Department for
Transport

FS13 Future of Transport - Equalities and access to opportunity

FS13 Rapid evidence review

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Contents

1   Project background

Mott MacDonald has been commissioned by the Department for Transport to provide insight into the main areas of risk and opportunity that future transport technologies and services could present for different sections of society, including people with characteristics protected under the Equality Act 2010[1] and people from different socio-economic backgrounds. The insight will provide guidance in prioritising workstreams for the Future of Transport Regulatory Review. This chapter summarises the background context to the Review and presents the structure of the commission and the report.

1.1   Introduction

Mobility is key to a socially and economically connected society. As advancements in technology continue, and the demographics of UK society change, there is a need for transportation networks to respond to these technological and societal shifts. These changes can bring many opportunities associated with transport but may also create new challenges and potentially exacerbate inequalities in society.

There are three main ways in which transport is linked to inequality, and can affect one another:[2]

1. The first relates to how people are distributed geographically, and to how this distribution is affected by income and other economic factors. People with more financial resources have more options in both where to live and how to travel and transport links are a key component of land value and housing costs.
2. The second relates to how opportunities are distributed, including employment opportunities. Concentration of jobs and community resources is often enabled by transport links, meaning access to these transport links is necessary for accessing those opportunities.
3. The third relates to how accessible the transport system itself is, in terms of its cost, its geographical accessibility, and the frequency and reliability of services.

As transport technology develops, the ways of accessing, using, and integrating transport are changing. For example, there has already begun a shift to seeing 'mobility as a service', with integrated ticketing, new and advanced customer

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[1] UK Public General Acts, (2010), 'Equality Act 2010'.

[2] NatCen (2019), 'Transport and inequality: An evidence review for the Department for Transport'

information services, and more joined-up modal networks.[3] These types of innovations are only set to continue, but of central importance is that the networks remain accessible for all those who wish to use them, not simply the wealthiest or most able.

1.2   Project aims

The objective of this study, as defined by the Department for Transport (DfT), is to establish the main areas of risk and opportunity that future transport technologies and services could present for people with protected characteristics and from different socio-economic backgrounds, to inform the Future of Transport Regulatory Review.

This objective is underpinned by key principles set out in the Future of Mobility: Urban Strategy. Pertinent to this work is the second principle that states that **"the benefits of innovation in mobility must be available to all parts of the UK and all segments of society".**

By considering current trends, challenges and opportunities of public and private transport use, as well as active travel modes, it is possible to map how future transport technologies might impact people in terms of their protected characteristics, as well as different socioeconomic backgrounds. The outcome of the project will set out these impacts and the associated risks or opportunities.

1.3   Structure of the commission

This report responds to the requirements of Stage 1 as part of a three-part commission to inform more detailed work for the DfT Future of Transport Regulatory Review. The parts of the commission are summarised below:

● **Stage 1** focuses on a rapid evidence review to consolidate knowledge about how different segments of society use and experience transport differently today, including barriers and challenges and how transport can advance equality of opportunity.
● **Stage 2** will expand on the findings from Stage 1 to consider how future developments in transport might present risks and opportunities for protected characteristic groups and people from different socio-economic backgrounds. By considering these groups in the context of a range of future mobility scenarios, as prepared with the Government Office for Science, it will also identify areas of risk and opportunity to inform the Future of Transport Regulatory Review.

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[3] Government Office for Science (2020), 'A time of unprecedented change in the transport system '

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- **Stage 3** will be carried out in parallel to Stage 2 and will comprise of stakeholder interviews with organisations that represent groups with a variety of protected characteristics. Stakeholder interviews will be used to gain an understanding of how innovation in mobility might affect certain segments of society differently. It will also test and validate some of the early findings from findings from Stage 2.
- The **final deliverable** will bring together findings from Stage 2 and Stage 3 and summarise the main areas of risk and opportunity of future transport technologies for people with protected characteristics and from different socio-economic backgrounds.

1.4 Structure and purpose of this report

This report sets out the findings of the rapid evidence review which comprises Stage 1. It highlights cross-cutting themes in relation to the existing travel experiences of people with protected characteristics and/or belonging to certain socio-economic groups. Emphasising these themes will enable the application of current experiences to areas of focus for future innovation in transport, providing insight into risks and opportunities that will inform the Regulatory Review, particularly around the prioritisation of policy.

- **Chapter 2:** lays out the methodology underpinning the rapid evidence review.
- **Chapter 3:** provides a review of literature relating to current transport trends among protected characteristic groups and different socio-economic groups. The review takes key groups within each protected characteristic in turn, looking at current experiences and challenges before considering associated risks and opportunities. The report considers intersectionality of groups, as many experiences and challenges cut across a range of demographics.
- **Chapter 4:** provides a short overview of findings from the literature review and considers some of the reoccurring themes across all groups and considers next steps for the commission.

2 Methodology

Stage 1 was approached by undertaking a rapid evidence review of existing literature to establish current experiences and challenges in using transport across all protected characteristic groups and different socio-economic backgrounds. The research was organised according to four separate activities, which are discussed in more detailed this chapter.

2.1 Overview

A rapid evidence review was undertaken to establish the extent and availability of existing research, data, evidence and other resources to inform the rapid evidence review. This included four separate activities:

1. Review of key future of mobility documents.
2. Collating existing evidence.
3. Review and analysis of evidence.
4. Synthesis of evidence and findings.

2.2 Review of key future of mobility documents

The initial activity entailed familiarisation with the documents that underpin the Future of Transport Regulatory Review, including:

● Future of Mobility: Urban Strategy[4]
● Future of Transport Regulatory Review Call for Evidence[5]
● Access to Transport and Life Opportunities report[6]
● Transport and inequality: An evidence review for the Department for Transport [7]

Consideration was given to the emerging evidence and themes from the four documents, and how these should be considered throughout this commission.

2.3 Collating evidence

The collation of evidence was initially approached by identifying documents, reports and data that the team had access to as part of previous DfT and other

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[4]DfT (2019) 'Future of Mobility: Urban strategy'

[5] DfT (2020) 'Future of Transport Regulatory Review: Call for evidence'

[6] NatCen, UWE Bristol, (2020) 'Access to Transport and Life Opportunities'

[7] NatCen (2019), 'Transport and inequality: An evidence review for the Department for Transport'

transport commissions, as well as drawing on wider knowledge of existing literature bringing together protected characteristic groups with challenges and experiences in using transport.

A set of key search terms, which can be found in Appendix A, were then determined to identify additional documents for review. This produced a long list of documents to review for the commission, which were narrowed down to 30 key documents according to the depth and relevance of information provided, to ensure appropriate coverage across the protected characteristic and socio-economic groups considered, as well as different transport areas and modes and year of publication, prioritising more recent evidence. The full reference list can be found in Appendix B.

2.4   Review and analysis of evidence

The list of 30 key documents was then organised according to nine protected characteristic groups and two socio-economic groups, as well as transport mode where available, to enable a rapid evidence review according to the proposed report structure. The evidence was then reviewed and analysed by taking each group, in turn:

- Protected characteristic groups[8]:
  - Age, including children, younger people, and older people
  - Disability, including carers
  - Gender reassignment
  - Marriage and civil partnership
  - Pregnancy and maternity
  - Race
  - Religion or belief
  - Sex, including women and men
  - Sexual orientation
- People from different socio-economic backgrounds:
  - people on low incomes and people from deprived communities
  - people with low levels of education and literacy, and people who do not speak or understand English (i.e. new migrants, asylum seekers, or tourists);

Where applicable, evidence from the 30 key documents was also supplemented with evidence from additional documents where a more nuanced perspective or

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[8] The Government Equalities Office/ Home Office definition of each protected characteristic group can be found in Appendix B.

more specific evidence was deemed to be needed. The list of complementary documents can be found in Appendix B.

2.5   Synthesis of evidence and findings

This report is the result of the above steps, organised by group to ensure comprehensive consideration of each group individually. Each section included in Chapter 4 provides an overview of current experiences and challenges, followed by risk and opportunity. Where there is a recognised overlap with other groups, or where an impact may affect someone belonging to two or more groups, this is highlighted in green. Key themes are emboldened throughout the review. The final section of this report considers the key findings emerging from this evidence review based on the themes drawn out from the evidence review.

3 Rapid evidence review

The following chapter considers current experiences and challenges in using transport across all protected characteristic groups and different socio-economic backgrounds. It also presents key risks and opportunities in terms of advancement of equality for each of the groups considered.

3.1 Age

3.1.1 Older people (people aged 65 and over)

3.1.1.1 Current experiences and challenges

Access to appropriate forms of transport can help older people avail themselves of goods, services, employment and other activities, with public transport in particular playing a crucial role in remaining connected and maintaining independency when older people are unable to drive[9]. The simple ability to travel, and the feeling of independence it provides, are also key to the emotional experience and confidence of older people when using transport[10].

A number of transport concessions, designed to address the **affordability** of public transport, are available for older people. Age UK[11] provides insight on the main concessions available, which include: free bus passes across England, the Senior Railcard and London Freedom Pass, as well as a variety of local and regional discounts. While this supports older people, ensuring transport is affordable to them, Age UK also recognises that dependence on budgetary decisions might affect the availability of discounted travel schemes and present a challenge in affecting older people's ability to travel conveniently.[12]

In terms of **availability**, it is important that public transport is available in proximity to residential areas, community resources, and other destinations,

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[9] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

[10] Marsden, G., Cattan, M., Jopson, A., Woodward, J., (2008), 'Older people and transport', Strategic Promotion of Ageing Research Capacity.

[11] Age UK (2020) 'Free bus and transport concessions'

[12] Holley-Moore, G., Creighton, H., (2015) 'The future of transport in an ageing society', Age UK.

with services times and frequencies meeting users' requirements. [13] Older people can struggle with the location of points of access on the transport network, such as bus stops, station interchanges and railway stations, which might not be within easy reach of where they live and the location they wish to get to. Older people may also be dependent on public transport provisions that correspond to increased demand during the morning and afternoon in line with working hours, potentially not suiting their needs of travelling during different times of the day.[14]

This might be exacerbated in **rural areas**, which often have higher than average proportions of older people, a rapidly ageing population and acute accessibility issues. A study by Rural England highlighted issues experienced by vulnerable, older adults living in rural areas. The characteristics of rural areas, as well as many suburban areas where public transport provision is poor and communities are car-dependent, can result in an increase in loneliness and social isolation. The increasing absence of shops, post offices, pubs and other facilities in rural areas can limit opportunities for interaction amongst the population living there. Coupled with the lack of availability of public transport in rural areas the chances of becoming socially isolated are increased. Bus services tend to be infrequent and limited in terms of destination in rural communities.[15] This also reflects funding constraints in bus provision for such areas, and a lack of service is often replaced by alternative solutions such as community transport and Demand Responsive Transport Services.

