Best practice in engaging disabled people in cycling for active travel: review of literature

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Introduction

The literature review outlined in this document forms part of a wider research project conducted by Cycling UK, for which the overall objective is to develop and share evidence-informed best practice recommendations on how inclusive cycling centres can enable disabled people to access active travel options and cycling as a mode of transport. This research is being conducted alongside Cycling UK's Inclusive Cycling Experience (ICE) project, funded by the Motability Foundation, which aims to support disabled people in Manchester and Inverness to access cycling through free try-out sessions and loans of a range of standard and non-standard cycles and e-bikes. The first stage of the research was to conduct a review to collate and synthesise existing evidence to understand what is currently known around engaging disabled people in cycling as a form of active travel.

Background

Around 16.1 million people in the UK are disabled, representing 24% of the total population (based on data from the Family Resources Survey 2022-2023, Department for Work and Pensions, 2024). There is clear evidence of huge disparities in access to transport amongst disabled people in comparison to non-disabled people, and particularly in access to cycling. Research by Transport for All (2023), including a review of literature, a series of workshops and a survey completed by over 500 people, found that disabled people face barriers to all forms of transport (including public transport, private transport and active travel), and as a result make roughly 30% fewer journeys across all modes of transport than non-disabled people. As stated by Transport for All *"for disabled people to truly be equal members of society, this disability transport gap must be closed"* (2023: 6). Most notably, Transport for All showed that disabled people rated cycling as the most inaccessible of all modes of transport, rating their experience of cycling as 0.62 out of 3, and with only 4% of respondents saying that they could cycle with ease, while 41% said they could not cycle at all.

Sustrans and Arup (2020) report that 9% of disabled people cycle at least once a week, in comparison to 17% of non-disabled people, and 78% of disabled people never cycle. A study examining Sport England's Active People Survey data (Goodman and Aldred, 2018) shows substantial inequalities in relation to gender, age, disability, and ethnicity for both leisure and utility cycling amongst English adults, finding that 3% of disabled people in England cycled for utility purposes in the previous four weeks, compared to 7% of non-disabled people. For disabled people, cycling has the potential to improve transport opportunities by providing a direct, autonomous, door-to-door means of

transport (Berent et al, 2021). In addition, cycling can bring wider wellbeing benefits with potential to improve the independence and the physical and mental health of many disabled people (Inckle, 2020), who are twice as likely to be inactive compared to non-disabled people in England (42% compared to 21%) (Sport England, 2018).

In 2017, Clayton et al. described that disability was an under-researched area within cycling studies, and called for further research to understand better the range of different contexts in which disabled people are cycling, particularly for transport purposes, and what the specific requirements might be. They argued that this would improve inclusivity in cycle infrastructure plus help to develop guidance for designers and promoters of cycling. Similarly, a systematic review of evidence around interventions aiming to promote active travel (including cycling, walking or wheeling) noted that, across all included studies, there was very little consideration of disability, and when included this tended to be in the context of older or retired adults only (Roaf et al., 2024). The present research by Cycling UK intends to build an evidence base to help understand what would better enable disabled people to cycle for transport. This will contribute to wider evidence around what makes cycling accessible.

Review aims and methodology

The specific aim of the literature review is to understand the existing insight and guidance, plus identify any gaps in the existing evidence and areas for further exploration in the subsequent empirical research. The broad research questions explored in the literature review included:

- What are the barriers and enablers for cycling as a mode of transport for disabled people?
- What lessons can be learnt from cycling interventions with a focus on active travel?
    - What works – examples of delivery and success factors?
    - What doesn't work – examples of challenges?

After defining the aims and research questions for the literature review, the next step was to conduct a comprehensive search for relevant sources. The search encompassed both academic literature and grey literature (including unpublished reports and commissioned research). This involved scanning academic databases, conducting Google searches, and reviewing the websites of disability, cycling, and active travel organisations. All identified literature was screened by reviewing abstracts, executive summaries, or introductions, with papers deemed irrelevant to the review aims excluded. Remaining papers were downloaded, read in full and critically examined to synthesise the key findings.

It should be noted that this review is focused primarily on how to engage disabled people through interventions using current infrastructure. There are many examples in the literature of where policy or infrastructure developments are suggested to have positive impact on enabling disabled people to cycle, with a strong and compelling case for campaigning for funding and policy support for active travel. However, this project focuses on what can be done in the shorter and medium term through inclusive cycling centres and the provision of inclusive cycling sessions and programmes, and the provision of hire and loan of non-standard cycles.

As Clayton et al. (2017) found, this review has confirmed that there remains a gap in literature around engaging disabled people in cycling, in particular on how interventions which aim to engage disabled people are delivered and what can be learnt in this area. As a result, in the absence of extensive literature specific to cycling, the review also incorporates some insight from wider literature around interventions for disabled people beyond cycling, including other forms of active travel plus wider sport or physical activity interventions. This literature provides some additional valuable learning and considerations around engaging disabled people. The existing literature is mostly based on research which uses cross-sectional surveys or qualitative interviews or focus groups with disabled people, and those delivering interventions. There is a predominant focus in the literature on identifying the barriers and facilitators to participation in cycling or other forms of activity, sport and leisure amongst disabled people. Some unpublished reports are guides or manuals, aimed at those involved in the design or delivery of interventions, and which are envisaged to enable the planning of more effective interventions and programmes.

Structure of this report

The following sections outline some of the key learnings from the literature and make recommendations around what would help to both engage disabled people in cycling, and to sustain their participation. In particular, the literature demonstrates that the process of designing a successful intervention should extend beyond the actual delivery of sessions themselves, and includes a need to:

1. Fully understand and appropriately target participants.
2. Communicate and engage effectively.
3. Deliver appropriate and effective sessions.
4. Be run by people with skills and training, and in partnership with other local organisations.

Definitions

Throughout this report, the term 'disabled' is used to refer to anyone who faces access barriers due to a physical or mental impairment. The terms 'cycling' and 'cycle' are used to refer to journeys made on all types of cycle including two-wheeled pedal bikes, e-bikes, trikes, handcycles, cargo-bikes, recumbents, and tandems.

