RiDC

Going Electric

Plug-in cars

Research findings

Feburary 2020

www.ridc.org.uk

@RIDC_UK

Company Registered in England: 2669868 Registered Charity No: 1007726
VAT Registration No: 577 8406 92

Motability

RiDC – Participatory research

We always start from the perspective of disabled and older people.

RiDC believes that by working with disabled and older people, listening to their needs and reflecting their lives in our research, we make sure nobody is excluded or left behind.

- UK wide pan-disability consumer panel of over 1,600 disabled and older people.
- The panel members are the experts on the ground and are core to all our work.

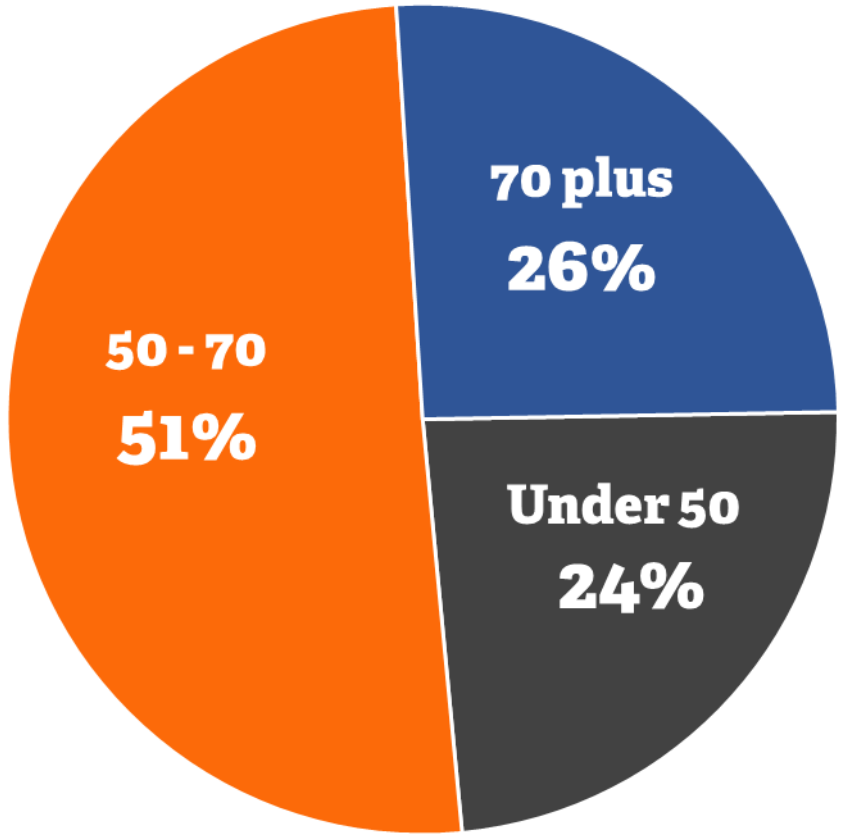
We currently have 1,628 panel members.

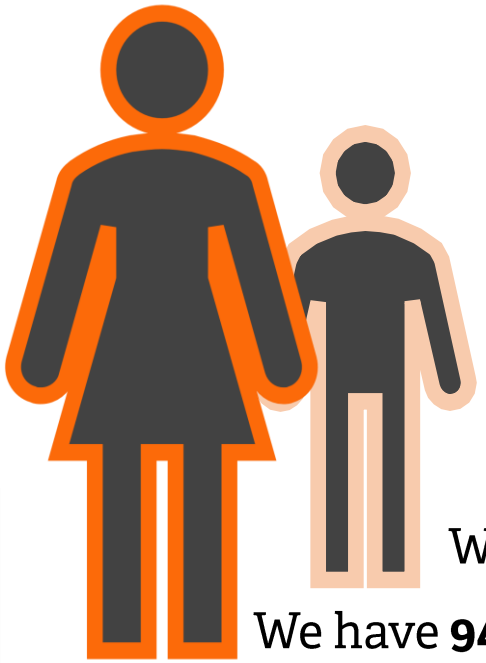
In terms of different types of impairment, the panel is made up as follows:

Mobility impairment	1,031 (79%)
Visual impairment	953 (73%)
Dexterity issues	568 (43%)
Cognitive impairment	562 (43%)
Hearing impairment	407 (31%)
Communication difficulties	209 (16%)
Behavioural issues	168 (13%)
Learning difficulties	127 (9%)

Age profile.