Older people are more likely to have a disability or long-term health problem that can affect their ability to use transport, including: mobility impairments, hearing impairments and cognitive impairments.[16] In this sense, older people can share many of the needs of **disabled people**, and face challenges when undertaking a journey, including difficulties in completing first and last mile travel as well as changing between transport modes where necessary. Older people with a disability or long-term health condition might also be more reliant

[13] Passenger Transport Executives Group (2010), 'Transport and social inclusion: how have we made the connection in our cities?'; Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

[14] Passenger Transport Executives Group (2010), 'Transport and social inclusion: how have we made the connection in our cities?'; Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

[15] Rural England (2016): 'Older people in rural areas: Vulnerability due to loneliness and isolation paper'

[16] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

on staff on public transport to provide assistance to enable them to undertake a journey.

Older people can also struggle with elements such as finding accurate and up to date pre-travel information, including timetables, the availability of accessible infrastructure (such as disabled parking), and information about ticketing and staff availability when using public transport. Such experiences are similar to some of the challenges that people who suffer from conditions that cause memory loss such as dementia and Alzheimer's disease, and who might have difficulties interpreting and remembering information, such as people on the autism spectrum experience in journey planning. This can, in turn, exacerbate feelings of stress in relation to travel (and public transport travel in particular).[17]

Evidence also suggests that older people are not as likely as younger people to be users of **new technology** and many choose to use familiar technology, such as TV or radio, to access information.[18] Older people frequently report preferring journey planning information provided in simple formats such as timetable booklets, by telephone, or direct from trained staff available to help. There is evidence that older people are more likely to struggle to use many of the digital tools needed to undertake travel such as touch-screen ticket machines[19], while also being less likely to use smartphones for transport planning purposes (69% versus 82% in younger people).[20]

It has also been documented that having access to pre-travel information is strongly linked to having access to Information and Communication Technologies (ICTs) such smartphones and internet connectivity. [21] However, people living in **rural areas** tend to be excluded or face challenges accessing ICTs compared to those living in urban areas, due to poorer connectivity. [22]. This suggests that pre-travel information can be less accessible to people living

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[17] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

[18] Age Concern (no date) 'Introducing another World: older people and digital inclusion'.

[19] Rail Delivery Group (2015), 'On Track for 2020? The future of accessible rail travel'.

[20] Department for Transport, (2019), 'Transport and Technology: Public Attitudes Tracker'.

[21] Yeboah et al,. (2019): 'Understanding factors influencing public transport passengers' pre-travel information-seeking behaviour'

[22] Farrington et al,. (2015): 'Two-Speed Britain: Rural Internet Use'.

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in rural areas, and coupled with lower uptake in new technologies use for older
people, this might present a significant challenge for this group.

Research also suggested that uptake of **shared mobility services** is lower
amongst **older people** and **disabled people**. [23]This is related to barriers such
as the lack of on-demand accessible options, unfamiliarity with the technology
needed to book services and inability to use digital payment on a smartphone,
and not being comfortable with unfamiliar ride hailing drivers. The same
research also evidenced that volunteer transportation systems can more easily
serve older and disabled people due to higher client engagement, lower costs
and higher user familiarity with the service providers.[24]

It is also important to highlight that older people in the 80 to 90 age groups tend
disproportionately to be **women** living alone. This group tends to use walking
and public transport as their preferred travel and mobility options,[25] potentially
exacerbating some of the experiences and challenges discussed above.

3.1.1.2   Risks and opportunities

As discussed, old age can cause changes in mobility patterns as a range of
factors combine to increase the number of barriers to travel for older people.
Ageing is linked with a reduction **in car usage** and **driving**, often caused by the
worsening of physical conditions, increased stress associated with driving, car
maintenance costs and less need to drive for full time work,[26] as well as forced
cessation of driving due to old age. Ceasing to drive, in particular, can provide a
major challenge for many older people, significantly reducing travel options. As
a consequence, older people become more reliant on taxis and lifts from family
and friends as a transport mode, providing a supplement to the publicly
accessible fixed-route bus and rail system. While there are social benefits to
people travelling with their families, this raises considerations around the
accessibility and availability of **special transport services** for older people to
travel around, such as demand-responsive services and shared taxis, especially

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[23] National Aging and Disability Transportation Center, (2019), 'Creating
    inclusive shared mobility for older adults and people with disabilities'.

[24] National Aging and Disability Transportation Center, (2019), 'Creating
    inclusive shared mobility for older adults and people with disabilities'.

[25] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older
    people in European Context, Journal of Population Ageing', 10(2017): 343-
    361.

[26] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older
    people in European Context, Journal of Population Ageing', 10(2017): 343-
    361.

for those who might not be able to rely on well-established social networks for transport needs. [27]

Research from Age UK has found that an improved **provision of active transport** (including walking and cycling) could disproportionately benefit older people.[28] Increased provision of active transport is likely to improve the amount of physical activity, which is linked to better cognitive performance,[29] better mental health outcomes[30] and reduce overall morbidity and mortality.[31] Encouraging active travel among older demographics could therefore lead to positive health and transport outcomes. Currently only 8% of men and 3% of women over the age of 65 in the UK cycle, a much lower proportion compared to both the general population in the UK and those over the age of 65 in European countries, highlighting the current lack of engagement of this demographic with **walking and cycling infrastructure**.[32]Research from transport charity Sustrans[33] also highlighted the high cost of adapted bicycles, a lack of dedicated cycling infrastructure, and fears about personal safety on the roads as barriers to older people cycling.

3.1.2 Younger people (people aged 16-24)

3.1.2.1 Current experiences and challenges

While there has been a recent uplift in the proportion of younger people who have a driving licence,[34] vehicle ownership tends to be low among younger age groups, partly due to the **costs** of learning to drive, as well as maintaining a

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[27] Shrestha, B. P., et al., (2017) 'Review of public transport needs of older people in European Context, Journal of Population Ageing', 10(2017): 343-361.

[28] Holley-Moore, G., Creighton, H., (2015) 'The future of transport in an ageing society', Age UK.

[29] Kirk-Sanchez, N. et al. (2014): 'Physical exercise and cognitive performance in the elderly: current perspectives'

[30] Gunnell, K. et al. (2014): 'Goal contents, motivation, psychological need satisfaction, well-being and physical activity: A test of self determination theory over 6 months'

[31] Holme, I. and Anderssen, S. (2015): 'Increases in physical activity is as important as smoking cessation for reduction in total mortality in elderly men: 12 years of follow-up of the Oslo II study'

[32] Holley-Moore, G., Creighton, H., (2015) 'The future of transport in an ageing society', Age UK.

[33] Sustrans, Arup, (2019) 'Inclusive cycling in cities and towns'.

[34] Department for Transport, (2019), 'National Travel Survey: England 2018'.

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vehicle and the associated insurance costs,[35] making this group increasingly
reliant on public transport. Younger people in fact make more journeys by rail,
bus and coach than all other age groups,[36] and rely on public transport to
access education, training, employment and recreational opportunities.
Evidence also suggests that walking and cycling is also more common among
younger people (particularly **younger men**) than all other age groups, and
younger people are more likely to say they walk rather than drive more often for
the sake of the environment.[37] Younger people might also have a higher
propensity to try different forms of transport, including active travel, and to
continue using it if the mode fits with their lifestyle and values.[38]

Transport **affordability** and **availability** are key challenges for younger people
relying on public transport to access work, education and other activities. The
availability of statutory concessionary travel schemes tends to be less
consistent for younger people in comparison to other groups (such as older or
disabled people) and is often provided at the discretion of the local authority or
transport operator.[39] Younger people also tend to have less disposable income
available than previous generations of younger people and are more likely to
work in low-waged, uncontracted sectors.[40]

Younger people living in rural areas are more likely to have a driving licence
than those who live in urban areas, For younger people living in **rural areas**[41] a
lack of regular and affordable transport can also be a barrier to employment,
determining a correlation between younger people and those on **lower
incomes** – such as younger people living in **areas of rural deprivation**, who

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[35] Chatterjeem K., et al., (2018), 'Young People's travel – what's changed and
why? Review and Analysis'; Starling, N., (2017) 'Motor Insurance Premiums
for Young Drivers in the UK and Europe', RAC Foundation.

[36] Pistoll, S., Cummins, S., (2019), 'Exploring changes in active travel uptake
and cessation across the lifespan: longitudinal evidence from the UK
Householder Longitudinal Survey'.

[37] Chatterjeem K., et al., (2018), 'Young People's travel – what's changed and
why? Review and Analysis';

[38] Pistoll, S., Cummins, S., (2019), 'Exploring changes in active travel uptake
and cessation across the lifespan: longitudinal evidence from the UK
Householder Longitudinal Survey'.

[39] Campaign for Better Transport, (2016), 'Why getting transport right matters to
young people'.

[40] Chatterjeem K., et al., (2018), 'Young People's travel – what's changed and
why? Review and Analysis'

[41] Berrington, A., Mikolai

are unemployed, or who are employed in lower-skilled jobs.[42] Evidence suggests that low skilled jobs are increasingly being located out of city centres and involve shift or weekend work; therefore a lack of regular and affordable public transport (particularly to more rural areas), coupled with low ownership and access to private vehicles are likely to be a barrier to employment for some younger people.[43]

Safety and **personal security** are also important aspects of the mobility experience for younger people. Younger people are more likely to be involved in crime on public transport; as both perpetrators and victims of low-level disorder and anti-social behaviour. Younger people are more likely to regard public transport as a hostile environment.[44] Younger adults are also more likely to be victims of violent crimes than those in older age groups, with **younger men** more likely to be victims of violent crime where the perpetrator was a stranger or acquaintance.[45] In turn, the fear of antisocial behaviour on the part of younger people (rightly or wrongly), and lack of perceived safety when using public transport can deter young people from using public transport, this experience is shared by other groups, including **older people**, **religious groups**, **BAME communities**, **LGB people**, **trans people** and **women.**[46]

3.1.2.2   Risks and opportunities

The promotion of **active travel** could offer particular opportunities for younger people, when used to undertake first and last mile journeys. Frequent public transport use involves walking or cycling components across the journey, and evidence suggests that younger people are more likely to already engage with active travel modes and are more receptive to new forms of travel when given the opportunity.[47]

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[42] Campaign for Better Transport, (2016), 'Why getting transport right matters to young people'.

[43] Campaign for Better Transport (2016): 'Why getting transport right matters to young people'

[44] British Transport Police Authority, (2008), 'Fear of crime and concerns about personal safety on the rail network'.

[45] Office for National Statistics, (2019(, 'The nature of violent crime in England and Wales: year ending March 2018'.

[46] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[47] Pistoll, S., Cummins, S., (2019), 'Exploring changes in active travel uptake and cessation across the lifespan: longitudinal evidence from the UK Householder Longitudinal Survey'.

Active travel, including cycling and micromobility services such as e-bikes and e-scooters presents opportunities to ensure the inclusion of younger people in using a variety of transport modes, particularly in ensuring that roads are safe for all, but that transport modes are also affordable to younger people.

Ensuring a safer travel environment for young people (for example through surveillance measures such as improved lighting, CCTV and improved real-time data provision) can reduce the fear of being a victim of crime among this group. Technological advancements can pose opportunities to increase safety of travel and work to deter potential perpetrators of crime.