Inclusive and preferred language

It is important to note that this literature review uses some sources that do not use inclusive writing or preferred language around disability. When discussing and summarising these sources, preferred language has been used, however there are some examples of quoted text which have been written as verbatim in their original format. All quoted text appears in italics and the sources are referenced.

1. Understanding and targeting participants

In 2011, the Department for Transport produced a good practice guide for delivering inclusive cycle training, outlining a number of suggested steps for delivery. The first steps were:

- ***Do the groundwork:*** *Instructors should ensure they have a good understanding of delivering cycle training to disabled people, and should carefully prepare the delivery of training sessions based on that knowledge.*
- ***Understand the needs of trainees:*** *Knowing who will be in a training session, and understanding what specific or additional needs they have, will be crucial to helping instructors provide a safe, controlled, effective and enjoyable cycle session.*
- ***Delivering training:*** *One-to-one or in a group? The decision of whether to teach a disabled person on a one-to-one basis or in a group is critical as it can determine how effective the training is for the individual and the rest of the group.*

(Department of Transport, 2011)

Although this guide relates specifically to training, and was published a considerable time ago, the current literature more broadly related to cycling sessions and programmes is similar. It also suggests the need for spending time, in advance of setting up an intervention targeted at disabled people, doing groundwork, and developing a full understanding of the needs of the people in

which the intervention is targeting. This includes understanding the barriers and enablers to cycling for disabled people and effectively consulting with people on how best to design and deliver the activity to meet their needs, wants and interests. This also includes developing an understanding of wider factors that will impact upon participation.

Understanding barriers and enablers to cycling

The literature shows that there is significant latent demand to be physically active in general amongst disabled people, with the Activity Alliance (2023) annual disability and activity survey showing that disabled people were more likely to say that they wanted to be more active compared to non-disabled people (77% versus 54%). These figures had not changed since 2019 with the challenges of the Covid-19 pandemic preventing progress. The Activity Alliance found, through workshops conducted with disabled people, that people felt they now had less choice of suitable and accessible ways for them to be active due to facilities or sessions not reopening or reaching disabled people after the pandemic, having less support, restrictions on opening times or bookings, and finding it harder to afford the costs associated with being active.

Whilst the Activity Alliance research relates to participation in sport and physical activity in general, research from Wheels for Wellbeing (2021) also highlights that the pandemic had a range of impacts on disabled people's participation in cycling. Through a survey conducted with 245 participants (in which just over 82% of respondents were disabled people and nearly 14% responded on behalf of a disabled person), Wheels for Wellbeing found that 39% cycled more or began cycling for the first time during the pandemic, and just under one third (28.75%) cycled less. Reasons for decreased cycling included the closure of inclusive cycling centres, as well as pop-up infrastructure that blocked access. Hostility from road-users and members of the public also deterred many disabled people from cycling during this time. On the other hand, some other people cycled more, or for the first time, because of the quiet roads, new accessible infrastructure or a lack of other transport or exercise options. Wheels for Wellbeing found that the main reasons disabled people cycled were for leisure, exercise and mental health. Just over half cycled for general transport – especially where other forms of transport were inaccessible. The most frequent barriers to cycling that respondents encountered were inaccessible infrastructure (53.28%), lack of parking or storage for their cycle (34.93%), and the cost of a cycle or adaptations (32.75%). Other barriers included not being able to access cycle hire or an inclusive cycling session. Nearly one quarter (23.68%) reported being the target of abuse and hostility and a similar number (25.32%) cited concerns about benefit penalties if they cycled (concerns over Department for Work and Pensions' disability benefits being stopped because

they might be deemed 'too active' if they cycled – discounting their disability status).

Similarly, the Transport for All research (2023), described earlier, also found a wide range of barriers to cycling for disabled people, reflecting the low experience rating that participants gave cycling as a mode of travel. The barriers to cycling were often so prohibitive that they prevented people from cycling altogether. Barriers included lack of accessible or safe infrastructure; access to suitable cycles (cycles being too expensive and there not being enough opportunities to hire cycles); and a lack of cycling skills and confidence plus a lack of adult sessions to help people to improve their skills and confidence. 21% said that they didn't have the skills or confidence to be able to cycle safely. Financial barriers prevented 13% of respondents from accessing a suitable cycle or storage space. Non-standard cycles in particular can be prohibitively expensive due to their engineering complexity and customisation requirements (Cycling UK, 2024). Transport for All found that 18% of respondents were impacted by a pervasive belief that disabled people cannot cycle. Sustrans and Arup (2020) found that 23% of disabled people think cycling is not for people like themselves, in contrast with 11% of non-disabled people. A further key barrier to cycling for disabled people is described in some literature as being the perception of cycling as being unsafe and dangerous, and as an activity for 'sporty' and physically 'strong' people, characteristics stereotypically not associated with disabled people (see for example, Aldred, 2013; Daley and Rissel, 2011; Inckle, 2019).

The most important enablers to disabled people cycling identified by Wheels for Wellbeing (2021) were accessible cycle infrastructure, subsidies for non-standard cycles, recognising cycles as mobility aids and reducing the speed and quantity of traffic in residential areas. Qualitative responses emphasised the need for safe and supportive cycling environments, ranging from specialist inclusive sessions to segregated and off-road provision, quieter streets and the re-education of drivers. Many respondents also highlighted the need to use their cycles on a range of public transport services in order to enable them to make more journeys, including multi-modal trips.

Understanding different needs

The literature demonstrates some differing access needs, requirements and interests when it comes to sports participation amongst disabled people. For example, Sport England and the English Federation of Disability Sport (EFDS) (2016a) conducted research with people with a range of different health conditions or impairments. They found that some individuals with predominantly mental health, learning or cognitive impairments preferred smaller classes or one-to-one sessions. For those that have visual impairments, individuals were

more concerned about having somewhere appropriate that they could leave their guide dog and having someone available to guide them around the venue or equipment in advance. Individuals who have hearing impairments would like to be able to communicate either via an interpreter or online to state their individual needs, and to agree appropriate signals with the instructor beforehand.

