Thinks
Insight & Strategy

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Evidence Review on Accessible Transport: Informing our innovation priorities

Motability
Final report

Contents

1. Executive summary

1.1 Background to the research

Motability commissioned independent research consultancy Thinks Insight & Strategy to review the evidence about disabled people's experiences of travel and transport since Motability's last Innovation Review supported by the non-profit Social Finance in 2020. Since the establishment of Motability's Innovation function in 2020, the transport landscape and Motability's internal functions have changed a great deal. The Covid-19 pandemic and ongoing cost-of-living crisis continue to impact disabled people's experiences of travel, while innovation around future transport initiatives are rapidly underway. As such, this research explores how the landscape of travel and transport has changed since this last review and any themes for consideration in Motability's innovation activities in the future.

1.2 Key findings

- **The events of the last three years, including the Covid-19 pandemic and the cost-of-living crisis, have presented new barriers to travel for disabled people.** Increased challenges with lack of staff and health concerns regarding public transport have led some disabled people to decrease the amount they travel, further reducing travel for social connections and limiting independence. Private travel, a lifeline for many during the pandemic, is now at risk due to rising costs of petrol and balancing this with other essentials.
- **As the world re-opens and people look forward to getting back to travel, air travel remains a very challenging form of transport for many disabled people.** A lack of consistent regulation means accessibility in airports and on airplanes is inconsistently applied. This form of travel requires an extensive planning burden and can be anxiety-inducing for many disabled people. Further work is needed to make this form of travel accessible for disabled people, including non-visible disabilities which often feel ignored.
- **The future of transport provides a host of challenges and opportunities in accessible transport.** Shared and micro mobility, electric vehicles and autonomous vehicles are all exciting initiatives where innovation is progressing quickly. While these forms of transport present opportunities in accessible travel, it is critical that the voices of disabled travelers are included at the design stage of these technologies.
- **Inclusive design must be a part of any future transport or technology.** Advocacy is needed in this space to ensure that experts in future transport design are co-creating with disabled people at this early

stage in the future of transport technologies. Retrofitting accessibility onto technologies and transport options is likely to be costly and ineffective.

- **Stakeholders in the accessible transport area are eager to emphasise that future innovation should focus on following through to implementation and adoption wherever possible.** Barriers to accessible travel are felt to be a well-explored area, with potential solutions having been discussed and researched. A significant gap is then working to put these solutions into practice in a timely manner.

2. Introduction

2.1 Objectives of the research

In 2020, Motability carried out a strategic Innovation Review, identifying 19 potential areas of accessible transport in need of innovation. This research sets out to refresh the evidence base three years on, building on what Motability has learned about disabled people's experiences of travel and transport. This will not only help Motability assess what's changed in the past three years, but also to identify any emerging issues, understand any initiatives already in place to address these, and explore any areas where there is scope for further innovation and project activity. In particular, this research aims to:

- Gather and assess evidence as to what has changed in disabled people's experiences of transport since 2020
- Identify emerging issues in disability and transport
- Identify emerging areas for innovation in accessible transport
- Identify where work is being done to improve accessible transport
- Identify where work is already being conducted in the transport-focused and accessibility-focused spaces

2.2 About the research process

We conducted a rapid evidence assessment (REA) of existing data and research on the landscape of disabled people travelling, what has changed since 2020 and any resulting new innovation opportunities and accessible transport challenges. We reviewed 41 sources in detail, including research and thought leadership from the sector on what has changed in disabled people's experiences of traveling since 2020 and evidence about future transport needs.

We began the evidence assessment with 19 long-list theme areas from Motability's previous innovation review in 2020. In a mapping workshop with Motability, we worked collaboratively to add to these areas and group into the following broad themes:

- Community transport
- Public transport
- Private travel
- Active travel (walking, wheeling and cycling)
- Access to social connections and well being
- Access to equipment
- Access to opportunities
- Future transport
- Cost-of-living

Sources were then collated across all themes, with an initial review to assess relevance. Through this process, a number of themes were deprioritised for

further exploration in collaboration with Motability, as the evidence and opportunities for innovation were felt to be clearer than in other topic areas. Through an iterative process, the following four specific themes were selected for more detailed assessment and review:

- Access to environments
- Planning burden and information
- Travel for social connections
- Future travel

In this report, these four themes will be standalone chapters we 'deep dive' into – structured according to barriers faced, existing initiatives to tackle these challenges, and opportunities for innovation. A breakdown of the full list of themes is included in the appendix, with further summary detail of all sources collated across all themes included in the accompanying evidence grid.

We also conducted a programme of stakeholder engagement alongside the REA. We conducted six tele-depth interviews with expert stakeholders in accessible transport. These interviews were spread throughout the evidence review, including at the start to contextualise the review. We also conducted a future-focused stakeholder workshop with transport experts outside the accessibility-focused transport area. This workshop ensured the research took into account broader trends in the future of transport that will inevitably impact disabled people and accessible transport.

Please see Appendix 1 for a detailed breakdown of the methodology.

2.3 Context of the research

This research takes place three years on from the start of the Covid-19 pandemic, which had a profound and disproportionate impact on disabled people in the UK[1]. Many disabled people experienced uncertainty around the risks to their health and wellbeing when leaving their homes as a result of the pandemic, which compounded pre-existing barriers to using both public and private modes of transport[2].

We spoke to expert stakeholders in the transport and accessibility space during this research. There was a sense among stakeholders that the pandemic had provided a unique opportunity to rethink the accessibility of travel and transport infrastructure, but that in reality there had been very little positive change as a result. As such, the pandemic is not felt to have radically changed transport infrastructure in the way it could have. Rather, it is seen as having reinforced challenges with transport for disabled people.

[1] The Health Foundation. 'The forgotten crisis: exploring the disproportionate impact of the pandemic on disabled people' (2021)
[2] Thinks Insight and Strategy/Motability. 'Impact of Covid-19 on disabled people's experiences of transport' (2022)

"A couple of years on [from the pandemic] it's clear how little impact its had, and how strong the underlying trends are… there are some megatrends but the pandemic in retrospect is seen more as a 'blip' which has sped up underlying changes, rather than being a directional change… how difficult it made the lives of non-disabled people maybe put into perspective how difficult it can be for disabled people." (Future focused workshop)

A new challenge, which is also having a disproportionate impact on disabled people, is the cost-of-living crisis[3]. The price increase in fuel, utilities bills, and everyday essentials is impacting disabled individuals and their households, who have, on average, lower incomes than their non-disabled counterparts[4]. Disabled people are more vulnerable to rising costs, as they already face additional costs on essentials like transport and specialist equipment. As such, the evidence suggests the cost-of-living crisis is creating financial barriers to travel, which is compounding pre-existing barriers. As a result, roughly twice as many disabled adults have cut back spending on transport compared to non-disabled adults[5].

In the context of the rising cost of living, active travel (walking, wheeling, and cycling) becomes even more important as disabled people try to save money. However, as chapter 3 of this report will explore, the built environment is not always accessible to disabled people, and this creates barriers to active travel.

