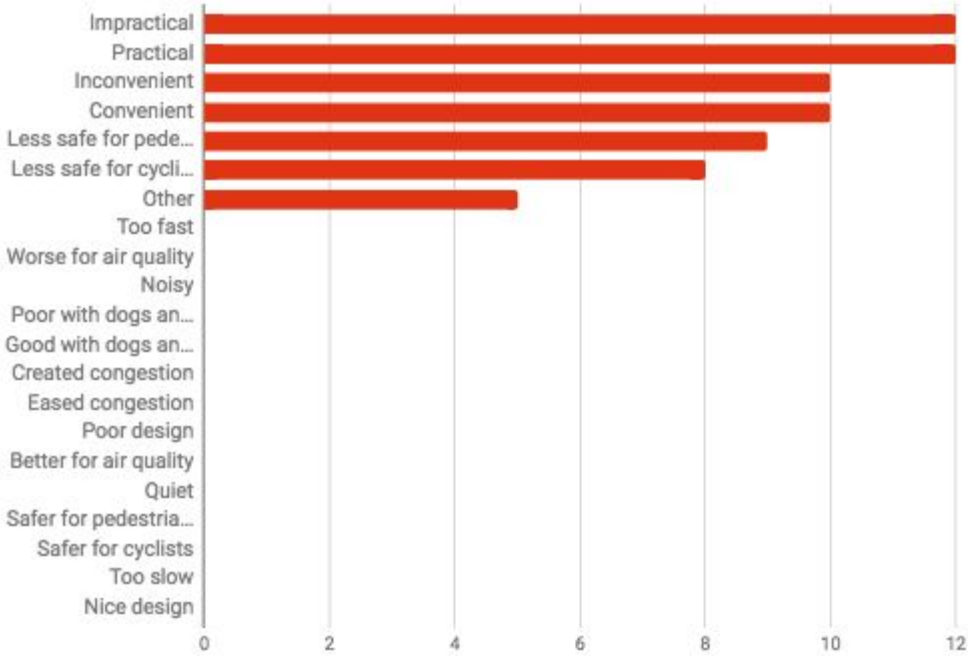
- make travel slower because it would add to congestion
- be inconvenient because they will create more traffic and reduce pedestrian only areas
- be unsafe because they cannot cope with the complexity of road systems and a variety of road users



Rate my drive: Negative feelings about driverless vehicles

Similarly for those who observed the vehicles, the negative comments were when people thought that:

- the pods were impractical because they appeared slow and unpredictable
- the pods would be unsafe in more complex situations because they appeared to find even simple situations (e.g. a cyclist squeezing through a gap) difficult to cope with
- these two factors would mean that they are not used in the places where they could be most useful



8. Conclusions and recommendations for further study

Conclusions (1 of 2)

As a whole, the GATEway project has generated significant new insight into how driverless vehicles are perceived by the public in a local context. At the time of writing this research hasn't yet been consolidated.

The conclusions of the sentiment mapping exercise can be summarised in three areas:

High expectations and intrigue
The Pre-trial sentiment map collected people's hopes and fears for driverless vehicles in and around Greenwich. This data indicates that participants are extremely positive about the opportunities that driverless technology offers - in particular for convenience and access.. Whilst encouraging for those aiming to implement driverless services, there is a danger that people's expectations are so high, that they will difficult to meet.

However, responses to the driverless actual vehicles seem to indicate that even though the very basic service that was trialled was a long way from meeting expectations, many were sufficiently intrigued to remain positive about the potential, even having noted that the vehicles are slow and not particularly useful. How long that positivity would remain is unknown.

Gartner observes that driverless technology is at the peak hype in it's well-known hype cycle. If it follows the cycle, their prediction is that public perception of the technology will crash before then building again more slowly. This could present challenges in the near future.

Local context for safety and familiarity
The GATEway project was designed as a project that is firmly rooted in a particular area of London. This was useful to interrogate to what extent people see driverless technology as being inherently safe or unsafe, or whether they perceive safety as something that's contextual to their area.

Whilst our study hasn't answered this question, there is evidence on the Pre-trial map that people will want to be convinced of driverless vehicles' ability to navigate their own local complex junctions or routes. So the way in which driverless

Conclusions (2 of 2)

technology is introduced to an area - and the way the public are involved in this process will be important to its success.

Perceptions of safety on 'Rate my drive' were also heavily caveated with the question of how the vehicles would cope on a real road.

However it should also be noted that in general, concerns about safety were relatively few.