Despite some differing access needs and requirements, the research predominantly finds that disabled people prefer sessions which have a broad focus to cater for a range of disabilities, rather than those which focus on one particular disability alone (Sport England and EFDS, 2016a). There is a preference to be involved in an inclusive session which caters for a range of needs and provides equal opportunities to participate. This approach requires instructors to be able to fully support a range of different needs. Sport England and EFDS encourage deliverers to have conversations with individuals about what they can do and what they need help with and provide resources to enable staff to understand an individual's abilities, access needs, and the reasonable adjustments that can be made. This approach does not require deliverers to have a full in-depth knowledge or understanding of different disabilities or health conditions, but rather to be able to work with different individuals to understand what their needs and preferences are and how cycling can be made accessible to them.

Similarly, Women in Sport and Get out Get Active (2018) conducted research with older inactive women (nearly all of whom had a disability or life-limiting health condition), asking questions around the barriers and enablers to physical activity that they faced, and what would encourage them to become more active. The research, titled *'Me, not my age or impairment'* found that women did not want to be defined by their age, their impairment or health condition, but wanted sessions that were open and accepting, with all abilities welcomed. The women were described as independent and wanting to have control over their own lives.

This approach to delivery is consistent with the *'social model of disability'*, a theoretical approach which presents people as disabled by barriers in society, not by their impairment or difference (outlined, for example, in the work of Oliver, 1996). This approach focuses on the removal of barriers to accessibility and improving equality and inclusion within society. This is in contrast to the *'medical model of disability'* in which individuals are described as being disabled by their impairments or differences, often placing low expectations on disabled people and leading to a loss of independence. Carbonneau et al. (2017) describe a need to focus on a person's capabilities rather than their limitations. The literature overwhelmingly shows that an approach to any intervention which takes account of people's needs and differences and works to remove barriers is likely to be

more successful for empowering and engaging disabled people. Thus, in a practical situation it is not necessary to have experience of or fully understand different impairments or long-term health conditions. Instead, it is more important to understand the factors which prevent disabled people from taking part in cycling and what can be done about these.

Understanding other demographic characteristics and intersectionality

Similarly, there is also a need to consider other demographic characteristics and backgrounds which impact upon propensity to cycle. Other demographic groups that are underrepresented in cycling include minority ethnic groups, women and older people (defined as aged 65 or over). Data shows that most people who cycle in the UK are male and aged between 17 and 49 (Department for Transport, 2018). Sustrans and Arup (2020), in *'Cycling for Everyone'* describe a need to promote cycling as an inclusive activity open to all and develop a culture that makes cycling feel attractive and relevant for everyone. They call for campaigns which help to normalise cycling by showing it is for everyone, and for support and training for women, disabled people and older people to build their confidence in cycling. They also note the need to make cycling accessible for people that do not have access to employment or who are financially struggling.

Other literature highlights the need to understand individual needs and the different barriers faced by people on an individual level, following a process of understanding intersectionality – the ways in which different aspects of someone's identity overlap and shape an individual's experience. For example, Women in Sport and British Blind Sport (2016) argue that there is no ideal offer for visually impaired women because every woman is different, and there is a need for a personalised approach and to understand visually impaired women as individuals with different personal circumstances and lifestyles, rather than someone who is simply blind or partially sighted.

Gaining participant feedback

As part of the approach to understanding individual needs, the literature shows that successful programmes are designed in conjunction with participants to fully ensure that they meet both needs and interests. Knowledge of the factors that influence participation from the perspectives of the participants themselves provides information that can be used to design services. The Activity Alliance (2023) states that engaging with disabled people is important for organisations and deliverers who want to provide more inclusive opportunities. Meaningful co-design and co-production leads to improved knowledge, ideas, and decision making, as well as services that meet real needs

and provide better experiences for disabled people. They found that only 10% of disabled people have been given the opportunity to influence or design the activities they are involved in. Only 58% of disabled people say it is clear how they can provide feedback on activities they take part in. 81% of disabled people agreed that disabled people should have more of a say in policies that affect them and 33% want to be involved in influencing the types of activities they could take part in.

The EFDS (2014a) suggest the creation of user groups to test future ideas and communications. An example of how this has worked successfully with an intervention is provided by the pilot project Engage-HER, which focused on engaging more girls and young women in sport and creating sustainable experiences (Sported and Women in Sport, 2016). Different organisations were involved in the pilot, including the Knights Wheelchair Basketball Club. In order to engage more women and girls in wheelchair basketball, the club sought feedback from their female members. A user workshop enabled them to identify needs and gain feedback on existing provision and potential improvements - the first action being to test some female-only taster sessions.

Other organisations have similarly worked with disabled individuals to understand their needs and wants in relation to design and development of inclusive sessions. With funding from Motability, Sustrans partnered with Transport for All to conduct the Disabled Citizens Inquiry (Sustrans, 2023), in which they conducted four two-day workshops with disabled people across the UK. Disabled people shared their experiences, explored barriers, and worked together to suggest and design solutions for change. Participants were selected from different backgrounds, such as different impairment categories, use of mobility aids, ages, genders, ethnicities and socioeconomic backgrounds to ensure there was good representation of a range of demographics.
The Activity Alliance (2023) research with participants outlines some tips on co-production from the perspective of disabled people:

- *Include a range of people, not just established voices – proactively seek new people and different experiences.*
- *Good, inclusive engagement requires skills and resources – not an afterthought or tick-box exercise.*
- *Show people you value and respect their contribution, sharing their lived experience, and their skills and expertise. Show how working together has led to change.*
- *Use it to make sure resources are spent on initiatives that are accessible and meet a real need.*

Understanding and targeting participants – key points

- Decide who the intervention is targeting – make this clear. An inclusive session which caters for all is likely to be more popular than sessions catering only for specific group(s) of disabled people.
- Whilst it may not be possible in the short term to change some barriers (for example, infrastructure), understanding the ways in which these barriers impact upon individuals, and what changes are realistically possible to help people to consider cycling as an option is important.
- It is less important for deliverers to understand the specifics of the disability and / or health condition(s), but more important to understand what barriers people face and how these can be overcome - take time to understand the needs of the participants and what can be done to make cycling accessible for them.
- Bear in mind other demographic factors beyond disability which can also impact upon ability to participate – recognising everyone is different.
- Work with participants themselves to develop and design sessions that work for them and gather their feedback.