It was important for Motability's Innovation Team to revisit and refresh the accessible transport evidence base in the context of these major global events, which have changed the travel and transport landscape significantly.

2.4 Cross cutting themes

There are a number of themes that emerge from the literature review and engagement with stakeholders that were not originally identified as standalone areas for innovation. These themes are important to consider alongside any projects or ideas that are taken forward by Motability's innovation team, as they complement and elevate the more specific themes that are detailed in the remainder of this report.

- **Co-production with disabled people:** stakeholders emphasise the diverse nature of disabled people; a one-size-fits-all approach is unlikely to be effective. Creating solutions *with* disabled people, rather than *for* disabled people, is much more likely to take these variations into account.

"We need to be aware of and have a diversity of inputs to make a truly diverse service." (Future focused workshop)

[3] The Guardian. 'Disabled people among hardest hit by cost of living crisis, find study' (2023)
[4] ONS. 'Impact of increased cost of living on adults living across Great Britain' (2022)
[5] Resolution Foundation. 'Costly differences, Living standards for working-age people with disabilities' (2023)

- **Collaboration with those with knowledge in this space:** the breadth of expertise in this area is evident from both the literature review and stakeholder engagement. There are many actors working in this space and we detail what innovations already exist across each theme in the remainder of this report. Seeking opportunities to collaborate could be a very effective way to support a sector where there is felt to be a great deal of innovation, but difficulties following through to implementation.

  "We need a cross sectorial design approach and a user-centred approach." (Future focused workshop)

- **Localised initiatives:** alongside collaborating with experts in the accessible transport sector, working directly with disabled people, and consulting the wider local community to co-create transport solutions is likely to lead to results that better serve the needs of the local area.

  "We need to ensure communities can co-create. Different demographics use transport differently." (Future focused workshop)

- **Access to equipment:** appropriate and accessible equipment is a lifeline for many disabled people and often the first thing needed in order to travel. Access to equipment such as adapted vehicles, wheelchairs or mobility scooters among others is a necessary precursor to the themes detailed in this report. This presents both opportunities to support disabled people to travel independently, as well as address significant barriers related to cost and incompatibility with public transport systems.

  "The price of equipment and living independently is a high price to pay for being disabled… The cost of living when you're disabled is a lot higher. The types of houses you can live in, cars you can buy and the adaptive equipment for your house." (Stakeholder depth interview)

- **Use of technology:** technology is seen as having a significant role to play in the future of transport. However, there is debate around whether this will support more accessible travel or exclude disabled people from transport further. Concerns include furthering the digital divide, technologies being inaccessible, and apps highlighting where disabled people *can't* go as opposed to where is accessible. It is critical that as new technologies are developed, they are co-produced with disabled people to ensure the diverse perspectives of this audience are taken into account.

  "There is a huge risk of digital exclusion. If we rely on connectivity for some systems, and this isn't equal across the country, we are creating more barriers for groups who already face barriers to transport use." (Future focused workshop)

3. Access to environments

An accessible built environment encourages active travel, social connections, and access to opportunities, including employment, education and healthcare. However, an inaccessible built environment can significantly curtail a disabled person's freedom to travel. This chapter will explore built environment barriers across public transport, private travel and active travel and where innovation could help reduce these.

3.1 Reducing built environment barriers

Inaccessible built environments present barriers to travel for disabled people[6]. Even in instances where these barriers to travel do not materialise, *perceived barriers* can be as much of a deterrent to undertaking a journey as physical barriers, such as inaccessible infrastructure. Over the course of this research, four barriers emerged which are felt to impede access to the built environment[7]:

Barrier area	Constraints identified
Structural	• Inaccessible built environment i.e., poorly kept pavements, steps, or narrow gates. • Inaccessible crosswalks make it difficult to cross the street i.e., raised kerbs, a lack of tactile pavements, and a lack of official crossing infrastructure. • 'Street furniture' or pavement parking can block the path of those using mobility equipment. • Inaccessible public transportation infrastructure i.e., stairs in a train station. • A lack of accessible facilities i.e., no disabled toilets. • Inaccessibility at the destination i.e., going to the beach can present difficulties due to difficulties walking/wheeling on sand. • A lack of access to specialist equipment needed for certain destinations i.e., ski chairs. • Service providers imposing restrictive rules i.e., only a certain number of wheelchair users are allowed on a particular train or flight. • Being denied service e.g., taxis refusing wheelchair users. • Navigating intermodal travel and the challenges that come with each step in a journey where one inaccessible component or piece of infrastructure has the potential to disrupt the entire journey.

[6] Sustrans. 'Disabled Citizens' Inquiry: Giving disabled people a voice in walking and wheeling policy and practice' (2023)
[7] Journal of Hospitality and Tourism Management. 'Reframing the experiences of travellers with mobility impairments: Enhancing the leisure constraints model' (2021)

Psychological	• Feelings of anxiety, stress, or vulnerability travelling. • Fear of being treated differently by staff or other travelers. • Uncertainty around what will happen during the journey, i.e., a lack of reliable passenger assistance, or at the destination itself. • Worry about assistive equipment in the hands of others i.e., potential damage. • Inconsistency of services creating uncertainty and/or anxiety. • Fear of loss of dignity.
Interpersonal	• Physical and/or psychological dependency on others in order to travel i.e., a need for travel companions or helpful strangers. • By extension, the unavailability of travel companions or the need to plan trips around them. • The attitudes and behaviours of other passengers i.e., patronising behaviour, humiliation and/or disrespect, a lack of awareness about how to interact with disabled people, being treated differently or mistreated. • The attitudes and behaviours of service providers and staff i.e., disabled people being 'forgotten' by staff and therefore missing their stop or train - meaning they end up in an area they don't know or feel safe in; being treated by staff as an inconvenience; being blamed for delays.
Financial	• Having to cut back spending on public and/or private transport. • Having to pay for support i.e., travel companions increase costs if not made freely available. • Not having money to pay for necessary specialist equipment to travel. • Not having contactless payment options i.e., those who are digitally excluded.

These are difficult issues to resolve, as challenges and solutions are likely to vary due to the diverse nature of disability. For example, tactile pavement was introduced with advocacy from RNIB. This is crucial for blind and partially sighted people to be able to navigate the built environment and cross the street safely. However, this can create obstacles for people with balance and/or mobility issues. This illustrates how what's accessible for one disabled person, can be inaccessible for another disabled person. Working to address built environment barriers in collaboration with disabled people will be key to finding an array of solutions to meet the varied needs of disabled people.

The built environment can also present opportunities for accessible travel. Research shows there is a positive correlation between built environment and transport infrastructure being made more accessible and uptake by disabled travellers. For example, increased step-free accessibility at a railway station is likely to lead to increased travel at the station by people with reduced mobility[8].

3.2 Access to public transport, private travel, and active travel

Access to all transport types is impacted by the built environment and transport infrastructure, each with their own challenges and opportunities to support accessible travel.

