

Behavioural Research

Annabel Knightley – Principal Researcher, TRL

aknightley@trl.co.uk

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Design decisions are more effective when they are based on a solid understanding of behaviour

Avoid jumping to the first solution that comes to mind...



1920s

Problem:
Printing
books is too
expensive

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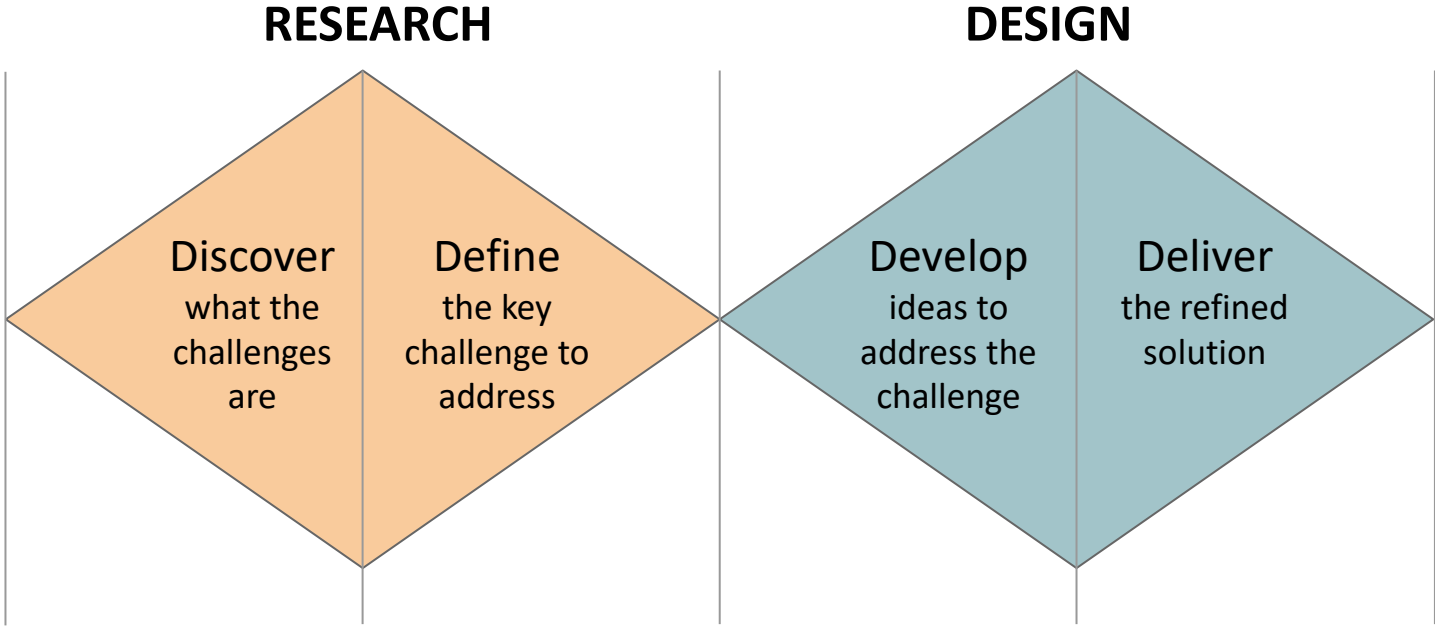
Idea: Printing tiny
books which
people can read
with a magnifying
glass!