2. Effective communication and engagement

Once a target audience has been identified and preparatory time has been taken to understand the needs of that audience, the next step is to make sure that communication or marketing materials reach the relevant people and that the messages provided are the right ones. The Department for Transport guide to delivering cycle training to disabled people (2011) highlights that effective communication is key to the success of any training session and that methods for communicating must reflect the needs of the trainees. The current literature suggests a need to provide as much information as possible about the sessions. There should be full consideration of effective communication both prior to sessions and during an initial session or initial contact for effective first impressions.

Effective marketing and communication

Jaarsma et al.'s (2019) research examines how to improve communication of information about physical activity opportunities for disabled people, and involved interviews with 48 disabled people, 34 carers and 12 session facilitators. The authors argue that to be able to successfully target the appropriate audience, it is important for organisations to know why people want to become physically active. They argue that there is an importance in tailoring

messages to suit the target audience, using credible messengers, and using effective methods to deliver messages. Also, disabled people might need more specific information about where the activity is taking place, who can attend (i.e. age, impairment specific), and the level of the opportunity. Jaarsma et al. suggest that it would be useful to promote physical activities through interactive resources such as social media and practical demonstrations where people could ask questions or be able to receive follow-up information, although the findings also indicate that there is not one channel that works best in promoting physical activity. For example, depending on age, disability / impairment and preference, disabled people will use different resources at different times. Therefore, even though social media channels have become more important resources to distribute information in recent years, they encourage organisations to also continue using more traditional resources alongside social media.

In relation to sport and physical activity generally, the Activity Alliance (2023) state that disabled people are half as likely to see *'people like me'* both playing and working in sport and activity. An analysis of over 50 London transport and cycling strategy documents by Andrews et al. (2017) showed that this is also the case in relation to representation of disabled people in cycling. The authors looked at the representation of disabled people in both image and text. They found that broader transport related documents and strategy documents would normally present disabled people as public transport users or pedestrians, rather than as cyclists, and those documents that related specifically to cycling also rarely showed non-standard cycles. They call for measures to improve the overall visibility of disabled cyclists through imagery and language and argue that the more images of non-standard cycles made available and in circulation, the more likely it is that a disabled person will come across them and be encouraged to discover more. The same principle can be applied to an increased number of references made to disabled people as cyclists.

Wheels for Wellbeing (2020) similarly call for cycling language and imagery to become more inclusive - using more images of non-standard cycles and actively acknowledging the fact that cycles are sometimes used as a mobility aid. They highlight that the terms 'bicycle' and 'on two wheels' can exclude anyone who does not ride a two-wheeled cycle and reinforces the assumption that cycling can only be done on two wheels. They therefore argue for the term 'bicycle' to be replaced by 'cycle' in any cycling-related communications.

Using feedback from disabled people, the EFDS, in the report *'Talk to me: Understanding how to increase participation in sport and physical activity amongst disabled people in the UK'* (2014b) set out key principles sport and physical activity providers can follow to improve their offer to disabled people

and make it more appealing. The principles are grouped into three categories, representing three steps providers need to take to improve their offer, namely drive awareness, engage the audience, and offer support and reassurance. The report and its' principles continue to be widely used across the sector including by a variety of sport, physical activity and disability organisations. The three steps and the principles of each are outlined below.

Step one: Drive awareness

- *Principle one: Use the channels I already trust. For example, social media, local media.*
- *Principle two: Stay local to me. Travelling is a barrier and most prefer opportunities close to home.*

Step two: Engage the audience

- *Principle three: Don't lead with my impairment or health condition. Many people do not identify with being disabled and are put off by advertising that focuses on disability.*
- *Principle four: Talk to as many of my values as possible. Understanding values and linking activities to these can make taking part more appealing.*
- *Principle five: Continue to fulfil my values in new ways. Keep me interested over time through new ideas.*

Step three: Offer support and reassurance

- *Principle six: Reassure me I'm going to fit in. Reassure me that activities will be suitable for my needs.*
- *Principle seven: Make me feel I can do it.*
- *Principle eight: Make it easy for me to tell you my needs. Listen to me.*
- *Principle nine: Ensure my first experience is good. Make me feel welcome and included.*
- *Principle ten: Encourage me via existing advocates. Engage disabled people that are already involved to promote to others.*

(EFDS, 2014b)

A later guide from Sport England and EFDS (2016b) builds on the *Talk to me* principles and describes the importance of considering the most appropriate messages in publicity materials and images, based on who the programme is targeting. The guide suggests that messages need to be clear and accessible but provide enough information so that participants are fully informed about what the session involves. The messages and images also need to get across the idea that the activity is relevant to disabled people without making them feel labelled. Messages need to reassure them that their needs will be taken into account by acknowledging that everyone is different rather than singling out those with impairments or health conditions. Therefore, they suggest that rather than advertising as *"activities suitable for people with disabilities"*, for example,

the wording could instead describe *"flexible activities adapted to your abilities"* (Sport England and EFDS, 2016b: 17).

Positive first impressions

Another important aspect of communicating with disabled people and encouraging them to attend was to offer opportunities for people to view the session beforehand to help them decide whether they might be comfortable with it. This may also include building in time before a session to allow for an informal, preliminary meeting with the instructor and potential participant. This allows participants a confidential time to share their concerns and expectations, reassuring them that they will be supported and looked after. It also provides an opportunity for the instructor to familiarise themselves with the needs of the participants and to tailor the activity accordingly.

It was suggested by Women in Sport and British Blind Sport (2016) that a good induction and tour of any facilities can help visually impaired women overcome confidence issues and safety concerns. Positive first experiences can encourage visually impaired women to return and make attendance a habit. They also encourage deliverers to record the participant's requirements and share with other staff members (where appropriate and permission has been given) for future reference so that participants do not need to continually re-state their requirements. British Blind Sport (2014) also describe that it may take a few visits for visually impaired people to feel comfortable with the facility and the surrounding environment. They suggest that deliverers should describe the venue in promotional literature.