77% of RiDC panel aged over 50



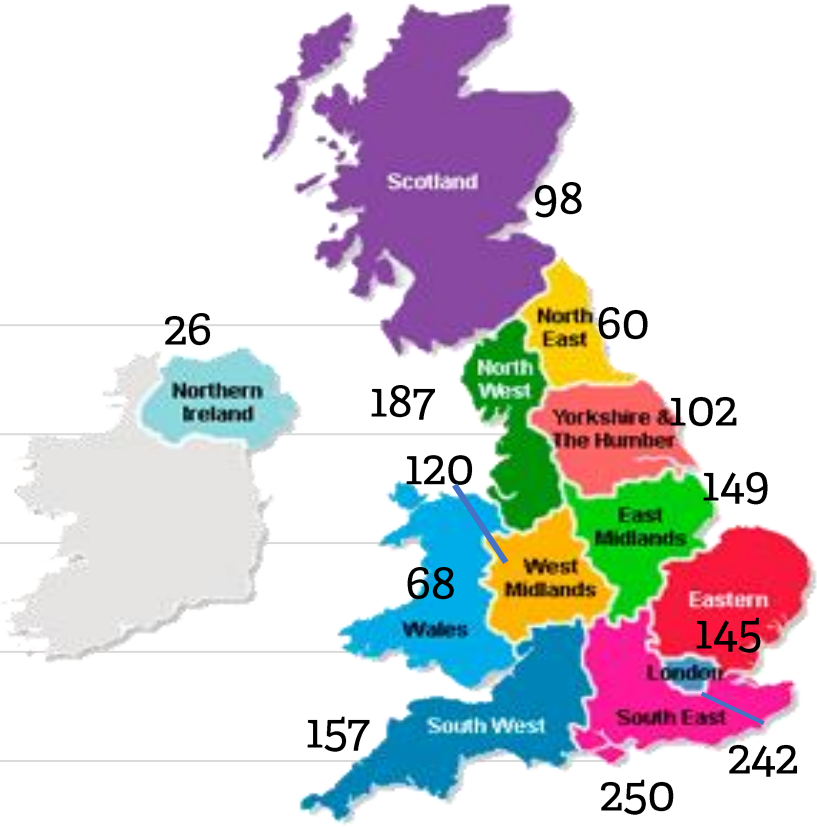


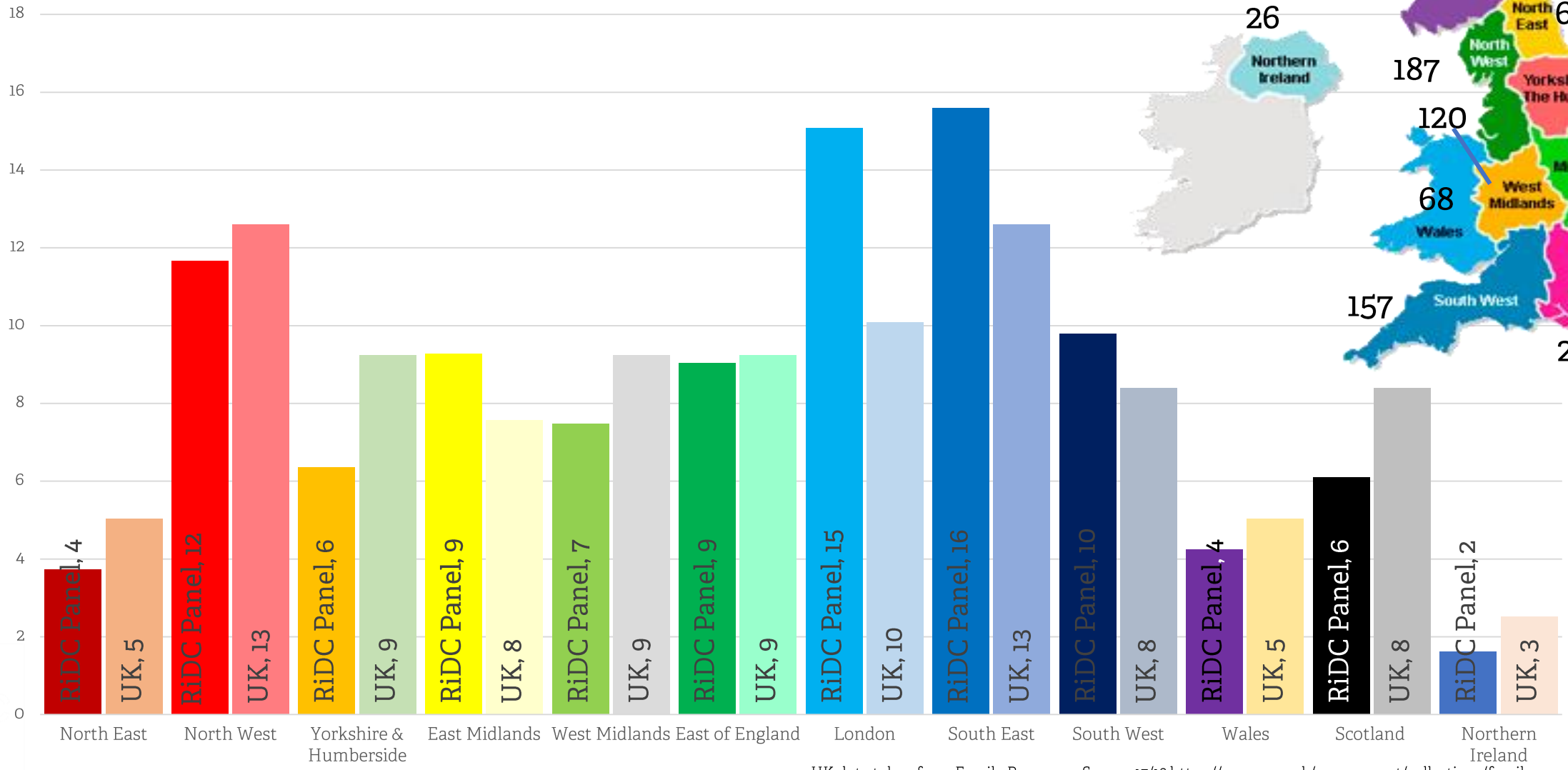
We have **658 male** panel members (41%; UK = 45%).

We have **946** female panel members (59%; UK = 55%).

Distribution of RiDC consumer panel

Compared with UK profile of disabled people





UK data taken from Family Resources Survey 17/18 https://www.gov.uk/government/collections/family-resources-survey--2

Background to research

Funded by

We were commissioned by the Motability Tenth Anniversary Trust to investigate the needs and experiences of disabled motorists using plug-in electric vehicles.

The need & scope

Previous research into this area indicated that very little information was available to inform disabled motorist about going electric or choosing between vehicle models.

Further to this we found little evidence of research into the usability or accessibility of charging points and equipment (cables and connectors) for older and disabled drivers or meaningful accessibility information about them.

The need & scope

We identified **six key research questions** which required research. These formed the direction of our work.

1. Does the usability of charging cables and connectors vary by manufacturer and model?
2. How easy is it to use in-car charging equipment?
3. How accessible and varied are the locations and charging equipment at public charging points?
4. How usable are home charging points and do they vary by brand and model?
5. Is going electric more suited to motorist with particular disabilities?
6. How does the length of journey impact disabled motorists?

Three main elements to the research

1. Desk research

- Published reports and articles