Public transport brings a host of challenges for many disabled people. From inter-modal journeys to the attitudes and behaviours of other passengers and staff, traveling via public transport can be an anxiety-inducing experience for many disabled people. Barriers include:

- **Inter-modal journeys:** Journeys utilising more than one form of transport often creates opportunities for things to go wrong at multiple touchpoints, with each threatening to disrupt the entire journey.
- **Attitudes and behaviours of other passengers and staff:** This emerged as a significant barrier, particularly for those with non-visible disabilities, who find accessing accommodations such as being offered a seat or using passenger assistance can be more difficult. For example, disabled people with non-visible disabilities describe experiences of being asked to 'prove' their disability[9]. Additionally, passengers who may be 'trying to help' can cause feelings of discomfort or inferiority among disabled people, by assuming they need support when they don't require help at that time. There are also often inconsistencies in accessing appropriate support from transport staff, with staff not always being prepared or adequately trained to provide support in the moment.

- **Lack of appropriate assistance:** Even when having booked assistance, disabled travelers report it is not a guarantee that assistance will actually be available when needed. As discussed in the following chapter on the burden of journey planning, this creates considerable stress ahead of completing a journey[10].

Private vehicles are a lifeline for many disabled people, enabling door-to-door transport. During the pandemic, this was the primary and only form of transport

[8] European Transport Research Review. 'Step-free railway station access in the UK: the value of inclusive design' (2021)
[9] Wayland, S. *et al.* 'I had every right to be there: discriminatory acts towards young people with disabilities on public transport' (2022)
[10] Alexiou, G. 'For Disabled People, Inclusive Transportation Is About Much More Than Lifts And Ramps' (2021)

for many disabled people, with health concerns prompting many to only use public transport if absolutely necessary[11]. However, private transport does not come without its own share of challenges:

- **A lack of understanding of guide dog owners' rights by private vehicle hire and taxi companies:** Those with guide dogs report challenges in accessing private vehicle hires and taxis that will accommodate their guide dogs[12]. This shows a lack of understanding and inconsistent enforcement of the legislative rights of those who travel with service animals.
- **Inaccessible electric vehicle (EV) charging points:** Research shows that there is appetite for uptake of electric vehicles among disabled people. However, the inaccessibility of charging points is a concern for many, in particular[13]:
    - Lifting the charge cable from the boot and closing the boot;
    - Maneuvering the cable to the charge point;
    - Navigating the space and trip hazards around the car and charge point.
- **Cost:** The cost of traveling by private vehicle is a concern for many. As detailed in our previous research for Motability in 2021-2022, the rising cost of living has made traveling by car untenable for some as people balance the costs of essentials like food, heating and medical bills with the cost of petrol and taxis[14].
- **Low-traffic neighbourhoods (LTNs):** LTNs have been the subject of considerable debate but what can be agreed is that LTNs are not fully accessible to disabled people in their current form[15]. For example, some disabled people rely on private vehicle hire for door-to-door transport as they do not have accessible public transport options in their local area. For this subgroup, access to taxis and vehicle hire can be more difficult in a LTN. Others have concerns about emergency services not being able to reach them in good time and feeling isolated without the use of their private vehicle.
    - However, some also identify benefits of LTNs, feeling that active travel is less overwhelming and feeling they have more time and confidence to cross the road with less cars on the road.

> *"During Covid, regions were putting up these really inaccessible barriers. They were designed to block roads to support active*

[11] Thinks Insight and Strategy/Motability. 'Impact of Covid-19 on disabled people's experiences of transport' (2022)
[12] Rickly, J.M. *et al.* 'Travelling with a Guide Dog: Experiences of People with Vision Impairment' (2021)
[13] RiDC. 'Inaccessible Charging is Barrier to Electric for Disabled and Older Drivers' (2021)
[14] Thinks/Motability. 'The Impact of Covid-19 on disabled people's experiences of transport' (2022)

travel but they were really narrow. You couldn't get an adapted bike through… If we're going to build an active environment, we need to make sure we look at those barriers." (Stakeholder depth interview)

With the uptake in **active travel** initiatives since the Covid-19 pandemic, there is an opportunity to ensure new design in this area is co-created with disabled people. Currently, street clutter and the introduction of low-traffic neighbourhoods presents key barriers for disabled people in engaging in their environments and neighbourhoods:

- **Inaccessible pavements:** Street clutter including dock-less bicycles, electric vehicle charging stations and street furniture can all pose hazards to disabled people, particularly those who are blind or partially sighted.[15]
- **Inaccessible cycle lanes:** Cycle lanes and cycle parking facilities frequently fail to account for the dimensions and requirements of non-standard cycles, making door-to-door cycle journeys all but impossible for many disabled cyclists.

"[Over the past 3 years] I've seen more cycle paths put up – many of which don't take into account the needs of disabled users, in terms of specialist cycles that disabled people use. Turning radiuses aren't wide enough, the design standards that exist for cycling provisions local councils seem happy to ignore." (Stakeholder depth interview)

3.3 What initiatives to promote better access to environments already exist?

The Government has a range of levers that can be used to achieve more accessible built environments in place. This includes the National Planning Policy Framework, which states that local planning authorities should take inclusive design into account when planning designs for the built environment. This Framework advises that inclusive design should be considered at every stage of the development and design process, and not be considered a 'Regulations issue'[16].

There are a number of organisations working in this space, where there may be opportunities to partner and expand the scope of the work further, for example:

- **Living Streets UK** is a UK charity working to achieve a better walking environment and inspire people to use active travel. This charity

[15] Transport for all. 'Pave The Way: The impact of Low Traffic Neighbourhoods (LTNs) on disabled people, and the future of accessible Active Travel' (2021)
[16] House of Commons: Women and Equalities Committee 'Building for Equality: Disability and the Built Environment' (2017)

approaches active travel from many angles, including making streets more accessible for wheeling and use of mobility equipment.

- **United Response** is a UK charity supporting disabled people with learning disabilities, mental health needs and physical disabilities. They support people with learning disabilities or autism to travel independently using public transport. They also offer autism awareness training courses for public transport staff, delivered by people on the autism spectrum.
- **EASST** is a UK charity who have an online training course to help public transport staff better understand the needs of disabled passengers. The course offers practical guidance on how to better understand and support passengers with different types of disability with video testimony, reading materials, presentations and quizzes.

There are also a number of campaigns encouraging the non-disabled public to be patient and kind towards disabled people when traveling on public transport. For example:

- **'It's everyone's journey' from the Department for Transport** forms a key part of the Government's Inclusive Transport Strategy. This campaign champions equal access on public transport and was developed in partnership with industry, disability groups and disabled people.
- **'Small words. Big impact' from Transport for London** encourages positive travel behaviours among all passengers as they use public transport. The key messages in this campaign encourage behaviours all passengers can enact, such as being kind and patient with others.

3.4 Opportunities for innovation

While overhauling inaccessible built environment is a significant undertaking, there is an **opportunity to work with transport companies as their rolling stock approaches time for renewal**. For example, Merseyrail and Transport Focus worked together to involve disabled people in the design of new train stock[17]. A consortium of disabled passengers and carers worked with Merseyrail to test and feedback on mockups for new train designs, including the layout of the train and seats as well as the content and format of passenger information to be displayed in the train.

