Get on Board – The Economics of Making the Rail Network Fully Accessible

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About this report

Leonard Cheshire are campaigning to make train travel accessible to everybody and specifically to put into legislation a legally binding guarantee that all rail journeys in Britain will be fully accessible by 2030. This report seeks to estimates the financial commitment that would be required to meet this guarantee. We review a range of capital and operational accessibility improvements that would be required and construct a cost model to estimate the cost of providing step-free access to platform level across the entire UK rail network. We estimate that this would cost just 1-3% of total transport capital investment over the next decade.

Full public transport accessibility should be a basic right, but it also delivers a wide range of individual and social benefits. We review the evidence on the benefits and find that economic appraisal evidence suggests significant benefits. We also produce new estimates of improved labour market access and find that a fully accessible rail system could help around 51,000 disabled people into employment and a further 85,000 employed disabled people into a new job.

About WPI Economics

WPI Economics is a specialist economics and public policy consultancy. We are driven by a desire to make a difference, both through the work we undertake and by taking our responsibilities as a business seriously. We provide a range of public, private and charitable clients with research, economic analysis and advice to influence and deliver better outcomes through improved public policy design and delivery.

About the authors

James Edgar, Chief Economist

James has fifteen years of experience working as an economist at the forefront of policy making. His areas of expertise include transport, utility regulation, consumer policy, environmental and digital issues. Prior to joining WPI James was Head of Policy for Digital and Regulation at the consumer champion Which?. Before this he worked for a decade at the Department for Transport, including as the Head of Road Economics after establishing the successful multi-disciplinary team. He has experience of local transport, freight, rail and environmental issues.

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Leonard Cheshire are campaigning to make train travel accessible to everybody through their *Get on Board* campaign, and specifically to put into legislation a legally binding guarantee that all rail journeys in Britain will be fully accessible by 2030. Leonard Cheshire have previously estimated that 38% of stations were not yet step-free and at the current rate of progress it would take until 2070 to make the entire rail system step-free.[1] To support the campaign, they commissioned us to:

- capture the financial commitment required to fully implement this target, and,
- gather the evidence on the social and economic benefits that meeting the target would bring.

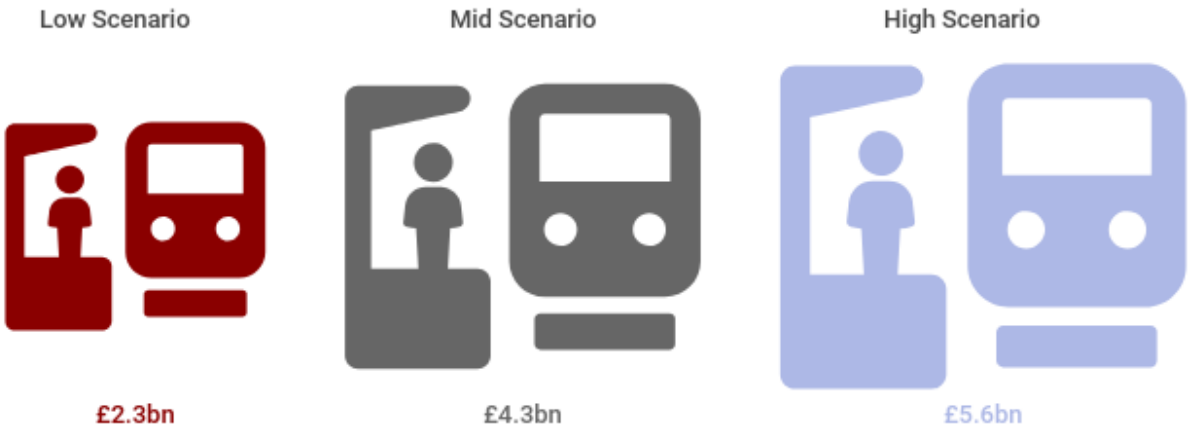
We have brought to bear our knowledge of transport cost modelling and strategy for this work which will complement interviews that Leonard Cheshire will be conducting. These interviews will be carried out with a range of disabled people to ensure that their perspectives and lived experiences are a key part of building the next phase of the campaign.

Although disabled people have widely varying accessibility needs, the primary focus of the *Get on Board* campaign and hence this report is the impact poor accessibility on the rail network has for those with mobility impairments. We discuss various types of accessibility improvements including full accessibility on boarding and alighting from trains, accessibility within train carriages, and broader elements such as fully trained staff. However, our costing focuses on the provision of step-free access at train stations to platform level as the area where the most significant capital cost is likely to be incurred.