- Telephone interviews with key industry and consumer motoring contacts.

2. Online survey

- Attitudes towards electric vehicles
- Knowledge of electric vehicles.

3. Consumer workshops

- Attitudes towards plug-in electric vehicles
- Usability / Accessibility of plug-in electric vehciles

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Main findings from these research elements

1. Desk research

- Fragmented delivery of recharging infrastructure
- Industry settling on two main connector types, (Type 2 and CCS)
- Lack of accessible charging stations
- Lack of information about location of accessible charging stations
- Lack of research into suitability of electric cars and disabled people

2. Online survey (n=201)

- Willingness to consider purchasing an electric car (2/3rds of our respondents said they would consider buying an electric cars)
- Cost and range were the largest concerns when considering to buy an electric car
- Knowledge and experience of electric cars was limited with the proliferation of acronyms adding to confusion.

3. Consumer workshops

- Difficulty in using charging cables
- Difficulty in accessing charging stations / road side points
- Heightened anxiety over range and access
- Loss of independence

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Focus of this presentation is on what the research uncovered about the accessibility of charging electric vehicles (for people with disabilities):

- How easy is in-car charging equipment to use?
- How accessible and varied are the locations and charging equipment at public charging points?
- Is going electric more suited to motorist with particular disabilities?
- How does the length of journey impact disabled motorists?