Sport England and EFDS (2016b) outline four things to help ensure a positive first experience:

- *Actively suggesting first timers come and watch or take a sneaky peek on YouTube / social media sites, at a pre-recorded class.*
- *Providing an opportunity to talk privately with, or email, the instructor / organiser before the session.*
- *Ensuring a session is run so that it is totally acceptable to rest, sit down and watch, or leave and re-join the class.*
- *Let individuals know in advance if support will be available, or if they can bring their own.*

Effective communication and engagement – key points

- Taking steps to understand and consult with the audience (as outlined in the previous section of this report) will help to highlight the most appropriate methods of communication and engagement.

- Use the *Talk to me* principles – consider how to raise awareness, how best to engage participants and speak to their needs and wants and offer support and reassurance that the programme is accessible for them.
- Provide as much information as possible so that participants are fully informed about what the session involves.
- Provide opportunities for taster sessions and to observe sessions or meet deliverers in advance.

3. Delivery of sessions

The evidence suggests that the preparatory work outlined in the two steps above will help deliverers to effectively design and market sessions for disabled participants, through having a clear understanding of motivations, wants and needs. Consultation with targeted participants is crucial in order to offer the right approach. In addition, the literature outlines some specific considerations in the delivery of sessions, through a number of papers which describe successful 'models' of delivery, and elements which constitute an effective or good quality experience. The Department for Transport (2011) guide for cycle training suggests that:

> *"The abilities of an individual with a particular impairment, and the way in which they have adapted to and coped with their condition, will be unique to them. Consequently, the strategies that will be appropriate in delivering cycle training will also be specific to that person and therefore it is not possible to provide generic, clear-cut advice on how to train every individual"* (Department for Transport, 2011: 10)

Indeed, further literature uncovered in this review also shows that there is not a 'one-size-fits-all' approach to delivering any intervention and whilst it is impossible to outline one approach to delivery, rather, this section provides a summary of the key themes and areas for consideration when developing interventions. It includes practical considerations around the accessibility of locations for sessions, session delivery and cycles, and highlights the importance of social interaction and social time in sessions.

Accessibility of location and venue

The prevalence of inclusive cycling centres has helped to introduce some disabled people to cycling. Such centres give disabled people access to cycling and help them find a cycle which is suited to them. The first consideration in delivering opportunities for disabled people is the accessibility of such

centres and / or sessions. Indeed, the Transport for All research found that *"access barriers start having an impact on disabled people before we're even past the front door"*(2023: 21). The majority of survey respondents (62%) reported that they need to plan their journeys in advance 'most or all of the time'. Transport for All described advance planning as being an essential part of many disabled people's transport arrangements. Disabled people explained how access barriers are so pervasive that extensive research must be done, and arrangements made, before setting out, just to ensure the journey will be accessible. This indicates that careful consideration should be made around location and accessibility of facilities.

When attending cycling centres or sessions, participants may need to use a range of methods of transport to get there. Parking should be considered as well as access to public transport. Disabled people tend to be more reliant for day-to-day travel on driving or being driven, either by door-to-door services, such as community transport services, or by taxis and private car hire (Wheels for Wellbeing, 2020). As suggested by Kung and Taylor (2014), through secondary data analysis of the National Benchmarking Service dataset for sports and leisure centres, disabled participants were also more likely than non-disabled participants to travel via public transport. The authors suggest that it may be necessary to provide free transportation to sports centres where there are high proportions of disabled people in the catchment area population, as it is likely that mobility or transport problems are obstacles to their participation. Certainly, British Blind Sport (2014) describe expensive public transport as being a barrier for blind and partially sighted people and point out that the timing of sessions requires consideration, for public transport times do not always suitably align with scheduled activities. While deliverers of sessions cannot control public transport, it is important to consider the impact on provision when planning sessions.

As well as travel to sessions, consideration should be made around physical access to any premises or locations where activities take place. EFDS and Age UK (2012) suggest the need to consider health and safety and carry out a risk assessment according to different impairments and how disabled people will be able to evacuate the building in case of an emergency. Sport England (2024) has produced design guidance notes for consideration and assessment of whether facilities are accessible and inclusive for disabled people. Although this guidance is more applicable to those designing indoor sports and leisure facilities, there are useful sections that those planning outdoor cycling sessions could also consider when selecting locations, including travel and arrival at the location, safe routes from car parks, signage, provision of accessible toilets and changing facilities. The documents highlight a range of important considerations to ensure that facilities meet a wide spectrum of access needs.

Carey et al. (2023), in research with providers of inclusive cycling sessions for young people in Australia, found that providers sought quiet, enclosed spaces, away from car traffic, which were believed to be safer. Flat concrete areas were preferred, offering sufficient space for cycles with a larger turning circle. Factors such as uneven terrain, poorly maintained pathways, tight corners and excessive hills were considered barriers to non-standard cycles.

Flexible approach to delivery

Berent et al. (2021) found that there is a variety of delivery content across cycling sessions in the UK, for example, with some sessions including traffic / road safety education, but others focusing on off-road cycling only; some sessions focusing on cycling for enjoyment and offering a new experience, but others being more structured and focused on skill development and meeting particular skill milestones. Much of the wider literature around delivery of interventions with disabled people outlines a need for sessions to be run in a flexible manner with deliverers demonstrating they are open to accommodating different people's needs. This could include for example, allowing individuals to go at their own pace, or start / stop whenever they like. Sport England and EFDS (2016b) describe that in inclusive sessions, this approach needs to apply to everyone – i.e. not singling out disabled people taking part for special attention. In addition, consideration should be given to the ways in which activities need to be modified to ensure that they are inclusive to a range of access needs. Generally, there was a preference for inclusive activities where individuals could work at the level that suited them. This is also highlighted by Women in Sport and British Blind Sport (2016), who identified barriers which prevent or reduce participation by visually impaired women in sport. They suggest that specific activities designed for visually impaired people, and other disabled people, are not always appealing or even necessary for visually impaired women to participate, and that deliverers could enable visually impaired women to participate by making small changes to existing provision. In many cases, mainstream activities could easily be adapted by recruiting additional volunteers, by making allowances for guide dogs to accompany blind participants, or by allowing a sighted friend to accompany participants for free.