We estimate that the provision of full step-free access to platform level would cost just 1-3% of total transport capital investment

We have used publicly available data to construct a cost model, combining estimated costs of accessibility improvements with information on the 1,000 stations that are not yet step-free. Our model suggests the total cost of making the entire railway network step-free to platform level would cost between £2.3bn-£5.6bn, with a central estimate of £4.3bn (figure 1).

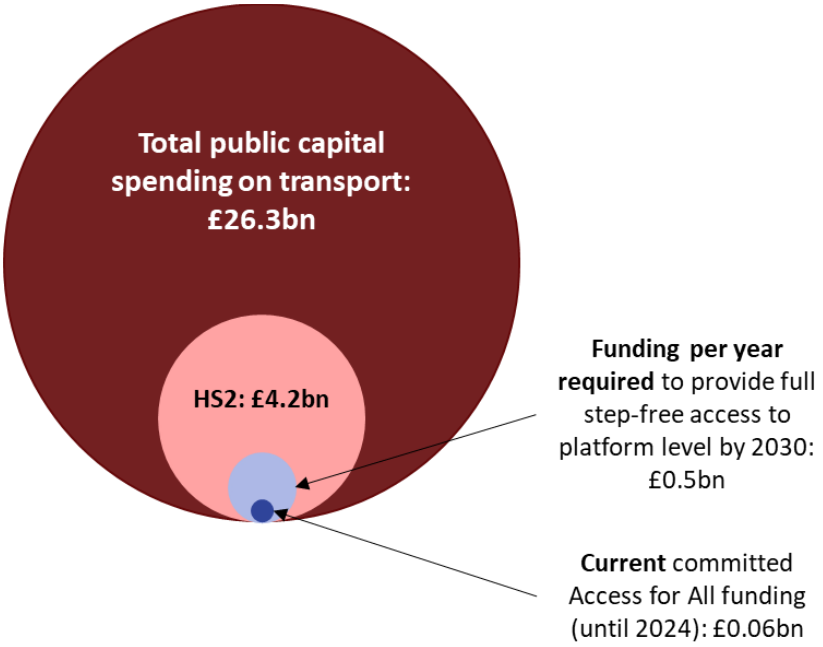
Figure 1: WPI modelling of the costs of making every station step-free



Source: WPI modelling

Figure 2 shows in visual terms how our central estimate compares to overall transport capital spending. The annual spending requirement of our scenarios is between 1% and 3% of planned transport capital spending. Put another way, our central estimate suggests the ***total*** cost would be equivalent to just a ***single year*** *of* spending on High Speed 2.

Figure 2: Annual funding required to provide full step-free access to platform level (central estimate) compared to UK average annual expected transport funding between 2020-2030



Source: WPI calculations, DfT Inclusive Transport Strategy, Transport Statistics GB Table TSGB1303 and National Infrastructure Assessment 2018

Improving other aspects of accessibility

To provide a fully accessible rail system a range of other areas need to be improved too. In this report we take full accessibility to mean a rail system that met the vision set out by the Government in the Inclusive Transport Strategy that "disabled people have the same access to transport as everyone else. They will travel confidently, easily and without extra cost."[2] A range of measures beyond step-free access to platform level would be needed to achieve this including:

- The platform-train interface: There are capital improvements that can make it easier for people to get on and off trains, including rebuilding platforms and train carriages with retractable steps or "gap filler" ramps.
- Accessibility on train carriages: All rolling stock was supposed to comply to PRM-TSI (Persons with Reduced Mobility Technical Specifications for Interoperability: a European standard for the accessibility of train carriages) by the beginning of 2020, but dispensations had to be made for certain non-compliant carriages. Although PRM-TSI is the current legal standard, there is some evidence to suggest that it falls short in certain areas.
- Other capital investment: Minor improvement works include induction loops, appropriate signage, tactile paving, accessible toilets, onward travel and interchange facilities.

- **Operational changes:** Operational concerns such as the provision of staff, systems for passenger assistance and communication will continue to be essential for the accessibility of the railway, no matter how much is invested in capital improvements.