3.1.3   Children (people under 16)

3.1.3.1   Current experiences and challenges

Children generally lack the ability to travel independently due to their age, and do not have access to their own private transport; making them more vulnerable to the effects of social isolation and community severance when suitable transport is not available. In particular, the **availability** and **affordability** of transport can contribute to children's access to important social resources. For instance, transport affects attendance at before or after school clubs and extracurricular activities, with some children likely to be more reliant on public transport or active travel modes, if their parents or carers are not available to provide connections via private car.[48]

Safety is also a key part of the travel experience for children. Road casualty data highlights that children have historically tended to be involved in accidents as pedestrians (58% of recorded fatalities for 2018) and car passengers (31% of recorded fatalities for 2017), reflecting transport forms most commonly used by children.[49]

3.1.3.2   Risks and opportunities

Policies and initiative that promote the use **active travel modes**, such as those aimed at reducing car travel and provision of more and better cycle infrastructure present an opportunity to further promote health and wellbeing amongst children. Providing the means for children to move more can support numerous health outcomes, such as reducing the risks of childhood obesity. This is particularly important for children who are potentially more likely to develop childhood obesity due to other characteristics, including **deprivation**[50]

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[48] British Youth Council (2012): 'Transport and Young People'

[49] Department for Transport (2018), 'Reported road casualties in Great Britain: 2017 annual report'.

[50] HM Government, (2016) 'Childhood Obesity: A Plan for Action'.

and **BAME background** (particularly for Bangladeshi and Black children).[51] Behaviours that encourage children to be more active, such as walking instead of using the car, can also offer opportunities for **parents** to be more active, including **mothers who have recently given birth**, while also acting as a good example to children.[52]

This is an area of focus embedded within DfT's Cycling and Walking Investment Strategy,[53] which aims to increase walking and cycling to school for children through a range of measures including improving the safety of the street environment. More recently, the Emergency Active Travel Fund has been established to support local transport authorities with producing cycling and walking facilities as part of the work to combat the COVID-19 pandemic.[54]

While evidence links traffic exhaust emissions (including from road, aircraft and maritime transport) to depleting air quality and human health,[55] the effects of poor air quality are particularly significant for the **health** of children, and can affect their physical development as well as cause and worsen respiratory conditions such as asthma and pneumonia.[56] When considering polluting from road traffic, children and younger people's height and the use of pushchairs means they might be closer to emissions sources such as car exhausts. [57] As covered in section 3.10.1, children from **lower socio-economic backgrounds** are also more likely to be exposed to high levels of pollution due to living in densely populated urban areas. Several measures, including the introduction of Clean Air Zones across cities in the UK, [58] and the support for low-emission vehicles have already formed part of the effort in reducing pollution from road vehicles. In light of this, additional measures and improvements in transport provision and infrastructure that are likely to improve air quality would present a significant opportunity for health improvement for this group.

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[51] Public Health England (2019), Differences in child obesity by ethnic group'; Gov.uk, (2019) 'Overweight children'

[52] Khanom., A., et al., (2020) 'Parent recommendations to support physical activity for families with young children', Health Expectations (2020) 23:2.

[53] Department for Transport, (2017), 'Cycling and Walking Investment Strategy'.

[54] Gov.uk, (2020), Emergency active travel fund: local transport authority allocations'.

[55] Colvile, R. N., et al., (2001), 'The transport sector as a source of air pollution', Atmospheric Environment (2001): 1537-1565.

[56] British Lung Foundation (2017), 'Risks to your child's lungs'.

[57] British Lung Foundation (2017), 'Risks to your child's lungs'.

[58] Department for Transport, (2020), 'Clean Air Zone Framework. Principles for setting up Clean Air Zones in England'.

3.2 Disability (disabled people and their carers)

Disabled people face a range of challenges in relation to mobility and various modes of transportation. Primarily, key obstacles relate to a lack of **accessible infrastructure**, at stops, stations and other locations, as well as in use of vehicles themselves.[59] Where people are unable to rely on public transport either due to structural barriers or because of geographical location, they are likely to increasingly rely on more expensive services such as taxis and private hire vehicles (PHVs) – affecting the **affordability** of travel.[60] **Accessible and inclusive information** relating to routes and tickets is also a key challenge. Adequate information, alongside **staff presence and assistance** can help to make disabled passengers feel **safer** when travelling, as well as making journeys easier and more stress-free.[61] **Active travel** modes for disabled people are reliant on well marked shared spaces and clear pedestrian routes, where these are present, modes such has walking and cycling can have both mental and physical health benefits for disabled people.[62] Undertaking an analysis of current transport trends among disabled people it is important to note that disabled people are not a homogenous group, their needs and abilities can vary greatly depending on the nature and severity of their disability.

3.2.1 Current experiences and challenges

Appropriate transport provision enables disabled people to participate in their community, maintain social networks, and access employment, education, healthcare and other services. Research by the Office for National Statistics (ONS) found that people in the UK with a physical impairment, neurodiverse condition or learning disability tend to have lower levels of social contact compared to other sections of the population. The research also suggests that most disabled adults in the UK experience participation restriction regarding leisure activities, particularly spending time with family and visiting friends.[63] The unemployment rate in the UK for disabled people was 6.7% in 2019, despite this rate having reduced, it is still nearly double the national unemployment rate.[64] In addition, these statistics do not take into account the

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[59] Government Office for Science (2019): 'Inequalities in Mobility and Access in the UK Transport System'

[60] Government Office for Science (2019): 'Inequalities in Mobility and Access in the UK Transport System'

[61] Rail Delivery Group (2015), 'On Track for 2020? The future of accessible rail travel'.

[62] Living Streets (2016): 'Overcoming barriers and identifying opportunities for everyday walking for disabled people'

[63] Office for National Statistics (2015): 'Life opportunities survey'

[64] House of Commons Library (2018): 'People with disabilities in employment'

economic impact COVID-19 has had in the UK, and it is expected that these rates will now be higher. Evidence shows that difficulty in **accessing** transport is the second most common barrier to work among disabled people. For example, 52% of working-age disabled adults stated difficulty in accessing bus services as a barrier.[65]While disabled people tend to travel less than non-disabled people, many are nonetheless **reliant on public transport**. There can be large variances in a person's travel patterns depending on their disability and its severity. For example, according to DfT's 'disabled people's travel behaviour and attitudes to travel' report, having a learning or physical disability correlates strongly to travel by bus.[66] Around 60% of disabled people have no access to a car and use the bus around 20% more than their non-disabled counterparts.[67]

Disabled people are more likely to report negative and problematic journey experiences, alongside limited awareness of viable alternatives.[68] For some disabled people, the attitude of staff and other passengers, as well as the **unpredictability** of public transport (both timings and capacity), prevents them from using public transport. For neurodiverse people, a lack of routine or unexpected events can become overwhelming, leading to high levels of stress and anxiety. The most prevalent concerns, in public transport use, among neurodiverse individuals and their families are safety and spatial awareness. Specific problems include finding one's way to the bus stop, boarding the correct service and disembarking at the correct stop. Sensory sensitivity, similarly, was found to be an obstacle.[69]

Overcrowding at peak times can make travelling particularly difficult for those with reduced mobility and people who are more vulnerable to stress and anxiety in crowded places, as fast-moving, dense crowds of people can reduce **accessibility** and make vulnerable passengers feel **unsafe**.[70] For those people unable to stand on a moving train, there may be difficulties, even outside peak hours, in finding a seat on services which have reduced the number of seats in order to increase overall carrying capacity.[71] This can result in increased levels

[65] Office of Disability Issues (2011): 'ODI life opportunities survey: Wave 1 results'

[66] DfT (2017): 'Disabled people's travel behaviour and attitudes to travel'

[67] Equality and Human Rights Commission (2017): 'Being disabled in Britain'

[68] Butcher, L (2018) 'Access to transport for disabled people'

[69] Rezae, M (2019), 'Public transport planning tool for users on the autism spectrum: from concept to prototype'

[70] Transport for London (2010) 'Exploring the journey experiences of disabled commuters'.

[71] Rail Delivery Group (2015), 'On Track for 2020? The future of accessible rail travel'.

of stress and anxiety associated with the use of public transport for those with reduced mobility.[72]

An increased number of staff available means that disabled people are more likely to be able to access passenger assistance services without having to book in advance.[73] Booking assistance in advance of a journey ensures that there is someone available to help the passengers upon arrival, however, it also means that passengers must plan their journeys and are less likely to make last minute journeys by public transport.[74]

Disabled passengers often travel to, from and between legs of their journey via various transport modes, sometimes with challenges to the successful completion of the first and last mile of a journey. Challenges can include finding and using suitable parking areas when using a private vehicle for a portion of the journey, public transport connections, and differing levels of **staff support** (where support is available) for different legs of the journey.[75]Because of these challenges, disabled people tend to rely heavily on Taxis and PHVs in completing door to door journeys, particularly where other forms of transport might not be **available** or **accessible**.

However, Taxis and PHVs themselves vary in their accessibility. DfT evidence highlights that around 58% of vehicles are wheelchair accessible, but these tend to be concentrated in taxi fleets in urban locations, and potentially as little as 2% of vehicles are accessible nationally.[76] Statistics show that there has been a slight decrease in the number of wheelchair accessible taxis in the year 2018-19 in both urban and rural settings (-4.2% and -2.6% respectively). However, in contrast there has been a more significant increase in accessible PHVs in both locations (12.2% and 7.7% respectively).[77] In rural settings there are between 2 and 3 licensed vehicles per 1000 people, this increases to between 4 and 6 for urban areas and 12 in London.[78] These differences show the difficulties wheelchair users living in rural areas may face in trying to access

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[72] National Institute for Health and Care Excellence (NICE). (2018): 'Learning disabilities and behaviour that challenges: service design and delivery'

[73] Department for Transport (2019): 'Research on experiences of disabled rail passengers'

[74] Department for Transport (2019): 'Research on experiences of disabled rail passengers'

[75] Department for Transport (2018), 'The Inclusive Transport Strategy: Achieving Equal Access for Disabled People'

[76] Department for Transport (2018), 'The Inclusive Transport Strategy: Achieving Equal Access for Disabled People'

[77] Department for Transport (2019), 'Taxi and PHV Statistics'

[78] Department for Transport (2019), 'Taxi and PHV Statistics'

taxis and private hire vehicles, compared to more urban areas where there is a higher number of accessible vehicles. The varying level of Taxi and PHV accessibility can affect disabled people's ability to complete the first and last mile portions of their journeys and might also impact on the cost of undertaking a journey.