> *"I offer Mersey Rail's new rolling stock as an example of effective public engagement and co-creation." (Future focused workshop)*

As more rolling stock in public transport reaches the end of its life cycle, there is the opportunity for Motability or others to work with these transport providers

[17] Transport Focus. 'Future Merseyrail rolling stock: Passenger influenced design' (2020)

and third-sector organisations to bring the voice of disabled people into the design process of new rolling stock.

There are also opportunities for innovation from a policy perspective, where there are calls for:

- **Long-term dedicated pavement funding to maintain and improve pavements:** Research shows this would support 79% of disabled people to walk or wheel more. This would entail funding footway improvements when implementing low traffic neighbourhoods, strengthening national guidance for inclusive pavement design, and improving and enforcing standards for maintaining accessibility during roadworks[18].
- Influencing the Government, National Rail and Train Operating Companies to **committing to roll out step-free access** to more UK railway stations[19].

[18] Sustrans. 'Disabled Citizens' Inquiry: Giving disabled people a voice in walking and wheeling policy and practice' (2023)
[19] European Transport Research Review. 'Step-free railway station access in the UK: the value of inclusive design' (2021)

4. Planning burden and information

For disabled people, access to transport is often severely impeded by a lack of available information on accessible routes and infrastructure. This adds to the burden that disabled people face when planning door-to-door transport. This chapter will explore the impacts of the planning burden, how the events of the past three years have exacerbated this, and what initiatives have been explored to alleviate this well-known barrier to travel for disabled people.

4.1 Barriers to travel and the impact of the planning burden

The research shows many disabled people experience anxiety around planning journeys. Previous experiences of information being incorrect or assistance not being available when needed have taught disabled people that they cannot always rely on the correct accommodations being made[20].

We know that prior to the pandemic, the following barriers in accessible travel led to an increased planning burden[21]:

- Unavailable or inaccurate information about accessible infrastructure in public transport.
- A lack of available public transport staff to facilitate passenger assistance to passengers who wish to 'turn up and go' (and even sometimes those who had booked ahead).
- Information and booking processes differ across trainline operators, which can cause confusion as to whether or not Passenger Assistance has been booked across the entire journey.
- A lack of information about accessible service stations along motorways.
- A lack of information about alternative accessible routes in the case of transport delays, diversions, and broken-down infrastructure

> *"My number one priority would be the ability to turn up and go on public transport and not have to pre-plan everything, especially thinking about trains. Raise platforms, and accessible rolling stock would be the first one – so you don't need to get someone out with a ramp. It's very difficult as it stands. It's just basic stuff they just decided it's easier not to do."*
> *(Stakeholder Interview)*

The impacts of these barriers are significant. Disabled people compensate for an inaccessible system by spending considerable time seeking out information by phone and online, and booking assistance through often outdated processes that

[20] Alexiou, G. 'For Disabled People, Inclusive Transportation Is About Much More Than Lifts And Ramps' (2021)
[21] Gifford, B. 'Does Britain Have a Transport Accessibility Problem?' (2020)

require significant lead-in times. This leads some to choose not to make a journey at all, unless necessary.

The psychological impacts are significant, with many disabled travellers experiencing anxiety around travel. Previous personal negative experiences and hearing about the negative experiences of others when travel doesn't go to plan are abundant and show that this anxiety is not always unfounded[22]. Even when a journey does go to plan, the stress of planning multi-modal travel in particular leads to a negative experience of travel.

This burden was amplified during the Covid-19 pandemic, when transport operators cut back staff and routes were often changed or diverted across public transport systems at short notice[23]. A lack of staff on public transport and the increased unreliability of live travel information added to the significant planning that many disabled people were already undertaking pre-pandemic. In our previous research with Motability in 2021-2022[24], disabled people described starting journeys one to two hours early during the pandemic, for example in case staff were unable to support them as planned or there was no disabled parking available.

4.2 What initiatives to alleviate the planning burden already exist?

As discussed in the previous section, the planning burden is a well-documented barrier to travel for disabled people. As such, a number of initiatives have been developed in recent years and are already in place to help alleviate this issue:

- **The 'Passenger Assistance' app, developed by Transreport in partnership with National Rail[25]:** This app is the first of its kind in the UK and aims to offer a convenient and fast way for disabled passengers to request assistance *across* the National Rail network (as opposed to making separate bookings with each trainline operator involved in the journey). The app allows users to request assistance, avoiding the need to reach out to a contact centre (although this is still available for those who wish to book by telephone), and provides confirmation that the appropriate assistance has been booked throughout the journey. Each customer builds a profile to give detail on their assistance needs, with the option to provide additional information that they would like staff to know.
- **An audio guide to help blind and partially sighted passengers navigate Bristol Temple Meads station[26]:** This guide is a first of its kind in the UK and was co-created with disabled people through work with

[22] Alexiou, G. 'For Disabled People, Inclusive Transportation Is About Much More Than Lifts And Ramps' (2021)
[23] Thinks Insight and Strategy/Motability. 'Impact of Covid-19 on disabled people's experiences of transport' (2022)
[24] Thinks/Motability. 'The Impact of Covid-19 on disabled people's experiences of transport' (2022)
[25] Rail Delivery Group. 'Passenger Assistance app to help disabled rail passengers travel with confidence in first for public transport' (2021)
[26] Mann, J. 'First of its kind audio guide to improve accessibility in Bristol Temple Meads' (2023)

the British Sight Loss Council (BSLC), to ensure the resulting audio guide is grounded in the experiences of real people.

The guide includes a platform list summary, information about the main entrance, exits, taxi rank and shops, as well as guidance for specific platforms and destinations. Information regarding passenger assistance, customer services, toilets and lifts are also included in the guide. There is an ambition by Network Rail to continue to collaborate with BSLC to launch wayfinding guides for other stations in the UK.

- **Reduction in the amount of notice required for disabled passengers to book Passenger Assistance[27].** In April 2022, the amount of notice needed to book Passenger Assistance was reduced from six hours to two. This provides more flexibility to travelers to make more spontaneous plans and be flexible if their plans change. While 'turn up and go' is still available as a scheme to travel without booking assistance in advance, this is still felt to be risky due to the potential of staff not being available at that time.

4.3 Opportunities for innovation

While various journey planning apps are commonly used by both the disabled and non-disabled general public, such as Google Maps and City Mapper, these apps often tell disabled people where they *can't* go, rather where they can. There is the opportunity to **build a more *empowering* app**, that provides live travel information, as well as up-to-date information on accessible infrastructure, routes, and timetables. Having this information on hand at a central place would be a significant help to disabled people. Ensuring that information is delivered to allow disabled people to make informed decisions about their travel routes will help support further access to opportunities and address some of the psychological impacts of constantly dealing with inaccurate and missing travel information.

In our previous research for Motability in 2021-2022, participants came up with the idea for **online video accessibility tours[28]**. Participants told us about how they attempt to view a station or area with Google Maps street view when planning journeys in unfamiliar places. Having a video or 3D interactive map of different routes and transport modes would support disabled people to assess the accessibility of a journey according to their own support needs and overcome the anxiety of receiving inaccurate information. As with any app to deliver information, keeping accessibility tours up to date and indicating when they were last updated will be important.