Full public transport accessibility should be a basic right, but it also delivers a wide range of individual and social benefits

Disabled people should have the same access to transport as everyone else, which Government policy recognises in the Inclusive Transport Strategy.[3] As such, full public transport accessibility should simply be a basic right. However, in addition to delivering this right there are a wide range of other benefits to making the rail system fully accessible:

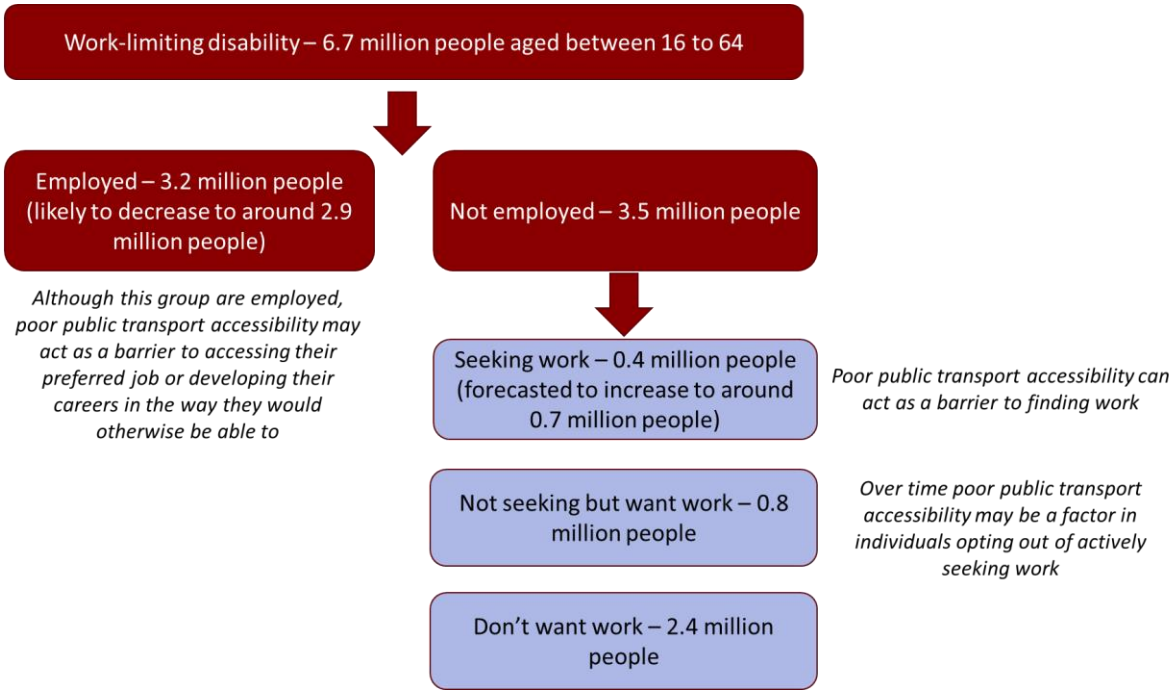
- **Benefits to the individual:** Improved accessibility provides an increased ability to access public services, education, the labour market and leisure and social opportunities. It can lead to improved health, including mental well-being,
- **Benefits to the economy:** Improved accessibility increases labour market engagement, widening the talent pool that employers have access to, and increases engagement with the local and national economy,
- **Benefits to society:** Improved accessibility can reduce car use, which in turn reduces congestion and brings environmental benefits. It can also reduce boarding time for other public transport passengers and bring wider benefits to older people, those with young children or heavy luggage.

A detailed review[4] of the benefits of Access for All, the main programme delivering accessibility improvements in rail, found that in total the quantified benefits exceeded costs by on average 2.4 times and this is likely to be an under-estimate. Although some stations will have lower benefits than this, the evidence shows that even on a narrow business case approach alone there are substantial benefits.

How public transport accessibility could improve labour market access

We have also produced new analysis of the benefits that arise from improved public transport accessibility on labour market engagement. Poor public transport accessibility acts as a barrier to employment and has a range of impacts for the individual and society. We have established a framework to understand the numbers of people who could be affected, and the type of problems that poor public transport accessibility can cause, shown in figure 3. Within this framework we have used the term “work-limiting disability” as this is based on how the Office for National Statistics refers to their calculation of the number of people who have a long-term disability which affects the kind or amount of work they might do.[5] This phrasing does not follow the social model of disability, as it does not acknowledge that it is the societal barriers that limit the work disabled people can do, not their disability.