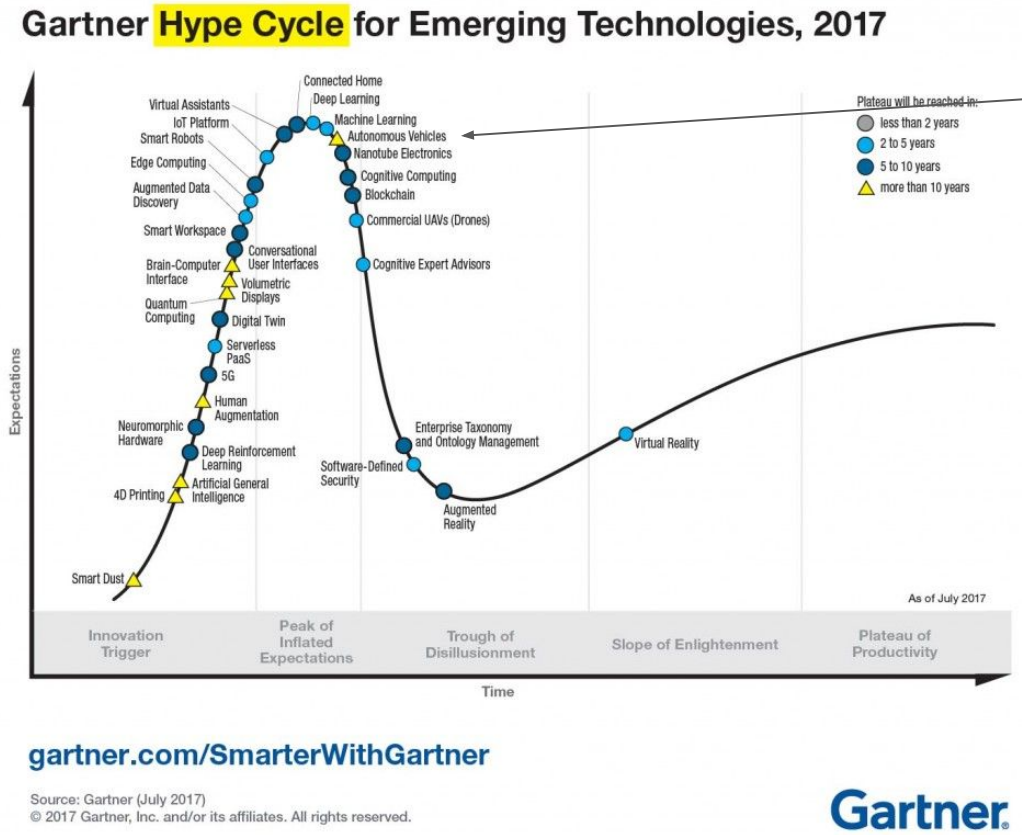
Design of the vehicles
A large proportion of respondents to the 'Rate my drive' map commented on the design of the driverless pods. Our hypothesis is that this is because of the high level of interest in the idea of 'gained time' - time when you might otherwise be driving that can now be spent doing something else.

Interest in these ideas is supported by the Royal College of Art's work on this project.

Use of space in relation to cyclists and pedestrians is key
Although overall, people were positive about the impact of driverless vehicles on cyclists, there were a significant number of comments that were critical of the way that the pods interacted with cyclists. And cyclists themselves were the most critical group.

In particular, ensuring that space reserved for cyclists and pedestrians doesn't become space for other vehicles will be very important.

Expectations and hype



Autonomous vehicles

Autonomous vehicles at height of hype

According to Gartner's Hype Cycle for Emerging Technologies, autonomous vehicles are at the height of the public hype and expectations. According to the Gartner model, this technology is likely to go down significantly in public regard and confidence before finally becoming accepted and adopted.

Practical implications for cities

We make a number of practical suggestions based on this research to help cities in planning and implementing autonomous vehicle programmes:

1. **Be clear about the vision.** Who will benefit, how and why? People want to know how it will benefit them. Practical considerations are important. People want to see how it will impact their quality of life.

2. **Make the most of convenience and accessibility benefits in the short term.** Where possible, deliver quick wins maximise public support.

3. **Be public and local in safety testing.** People want to be convinced that the vehicles will work in their neighbourhood, and see an 'official stamp' of safety.

4. **Make sure that cyclists and pedestrian spaces are not impacted.**

5. **Invest in vehicle design. It will have an significant impact.**

Recommendations for further research

We suggest a number of areas for further research which would significantly add to the knowledge collected during this project:

1. **Trial of a 'real' service**. The potential for convenience was rated very highly. Testing a service that offered some level of real convenience would provide valuable additional information about meeting of expectations. This service should be available to the public over several months.

2. **Perceptions of safety on the road**. People want to see driverless vehicles in real-life, local context situations. This has myriad challenges but is required, and will produce a fascinating sentiment map.

3. **Conduct analogous studies in different boroughs / cities**

4. **Private vs public vehicles**. The public trials were of a prototype 'public' service. It would be very useful to contrast people's perceptions of this with 'private' driverless vehicles.