Insight into answering these questions came mainly through the survey and usability workshops.

Driver touch points during typical journey, including an example of potential failures





Action	Planning a journey	Starting a journey	Getting to destination	Parking / recharging	Return journey
Consideration	Charging points along route	Range available	Traffic & roadworks	Accessible charging point & time	Traffic & roadworks
Potential failures	No info accessible charging points	Not enough range available	Inefficient driving	Inaccessible charging point	Unsafe driving
Mitigation	Home charge to 100%	Reschedule journey	Cut short journey	Take friend or carer	Turn off heating
Impact	Do not make journey	Increased anxiety	Stranded	Loss of independence	Lowered expectation

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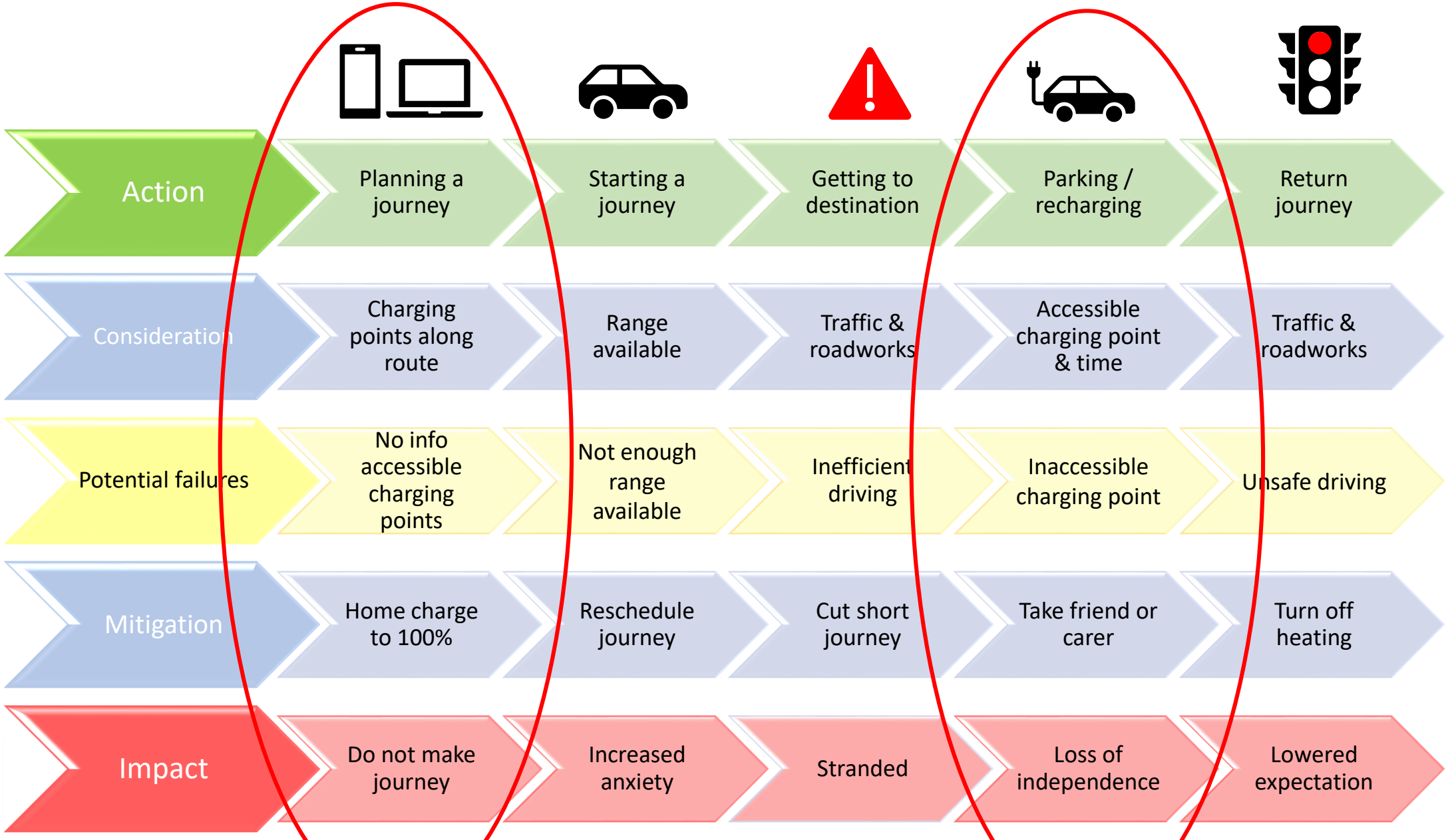
Driver touch points during typical journey, including an example of potential failures