Journey planning and information are also critical to the travel experiences of disabled people. There is an increased use of **technology** (automation, internet, and social media) both for ticket purchase and for updates and information. This risks excluding people whose internet usage is low, only 53% of disabled people have access to a smartphone, and only 67% of disabled people compared to 92% of non-disabled people use the internet.[79] Automated tickets machines without tactile or audio feedback function make it difficult for visually impaired people to buy tickets.[80] Visually impaired people may find it difficult to access websites with journey planners and information about tickets and fares.[81] The presence of audio instructions is important in order to complete journeys. However, a DfT consultation with 700 visually impaired people found that 50% felt that they were unable to rely on announcements on modes of transport or at stations, making it difficult for them to travel without planning the route in advance.[82]

People with learning disabilities that result in reduced literacy and numeracy skills may also find it difficult to understand route maps, fares and signs, while a lack of straightforward and easily accessible information could affect someone's mental health. Passengers with a range of disabilities are therefore likely to be disproportionately affected by the volume of information regarding ticketing, routes and restrictions when using public transport.[83] There are a number of more recent innovations in mapping that may enhance the journey planning experience for disabled people. Tactile maps with and without braille for visually impaired people, acoustic maps and written route descriptions are all possibilities. However, perhaps the most useful for disabled passengers is a map that can be downloaded and therefore is accessible on a device throughout the journey. This type of map can be designed with a 'touch over'

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[79] Ofcom (2018): 'Access and Inclusion 2018: Consumers' experiences in communications markets'

[80] Guide Dogs for the Blind (2013); House of Commons Transport Committee (2013-14): 'Access to transport for disabled people'

[81] Department for Transport (2017) 'Disabled people's travel behaviour and attitudes to travel'

[82] RNIB (2018): 'Rail research summary and key recommendations'

[83] Department for Transport (2017) 'Disabled people's travel behaviour and attitudes to travel'

option which uses vibration and audio feedback to aid navigation.[84] While this assumes access to a smartphone, the provision of these maps in stations and at bus stops is also a possibility.

Travel infrastructure which is designed with measures such as lighting and clear sightlines that are integrated with public transport, can enhance feelings of safety.[85] Research has found that in urban areas, active travel routes are associated with an increased perception of risk, often due to poor lighting or a lack of people using the route.[86] This **perception of crime** can impact disabled people who are at a higher risk of being a victim or witnessing a crime. Research highlights that groups who were more likely to have had contact with their local police as a victim or witness include **disabled people**, those from **BAME backgrounds** and **younger people** aged 16-34.[87] The latter two groups are also most likely to be approached by the police, particularly if they are male.[88]

There is a relatively low participation rate in **active travel** for disabled people, research has shown that disabled people with a range of learning and physical impairments, state that a reason for their lack of activity is due to the **inaccessibility of the pedestrian environment**, particularly road crossings where evidence shows they feel particularly vulnerable.[89] The timing of crossings, a lack of working crossings and the absence of dropped kerbs are all cited as barriers, and uneven surfaces increase the chance of falling for people with reduced mobility. For wheelchair users' obstructions such as advertising boards or bins can make the pedestrian environment particularly challenging.[90]

Air quality depletion linked to traffic exhaust emissions can have detrimental effects on certain groups of disabled people. The British Lung Foundation states those at highest risk to air pollution effects are those already living with pre-

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[84] Poppinga, B (2011), 'TouchOver map: audio-tactile exploration of interactive maps'

[85]' British Transport Police Authority, (2008), 'Fear of crime and concerns about personal safety on the rail network'.

[86] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[87] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[88] Ministry of Justice, (2016), 'Black, Asian and Minority Ethnic disproportionality in the Criminal Justice System in England and Wales'

[89] Living Streets (2016): 'Overcoming barriers and identifying opportunities for everyday walking for disabled people'

[90] Living Streets (2016): 'Overcoming barriers and identifying opportunities for everyday walking for disabled people'

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existing health conditions, predominantly those with such lung conditions as
asthma or Chronic Obstructive Pulmonary Disease (COPD).[91] The exacerbation
of asthma and triggering of asthma attacks in connection to 'traffic related air
pollution has been strongly linked with increases of accident and emergency
visits in those with the condition'.[92]

3.2.2 Risks and opportunities

Providing access to transport for disabled people brings numerous benefits
including the widening of employment opportunities, increased access to
education, and enabling disabled people to participate more fully in their
communities.[93]

Any increase in the provision of active transport is likely to have a
disproportionately positive health impact for **children**, **older people**, and
disabled people. Where there are provisions of dropped kerbs, toucan and
pelican crossings and clear pavements, people with reduced mobility and visual
impairments are more likely to choose to walk as they feel secure and able to
do so.[94] If active travel infrastructure, such as walking and cycling routes, is
designed in a way that improves feelings of safety through lighting, CCTV and
clear sight-lines it works to encourage and facilitate an increase in active travel
among disabled people.[95]

An increase in multimodal transport networks may help disabled people to
complete the first and last mile of their journeys with more ease, and through
smart ticketing could also be more cost effective. However, the realisation of
these benefits is dependent on accessible information during the journey
planning and ticket buying stages. Where technological solutions are designed
with a diverse spectrum of people in mind, it may be that adaptations are made
available to better tailor the website or app to the individual user. For example,
some people with autism struggle to interact and converse with people directly,
therefore an app that circumnavigates this would be beneficial, while for others
the use of technology can be a barrier in itself.[96] This highlights the diverse

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[91] The British Lung Foundation (2017): 'Who's most at risk from air pollution'

[92] Geraint Davies (2018) 'Briefing: The health effects of air pollution: time to act,
(pg. 17, Prf. Frank Kelly)'

[93] House of Commons Transport Committee (2013-14): 'Access to transport for
disabled people'

[94] Public Health England (2016) 'Working together to promote active travel'

[95] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-
2018', TfL Compliance, Policing and on-street services.

[96] Falkmer, M., Barnett, T. et al (2015), 'Viewpoints of adults with and without
Autism Spectrum Disorders on public transport'

spectrum of disability and that a one size fits all approach would not be successful. The provision of accessible information through inclusive methods can allow disabled people to maintain or gain independent mobility, increase confidence and improve social, mental and physical wellbeing.

3.3 Sex

3.3.1 Female

3.3.1.1 Current experiences and challenges

Affordable, reliable and dependable transport allows people to access essential life opportunities; conversely, a lack of transport is linked to social disadvantage, exclusion and gender inequality.[97] As women are more likely than men to live on **low incomes**, work part-time and undertake unpaid work in the home and the community, such as being **carers** for dependent relatives, poor quality, unreliable and expensive transport has a far bigger impact on the lives of women.[98] Less women across the UK hold a driving license compared to men (67% versus 77%).[99] Women also tend to **not have access to a car**, particularly during the day as they either cannot afford one, or the family car is being used by a partner.[100]

In terms of **affordability** and **availability**, it might not be financially convenient for women to pay for monthly or weekly transport passes when working flexibly. **Caring responsibilities** also tend to disproportionately fall to women and often require making multiple short journeys during a day – for example, to drop off children at school, visit family members and shop for food – which creates an additional challenge if private transport is not available. In such cases public transport services may not sufficiently interconnected, requiring journeys with several changes and a long commuting time.

Evidence shows that women are more likely to **walk** for travel than men, making up to four times more walking trips than men in the 30-39 age group.[101] One

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[97] Gill, R., (2018), '2018 WBG Briefing: Public transport and Gender', Women's Budget Group.

[98] Gill, R., (2018), '2018 WBG Briefing: Public transport and Gender', Women's Budget Group.

[99] Department for Transport (2019) 'Full car driving licence holders by age and gender'.

[100] Longowrth, J., (2016), 'How to eliminate the gender pay gap?', Centre for Employment Studies Research

[101] Department for Transport (2018): 'Walking and cycling statistics, England 2017'

suggestion for this is that women are more likely to walk with their children to school than men.[102]

When involved in a road accident, women are also more likely to fall casualties then men. In 2018, 53% of women involved in an accident were casualties, as opposed to men where only 38% of those involved in a vehicle accident fell casualties.[103] Evidence suggests that some of the sex disparity in injuries might be related to safety designs in vehicles specifically tailored toward the male population.[104]

While fewer women tend to have **access to private transport**, women make greater use of taxis and PHVs in comparison to men, increasing with **older age**, where women aged 70+ make almost double the number of trips than men of the same age (14 trips per person per year compared with 7 trips per person per year).[105] This is despite challenges around costs and **affordability** as well as **personal safety** when using a PHV or taxi as passengers can feel vulnerable and concerned due to travelling with strangers (especially when rides are shared with other passengers).[106]

Feelings of **personal safety** and **security** are thus a recognised barrier to women using public transport; in 2017-2018 34% of women contacted as part of research on safety and security on behalf of Transport for London (TfL) reported being very or quite worried when using public transport, and 37% reported having experienced specific incidents when using public transport.[107] The same study also reported women being significantly more likely to have experienced unwanted sexual behaviour, especially in **younger age** groups (20% of women aged 16-34), compared to 10% across the general public. [108] It is estimated that a large proportion of incidents, including for unwanted sexual behaviour, are not

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[102] Department for Transport (2018): 'Walking and cycling statistics, England 2017'

[103] Department for Transport, (2019), Reported Road Casualties Great Britain: 2018 annual report'.

[104] Bose, D., et al., (2011), 'Vulnerability of Female Drivers Involved in Motor Vehicle Crashes: An Analysis of US population at risk

[105] Department for Transport (2019), 'Taxi and Private Hire Vehicle Statistics, England: 2019'; Department for Transport, (2019), 'Transport and Technology: Public Attitudes Tracker'.

[106] Suzy Lamplugh Trust, (2018), 'Steering towards safer taxi and Private Hire licensing'.

[107] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[108] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

reported; reasons for this include: the victim considering the incident not serious enough, or not knowing how to report an incident.[109]

Research also shows that women are more likely than men to have **felt unsafe undertaking everyday activities**.[110] This includes 49% and 46% of women reporting having felt unsafe when walking down an alleyway by themselves or when walking alone at night It is estimated that a large proportion of incidents, including for unwanted sexual behaviour, are not reported; reasons for this include: the victim considering the incident not serious enough, or not knowing how to report an incident. It is estimated that a large proportion of incidents When it comes to reporting unwanted sexual behaviour incidents, respectively, compared with 11% and 13% of men reporting to have felt the same. compared with 11% and 13% of men reporting to have felt the same. 85% of women in the study also reported having felt unsafe when getting into a taxi or ride-share, compared to 47% of men.[111] The same research suggests that fear of sexual assault is a large component of why women feel more unsafe in various everyday situations then men and steps taken by women to protect themselves include: avoiding being alone, avoiding certain areas and avoiding being out at certain times,[112] which might impact the way they decide to (or avoid) travel.

3.3.1.2   Risks and opportunities

Ensuring that public transport provision is **affordable** and improving public transport **connections,** making them more reliable, would enable women to undertake better connected journeys. In addition, a reduction in travelling times and interchanging would also benefit women by freeing up their capacity to undertake other activities.[113]Changes in fare structure that allow more flexibility to reflect more flexible working patterns (such as paid part time work) would present a significant opportunity to women. The additional flexibility introduced by **new technologies** such as smart-ticketing or better-connected systems and journeys, where this also provides cost-saving solutions, might present an

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[109] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[110] Smith, M., (2019), 'One in three women consciously take steps to avoid being sexually assaulted', YouGov.

[111] Smith, M., (2019), 'One in three women consciously take steps to avoid being sexually assaulted', YouGov.