Electric vehicle charge points – not designed with disabled users in mind

2020s

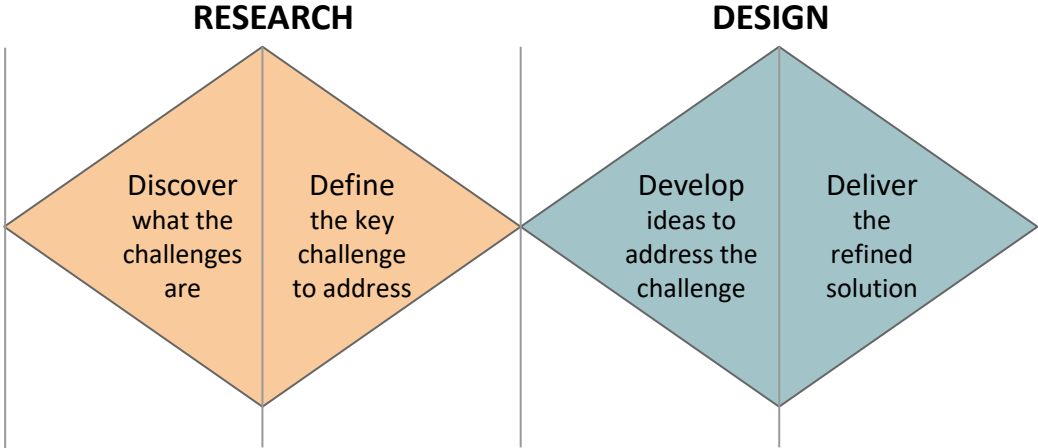


Double diamond approach



The 'double diamond' (Design Council)

Double diamond approach



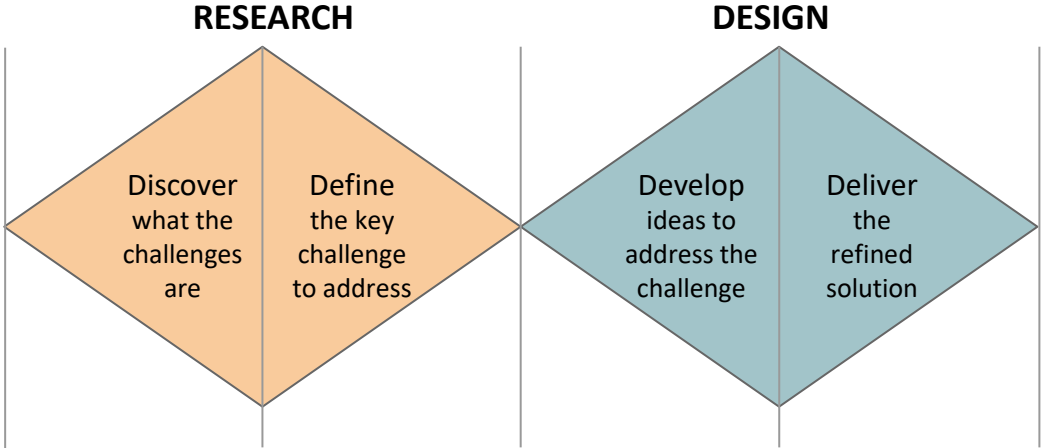
How people feel, think about or experience something

Idea development & co-design

How people behave in a given situation

Testing and evaluations

Double diamond approach



Exploring how to ensure future automated passenger services are accessible



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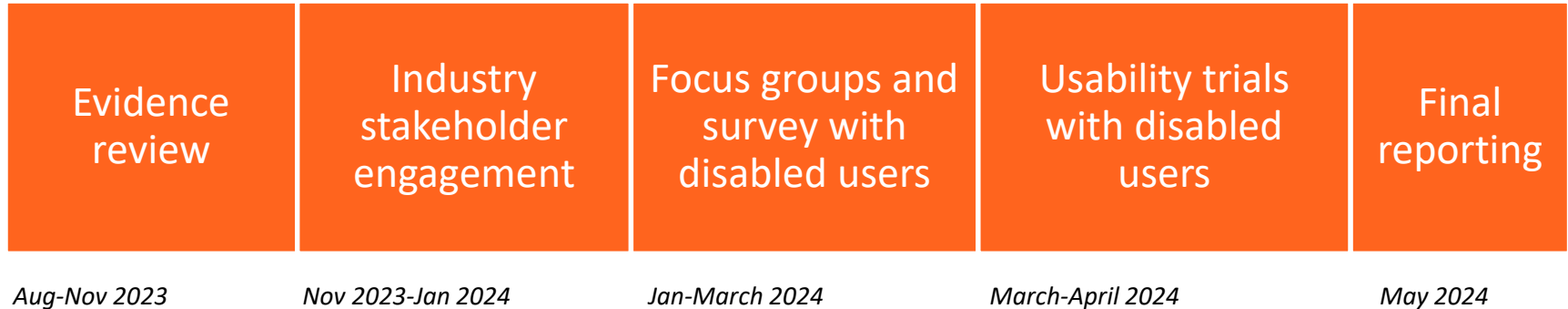
Testing and evaluations