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Planning a journey

Considerations

Typical considerations will be:

- **Route planning**
  - Time of day, traffic density, roadworks, range of car & charge level, finding accessible charge points, wireless coverage, range margin of safety
- **Practical considerations**
  - Overall time of journey
  - Electrical devices using battery life
  - Wheelchair hoist and charge, heating pads
- **Contingency planning**
  - Charge points along alterative routes
  - Phones / communications
  - Wireless coverage
  - Decrease range to increase margin of safety

Planning a journey

Planning a journey

Potential failures

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  Wireless coverage

  Decrease range to increase margin of safety

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Parking / recharging

Parking/ recharging

Considerations

Typical considerations will be:

- **Availability**
  - In use or not, any queue & time to wait
  - Planned or opportunistic stop
  - Type of connectors and flow rates
  - Supplier sign-up
- **Time**
  - % charge to journey completion
  - Compromise margin of safety
- **Accessibility**
  - Accessible to the needs of the user – access, reach, weight
  - Type of recharge station – curb, petrol station, car parks (train, store, shopping centre)
  - Covered/uncovered

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Parking / recharging

Parking/ recharging

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Accessibility issues – off street charging hub

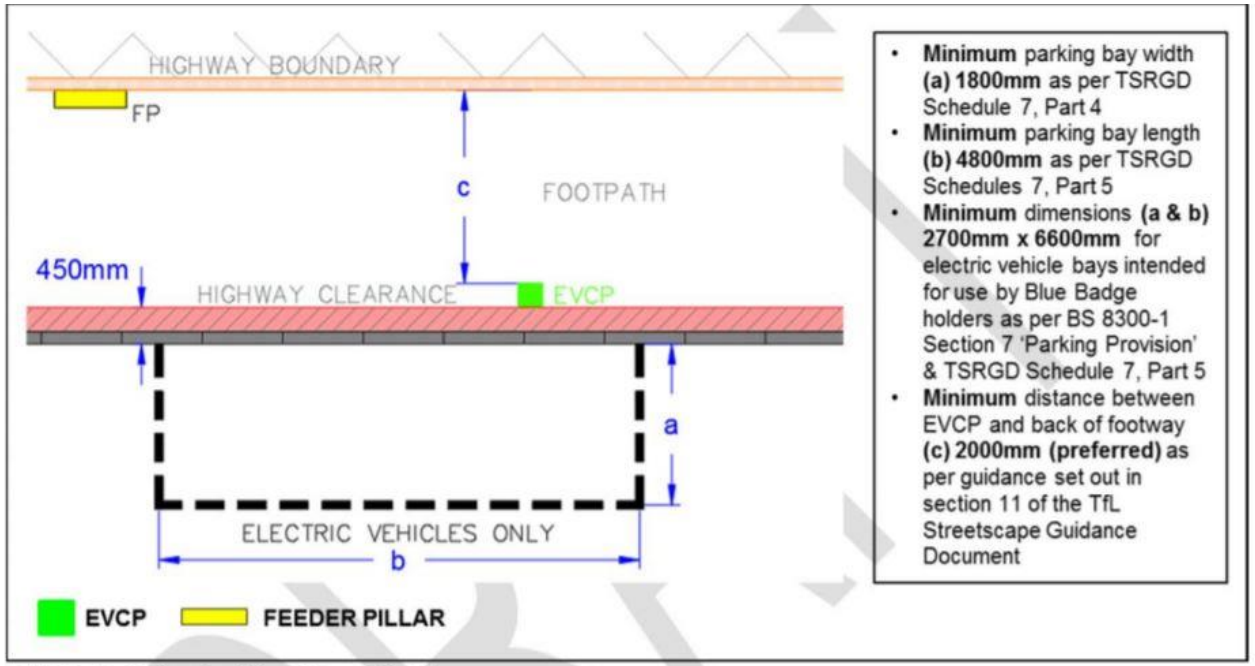
Reality

obstructions

Lack of access space

Curb

Accessibility issues – roadside charging point



- **Minimum** parking bay width **(a) 1800mm** as per TSRGD Schedule 7, Part 4
- **Minimum** parking bay length **(b) 4800mm** as per TSRGD Schedules 7, Part 5
- **Minimum** dimensions **(a & b) 2700mm x 6600mm** for electric vehicle bays intended for use by Blue Badge holders as per BS 8300-1 Section 7 'Parking Provision' & TSRGD Schedule 7, Part 5
- **Minimum** distance between EVCP and back of footway **(c) 2000mm (preferred)** as per guidance set out in section 11 of the TfL Streetscape Guidance Document

TSRGD – Traffic Signs Regulations & General Directions
BS 8300-1 – Design of an Accessible and Inclusive Built Environment, Part 1: External Environment – Code of Practice

Guidance

Reality

Curb

Access is around the charge point piller

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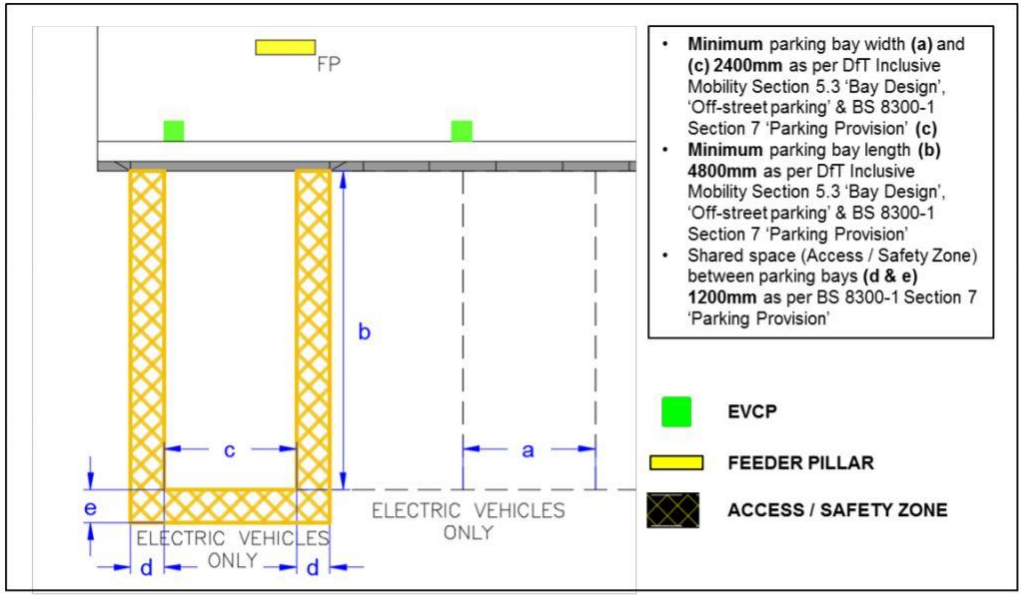
Accessibility issues - the footprint



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Guidance

Reality

Lots of obstacles in front of charge point

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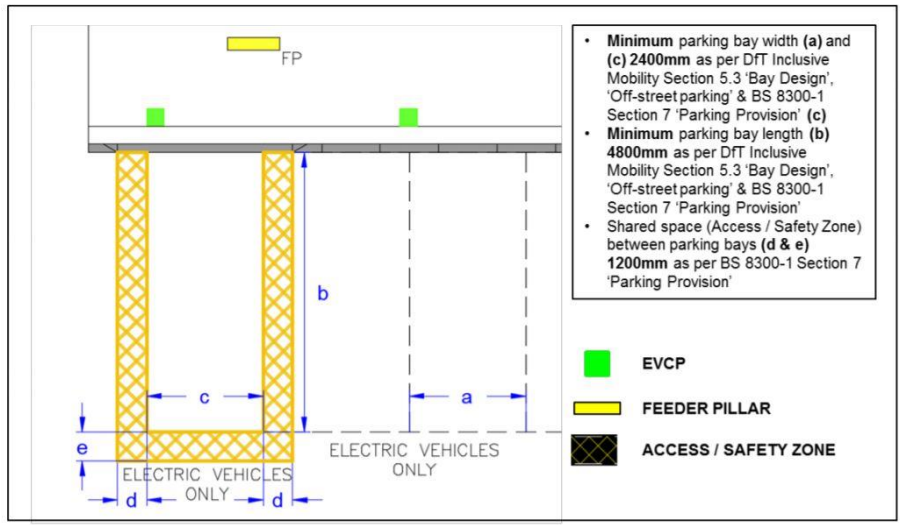
Accessibility issues - the footprint