[112] Smith, M., (2019), 'One in three women consciously take steps to avoid being sexually assaulted', YouGov.

[113] Gill, R., (2018), '2018 WBG Briefing: Public transport and Gender', Women's Budget Group.

opportunity to alleviate financial and time demands for women using public transport.

Improved **feelings of safety**, both on public transport as well as the local environment when walking would also present an opportunity for women in enabling them to undertake more comfortable journeys. Infrastructure can be designed in a way that improves feelings of safety for users, including through lighting, CCTV, security presence of staff and live feeds for journey planning.

The OECD[114] also stresses that women are far more sensitive than men to environmental issues such as climate change and air pollution in their choices of modes of travel. This could provide opportunities to increase uptake of certain **active-travel** modes (such as cycling) for women, where this is currently not as high as for men. Research evidences that gender inequality in cycling is common, with low levels of cycling among women compared to men.[115] This could be due to cultural factors that remain in place despite an increase in the promotion of active travel. Promoting gender quality and normalising cycling culturally could benefit women in increasing the numbers of those cycling regularly.[116] Cycling charity Sustrans also highlights that perceptions of safety are also likely to be a significant barrier for many women wanting to cycle, especially after dark.[117] This is probably due to concerns over traffic and personal safety and might be a challenge especially during the winter months, where many journeys happen in the hours of darkness. [118]

3.3.2   Male

3.3.2.1   Current experiences and challenges

There are clear discrepancies between women and men when it comes to transport habits. In 2018, 77% of men of all ages held a driving licence compared to 67% of women[119] and even though men tend to undertake less

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[114] OECD, (2020), 'Gender and environmental statistics. OECD Publishing, Paris.

[115] Aldred, R., Woodcock, J., Goodman, A., (2016)' Does More Cycling Mean More Diversity in Cycling?', *Transport Reviews*, 36:1, 28-44; Sustrans, (2018), 'Inclusive city cycling, Women: reducing the gender gap'

[116] Aldred, R., Woodcock, J., Goodman, A., (2016)' Does More Cycling Mean More Diversity in Cycling?', *Transport Reviews*, 36:1, 28-44

[117] Sustrans, (2018), 'Inclusive city cycling, Women: reducing the gender gap'

[118] Sustrans, (2018), 'Inclusive city cycling, Women: reducing the gender gap'

[119] Department for Transport (2019) 'Full car driving licence holders by age and gender'.

trips per year when travelling, they tend to travel further distances.[120] Private vehicle use and ownership is also higher amongst men, with evidence showing differences in driving habits, as well as a higher propensity to be employed in sectors that require driving, such as freight and logistics and public transport. [121]

Uptake of cycling is also more prevalent amongst men, especially in the **younger** age group, as they make nearly three times as many cycling trips than women, are twice as likely to cycle to work and travel almost four times further.[122]in light of this, men are also more likely to be road casualties when cycling, with 81% if all pedal cyclists killed on the road in 2017 being men. [123]

Men are in fact more likely to be involved in **road traffic accidents** across all transport modes[124] this is also due to their higher propensity to use certain transport modes. In the 2002 to 2016 period, 90% of motorcycle trips were done by men,[125] which is reflected in disproportionate casualties across this groups, with 91% of all motorcyclists killed on the roads being male.[126] **Younger men** are also more likely to be road casualties, where in 2017 62% of younger casualties (those aged 17 to 24) were male.[127]With pedestrians, female pedestrians account for just over half of journeys made by foot (52%), but men make up the majority of pedestrian casualties (57%). [128]

Younger men aged 16-19 are also more likely to be **victims of crime** on the public transport network compared to men of all other age groups, with one of

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[120] Department for Transport, (2019), 'National Travel Survey: England 2018'.

[121] Duchene, C., (2011), 'Gender and transport', OECD International Transport Forum.

[122] Aldred, R., Woodcock, J., Goodman, A., (2016)' Does More Cycling Mean More Diversity in Cycling?', *Transport Reviews*, 36:1, 28-44

[123] Department for Transport (2018), 'Reported road casualties in Great Britain: 2017 annual report'.

[124] Except for car, with a 50% male / female split in car occupants causalities in 2017.

[125] Department for Transport, (2018),'National Travel Survey:'

[126] Department for Transport (2018), 'Reported road casualties in Great Britain: 2017 annual report'.

[127] Department for Transport (2018), 'Reported road casualties in Great Britain: 2017 annual report'.

[128] Departmnent for Transport (2018), 'Reported road casualties in Great Britain: 2017 annual report'.

the most commonly feared crimes being violent crime, and particularly confrontation and assault by other groups of men. [129]

3.3.2.2 Risks and opportunities

Due to men's greater propensity to use private transport modes both for leisure and work including car, motorbikes and cycling, and evidence to suggest that men are more likely to be involved in road traffic accidents, interventions and the availability of transport modes that contribute to improvements in **road safety** would present a significant opportunity for men.

The propensity of men (particularly **younger men[130]**) to cycle more and travel further distances might also make men more sensitive to immediate changes to **cycling networks** and **active transport modes**.

3.4 Race

3.4.1 Current experiences and challenges

People from a BAME background are less likely to have **access to a private vehicle**, be more reliant on public transport to access employment, and live in densely populated urban areas – increasing their exposure to air pollution.[131] For many people from a BAME background, having **regular**, **affordable, clean** and **efficient** transport is essential.

In 2020 unemployment rates for people from BAME backgrounds are nearly twice those of people from White backgrounds (6.3% and 3.6% respectively).[132] Recent data from the ONS shows current instability in employment rates due to COVID-19, however, exact statistics are still being developed.[133] Data from Joseph Rowntree also shows that people from a BAME background are overrepresented in shift work, particularly in the NHS (6.1% of NHS employees are from Black backgrounds, despite this group accounting for only 3.1% of the working age population).[134]

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[129] British Transport Police Authority, (2008), 'Fear of crime and concerns about personal safety on the rail network'.

[130] Pistoll, S., Cummins, S., (2019), 'Exploring changes in active travel uptake and cessation across the lifespan: longitudinal evidence from the UK Householder Longitudinal Survey'.

[131] Joseph Rowntree Foundation (2014): 'How places influences employment outcomes for ethnic minorities'

[132] House of Commons Library (2020): 'Unemployment by ethnic background'

[133] ONS (2020), 'Employment in the UK: June 2020'

[134] Joseph Rowntree Foundation (2018) 'Tackling transport-related barriers to employment in low-income neighbourhoods'

Access to transport for some people is tied closely to geography, and **infrequent** public transport services, particularly in the evening and at weekends, can impact the type of employment people are able to access and can, for example, affect the ability to undertake shift work. Research has found that this was particularly the case for ethnic minority groups concentrated in more **deprived areas**.[135]

In 2017, 79% of distance travelled by White people was made by private vehicle, compared to 54% of distance travelled by Black people.[136] This is in line with other research that found that people from a BAME background are less likely to have **access to a private vehicle**. Lack of access to a car or van is highest for Black people (41%), mixed ethnicity (30%) and Asian (21%) in comparison with their white counterparts (19%). Black people are more than twice as likely not to have access to a car or van than white people.[137] Lower car ownership among people from a BAME background means that this group of people are more likely to rely on public transport to meet their travel needs.[138] People from Pakistani (99.1%), Bangladeshi (98.7%), and Black African (98.2%) backgrounds are most likely to live in an urban location, while from White ethnic groups are least likely to.[139] This geographical pattern means that the use of public transport for BAME people is higher than more car reliant rural communities. This means that the economic and social opportunities of people from BAME groups are more likely to be limited, to a greater extent, to places accessible by public transport than those their White counterparts.

People from BAME backgrounds are less likely to participate in **active travel** modes.[140] There is some disparity when looking at figures for people from a BAME background in relation to walking and cycling. DfT walking and cycling statistics suggest that people from a mixed ethnicity background were most likely to walk for travel once a week, while White British were the least likely.

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[135] Joseph Rowntree Foundation (2014): 'How places influences employment outcomes for ethnic minorities'

[136] Department for Transport (2018): 'Travel by distance, trips, type of transport and purpose'

[137] Department for Transport (2018); Car or van ownership

[138] Department for Transport (2015): 'Travel by car availability, income, ethnic group, household type and NS-SEC'

[139] Gov.uk (Ethnicity facts and figures')

[140] Goodman, A. and Aldred, R. (2019): 'Inequalities in utility and leisure cycling in England, and variation by local cycling prevalence'

However, when this is compared to walking for leisure, these trends are reversed.[141]

In terms of cycling, DfT data suggests that Black and Asian adults are least likely to cycle (with 7% and 8% of these groups respectively engaging in cycling at least once a week).14% of people from mixed ethnic backgrounds cycle as least once a week, and White British people are the most likely to cycle at least once a week (17%).[142]

Feelings of safety are important to consider when looking at travel patterns of people from a BAME background. It has been highlighted in research that people from a BAME background fear racial attacks when using public transport, thus potentially causing a barrier to their use of transport networks. In the same research, people from non-white ethnic backgrounds were found to be at least twice as likely as white people to have high levels of worry about a range of crimes, and particularly violent crime.[143] Concern about crime on public transport is also higher among **women** and **disabled people**.[144] Research by TfL found that people from a BAME background were more likely to state that their frequency of travel is affected as a result of these concerns.[145]

3.4.2   Risks and opportunities

Promotion or provision of sustainable and active travel helps reduce inequality and the negative impacts of air pollution on this group of people. The encouragement of **micromobility modes** such as e-bikes or scooters may be an affordable alternative to using public transport to access employment.

Similarly, research suggests that people from a BAME background are exposed to higher levels of **air pollution** compared to those who are white British, suggesting that people from a BAME background are disproportionately impacted by air pollution.[146] This higher level of exposure is linked to the high

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[141] Department for Transport (2018): 'Walking and cycling statistics, England 2017'

[142] Department for Transport (2018): 'Travel by distance, trips, type of transport and purpose'

[143] Department for Transport (2012): Transport for everyone: an action plan to promote equality

[144] Gardner, N (2017), 'Harassment on public transport and its impacts on women's travel behaviour'

[145] Transport for London (2012): Understanding the travel needs of London's diverse communities: BAME

[146] Fechta, D., et al (2015): 'Associations between air pollution and socioeconomic characteristics, ethnicity and age profile of neighbourhoods in England and the Netherlands'

proportion of BAME communities living in densely populated urban areas where air pollution is highest. The promotion of low and zero emission vehicles, as well as active transport modes both among BAME communities but also more widely will reduce the associated impacts of poor air quality.

Presence of staff can help to improve perceptions of safety on public transport networks, there is a risk that by automating many processes, staff numbers will reduce and people from a BAME background as well as **disabled people**, **older people**, **LGBT people** and **women** may feel more unsafe. Staff provide a beneficial presence as they are an assumed authority on transport networks and therefore may take a passive observer role in ensuring the safety of passengers and deterrence of crime. In terms of more proactive roles, consistent, regular and cross-modal training ensures that all members of staff have awareness and confidence when interacting with people with protected characteristics. Staff availability and training may mean that passenger experiences vary, in turn impacting future journey choices.