The Bikeability cycle training delivery guide (2023) uses the STEP model (space, task, equipment, people) as a framework for planning an inclusive cycle training session, using four categories to consider ways in which activities might be adapted in line with different needs. These include:

- ***Space:*** *Where will the training or individual activities take place? Can the space be adapted to make way for adapted cycles? Are there any obstacles to remove?*

- ***Task:*** *What will everyone do? Will everyone take part? Can the task be broken down or adapted? Can the activities be sped up, slowed down or varied within the group?*
- ***Equipment:*** *What will you use? Are adapted cycles needed?*
- ***People:*** *What is the range of abilities? Can your group work alone, in pairs or in groups? Are there other adults supporting? What do the riders want to achieve?*

The guide suggests that consent forms should ask about any additional needs to help plan the session, and that objectives should be created together with the rider to find out what they want to achieve. It is recommended to keep speaking with and observing riders throughout sessions to understand how they are finding the training and to be flexible with approach and teaching style.

The importance of flexibility in cycling opportunities for disabled people was further highlighted by Carey et al. (2023), in their research exploring practices to enable young people to cycle in Australia. The research included a survey with health, education and recreation providers that worked with people with cerebral palsy, neurodevelopmental and movement impairments. The study showed that the most important factors were a supportive environment, suitable cycle, and safe place to practice. Sessions needed to be customised to riders' unique needs and goals. Over 65% of those providers surveyed did not have a specific approach to training disabled people to cycle. As opposed to 'traditional' learn-to-ride interventions with two-wheeled bicycles which might be a more intensive practice, more commonly sessions with non-standard cycles were goal-directed and graded to the riders' ability level. The focus was on progressing through customised cycle adaptations and modifications with an emphasis on ensuring a comfortable, safe, and enjoyable riding experience.

Access to cycle loans

Whilst many disabled cyclists can use a standard two-wheel bicycle, some require a non-standard cycle which is typically wider and longer than a traditional cycle. The literature suggests that there is a demand for increased access to cycles amongst disabled people. Sustrans' Walking and Cycling Index (2024) found that 27% of disabled people do not cycle but would like to, and 25% of all people surveyed said that access to a non-standard cycle, such as a tricycle or a handcycle, would help them cycle more. Transport for All (2023) asked disabled people what improvements could be made to make cycling more accessible to them. The responses fell into two categories – firstly, improvements to infrastructure, and secondly, access to cycles. In terms of access to cycles, disabled people were more likely to want opportunities to hire cycles rather than to than buy cycles. Some wanted to hire adapted cycles from designated pick-up points. Of those who were interested in purchasing cycles,

most talked about cost as a barrier and suggested lowering the cost, or increasing the number of subsides and concessions available for disabled cyclists. Some respondents wanted more opportunities for classes in which they could try out and learn how to use a non-standard cycle, providing them with the opportunity to try out the cycle before committing to an expensive purchase.

Having an opportunity to try out or hire different cycles before purchase is shown to be an important provision in the literature. Cycling UK research conducted with disabled people in Scotland found that 62% of those surveyed were interested in cycle share or loan schemes because it would enable them to cycle more often, 49% felt it would help them get advice on the right cycle, and 48% were attracted to the possibility of trying a bike before potentially buying one (Cycling UK, 2021). As described by Wheels for Wellbeing (2020), disabled people are more likely to be unemployed or work part-time than non-disabled people and therefore may find it more difficult financially to purchase a cycle – and non-standard cycles are much more expensive than standard cycles. Many disabled people cannot access employee cycle hire schemes, such as Cycle to Work, due to being self-employed or earning too little to be eligible. Wheels for Wellbeing therefore highlight the need for disabled people to be able to access cycle hire schemes and they recommend that all cycle hire schemes should include at least e-bikes, which would increase the number of people who can access cycling. Cycling UK research (2021) found that the most popular cycle that disabled people said they would like to try was a three wheeled trike (49% of respondents), however there was a spread of interest for different types of cycle, reflecting the widely different needs of riders. When asked about preferred loan lengths, there was also a broad spread of interest in a range of durations – options from short loans (2-5 hours, or 30-90 minutes) up to long loans (over three months) all had support. This suggested that no singular model of scheme will suit all potential users, but variety and flexibility is important.

Choosing the right cycle

Wheels for Wellbeing's guidance on choosing the right cycle (2023) describes that a good cycle is one which is:

- *Easy to get on and off*
- *Easy to balance when moving and stationary*
- *Easy (or at least manageable) to pedal*
- *Comfortable to ride*
- *Fits on all the routes you want to use*
- *Easy for you to park and store*
- *One you enjoy riding!*

The advice from Wheels for Wellbeing is to try out lots of different cycles to find a preference and that organisations can help people to alter, try out or loan cycles to find the right cycle as well as the right riding position.

The literature shows the need for inclusive cycle session deliverers to take time in helping people find the right cycle for them, and to help people with any adjustments needed. As argued by Carey et al. (2023), disabled people face challenges in finding a suitable cycle and this is a barrier to participation and sustaining participation in cycling. In this research, deliverers described non-standard cycles as offering riders a solution to their particular physical and safety needs and most were confident that *"it is possible to find [a bike] to suit everyone"* and believed that adaptations existed to support most disabilities.

Carey et al. found that upright tricycles and modified cycles were most frequently used in practice and offered easily modified features which could be adjusted as skills improved, followed by recumbent cycles and handcycles, which were more commonly used by providers supporting young adults with spinal cord injury and traumatic brain injury and tandem cycles for people with visual or cognitive impairments. The providers highlighted the need for trials of different cycles, exploring different options, and having families and schools involved in this trial process. Carey et al. describe different training approaches, and that training has often previously focused on developing new skills, for example using skill checklists (such as Halayko's *'Cycle Skills Checklist'*, 2014) but that there is a gap in transitioning from formalised interventions to community-based active leisure participation, and that many people require additional follow-up within their own real-life setting. Carey et al. also found that consideration was needed around how user-friendly cycles are for people to be able to manoeuvre them during cycling practice, as well as transport them if needed.