[27] Transport for All. 'Rail assistance booking window shortens to two hours' (2022)
[28] Thinks Insight and Strategy/Motability . 'Impact of Covid-19 on disabled people's experiences of transport' (2022)

5. Travel for social connections

Findings from both the literature review and engagement with stakeholders suggests that as a result of inaccessible transport, disabled people are more likely that non-disabled people to make journeys only when necessary. As a result, travel for leisure and social connections is often curtailed for disabled people. This loss of independence and flexibility to travel for a variety of reasons can lead to feelings of isolation[29]. This chapter will explore disabled people's travel for social connections, the barriers faced, existing initiatives in this space, and areas where there is scope for innovation.

5.1 Impacts of barriers to travel for leisure and social connections

Disabled travelers have fewer travel options, receive poorer quality service, experience higher service delivery uncertainty, and must accept more personal and financial risk when travelling. Awareness of these barriers can lead to disabled people deciding not to make the journey unless necessary, with travel for social connections or leisure being most likely to be sacrificed here. Additionally, the lack of provisions for disabled people to travel spontaneously means that travel for social connections must be meticulously planned, limiting the ability of disabled people to make spontaneous plans with friends and family.

Barriers to travel for social connections are felt to have been exacerbated by major global events in the past 3 years. During the pandemic, disabled people's anxiety around travel increased, presenting a psychological barrier, alongside physical barriers of health concerns among those who are immunocompromised[30]. Stakeholders who participated in the research reflect that psychological barriers to travel that became heightened during the pandemic still continue to prevent some disabled people from returning to their pre-pandemic travel behaviours.

> *"I think I would say from a hidden disability/long-term mental health perspective. We stopped travelling during Covid – anxiety linked to travel is much higher. A lot of people are not travelling anymore, longer trips but even train rides, because of that increase in anxiety."*
> *(Stakeholder depth interview)*

In 2023, disabled people continue to be harder hit by the cost-of-living crisis. Due to being more likely to have to cut back on all but essential travel, travel for social connections and leisure are likely to be the first types of travel to go. This

[29] Thinks Insight and Strategy/Motability. 'The Impact of Covid-19 on disabled people's experiences of transport' (2022)
[30] Thinks Insight and Strategy/Motability. 'Impact of Covid-19 on disabled people's experiences of transport' (2022)

compounds existing barriers to travel for social connections, with a psychological impact on disabled people, for example feeling isolated from friends and family.

5.2 Understanding barriers to air travel

In both the literature review and the stakeholder engagement, air travel emerged as a mode of transport this is felt to be particularly inaccessible for people with a range of disabilities, both visible and non-visible. The extensive planning and navigating processes to book assistance and unpredictability of air travel has led many disabled people, particularly wheelchair users, to feel air travel does not accommodate their needs. Barriers include[31]:

- Airlines being unable to store personal wheelchairs in the cabin results in:
    - Anxiety that the wheelchair or other mobility aid will be damaged in the airplane hold or by baggage handlers.
    - Passengers having to wait for the wheelchair to be brought to them after the flight.
- Inconsistency in the provision of aisle chairs on board:
    - Where airlines provide an aisle chair, these often don't allow passengers to self-propel. As a result, passengers can only access the chair when airline staff are available and are unable to maintain independence on board.
    - Where airlines do not provide an aisle chair, wheelchair users are unable to use the toilet mid-flight. There is anecdotal evidence of wheelchair users avoiding eating or drinking the day of a flight to avoid having to access the toilet on the plane.
- A lack of adequately trained airline staff and/or passenger assistance in the airport.
- Long wait times for assistance, particularly once the flight lands, due to a lack of communication between airline and airport.

> *"When an airplane lands, [the airline's] job is done, it's then the job of the airport – it's a poor process between the airline provider and the airport to make sure disabled people are helped off the aircraft and it's a lack of process and communication between two providers. When people want to book a wheelchair user seat or more space some airlines still ask for proof of their disability. It's hard work to get what you need." (Stakeholder depth interview)*

[31] The Guardian. "I have to plan for if I am stranded, if I am dropped, if my chair is damaged': the perils of travelling while disabled' (2022)

While a great deal of the evidence focuses on the inaccessibility of air travel for those with mobility impairments, literature also points to the challenges in air travel for those with learning disabilities and/or sensory impairments. Barriers for this audience include[32]:

- Communication barriers, such as inappropriate visual cues, non-adapted signage and lack of information provision in adapted formats
- Lack of staff training in supporting travelers with learning disabilities and/or sensory impairments
- Excessively noisy concourses and crowds
- Ineffective wayfinding systems

> *"I have an autistic friend who was travelling, and she needed assistance – travelling being autistic, walking around the airport, getting on and off the plane – so much anxiety and over-stimulation and it's really triggering. There should be something, there's nothing available currently."*
> *(Stakeholder depth interview)*

Despite it being a legal requirement to offer passenger assistance free of charge when traveling by air, stakeholders who participated in the research feel short haul flight providers are far less equipped to provide adequate assistance than long haul flight providers. Evidence also suggests that airports and airplanes do not have to adhere to basic accessibility requirements, such as provision of walkways with a minimum width of 36-inches and slopes with a grade ration of one-to-twelve[33]. The resulting variance in airport and airline operator significantly increases the planning burden for disabled people, as discussed in chapter 4. This can also have financial implications as it decreases disabled people's options for air travel, particularly among short haul flight providers, which are more likely to be cheaper airlines.

5.3 What initiatives to alleviate barriers to air travel already exist?

The existing support initiatives outlined in chapters 3 & 4 to support disabled people in overcoming environmental barriers to travel and the planning burden will also support travel for social connections. As such, this section is focused on existing initiatives to support travel for social connection by air travel, as this was highlighted in the evidence as a particularly challenging area of travel:

- **Extension of the 'Passenger Assistance' app (discussed in chapter 4) for use by airline operators[34]:** The app Transreport originally

[32] Cerdan Chiscano, M. 'Autism Spectrum Disorder (ASD) and the Family Inclusive Airport Design Experience' (2021)
[33] Allen, Ahkiya. *et al.* 'Report on the Challenges of Air Transportation Experienced by People with Disabilities' (2019)
[34] Kunzler, J. 'How this app helps UK airports organize assistance for disabled passengers' (2023)

created to support disabled passengers to request passenger assistance across the National Rail network in the UK is being expanded for use by airline operators. While this is still in development and Transreport is working closely with airline operators, the app will allow users to book assistance directly with the airline and receive confirmation. Users will build a profile to give detail on any assistance needs, with the option to provide additional information that a user would like staff to know, as appropriate.