3.5 Religion and belief

3.5.1 Current experiences and challenges

Safety, and perceptions of safety, are particularly important for a number of groups when using the pedestrian environment and public transport. This includes people from particular religious or faith communities, for whom concern about hate crime is a particular issue. In the 2018-19 period, religious hate crimes in England and Wales increased by 3%. In the same period 12% of hate crimes were estimated to involve more than one motivating factor, with the majority of crimes relating to both race and religion.[147] 47% of religious hate crimes in the same period were against Muslims, or people perceived to be Muslim by the perpetrator.[148] Although this data does not specifically relate to experience of travel, it shows that certain groups of people, particularly Muslims, face an increasing risk of being victims of religious hate crime. Some religious groups tend to have a higher number of children and multi-generational households.[149] In some cases, older generations may not have English as a first language, while younger generations may have a large number of children.[150] Barriers to mobility as a result of a lack of English is detailed in section 3.10.2 below, while barriers faced for people with multiple

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[147] Home Office (2018): 'Hate crime, England and Wales, 2018/19'

[148] Home Office (2018): 'Hate crime, England and Wales, 2018/19'

[149] Pew Research Centre (2019), 'Religion and Living Arrangements Around the World'

[150] Pew Research Centre (2019), 'Religion and Living Arrangements Around the World'

children include cost, journey planning and ease.[151] For religious people who have a marked religious identity through clothing there is a heightened risk for harassment or discrimination, this is particularly true for women who are already more vulnerable regardless of religious dress code.[152] [153] Although evidence is not widespread, the everyday realities shown through the media highlights the gendered nature mobility among some religious communities.

The geographical distribution of faith schools means that **younger people** at these schools may have to travel further distances to access a particular school. As highlighted in section 3.1.2, alongside the fear of crime mentioned above, this particular group of younger people will have a distinct set of needs when using public transport. Feelings of **safety**, alongside **affordability** and **frequency** are important to ensuring school pupils are able to attend a school according to their religion or belief.

3.5.2   Risks and opportunities

While it might not be cost neutral and there might be other challenges associated with staff provision, a lack of staff presence may risk increased feelings of fear among passengers using public transport. Alongside **LGBT people**, **disabled people**, **older people**, **women** and **people from a BAME background**, interventions that may enhance the safety and security of public transport networks as well as active transport routes will encourage more people to travel without the fear of becoming a victim of crime.

3.6   Sexual orientation

3.6.1   Current experience and challenges

As with religious and faith and other protected characteristic groups, **safety and security** – and perceptions of safety and security – when using public spaces, and public transport is a key issue for lesbian, gay and bisexual (LGB) people. With hate crimes relating to a person's sexual orientation increasing by 25% in England and Wales in the 2018/2019 period,[154] and evidence that three in ten LGB people might adapt behaviour when choosing or avoiding to walk down a

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[151] McCarthy, L. (2016), 'Factors influencing travel mode choice among families with young children (aged 0–4): a review of the literature'

[152] BBC (2018), 'Muslim women call for end to abuse on public transport'

[153] Mashable (2015), 'Muslims increasingly vulnerable to abuse on London's public transport'

[154] Home Office (2019): 'Hate crime, England and Wales, 2018/19'

certain street,[155] people's sexual orientation might factor into people's decisions about the use of specific transport modes or routes.

The 2018 National LGBT survey also pointed to transport as the most common place where cisgender LGB survey respondents reported avoiding being open about their sexual orientation[156] as well as pointing to public transport as being considered an 'unsafe' space, that can be sometimes avoided altogether by this group.[157]

Together with **younger women**, and **younger disabled passengers**, LGB users of the London public transport network are more likely to have experienced unwanted sexual behaviours when using public transport and are in turn more likely to be worried or anxious about the **safety** of public transport.[158]

3.6.2 Risks and opportunities

Improvements in all aspects of **transport safety**, including transport infrastructure that ensures journeys can be undertaken in a safe, reliable and efficient manner, would improve feelings of personal safety and present a beneficial opportunity to all vulnerable groups when travelling, including LGB people.

As for other protected characteristic groups, such as **BAME** and **disabled people** as well as **women**, interventions that would promote the automation of processes and for instance reduce the presence of staff numbers on public transport might pose a risk by fostering feelings of unsafety amongst LGB people.

3.7 Pregnancy and maternity

3.7.1 Current experiences and challenges

Public transport plays a fundamental role in supporting social inclusion for many parents with young children, and parents with young children have been identified as a group that is particularly vulnerable to social isolation.[159]

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[155] Bachmann, C., Gooch, B., (2017), 'LGBT in Britain: Hate Crime and Discrimination', Stonewall.

[156] 65% of all cisgender respondents

[157] Government Equalities Office, (2018) 'National LGBT Survey'.

[158] Future Thinking, (2018), 'Attitudes to safety and security: annual report 2017-2018', TfL Compliance, Policing and on-street services.

[159] Pettersson, G., (2009), 'Priorities for the use of bus transport by disabled people, older people and parents with young children in buggies', Association of European Transport.

Evidence also suggests that, when private transport is available, parents with young children might chose it as a preferred transport method due to its **convenience** and **perceived safety**.[160]Although, as mentioned in section 3.3.1, women are also more likely to provide care roles for children, while also being less likely to have access to private transport, posing a challenge to this group. Children have also historically tended to be involved in car accidents as pedestrians and car passengers (58% and 31% of recorded fatalities for 2018 respectively), which is reflective of transport modes mostly used by parents with young children.

Some of the key challenges currently experienced by expectant mothers or parents with young children can include the lack of **availability** of public transport, as well as limitations in transport choice when travelling with a young child. The preference for children under three to use a car seat when travelling in a car (including taxis and PHV), minibus, coach or van[161] can for instance limit parents' choices when having to undertake travel, especially if the journey is un-planned or un-expected.

Similar to **disabled people**, and **older people**, the accessibility and design of physical spaces can also affect parents' ability to travel freely with small children, especially if using pushchairs.[162] The presence of uneven surfaces, lack of dropped kerbs, use of shared spaces as well as lack of dedicated car parking space can all limit the mobility of parents with a small child, making use of the pedestrian environment challenging for this group.

3.7.2   Risks and opportunities

Provision of better **physical accessibility** of public transport, as well as **availability** of public transport services for all, would contribute to meeting parents' travel needs – which may differ from travel patterns planned around working life – would enable this group to undertake more comfortable journeys while also responding to their needs and avoiding the risks of social isolation and severance.

Exposure to poor air quality and pollutants can also affect foetal development and cause low birth weights, premature births at well as stillbirths and miscarriages; sometimes having long-lasting effects on the health of the

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[160] Westman, J., Friman, M., Olsson, L.E., (2017) 'What drives them to drive?', Frontiers in psychology (2017): 8.

[161]HM Government (2020), 'Child car seats: the law'.

[162] Pettersson, G., (2009), 'Priorities for the use of bus transport by disabled people, older people and parents with young children in buggies', Association of European Transport.

baby.[163] Measures and transport improvements that offer opportunities to **improve air quality** could offer significant health benefits for pregnant women and women that have recently given birth.

3.8   Gender reassignment

3.8.1   Current experiences and challenges

The House of Commons Women and Equalities Committee highlights that **discrimination** is a part of daily life for trans people and that this has a significant impact upon a person's emotional state, resulting in fear, anxiety and anger, as well as generating behaviours of avoidance on the part of the person being or feeling discriminated against.[164]

Responses from the Government's transgender e-survey identified respondents' most widely-reported fear for their **safety** on the streets and when using public transport, with just under half of respondents[165] saying their greatest worry was being a victim of a violent crime or harassment.[166] This highlights that transgender people might be less prone to using public transport, and those who do may be less willing to spend time commuting, also potentially reducing their pool of wider employment, educational, health and recreational opportunities.

3.8.2   Risks and opportunities

Measures that would improve **feelings of safety** and thus confidence in travel would present an opportunity for this group; including infrastructure measures such as CCTV at public transport infrastructure and on transport services, and the improved visibility of staff in areas where people feel particularly vulnerable, again, including public transport.

The training of transport staff to ensure that they are able to offer appropriate support to transgender passengers would further support greater confidence in travel by this group.

3.9   Marriage and civil partnership

There is no evidence to suggest that this protected characteristic group might experience transport differently today.

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[163] British Lung Foundation (2017), 'Risks to your child's lungs'.

[164] House of Commons Women and Equalities Committee, (2015) 'Transgender Equality'.

[165] 47% of all respondents.

[166] HM Government (2011): 'Headline findings from our transgender E-surveys'

3.10 Socio-economic groups

3.10.1 People on low incomes and people from deprived communities

3.10.1.1 Current experiences and challenges

Affordability of public transport is one of the key barriers for people living on low incomes, such as people who are unemployed, in insecure or low paid work, and people who live in deprived areas. People living in deprived areas are significantly more likely to use buses than other groups of people, and bus travel therefore accounts for a larger percentage of their income.[167]

Evidence from the Joseph Rowntree Foundation[168] also highlights that residents in low-income neighbourhood often find commuting options constrained by **unaffordable** or **unreliable** public transport, especially when combined with the prospect of low-paid or unsecure employment. Low income jobs such as cleaning or security roles may require early starts or late finishes when public transport is not available.[169] Furthermore, peripheral sites of employment, such as retail, commercial and industrial parks are hard to access using the public transport system, making people living in low-income neighbourhoods more reliant on private transport.

However, lower income households have higher levels of non-car ownership – female heads of house, **children**, **younger** and **older people**, **people from a BAME background** and **disabled people** are often concentrated in this statistic.[170] There are geographical inequalities in the provision of transport and as a result differences in access to employment, healthcare, education, and other amenities occur. Often these are located in areas that already have good transport links or are due to have new transport hubs opening nearby. However, residential areas may have a wider scale of provision compared to areas of employment. The lower level of car ownership, combined with limited public

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[167] UK Women's Budget Group on public transport and gender (2018): 'Public transport and gender briefing'

[168] Crisp R., Ferrari, E., Gore, E., Green, S., McCarthy, L., Rae, A., Reeve, K., Stevens., M., (2018), Tackling transport-related barriers to employment in low-income neighbourhoods', Joseph Rowntree Foundation.