Exploring how to ensure future automated passenger services are accessible

- What challenges might disabled people face in interacting with new automated transport technologies?
- What are the potential benefits of automated transport for disabled people?
- To what extent is accessibility currently being considered in the design and development of automated transport technologies and services? How does this align with the needs of disabled people, and what can be done to improve the approach?
- What examples of good practice are emerging in this area to guide future developments?



Exploring how to ensure future automated passenger services are accessible



Evidence review – findings

- Disabled people experience obstacles across all stages of the journey when using non-automated transport
 - Likely to be the same with automated transport services too
- Vast majority of the evidence reviewed related to visually and mobility impaired participants
- Many of the papers did not fully investigate how to make automated vehicles accessible for disabled people.

| Journey stage | Existing transport issues faced by disabled people (I = Individual, S = Social, M = Material) | Boarding vehicle |
|---|--|---|
| Journey planning (info finding) | <ul style="list-style-type: none"> • Lack of knowledge and experience travelling alone adds anxiety to and prevents individuals from making independent journeys. (I) • Format of information is not accessible. (M) • Uncertainty about routes, schedules, walking distances, crowding levels and facilities. (M) • No single platform for all information. (M) • Poor public transport options in rural areas. (M) | <ul style="list-style-type: none"> • Lack of step free access onto vehicle, including mechanical faults with ramps. (M) • Drivers not 'kneeling' vehicles or deploying ramps correctly. (S) • Having to wait for a bus that will enable them to board / have space for their mobility aids. (M) • Risk of mobility aids being caught in gaps. (M) • Narrow entranceways and access corridors, and a lack of insufficient space to manoeuvre a wheelchair or other mobility aids. (M) • Difficulties communicating directly with the drivers or when paying the fare in the ticket window. (S) |
| Booking journey | <ul style="list-style-type: none"> • Limited accessible private hire vehicles available for booking. (M) • Limited services available on paratransit options. (M) • Having to pay more for a journey due to need to travel with a carer. (M) • Inconsistency in required payment methods, ticket validity and pricing. (M) • Difficulty arranging assistance. (M/S) | |
| Getting to the station, stop or vehicle | <ul style="list-style-type: none"> • Poor design of physical infrastructure on footpaths (e.g., dropped kerbs, tactile paving, construction works blocking pavement). (M) • Lack of step-free routes. (M) | <ul style="list-style-type: none"> • Priority seating not available / not clearly defined / not given up by others (M/S) • Few seats that are aptly positioned for disabled people. (M) • Overcrowding is a practical barrier: <ul style="list-style-type: none"> ○ limited space reserved for wheelchair users. (M) ○ persons with mental health issues may experience sensory overstimulation or invasion of personal space in crowded vehicles. (M) |
| Arriving at station or stop | <ul style="list-style-type: none"> • Limited stops or stations that are designed to accommodate wheelchair user or mobility aid user. (M) • The process of booking assistance or adapted service at stations is poor. (M) • Lack of disabled parking. (M) | <ul style="list-style-type: none"> • Placement of stop buttons / intercoms not user-friendly. (M) • Lack of step free access onto vehicle, including mechanical faults with ramps. (M) • Drivers not 'kneeling' vehicles or deploying ramps correctly. (S) |
| Finding the correct service | <ul style="list-style-type: none"> • Lack of consistency across the terminals makes: <ul style="list-style-type: none"> ○ it harder to navigate the terminal. (M) ○ users feel insecure or fearful for personal safety. (I) • Technologies and accessibility solutions that are supposed to make public transport more accessible are often not used properly, or are broken (for example elevators, escalators, screen readers or audio announcements on buses). (M) | <ul style="list-style-type: none"> • Poor design of physical infrastructure on footpaths. (M) |
| Waiting | <ul style="list-style-type: none"> • Paratransit options are unreliable (for example often late). (M) • Lack of shelters at bus stops. (M) • Insufficient space at bus stops for wheelchair users. (M) • Lack of facilities (e.g. toilets, waiting areas with heating, relief areas for assistance dogs) available, or in working order (M) • Inaccessible ticket vending machines. (M) | |