- **Best practice guidelines from the UK Civil Aviation Authority (CAA)[35]:** The CAA outlines the rights of disabled passengers, both in the airport and on an airplane. This includes the right to assistance from the moment a disabled passenger arrives at the airport and covers boarding the aircraft, during the flight, disembarking the aircraft, flight transfers and travel through the destination airport. The legal right to assistance in UK law applies when:
    - You fly on any airline from a UK airport;
    - You fly on an EU or UK registered airline to a UK airport;
    - You fly from outside of the UK or EU to the EU on a UK carrier.
- **Best practice guidelines for airports and airlines from the International Air Transport Association (IATA)[36]:** The IATA works to support international collaboration on best practice across airports and airlines. For example, the provision of guidance on transporting battery-powered wheelchairs safely and effectively.

5.4 Opportunities for innovation

While guidelines and best practice for accessibility in airports and on airplanes exists, there is the opportunity for an organisation to advocate for the adoption of IATA standards and CAA best practices to encourage airline providers and airports to more effectively service passengers with disabilities. Furthermore, advocacy to call for the following measures is needed:

- Ensuring existing measures are applied consistently across airports and airlines
- Ensuring there is appropriate staff training and timely and customer-oriented services for interacting with disabled people
- Making use of technological solutions to provide disabled passengers with choice and freedom to travel on their own terms
- Ensuring airlines efficiently communicate with disabled passengers before and during their travel experience

[35] Civil Aviation Authority. 'Passengers with disabilities and reduced mobility: Your rights in the UK' (2023)
[36] International Air Transport Association. 'Air travel accessibility for passengers with disabilities' (2023)

- Identifying good practice in passenger assistance during disruptions and irregular operations

Additionally, there is scope for innovation in supporting more accessible experiences for disabled people with non-visible disabilities. This could take the shape of working with disabled people to co-create solutions to provision of accessible information and accessing support for those with non-visible disabilities.

6. Future transport

Future transport trends and technologies are largely driven by convenience, sustainability, demand, technological advancement, and international competition[37]. These future transport trends and technologies pose both challenges and opportunities for disabled people. The extent to which they are accessible will depend on how they are designed, developed, and implemented. This chapter will explore changes in infrastructure, the impacts these could have on the future of accessible travel and opportunities for innovation in this space.

6.1 Changing infrastructure and new technologies

Examples of these future transport options include autonomous vehicles (AVs), electric vehicles (EVs), and micro-mobility such as e-bikes and e-scooters. While they have the potential to revolutionise travel for disabled people, they can also create challenges. For example:

Future transport option	Challenges	Opportunities
E-bikes/e-scooters	• When stored incorrectly and left on the pavement, they create a hazard that people could trip over[38]. • They are extremely quiet, meaning visually impaired people are unable to hear them coming and are in danger of being knocked over. • Not all cycle lanes are currently accessible for disabled people (i.e., they have a raised curb).	• Micro-mobility is 'greener' than private vehicles which rely on fuel. As such, it has a potential role to play in future transport, where transport choices are encouraged to be more sustainable by using low carbon electric batteries and energy from renewable sources.[39]
EVs	• They are extremely quiet, meaning visually impaired people are unable to hear them coming and are in danger of being knocked over.	• EVs are a 'greener' transport option than private vehicles which rely on fuel. • EVs may be more cost effective in the long-term,

[37] UKRI. 'Future Flight Vision and Roadmap' (2021)
[38] DIS. 'Accessibility and The Crowded Sidewalk: Micromobility's Impact on Public Space' (2021)
[39] Environmental Innovation and Societal Transitions. 'On the verge of change: Maverick innovation with mobility scooters' (2018)

	• Charging points for EVs are currently felt to be inaccessible.	with cost of petrol a concern.
AVs	• Under current legislation, disabled people who do not currently hold a driving license will be unable to use them – as a driver needs to be able to take over the system when required. • Custom design for people with specific impairments will be necessary.	• AVs could improve the accessibility, affordability, availability of transport because they could have lower operating costs than taxis, cover more ground than public transit, and offer convenient seating designs that meet the needs of disabled people.

"E-scooters and bikes get left on the pavement and turn into street furniture. This becomes a barrier for other people – [visually impaired] people for example getting struck by a scooter on a pavement. I'm not too keen on them because it creates danger for me personally, and street furniture for people trying to walk."
(Stakeholder depth interview)

"It's about how they're implemented, not the tech itself – any tech can be developed sympathetically or unsympathetically, and that makes a massive difference to disabled people." (Expert Stakeholder, Depth Interviews)

6.2 The impact of future transport trends on disabled people

While the technologies explored above come with challenges, this is an area of rapid change and innovation. The Society of Automotive Engineers (SAE) defines 6 levels of driving automation ranging from 0 (fully manual) to 5 (fully autonomous AVs). While vehicle automation currently still requires a legally capable driver to take over the system as required (as automation is currently at SAE level 3), research is being done to further the automation of private vehicles. People with physical and sensory disabilities are expected to be able to use a private automated vehicle of SAE level 4 or 5[40]. This has the potential to remove constraints related to driving and could therefore significantly improve access to opportunities and to the built environment.

[40] Demand for Emerging Transport Systems. 'Implications of vehicle automation for accessibility and social inclusion of people on low income, people with physical and sensory disabilities, and older people' (2019)

Additionally, the move towards greener transport, such as low-carbon technologies and shared transport, also holds potential to improve disabled people's access to travel and transport. Ride sharing companies have the potential to provide quick response and high-quality transport services for disabled and older people. For many users, they have surpassed taxis in terms of cost, reliability, availability, ease of ordering/billing and response time. However, further work with ride sharing companies must take place to ensure companies consider traveling experiences of disabled people, in particular those with mobility equipment and those who are digitally excluded and may not use smart phones or be able to access e-payment options.[41] Unlike taxis and private hire vehicles from licensed authorities, ridesharing companies are not required to have a minimum number of wheelchair accessible vehicles (WAVs) in their fleets.[42] While some ridesharing companies have launched their own initiatives, such as Uber Access (can accommodate electric wheelchairs) and Uber Assist (drivers are trained to give additional support and can accommodate foldable wheelchairs) these services can have long waiting times due to a lack of accessible vehicles in the fleet.

Stakeholders are eager to emphasise that through co-creation with disabled people and co-production with transport experts in this area, there is significant potential for future transport initiatives and technologies to be designed inclusively from the outset. Considering the views and access needs of disabled people at this early stage has the potential to make future transport more accessible and easier to use for everyone.

> *"[The impact of new transport trends and technologies on the built environment can be] both positive and negative – depends how they're implemented and how they make the streets safer for disabled people. How they prioritise moving people around – do they prioritise the vulnerable or the fast-moving?"*
> *(Stakeholder depth interview)*

6.3 Opportunities for innovation

There is scope for Motability and others to innovate in this space, to ensure future transport trends and technologies are accessible for all disabled people. As a rule of thumb, local community buy-in and co-development with disabled people with a wide range of disabilities will ensure new future transport infrastructure lands effectively and doesn't further entrench previous barriers or indeed, create new ones.

[41] University of California Institute for Transportation Studies. 'Examining the Potential for Uber and Lyft to be Included in Subsidized Mobility Programs Targeted to Seniors, Low Income Adults, and People with Disabilities' (2020)
[42] Leonard Cheshire/Motability. 'Driving Change: Improving the Accessibility of Taxis and Private Hire Vehicles for Disabled People' (2023).