In terms of adaptations and adjustments to cycles, Johnston (2007) explored existing evidence around the biomechanical effects of changes to positioning (including seat height, crank arm length, foot position), cadence, and workload, which show that many factors can influence the biomechanics of cycling. The paper finds, however, a limited number of studies examining the biomechanics of cycling for disabled people. The available studies are mostly conducted with non-disabled adults and children and suggest that cycling in a recumbent position may encourage the use of the hip extensors, and a higher seat height and placing the ball of the foot on the pedal may encourage the use of the plantar flexors. Moments around the hip, knee, and ankle may increase with increases in cadence, and moments at the hip and knee may increase with increasing workloads. Thus, knowledge of these factors is important for professionals who prescribe cycling as an intervention for disabled people, because changing any of these factors can potentially influence the physical

outcomes, as well as making the cycle more accessible to use. However, the paper suggests that further research is needed to more fully examine the effects during cycling for disabled people to gain a better understanding of manipulations that may lead to improvements in impairments specific to the needs of each person.

Social interaction

As shown by Office for National Statistics data (ONS, 2022), disabled people are much more likely to be socially isolated than non-disabled people, with the proportion of disabled people in England who reported feeling lonely 'often or always' being over four times that of non-disabled people (15.1% compared to 3.6%). The literature suggests that cycling can reduce social isolation, especially where disabled people have access to a local inclusive cycling hub or live close to good quality cycle infrastructure (Wheels for Wellbeing, 2020). Berent et al. (2021), through research with deliverers plus disabled people and their carers, found that most participants attended cycle training or activity sessions on a voluntary basis for physical exercise and for socialising. The opportunities for social interaction during sessions emerged from the literature as a key positive element for disabled people in other activity-based sessions and suggests that building in social time or ensuring that people have opportunities for social interaction, is an important part of the delivery of sessions.

Shirazipour (2017) conducted interviews with 18 physically disabled veterans. The results showed that group cohesion was an important element of a quality experience of activities. This included four specific elements:

- ***Camaraderie:*** *characterised by a shared sense of humour and understanding, and being there for each other even when challenged by the activity or psychological or physical boundaries.*
- ***Communication:*** *two-way open and honest communication was desired between athletes and coaches, as well as amongst teammates, to help build cohesive bonds and improve skills.*
- ***Acceptance:*** *the development of non-judgmental relationships.*
- ***Shared focus:*** *having shared goals for recovery, competition, and a shared approach to physical activity participation, which could potentially differ based on the individual or team.*

Carbonneau et al. (2017) found that feeling recognised as part of a group helps increase disabled participants' self-esteem. They describe a need for raising awareness of what the authors refer to as non-visible disabilities such as developmental or language deficiencies. This would help support the inclusion of disabled people within activities while raising awareness amongst non-disabled students about their peers with disabilities.

The above examples relate more to team sports or group activities, whereas cycle sessions may not always be in a group format and could be one-to-one with the participant and instructor. Both the EFDS (2013) and CFE (2016) also suggest that consideration should be given to provide opportunities where disabled people can take part with their families and friends. They highlight that family members and friends often have a significant role in encouraging disabled people to take part in different activities. Women in Sport and Get out Get Active (2018) suggest the use of buddy schemes which use a peer or family members to encourage and support participation to help engage women who lack social support networks. Developing activities where different generations of a family can be active together can provide an enjoyable way of spending quality time together.

Delivery of sessions – key points

- Delivery of successful interventions with disabled participants needs careful planning and consideration. It appears that there is not a 'one-size-fits-all' approach, but rather there is a need for flexibility to provide choice and personalisation in order to meet the needs of those involved.
- Consideration of accessibility of the location, as well as other practical considerations around the facilities available is essential.
- Being adaptable and flexible in delivery is crucial – working with participants to design sessions and loans that will work for them – identifying their needs and goals, gathering feedback throughout sessions, making changes as necessary and taking time to try out a range of cycles to find the right cycle and the right positioning for the individual.
- Making time for social interaction may be important for some disabled people who are more likely to be socially isolated – but again, working with individuals will be important to identify if this is something that individuals both want and are comfortable with. Involving family members or carers may be valuable for some participants.

4. Workforce and partnerships

The evidence also shows the need to give particular consideration to those that are delivering the sessions, in terms of their skills, knowledge and training, plus the need to work in partnership with other organisations.

Staff and training

The evidence shows that the whole experience of cycling has to be accessible, and this includes the customer service provided by those delivering the sessions. CFE Research (2016) found that elements such as consistent staffing, having staff who have strong 'soft people skills', and a team who collectively have knowledge and experience of both sport and disability were crucial factors in the success of interventions.

The Activity Alliance (2019) describes that deliverers who have had a good experience of delivering inclusive sessions have generally followed a four-point journey to success, which includes the following elements:

- ***Awareness:*** *they have awareness of inclusive sports and disability, they know what is possible and how to adapt their sports sessions successfully.*
- ***Exposure:*** *they have seen inclusive activity in action or been around disabled people in or out of sport before. They recognise that inclusive sessions can be just as fun, competitive and physical.*
- ***Trial:*** *they have had a go at adapting their sport for someone who is disabled to make the sport inclusive.*
- ***Reward:*** *they have personally experienced the benefits up close and have a sense of pride when an inclusive session works well.*

Research by the Activity Alliance (2019) investigated perceptions amongst people who deliver sport and physical activity sessions. The research found that deliverers need further support to increase their confidence in working with disabled participants, and that there is a desire for more training and information about including disabled participants. 52% of those who were not currently interested in delivering inclusive sessions said they would be much more interested if relevant training was available. Deliverers wanted both general information on the spectrum of impairments and practical guidance around differentiation and adapting sports. Indeed Jeanes et al. (2019) found that community sports clubs recognised they 'should' be providing opportunities for disabled people but frequently felt they lacked the resources necessary to translate this into reality.