Interviews – emerging thoughts

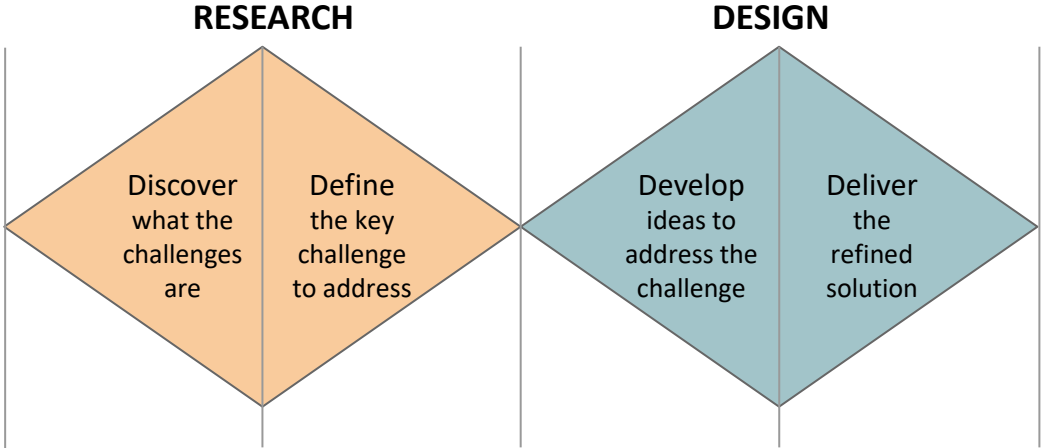
- Accessible vehicles will improve journeys for all, not just those who consider themselves to have a disability.
- Some assumptions that any guidance will copy existing guidance, e.g., PSVAR regulations – but is there any opportunity to make better guidance?
- Some developers are seeing an opportunity to design the 'form factor' from scratch to improve accessibility – but for others, the focus is less on accessibility and more on getting the autonomous technology to work.
- Debate about whether it's possible to have one-size-fits-all vehicle solutions, or whether there needs to be a range.

Next steps: focus groups, survey and usability trials with disabled users

What people say or recall or imagine is often different to how they actually behave.

It's useful to mix survey/interviews with observation to reveal a fuller picture of behaviour.

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Evaluation of the Mobility Credits trial initiative in Coventry