There are some specific areas where there is scope for innovation:

- **Custom design for people with specific impairments will be necessary[43].** Custom adaptations to future transport technologies, such as electric, fully autonomous, and/or shared vehicles, will be both necessary and expensive. What's a good solution for one disabled person isn't good for others. There is an opportunity for Motability to consider how they are going to fit custom adaptations to autonomous vehicles in their scheme in the future. For example:
    - For people with physical disabilities, future transport vehicles would need to be wheelchair accessible (e.g., have a ramp).
    - For people who are blind or partially sighted, in-vehicle audible and braille information systems about refuelling and maintenance would be necessary in any AVs.
- **Increase accessibility of ride-sharing apps and services for disabled people, including:**
    - For people with sensory disabilities, vehicle sharing apps need to have accessible features e.g. building on existing smartphones' accessibility features like on-screen magnifier, large text option, VoiceOver and offering seamless access to ride-hailing/sharing services.
    - Shared vehicles would need custom design e.g. multiple wheelchair seating arrangements.
- **Increase the availability and accessibility of charging points for electric vehicles, including:**
    - Research with users with mobility aids on access to charging cables and charging points.
- **Improve infrastructure for e-scooter and e-bike storage spaces so micro modes of mobility don't become street furniture:** including user testing with visually impaired people on pavement adaptations to cue the presence of storage spaces.
- **Ensure that no disabled person is left behind as we move towards an increasingly cashless transport system:** While contactless payments bring potential benefits, such as making transport less anxiety-inducing and reducing the planning burden, they also pose the risk of digital exclusion (particularly in the context of an aging population).

[43] Demand for Emerging Transport Systems. 'Implications of vehicle automation for accessibility and social inclusion of people on low income, people with physical and sensory disabilities, and older people' (2019)

7 Further considerations

Throughout the stakeholder engagement, experts in the field built on and gave feedback on the four themes that have been discussed in detail throughout this report. They also shared additional priorities that they feel are important to consider in the future of transport. These insights are explored further in this chapter.

7.1 Stakeholders' reported priorities

Stakeholders discussed the following themes as priorities for the future, as well as those they feel Motability could have a role in elevating and taking forward:

- **Ensuring a systems focus rather than a modal focus:** We know that planning door-to-door journeys is a significant burden for many disabled people, as public transport is unlikely to bring you straight to your destination or home. Stakeholders advise that potential solutions to transport barriers should take a zoomed out approach wherever possible to consider how they can support an door-to-door journey, including the elements that take place before you even start a journey, such as planning and booking.

  "The focus is really modal but a journey isn't like that. We need to consider the door-to-door journey. It's also planning and booking." (Future facing workshop)

- **Prioritising rural locations:** It is well-known that rural locations are the least well-served by public transport. Stakeholders are interested in localised solutions that work with disabled people in local communities to understand the needs of this group. This is felt to be particularly important in the context of the current cost-of-living crisis, as people look to reduce private car use.
- **Partnerships with transport operators in the process of renewing fleet infrastructure:** As in the example of Mersey Rail's new rolling stock detailed in Chapter 4, stakeholders suggest looking for opportunities where transport rolling stock is to be renewed and being a part of this. As much of UK transport infrastructure reaches an age where operators will be planning for renewal, this presents an opportunity to ensure disabled people are part of this conversation and designs are co-created with them.

- **Maintaining a focus on adoption:** Stakeholders are eager to emphasise that a great deal of research has been conducted in the accessible transport space, with the expert community feeling there are many known solutions to barriers disabled people face in accessing transport. The real need is therefore felt to be a body to help push towards implementation and adoption of solutions, to ensure the sector is taking advantage of existing solutions.

"The shelves are already groaning with proved solutions, we need to get people to use stuff we already know works. There is will, there is intention, there are solutions, there are skills but there isn't consistent implementation." (Future facing workshop)

- **Thinking about where artificial intelligence (AI) will sit in the future of accessible travel:** At present, there isn't a great deal of research on the impact AI may have on the future of travel. As this conversation grows, stakeholders are enthusiastic that disabled people are a part of this conversation and that solutions involving AI are designed to be inclusive from the outset and avoid retrofitting accessibility considerations as an afterthought. Stakeholders also emphasise that people who are digitally excluded also need to be considered in this conversation, so as not to add to the barriers this audience already faces.

"I don't think we have any idea the impact AI will have. There is the potential for journeys to be optimized, even to a personal level." (Future facing workshop)

7.2 Opportunities for innovation

Stakeholders also recognised additional areas for innovation, beyond those details in chapters three through six, where they feel Motability has potential to have an impact. These include:

- **Sharing experiences from adults who have been supported to travel autonomously:** Stakeholders speak highly of organisations and programmes that support disabled adults to travel independently, where appropriate. Particularly for adults with learning disabilities, this can be a learning curve but carries a high reward of greater independence. Stakeholders would like to see these initiatives celebrated and feel there are opportunities to partner with those conducting work in this area to roll programmes out across the UK and inspire other disabled adults to take part and work towards independent travel, where appropriate.
- **Consider partnerships outside the transport sector to have a more holistic view of the impacts on disabled people's travel experiences:** For example, working with environmental organisations to understand how air pollution impacts disabled people when travelling. For instance, this can be a significant barrier to taking part in active travel for those with lung conditions.
- **Taking a policy position and advocating for change at higher levels of government:** Stakeholders are looking for an organisation to speak on the cause of accessible travel and feel that Motability are in a unique position to take this forward. Motability are seen as having influence in this area, due to their relationship with the Government regarding use of PIP benefits in the Motability Scheme. As such, Stakeholders feel

Motability has the opportunity to be a strong voice in this area, driving policy change and focusing on the implementation of solutions.

"We fall in love with the problem, not the solution. We need to focus on policy change, be a policy driver aligning with government and influence." (Future facing workshop)

8 Conclusions

Throughout the research, a number of themes were identified as key areas for future innovation:

- **Air travel** is felt to be particularly inaccessible for disabled people. Throughout both the literature review and stakeholder engagement, air travel was felt to be difficult to plan for and levels of support unpredictable and inconsistent. At best, air travel can be anxiety producing for disabled people and at worst, it can reduce one's independence and potentially damage mobility equipment that a disabled person relies on.
    - There is felt to be a great deal of improvement needed here, in ensuring there is adequate infrastructure and appropriate staff training for airlines and airports. While there are standards for best practice in accessible air travel, there is felt to be a gap for an organisation who can represent and include the views of disabled people in this space.
- There is the opportunity to **partner with transport operators who are planning to refresh their rolling stock** in the near future. Infrastructure changes are costly and time-intensive, so seeking out partnerships to be involved in a refresh when it is planned is much more likely to make this offer appealing to transport operators.
    - This is a time when real change can happen, and taking the opportunity to seek out partnerships with transport operators now will reap rewards when rolling stock is refreshed.
- **Considering the entire journey** and avoiding a purely modal focus will be important in designing door-to-door transport solutions for disabled people. Beginning with planning a journey, supporting tools that will empower disabled people to plan where they can go (rather than a focus on where they can't) and navigating multiple transport types with the provision of timely and accurate information will have a significant impact on the psychological impacts of inaccessible transport.
    - Calls for a systems focus prioritise the door-to-door journey and there is a need for an organisation to help join up working across different transport types and support this goal.
- The **future of transport** is an exciting area and the literature details innovations in electric vehicles and autonomous vehicles and stakeholders discuss the potential future impacts of artificial intelligence. Across these areas, it will be important to ensure disabled people are involved in conversations and solutions are co-created with those with lived experience of disability.