In relation specifically to the delivery of cycling programmes for disabled people, Berent et al. (2021) conducted research with a range of individuals involved in the delivery of cycling activity. The research found that 50% of deliverers had been involved in some type of formal disability training in the past, but the remaining deliverers stated that they had learnt relevant skills through a range of less formal methods, including informal mentoring, previous experience working with disabled people, research, their own disability

experience, and conversations with disabled people. The deliverers stated that these less formal methods of learning enabled them to develop a personalised approach, learning directly from the recipients and consideration for context and individual needs. The research did highlight, however, that these methods can have a risk of misinformation, and the authors suggest that there is a need for more learning resources or supporting materials for cycling instructors to be able to easily access in order to educate themselves or to improve their delivery. Some deliverers also gave examples of training that they felt would potentially benefit them in the delivery of inclusive cycling sessions, which included training on:

- *Specific disabilities and possible impacts on cycling*
- *The variety of adapted cycles and accessories such as straps or adapted pedals*
- *Matching person with a bike*
- *How people with disabilities can achieve National Standard*
- *Communication skills and strategies*
- *Risk management*
- *Safeguarding and session logistics*
- *Mental health awareness.*

Berent et al. (2021)

The EFDS (2014a) suggest that effective programmes should consider pairing up coaches and volunteers with those skilled in supporting disabled people on a regular basis, as well as encouraging disabled people to consider becoming volunteers, coaches and leaders so they can inspire and raise the aspirations of others.

Working in partnership

Finally, working with partners across the sector was an element described in some of the literature as being important to bring additional knowledge and insight into disabled people's access needs and the barriers they face. In relation to physical activity and sport more generally, EFDS and Age UK (2012) describe that the most successful projects are those which have joined up with partners within the local community, including local healthcare trusts, local authorities, sport development through County Sports Partnerships (CSPs), local disability and disability sport groups, and that these relationships then become embedded within the community and create sustainability. Wheels for Wellbeing research (2020) shows that there is little awareness amongst transport professionals, including within local authorities, of the fact that disabled people can and do cycle. They argue that any training delivered to transport professionals and engineers should include training on how to cater for the needs of disabled people who cycle, and local authorities should work with

local inclusive cycling hubs to co-design and deliver inclusive cycling, giving transport officers the opportunity to try out non-standard cycles and experience first-hand the needs of disabled cyclists. They also argue that local authorities should be encouraged to develop strategic partnerships with local cycling and disability groups to develop inclusive cycling hubs in areas of need. As argued by the EFDS (2014a), working in partnership can have the impact of increased resources, potential to increase investment into disability sport, and an increase in opportunities.

Workforce and partnerships – key points

- It is important to have consistent staffing as well as staff who have strong 'soft people skills' to build relationships and deliver good customer service.
- There is a need for more training and resources for cycling deliverers to be able to effectively deliver sessions. Deliverers should have knowledge and experience of both cycling and delivering inclusive cycling – as described earlier, this might not mean that they have in-depth knowledge of different disabilities, impairments or health conditions, but rather that they know how to adapt delivery to support different needs and feel confident in doing this.
- Working in partnership with wider community organisations, disability organisations and the health and social care sector, as well as local authorities, will have multiple benefits. These include raising the knowledge and skills of deliverers in being able to effectively work with disabled participants, understanding need, and ensuring that sessions are designed and developed appropriately for the participants.
- Partnership can also include helping transport planners within local authorities to understand the needs of people using non-standard cycles when designing infrastructure.

Summary

Key themes

The literature that this review is based on includes a combination of cycling related literature and wider sport, physical activity and active travel related literature. There is useful and transferable evidence and guidance from wider literature which it is imperative to consider in developing effective inclusive cycling sessions. In particular, the evidence shows that the amount of time required for planning any intervention with disabled participants should not be

underestimated. There is a need for research and planning to understand the access needs as well as interests and preferences of the people that sessions are targeting. Following a social model of disability, this does not require a focus on a person's disability but rather on what can be done to better enable them to participate – i.e. what would make cycling a more attractive and accessible option for them. There is not going to be a 'one-size-fits-all' approach for all participants, but rather there is a need for flexibility in design and delivery to provide choice and personalisation in order to meet the needs of participants and address their individual barriers. Deliverers need to consult with the targeted participants when designing an intervention, following a process of co-design and co-production, and gathering feedback as an ongoing process, as well as working in partnership with wider stakeholders and organisations to help improve local opportunities and identify local needs. Taking these steps to get it right will help to ensure repeat participation and help cycling become sustainable for disabled participants.

Further research and next steps

This literature review has found that there remains a gap in existing evidence specifically around best practice for engaging disabled people in cycling for active travel. The current cycling related literature often focuses on infrastructure and calls for investment in accessible infrastructure to improve opportunities for disabled people to cycle. Whilst there is clear evidence that a lack of accessible infrastructure is a major barrier for many disabled people, there is also a need to develop more evidence around ways that disabled people could be more effectively enabled and supported to cycle through inclusive cycling interventions where the aims are to overcome barriers such as the cost of cycles, the lack of parking and storage and the lack of hire or share provision. The gap in evidence in this area indicates a need for more high-quality research to more fully evidence what works to generate evidence-based recommendations.

The next steps of this project are for Cycling UK to fill this gap through conducting empirical research to understand best practice from the perspective of disabled participants, deliverers of inclusive cycling interventions, and wider stakeholders including disability organisations, health and social care, active travel and cycling organisations. The research will also draw on evaluation data from Cycling UK's ICE project in order to explore if and how the project bridges some of the transport gaps for disabled people, and makes cycling as a mode of transport possible. The research will be qualitative in nature, incorporating a range of interviews and focus groups, and will test the themes that have been highlighted in the literature review, as well as aim to uncover and understand any further learnings or recommendations and generate best practice examples. The findings from both the literature review

and empirical research will be used to develop recommendations that can be shared with a range of partners and stakeholders to be used in the planning and implementation of inclusive cycling initiatives in the future, as well as by Cycling UK to inform the future delivery of the ICE project.

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