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Guidance

Reality

Access available

- but not to charge point

- and being occupied by a taxi

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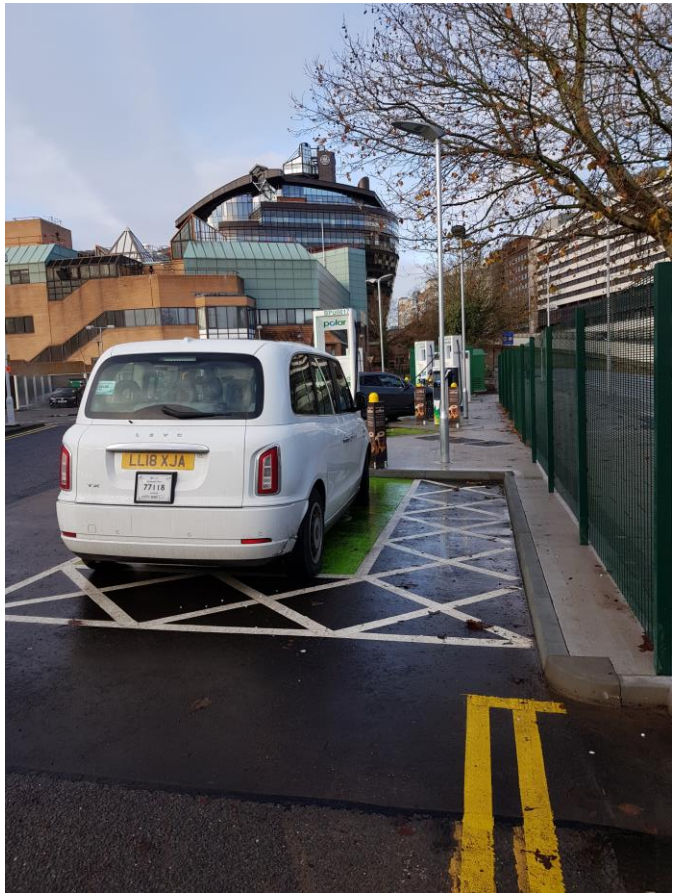
Accessible parking specifications used – without considering the usability of the interaction at the charge point?



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Other ‘points of pain’ at charging points

Accessibility / Usability

- Reach to charge point cable nozzle
- Weight of cables
- Carrying of cables – dirty
- Stiffness of connector
- Slippery underfoot – problematic for sticks

What people said after the usability testing ...

"Got to take the wheelchair out first, so the cable might be in front of the wheelchair" _ Angus

"It's completely inaccessible for a wheelchair user – they need disabled bays for charging!"_ Philip

"I spent five years gaining my independence, and this is a step backwards. This is not for me, this is taking away me independence" _ Andrew

What people said after the usability testing …

Lisa: "If I was on my own, I'd be crying right now"

Eric: "Why?"

Lisa: "Because it was too hard to plug it in there and there. People will just walk past and stare at you -to get back here and especially if I found a car right next to it and I could not get my wheelchair in to it [to the charging sockets for the cable car and charging point]"

"To me it's just condemning you to having to have someone with you all the time, you can't ever go out on your own"

"Imagine if it was chucking it down or snowing with no cover, trying to hold an umbrella whilst trying to plug this in?"

"**I'd lose my independence**"

Lisa: **"I really wanted an electric car but that was no good for me, it was just impossible, I couldn't do it"**

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Other concerns which came from the research

- Range anxiety
- Sheltered charging stations
- Managing sticks whilst holding cables
- Increased vulnerability
- Lack of drop curves

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Questions / Debate

How to make electric vehicle infrastructure accessible for disabled people?

What do we need to do to ensure disabled people are aware of the challenges in owning electric vehicles?

How do we mitigate some of the risks to disabled people currently inherent in owning an electric vehicle?

- Increased anxiety
- Increased vulnerability
- Decreased independence

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