Additionally, across any area of innovation taken forward, these cross-cutting themes are also important to remember:

- **Co-production with disabled people:** stakeholders emphasise the diverse nature of the disabled population, where a one-size-fits-all approach is unlikely to be effective. Creating solutions *with* disabled people, rather than *for* disabled people, is much more likely to take these variations into account.
- **Collaboration with those with knowledge in this space:** the breadth of expertise in this area is evident from both the literature review and stakeholder engagement. There are many actors working in this space and across each priority area below, we detail what innovations already exist. Seeking opportunities to collaborate could be a very effective way to support a sector where there is felt to be a great deal of innovation, but difficulties following through to implementation.
- **Localised initiatives:** alongside collaborating with experts in the accessible transport sector, co-creating transport solutions with local communities, and disabled people within the community, is likely to lead to results that better serve the unique transport needs of the local area.
- **Support for implementation:** working with experts and organisations in this space to support the implementation and adoptions of transport solutions that have already been developed, as many feel the barriers and challenges are well known and what is needed is support for policy change to aid in implementation of well-evidenced solutions.

Appendix 1 – methodology in detail

Our approach to this project combined a detailed literature review of relevant sources, interviews with experts in the disability space alongside a future focused workshop with experts in the transport space.

Literature review

Selecting themes for the review

As discussed in the body of this report, we worked collaboratively with Motability to group and refine a long-list of theme areas, to reach the four themes discussed in detail in throughout this report. The long-list of theme areas is below:

Broad theme area	Sub-theme area
Improve the quality of research and evidence base in relation to disability and transport	
Amplify user voice and what works in inclusive transport	
Community transport	
	Improving and expanding community transport
	Volunteer driver schemes
	Door-to-door transport
Public transport	
	Solutions to address negative behaviour and attitudes of staff and passengers
	Solutions to decrease the planning burden, including improving access to information
	Improve reliability and consistency of experience
	Support confidence in use
	Improve the smoothness of inter-modal transport experiences
Private travel	
	Access to and experience of private hire vehicles and taxis
	Access to short term car-rental of accessible vehicles
	Reduce barriers for disabled drivers and would-be drivers
Active travel	
	Enable better access to active travel options
	Support confidence in use
Access to social connections and well being	
	Facilitate more discretionary leisure travel
	Support holiday travel

	Assess barriers to using air travel and interventions to address these barriers
Access to equipment	
	Access to appropriate, quality and affordable mobility aids or assistive equipment i.e. mobility scooters, wheelchairs, other mobility aids
Access to environments	
	Reduce built environment barriers
	Solutions to built environment barriers
Access to opportunities	
	Support access to employment through improving the quality of transport
	Support access to education through improving the quality of transport
	Support access to healthcare through improving the quality of transport
Future transport	
	Support development/adoption of autonomous vehicles as new transport options for disabled people
	Ensure disabled people's needs are met in the shift to a greener transport system
	Innovations in technology in transport
	Innovations in shared and micro-mobility (i.e. e-scooter, e-bikes)
	Other future transport areas
Cost of living	
	Assess the impact of the cost of living on disabled people in relation to transport

Selecting sources for the evidence review

When selecting sources for review, we first consulted a list of sources compiled by Motability, before supplementing this with publicly available sources found through search engines such as Google Scholar. We took an iterative approach to building our source list, regularly discussing with Motability which of the theme areas to focus on.

As Motability were interested in changes since 2020, we aimed to review only sources published after 2020 (some from 2019 have been included in this report as they were particularly relevant). We also assessed relevance and quality of the sources, focusing on sources from the UK, and sorted them by the broad theme areas outlined in the above table.

In total, we gathered 138 sources covering 12 theme areas, and selected 43 of these for a closer review. Our robust source list includes a mixture of empirical data, research papers, charity reports, thought leadership articles, evidence assessments and media articles.

We decided which sources to prioritise for review according to:

- Topic area, ensuring a good spread across each of the priority areas Motability wanted to focus on;
- Geographic relevance, with a focus on data from the UK and Europe;
- Date of the research, prioritising the most recent sources to ensure relevancy.

Analysing sources to write the evidence review

We then applied a rigorous protocol to analysing these sources using a structured evidence grid in Excel.

The evidence grid was organised by theme area. This allowed us to easily filter for all the relevant information for each specific theme area across all the sources. This enabled us to systematically identify commonalities, differences and gaps across the dataset, including the prevalence of any key patterns.

The grid was populated throughout the research process by all members of the team in a live document. This ensured the team had oversight of the full set of sources, enabling us to draw our findings and conclusions from a complete dataset instead of team members only engaging with a limited set of sources individually assigned to them.

The grid was regularly reviewed by the team as the project progressed and formed the basis of brainstorming discussions about the findings. This regular review allowed us to critically analyse the evidence in the literature, identify themes and opportunities for innovation as the project evolved.

Expert Interviews

We conducted six 30-minute interviews with experts within the disability space. We worked with Motability to build a sample list of these experts.

During interviews, the experts spontaneously voiced what they consider to be key areas for innovation in transport, and were then prompted on Motability's specific areas of focus. We used a short discussion guide covering the initial longlist of key themes relevant to the research question (grouped broadly by barriers faced, existing initiatives, and areas for innovation). Since we were conducting interviews concurrently with the evidence review, we were able to explore the themes of focus in the review with stakeholders, as well as identify any gaps of additional areas to explore. We also used the expert interviews to snowball sources that covered gaps we identified during our literature review.

Future Focused Workshop

After the two initial stages of our research, we carried out a 2-hour Future Focused workshop with seven experts in the transport space, to hear about the future of transport outside of the accessibility-focused space. We were looking to speak to transport experts who do not necessarily have a disability focus, to gain a broader understanding of trends in transport that will inevitably impact disabled people and accessible transport. We approached both academic and industry experts.

Using a similar approach to the interviews, experts were given the opportunity to voice what they consider to be key areas for innovation in transport – especially emerging issues, trends, and technologies. As in the interviews, the experts were then prompted on Motability's specific areas of focus for innovation. We used a short discussion guide covering the whittled down shortlist of 10 key themes relevant to the research question.

The objectives of this session were:

- To ensure the research considers broader trends in transport – which will inevitably impact disabled people.
- To ensure the research takes a wide spectrum of stakeholder views into consideration.
- To understand any issues that will impact travel and transport for disabled people in the future.
- To encourage 'disruptive thinking' (i.e., challenge what we think we know about the transport space) to aid innovation.

Appendix 2 – Source list

The sources included in this sources list are those reviewed in detail in the evidence grid and referenced throughout this report.

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