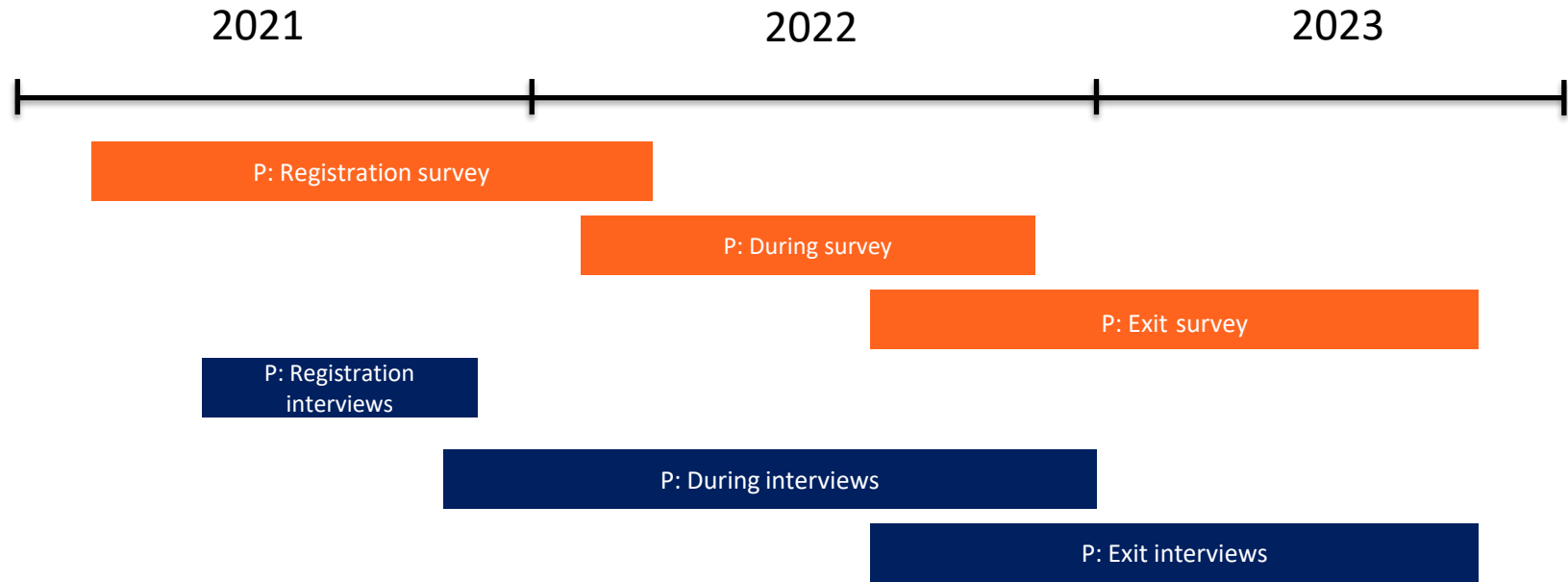
Evaluation of the Mobility Credits trial initiative in Coventry



- The Coventry Mobility Credits scheme offered residents of Coventry the opportunity to exchange an old, polluting vehicle for £3,000 worth of Mobility Credits.
- These credits could be exchanged on public transport (including bus, tram, and train), alternative transport services such as taxis, car sharing, and bike sharing or used for purchasing a bike or cycling accessories.
- Data were collected from participants of the scheme and non-participants (i.e., people who were not involved with the scheme).



Research activities



Key findings

- Trains, Uber, other taxis and buses were the modes of transport being used most by the largest proportion of participants; these modes were all used by over 50% of the sample.
- Most participants were using the credits to travel for leisure journeys, rather than commuting or school trips. Taxis, trains and bus were the most popular options for this journey type.
- For future leisure and commuting trips, participants reported they would be most likely to use their own vehicle or to walk (followed by buses, trains and taxis)
- At the end of the trial, 13 (out of 37) had bought a new car. 11 of these were petrol/diesel-fuelled.

MOTIVATION + ABILITY = BEHAVIOUR

“I want to do it”

“I can do it”

Based on the B-MAP model of behaviour (Fogg): <https://behaviordesign.stanford.edu/resources/fogg-behavior-model>

And the COM-B model of behaviour (Michie et al.)

It's necessary to support both motivation and ability in order to enable the outcome you're looking for

People can *want* to do something, but that's no good if the environment isn't designed in a way to allow it.

The environment can be designed to enable certain activities, but that's no good if people don't want to do them.

Design decisions are more effective when they are based on a solid understanding of behaviour.

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It's necessary to support both motivation and ability in order to enable the outcome you're looking for.



Questions?

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