[169] Crisp, R and Ferrari, E (2018), 'Tackling transport-related barriers to employment in low income neighbourhoods'

[170] Government Office for Science (2019) 'Inequalities in Mobility and Access in the UK Transport System'

transport services in many peripheral social housing estates, exacerbates issues around access to services, education and employment.[171]

Evidence suggests that people living in deprived areas face unequal access to certain modes of transport. Research has found that only a small number of deprived areas are served by the rail network, instead mostly being accessibly by local buses. Where there are train stations, they are often perceived as run-down and secluded, leading to **feelings of fear** about using them.[172]

People living in deprived neighbourhoods are significantly more likely to **feel unsafe** and believe that crime is a significant problem in the areas that they are living. According to a survey conducted in 2016, 42% of people living in the most deprived areas feel unsafe, this is compared to 15% of people living in the most affluent, and the national average of 26%.[173] This data shows that **fear of crime** for people living in deprived areas may be less likely to go out walking or cycling, causing a reduction in physical activity. Improving **feelings of safety** can encourage more people to use the local area and increase their levels of activity.[174] In addition to the fear of crime, concerns around road safety may be a factor in modal decisions. A 2018 study into pedestrian safety revealed that **children who live in deprived areas** are at a greater risk of being involved in a road related (as both a passenger and a pedestrian) accident when compared to other children.[175] **Children living in the most deprived quintile** are six times as likely to be involved in an accident than those living in the least deprived quintile.[176] This data highlights the disparity in road safety between deprived areas and areas that are more affluent. Rates of Killed or Seriously Injured casualties in relation to miles walked for people in the most deprived quintile is over double that of those living in the least deprived (0.58 and 0.28 casualties per million miles walked).[177]

Adults living in deprived areas are less likely to walk for leisure than people living in less deprived areas, however, they are more likely to walk for travel, perhaps a result of barriers to accessing public transport.[178] For people living in

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[171] Government Office for Science (2019) 'Inequalities in Mobility and Access in the UK Transport System'

[172] Joseph Rowntree Foundation (2018): 'Tackling transport-related barriers to employment in low-income neighbourhoods'

[173] Ipsos MORI (2016): 'Public views of policing in England and Wales. Research report for Her Majesty's Inspectorate of Constabulary'

[174] Active Living Research (2015): 'Creating places that promote physical activity: Perceiving is believing'

[175] RoSPA (2018): 'RoSPA pedestrian safety policy paper'

[176] RoSPA (2018): 'RoSPA pedestrian safety policy paper'

[177] Department for Transport (2015): 'Facts on pedestrian casualties'

[178] Department for Transport (2017): 'Cycling and walking investment strategy'

deprived areas who do not have access to private transport, walking and cycling can provide a **cost-effective** mode of transport while at the same time improving health and wellbeing, notwithstanding air quality issues.

There is major disparity between **people living in deprived areas** and communities in more affluent areas regarding the exposure of individuals to polluted air. Communities in deprived areas and from lower economic backgrounds, are found to experience twice the impact on lung function by pollutants than those from wealthier areas - and are three times more likely to develop COPD, as found by the UK Biobank in 2019.[179] This may be a result of the fact that more deprived communities generally live in more urban locations with little surrounding greenspace. Additionally, people living in deprived areas are more likely to have pre-existing medical conditions, which can affect an individual's capacity to provide a strong immune response when presented with new illness or disease.[180] This has become apparent in the COVID-19 pandemic which has shown the BAME communities are more likely to become severely ill due to existing health conditions.[181]

Increasing promotion and provision of active transport directly benefits people who reside in deprived areas by improving the local air quality and improving their health and wellbeing.[182] For example, obesity rates for **children** are highest amongst those in deprived areas. According to the Department for Health and Social Care, children aged five from the poorest income groups in the UK are twice as likely to be obese compared to their most well off counterparts, and children aged 11 are three times as likely to be obese.[183] Active transport, therefore, not only improves these people's health and wellbeing but can also help to reduce health inequalities more widely.[184]

3.10.1.2 Risks and opportunities

Public transport has the potential to increase access to employment and education, in return creating economic prosperity. However, this is based on

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[179] Air Quality News (2019): 'Air pollution has twice the impact on lung function for poorer households'

[180] Public Health England: 'Air quality matters'

[181] Joseph Rowntree Foundation (2020), 'COVID-19 is a greater health risk to people on low incomes: we can give a life-line'

[182] DfT (2017): 'Cycling and walking investment strategy'

[183] Department for Health and Social Care (2017): 'Childhood obesity: a plan for action'

[184] DfT (2017): 'Cycling and walking investment strategy'.

ensuring that transport networks connect more deprived areas to centres of employment and education.[185]

Promoting cost-effective transport modes alongside active travel will benefit people living in deprived areas both economically and in their wellbeing.

Ensuring feelings of safety are increased will encourage more people to participate in active travel modes and use public transport that is available. Safety can be improved by the provision of quality lighting, clear sightlines and where appropriate surveillance. Furthermore, concerns around road safety can be reduced through appropriate education, signs and road markings amongst other things.

3.10.2 People with low levels of education and literacy, and people who do not speak or understand English

3.10.2.1 Current experiences and challenges

For people who do not have English as a first language (such as new migrants, asylum seekers, or tourists), have special educational needs or certain cognitive impairments such as dyslexia and dyspraxia, understanding some types of information can be challenging. Trying to interpret and understand large amounts of journey or ticket information may lead to high levels of **stress and anxiety** for some people, creating a barrier to the use of public transport.[186]

Research has identified three key challenges in using public transport for people with communication difficulties.

- Firstly, the **accessibility of information** varies between modes and between locations. A lack of coherent and consistent information creates a barrier to travel for this group of people.
- Secondly, where modes of transport are integrated, **the amount of information** to consider can be overwhelming and debilitating for some people who may not be able to absorb and understand large volumes of information, particularly if they need to visualize or remember a number of modal or route changes.
- Thirdly, it was reported that people were often unsure of when they could ask for help and were uncertain about the culture of assistance. In addition, **staff**

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[185] Joseph Rowntree Foundation (2018): 'Tackling transport-related barriers to employment in low-income neighbourhoods'

186 Bigby, C. et al. (2017) 'Communication access on trains: a qualitative exploration of the perspectives of passengers with communication disabilities'

are not always available, or identifiable, making the prospect of asking for help **stressful and uncertain**.[187]

In the 2011 census, people from Bangladeshi ethnic backgrounds were the group most likely to not speak English well or at all. **Women** from **BAME backgrounds** were also more likely to not be able to speak English well, for example 60% of those who could not speak English well were female (Pakistani and Bangladeshi women were five times more likely than their male counterparts to speak no English at all).[188] Not having a high level of English proficiency acts as a barrier as information is predominantly communicated and represented in English, as are interactions with members of transport staff. As the census statistics show, this means that **women from a BAME background** are less likely to travel via public transport.

For refugees and some migrant workers, **affordability** of transport is important. These groups of people are often reliant on public transport to access employment and education, however they are also commonly employed in low paid jobs or rely on government benefits. Ensuring **information about transport services and tickets is accessible,** such as the provision of information in a range of accessible formats including community language and plain English[189], for people who do not have a high level of English proficiency will ensure that they are able to access employment and educational opportunities. Furthermore, for some migrants, community participation is important in processes of integration and being able to access community and social events via public transport is important for their mental wellbeing.[190]

3.10.2.2   Risks and opportunities

Access to technology can be more challenging for people who do not speak English. Mobile apps and other tools are not always available in a range of community languages and may exclude those who are potentially most in need of them – such as new arrivals in the UK, or those needing to access education and training. Although this is not specific to transport systems, it is something that will perhaps be a barrier as technology in transport is developed.

Ensuring information is available in a range of formats and languages where possible (text, images, audio for example), as well as ensuring staff are trained

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[187] Bigby, C. et al. (2017) 'Communication access on trains: a qualitative exploration of the perspectives of passengers with communication disabilities' in Disability and Rehabilitation 41

[188] Office for National Statistics (2018) English language skills

[189] Such as the Crystal Mark accreditation for Plain English

[190] Home Office (2019) 'Integrating refugees: What works? What can work? What does not work? A summary of the evidence'

to assist in an appropriate manner helps to increase the accessibility of public transport for this group of people.[191] The emergence of services that are designed to support access to travel for those whose first language is not English, or who have specific sensory requirements, could potentially benefit this group.

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[191] Bigby, C. et al. (2017) 'Communication access on trains: a qualitative exploration of the perspectives of passengers with communication disabilities' in Disability and Rehabilitation 41

4 Summary findings

This chapter reflects on some of the headline findings from the rapid evidence review and presents some of the common themes that have been identified across multiple protected characteristic groups and people with different socio-economic backgrounds. Evidence from the literature review and summary findings will be used as the starting point to inform Stage 2 of this commission.

The rapid evidence review highlighted that although different groups currently experience transport differently, and transport might present varied risks and opportunities to each group, a number of areas of overlap can be identified across all. They include:

● Availability

● Accessibility

● Affordability

● Safety

● Pollution and air quality

The 11 groups considered in the report, although in themselves diverse, are not mutually exclusive characteristics. Many people will have more than one or even two of the characteristics, meaning that people will experience a combination of challenges and opportunities at any one time. Moreover, both positive and negative experiences can be compounded to create particularly adverse or advantageous effects depending on what combination of characteristics or economic circumstances a person has. Therefore, when thinking about equality in future transport intersectionality should be at the forefront of considerations.

4.1 Availability

The availability of transport encompasses challenges and opportunities related to the reliability, regularity and efficiency of transport infrastructure and services. Ensuring transport networks serve key residential areas, employment centres and educational settings increases economic and educational opportunities for **people living in deprived areas**, **people from BAME backgrounds, women** and **younger people**. For people who are more reliant on public transport such as **older people**, **disabled people**, **low income families** and **people from BAME backgrounds**, providing services that are efficient with reliable timetables allows people to access shift work at evenings and weekends. Providing good quality public transport alongside active mode options, allows people to be able to choose options that are most suitable for them.

4.2   Accessibility

The accessibility and inclusive design of all modes of mobility, transport infrastructure and associated information is vital for all groups who wish to travel. Stops, stations and terminals become accessible when they are designed for all, regardless of **physical mobility**, **cognitive ability** or **language proficiency**. Alongside public transport infrastructure, PHVs are more user friendly when they are accessible for wheelchair users. Well trained and easily identifiable members of staff can make journeys more seamless and less stressful for people requiring passenger assistance services. Information relating to transport services is becoming increasingly digital which has a disproportionate impact on people who have reduced internet use or access to a smartphone, namely **older people**, **disabled people** and **low income families**. Where information is made available in a range of formats with adaptions to meet the needs of users, people are able to access the information, and subsequently the services they need to have a positive travel experience. In terms of active travel modes such as walking and cycling, inaccessible pedestrian environments can be a barrier to using such modes, however, where shared spaces are well marked, and routes made clear, it allows people to participate in more active modes of travel.

4.3   Affordability

The affordability of public transport disproportionately affects people who are more reliant on it to access employment, education, health services and social networks. Particularly people who are less likely to have access to a private vehicle and work in lower-paid shift work, this includes **older people**, **disabled people**, **women**, **people from a BAME background**, **people with low literacy or language proficiency, younger people**, and **low income families**. Affordable transport increases opportunities to access a range of services and amenities, as well as participating in social events.

4.4   Safety

Perceived and actual safety is of paramount importance in passengers' confidence and decisions to travel. Some protected characteristic groups are more likely to be impacted by both perceived and actual threats to personal safety while using transport. **Disabled people**, **women**, **people from a BAME background**, **religious groups**, **LGB people** and **trans people** are all more likely to be a victim of harassment or acts of discrimination. For these people this results in reduced feelings of safety when using public transport and when out walking or cycling, particularly at night or on quiet streets. **Older people** and **disabled people** are also considered to be more vulnerable passengers often in relation to having reduced physical mobility and potential cognitive

challenges. For all of these groups, the perceived risk means that journeys are tailored to be made at particular times of day, with others, or on busy routes.