Figure 3: How poor public transport accessibility could affect labour market engagement for disabled people (Jan-Mar 2020, with forecast adjustments for the economic impact of COVID-19)



Source: Labour Force Survey

Using evidence from Leonard Cheshire's Disabled Adult Survey we find that a fully accessible rail system could:

- help around 51,000 disabled people into employment (24,000 of whom are actively seeking work and 27,000 of whom say they would like to work) leading to benefits such as:
    - Exchequer benefits of £450 million per year
    - Economic output (GVA) boost of £1.3 billion
    - Increase well-being for those who gain employment[6]
- help around 85,000 employed disabled people into a new job. Research has shown the significant earnings and productivity benefits from employees gaining new jobs,[7] meaning that this is likely to lead to increased earnings and another economic boost.
- help a further 43,500 unemployed people and 115,000 employed people to attend an interview that may lead to a new job.

A step-free railway is an important part of reaching a fully accessible railway that could unlock these benefits.

The impact of COVID-19

The economic impact of COVID-19 makes this work even more important. We have shown how:

- Unemployment is already rising, and the consequences of unemployment can be longer-lasting for many people with disabilities.
- Full rail accessibility is likely to play an important part in helping some people with mobility impairments find new or better jobs as part of the recovery

Although public spending may be under more pressure, it is likely that large scale transport infrastructure spending will continue as public spending acts as a stimulus to the economy.

There is also a unique opportunity for substantial reform following the wholesale suspension of the normal rail franchise agreements in March 2020. This could help tackle a number of the barriers to the provision of accessibility improvements, including the current fragmented nature of the railway and a perceived lack of business case.

1. Introduction

Costing a legal guarantee that all rail journeys in Britain will be fully accessible by 2030

Leonard Cheshire[8] are campaigning to make train travel accessible to everybody through their *Get on Board* campaign. The primary objective of the campaign is to put into legislation a legally binding guarantee that all rail journeys in Britain will be fully accessible by 2030. To support the campaign, they commissioned us to capture the financial commitment required to fully implement this target. The commitment would build on the goal set in the Government's Inclusive Transport Strategy[9] that "By 2030 we envisage equal access for disabled people using the transport system, with assistance if physical infrastructure remains a barrier". It is especially important that the government and rail industry work together to hit that 2030 target, because by then the number of people aged over 75 will have increased by over quarter from 2020.[10] For this growing population of older people to live independently, it is vital that public transport meets their needs.

Table 1: Populations in the UK (2019)

Group	Population
All adults	53m
Working age adults (16-64)	41m
Number of working age adults that the Office for National Statistics calculates have a long-term disability which affects the kind or amount of work they might do	7m

Source: Labour Force Survey

Full accessibility will need both infrastructure provision and continued operational improvements

People who experience disability or impairment have widely varying accessibility needs, and therefore there are a wide range of accessibility improvements that are needed to deliver equal access. Improvements to both physical infrastructure and day-to-day operations are needed to provide truly equal access.

The primary focus of the *Get on Board* campaign and hence this report is the rail system, although we have also included discussion of the bus system where relevant. We cover a range of evidence on types of disability, but our focus is on mobility impairments as they are the most common form of disability in the UK.[11] Around 40% of stations do not have step-free access from the street to platforms[12] and research carried out in 2015 showed that one third of trains were estimated to not have a reasonable stepping distance from the platform to the train.[13]

We have focused on the provision of **step-free access at train stations to platform level** as the area where the most significant capital cost is likely to be incurred, but also discuss:

- Ensuring full accessibility on boarding and alighting from trains: accessibility to platform level is no good if getting on and off the train is not straightforward. In theory, the policies should be in place to achieve this through the provision of ramps deployed by train staff. However the assistance given by train companies can occasionally be of poor quality or entirely absent,
- Accessibility within train carriages such as accessible toilets, appropriate audio and visual communication and spaces for wheelchair users, and,

- Broader elements of accessibility at train stations including provision of information and fully trained staff.

The issue of fully trained staff and public attitudes is particularly important as some people experience apprehension, worry, or report feeling stigmatised because the attitudes of staff and passengers are not always sympathetic to their needs.[14] The recent Government campaign "It's everyone's journey" aims to bring together those who want to improve public transport for disabled people and deliver real change in public understanding and attitudes.[15]

Full public transport accessibility should be a basic right, but it also delivers a wide range of individual and social benefits

Disabled people should have the same access to transport as everyone else. This is not only the Disabled Persons Transport Advisory Committee's vision, but Government policy as set out in the Inclusive Transport Strategy.[16] The widely accepted social model of disability says that people are disabled by barriers in society, not by their impairment or difference[17] and as such full public transport accessibility should simply be a basic right. Our purpose in putting a cost on delivering part of this basic right - by making the rail network step-free to platform level - is to show whether it is deliverable by 2030 within existing levels of spending, or would need additional commitments.