In terms of physical danger, road traffic accidents pose a risk to both pedestrians and drivers. However, **younger people**, **children**, **disabled people, men** and **people living in deprived areas** are more likely to become involved in road accidents either due to an increased level of walking or cycling or a higher prevalence of vehicle traffic. In addition, recent research has shown that **women** are significantly more likely to be seriously injured or killed when involved in a car accident than men.[192]

Safety, whether perceived or actual, impacts the travel habits of almost all protected characteristic groups. As technology begins to take an increasingly central role in transport innovation and service provision, opportunities will arise to improve monitoring of networks, providing opportunities to help people to feel safer and more confident when travelling. Crime reporting mechanisms such as the British Transport Police text service and the Safe in the City App, as well as help points located on trains and at stations, help passengers to feel safer as technology allows a near instant connection to someone or something that can offer assistance. Furthermore, technological innovation in road transport presents an opportunity to increase road safety and reducing the rate of serious incidents involving pedestrians, cyclists and drivers. While technological advancements pose a number of opportunities to increase the safety of travel, it is important to highlight the role that staff presence plays in providing assurance and making passengers feel more comfortable in certain environments. Surveillance equipment, while becoming more accurate and advance, does not replicate the nuances of body language or verbal exchanges that a person present would be able to. Therefore, the move to more automation, while more efficient and physically safer, may not wholly replace the need for staff presence and assistance.

4.5   Pollution and air quality

There is a direct relationship between health, air quality and transport infrastructure. Changes and improvements in mobility that will help shift patterns to increase the use of more sustainable transport modes and potentially reduce the use of private vehicles will benefit all groups considered in this review, particularly those who might be more vulnerable to changes in air quality due to their vulnerability, health or pre-existing conditions such as **older people**, **children, disabled people, people from a BAME background**, **low income households** and **pregnant women**. As the concentration of air pollutants also

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[192] Forman, J., Poplin, G., Shaw, G., et al (2019), 'Automobile injury trends in the contemporary fleet: Belted occupants in frontal collisions'

tends to be highest in town and cities, opportunities to shift to more sustainable transport modes might be particularly significant in urban areas and have a bigger impact on people living in densely populated inner-city locations.

Table 4.1 below summarises some of the key areas of current challenge, and future risk and opportunity that have been identified across all the groups considered in the rapid evidence review. While all of the areas identified are pertinent to all groups, what the evidence review and table below highlight is those people that are likely to be disproportionately affected (positively or negatively) by these five, and therefore any changes to transport under these themes will have a larger impact on the groups ticked in each column.

 Table 4.1: Protected groups disproportionately affected by five key areas identified from evidence review

	Availability	Accessibility	Affordability	Safety	Pollution and air quality
Older people	Yes	Yes	Yes	Yes	Yes
Younger people	Yes		Yes	Yes	
Children	Yes		Yes	Yes	Yes
Disabled people	Yes	Yes	Yes	Yes	Yes
Gender reassignment		Yes		Yes	
Marriage and civil partnership					
Pregnancy and maternity		Yes		Yes	Yes
Race	Yes		Yes	Yes	Yes
Religion and belief	Yes			Yes	
Female	Yes	Yes	Yes	Yes	
Male				Yes	
Sexual orientation				Yes	
Low literacy / language		Yes	Yes		
Deprivation	Yes		Yes	Yes	Yes

4.6   Next steps in the commission

The five key areas detailed above provide the context for how current trends, risks and opportunities highlight those considerations that should be taken forward, forming a basis for further analysis of equality considerations in future transport. This is particularly the case with the eight areas of focus, as defined by Regulatory Review, namely:

- Zero emission vehicles
- Self-driving vehicles
- Drones and future flight
- Innovation in maritime
- Micromobility
- Buses, taxi and private hire vehicles
- Mobility as a service
- Transport data

Based on the outcomes of this evidence review, there will be a number of ways in which future transport and technology trends interact with the experiences of particular social groups. There will be multiple opportunities and challenges that may subsequently arise for protected characteristic and socio-economic groups.

The emerging findings are pertinent to all protected characteristic groups considered in this report, however, the effects are multifaced both within and across groups. The next stage will therefore interrogate further this variety and intersectionality, highlighting where effects on groups are not mutually exclusive, but connected and influenced by one another. An understanding of this at the next stage will ensure that for each area of focus, a holistic approach to equality will be considered and reported.

Appendices

A. Key words

Table A.1 below includes a list of key word associated to definitions for each protected characteristic group in the rapid evidence review.

Table A.1: List of key words search according to protected characteristic

Protected characteristic	Key word search for group	Protected characteristic	Protected characteristic
Age: older people	● Old ● Old person ● Older ● Elderly ● Pensioner ● Retired ● Senior citizen	Age: younger people	● Youth ● Young ● Teenager ● Adolescent ● Young adult
Age: children	● Kids ● Juniors ● Babies ● Newborn ● Children ● Child ● Toddler ● Schoolboy ● Schoolgirl	Disability (and carers)	● Disability ● Disabled ● Visual impairment ● Hearing impairment ● Learning disability ● Long term health condition ● Reduced mobility ● Wheelchair users ● Carers ● Caring responsibilities
Gender reassignment	● Transgender ● Transexual ● Non-binary ● Gender neutral	Marriage and civil partnership	● Married ● Husband ● Wife ● Partner

	● Genderless ● Trans		● Civil partnership ● Civil partner
Pregnancy and maternity	● Pregnancy ● Maternity ● Prenatal ● Postnatal ● Mother ● Father ● Parent	Race	● BAME ● Minority ethnic ● BAME communities ● Ethnic communities ● Race ● Ethnicity
Religion and belief	● Religious ● Religion ● Believer ● Buddhist ● Hindu ● Jew ● Muslim ● Sikh ● Christian ● Agnostic ● Atheist	Sex	● Sex ● Gender ● Male ● Female ● Man/Men ● Woman/Women ● Boy ● Girl
Sexual orientation	● Lesbian ● Gay ● Bisexual ● LGB ● LGBT ● LGBTQ+ ● Homosexual ● Heterosexual ● Queer ● Polysexual ● Asexual	People from deprived backgrounds	● Deprivation ● Low income households ● Low income families ● Deprived neighbourhoods ● Deprived areas ● Disadvantaged families ● Disadvantaged neighbourhoods ● Unemployment / unemployed

Key words from Table A.1 were used in combination with key words relevant to the topic area of this rapid evidence review in the selection of sources The list of the main key words utilised for the search and selection of relevant literature for the rapid evidence review is listed below:

- Challenges risks and opportunities of transport on age group: Older people, elderly people, retired people, over-65s
- Challenges risks and opportunities of transport on age group: children, under 16s
- Challenges risks and opportunities of transport on age group: young people
- Challenges risks and opportunities of transport on disabled people: wheelchair users, mobility impairments, sensory impairments (visually impaired, blind, deaf), mental illness, cognitive impairments and learning disabilities), long terms illnesses and health conditions (e.g. asthma, COPD, cancer)
- Challenges risks and opportunities of transport on gender reassignment: transgender people, trans people, gender non-binary people, cisgender
- Challenges risks and opportunities of transport on marriage and civil partnership: married people, civil partners
- Challenges risks and opportunities of transport on pregnancy and maternity: pregnant women, breastfeeding mothers, parents with young children, people travelling with pushchairs, prams, buggies etc.
- Challenges risks and opportunities of transport on race, ethnicity, nationality, country of origin, national group: Black, Asian and Minority Ethnic (BAME) or Black and Minority Ethnic (BME) groups, Gypsy, Roma and Traveller, White and White British.
- Challenges risks and opportunities of transport religion and belief: religions, faith groups, belief groups: minority faith communities (e.g. Buddhist, Hindu, Jewish, Muslim, Sikh), Christians, atheists
- Challenges risks and opportunities of transport on sex or gender: men, women
- Challenges risks and opportunities of transport on sexual orientation: lesbian, gay men and women, bisexual people (LGB), lesbian, gay, bisexual and transgender and others (LGBT+), straight or heterosexual people
- Challenges risks and opportunities of transport on people without access to a car
- Challenges risks and opportunities of transport on carers / caregivers
- Challenges risks and opportunities of transport on deprived communities, low income groups

- Rural areas and dislocation / separation from social networks, friends and family
- Transport and apprenticeships, training and skills
- Transport and job creation
- Transport and community resources: education, healthcare, places of worship, care homes, open space, parks and recreation
- Transport and air quality and respiratory conditions such as asthma (and impacts on children, disabled people, older people)
- Transport and noise exposure and disturbance
- Accessibility (for disabled people, older people, parents with pushchairs and small children)
- Public transport access

B. Bibliography

Table B.1 includes references for the 30 key documents that have been used to inform this rapid evidence review.

Table B.2: Main sources

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Table B.2 below lists out the additional resources that have been used to inform this rapid evidence review.

Table B.2: Additional resources

Active Living Research (2015) 'Creating places that promote physical activity: Perceiving is believing'
Bachmann, C., Gooch, B., (2017), 'LGBT in Britain: Hate Crime and Discrimination', Stonewall.
Bose, D., et al., (2011), 'Vulnerability of Female Drivers Involved in Motor Vehicle Crashes: An Analysis of US population at risk'.
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C. Protected characteristics

The Equality Act 2010[193] identifies nine protected characteristics, which in turn are defined by the Equality and Human Rights Commission (EHRC) as follows:

Table C.1 Protected characteristics

Protected characteristic	Equality and Human Rights Commission definition
Age	A person belonging to a particular age (for example 32-year olds) or range of ages (for example 18 to 30-year olds).
Disability	A person has a disability if she or he has a physical or mental impairment which has a substantial and long-term adverse effect on that person's ability to carry out normal day-to-day activities.
Gender reassignment	The process of transitioning from one gender to another
Marriage and civil partnership	Marriage is a union between a man and a woman or between a same-sex couple. Couples can also have their relationships legally recognised as 'civil partnerships'. Civil partners must not be treated less favourably than married couples (except where permitted by the Equality Act).
Pregnancy and maternity	Pregnancy is the condition of being pregnant or expecting a baby. Maternity refers to the period after the birth and is linked to maternity leave in the employment context. In the non-work context, protection against maternity discrimination is for 26 weeks after giving birth, and this includes treating a woman unfavourably because she is breastfeeding.
Race and ethnicity	Refers to the protected characteristic of race. It refers to a group of people defined by their race, colour, and nationality (including citizenship) ethnic or national origins.
Religion and belief	Religion has the meaning usually given to it, but belief includes religious and philosophical beliefs including lack of belief (such as Atheism). Generally, a belief

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[193] Government Equalities Office/Home Office (2010): 'Equality Act 2010'

	should affect someone's life choices or the way they live for it to be included in the definition.
Sex	A man, woman or non-binary person.
Sexual orientation	Whether a person's sexual attraction is towards their own sex, the opposite sex or to both sexes.