However, in addition to delivering this basic right, there are a wide range of other benefits to making the rail system fully accessible to both individuals and society more widely. These benefits also go beyond just those with mobility impairments. A fully accessible rail system would benefit those with visible and non-visible disabilities, people with sensory impairments, people carrying heavy luggage, older people and parents with small children. This is why the concept of inclusive design has been widely applied in recent years to public transport design. The concept recognises that there are a broad spectrum of additional needs across a large proportion of the population, and therefore challenges the idea that services should be designed for the "average" user first and then adaptions added to make them accessible. Instead, the design of products and services should seek to cater to as many people as reasonably possible in the first instance.[18]

We have carried out a literature review to summarise what is known about the individual and societal benefits and we add a new framework to understand the linkage between public transport accessibility and labour market access for those with mobility impairments.

Contents of this report

This report therefore:

i. Reviews the benefits that the provision of fully accessible public transport would bring, with new estimates regarding the economic benefits to the individual and society. These benefits are an additional argument on why accessibility should be delivered quickly but are not necessary to justify the expenditure, as having the same access to transport as everyone else should be a basic right,

ii. Presents the results of a cost model designed to provide a high-level estimate of the cost of making the railway fully step-free to platform level by 2030,

iii. Summarises material on what else would be required to deliver a fully accessible railway and broader public transport system,

iv. Summarises views from expert interviews on barriers, beyond cost, that appear to have stood in the way of making faster progress on accessibility.

Our cost model has been constructed using the limited publicly available data on the cost of making accessibility improvements, and as such there is significant uncertainty around our costing. However, we have carried out several sensitivity tests that suggest the range we have estimated is likely to be broadly correct. The rail industry together with Government and the regulator should estimate the cost fully, but our modelling shows a commitment to full accessibility is affordable. We have built the cost model in such a way that more detailed cost estimates could easily be incorporated.

This report has benefitted from engagement with several experts in the rail industry, and we have brought to bear our knowledge of transport cost modelling and strategy. Leonard Cheshire will be conducting a range of interviews with disabled people to ensure that their perspective and lived experience is a key part of building the next phase of their campaign.

2. Policy context

The Inclusive Transport Strategy sets out the Government's ambition for inclusive transport:

> *"Our vision is for disabled people to have the same access to transport as everyone else. They will travel confidently, easily and without extra cost.*
>
> *By 2030 we envisage equal access for disabled people using the transport system, with assistance if physical infrastructure remains a barrier."*[19]

It is this aim that Leonard Cheshire's *Get on Board* campaign is working towards and this report looks at the practicalities of achieving the 2030 target. Beyond this target for the future, rail accessibility in Great Britain sits in a complicated landscape of existing legislation, policy, funding and management structures. We provide a brief summary here to set our work in context.

Legislation

There is a great deal of primary and secondary legislation relating to accessibility on the railways, including:

- Railways Act 1993
- Human Rights Act 1998
- Equality Act 2010
- Railways (Interoperability) Regulations 2011
- Consumer Rights Act 2015

Together, these regulations set out the legal framework for accessibility on the railways, defining the rights of individuals and the duties owed by organisations. The equalities and human rights acts are specifically relevant to this report because they enshrine in law the human right of everyone to access services. The physical and institutional structure of the railways currently make it difficult for disabled people to fully enjoy the rights they possess and for the industry to successfully execute its obligations. That is why this report is not a cost/benefit exercise, but rather sets out what is required to allow everyone to access rail travel as easily as possible.

Funding

The main source of funding specifically targeted at making the railway more accessible is the Access for All programme, funded by central government. It has been running since 2006 and has recently been extended until 2024. There have been several tranches of Access for All funding, shown in table 2 below.

Table 2: Access for All funding streams

Access for All Programme	Funding
Main Programme 2006-2015	£378m
Main Programme 2015-2020	£110m
Main Programme 2019-2024 (Includes £50m deferred from 2015-2019)	£300m
Mid-Tier Programme 2012-2014	£37.5m
Small Schemes 2006-2016 (£5m-£7.5m was made available yearly between 2006-2016)	£47.5m

Source: Inclusive Transport Strategy (2019)

Access for All primarily exists to bring selected stations up to "new build" standard, although the Small Schemes and Mid-Tier Programme exist to enable smaller improvements. Access for All bids can include funding from third parties such as local authorities. The fund should not, however, be used as a supplementary source of investment for other major improvements. There has been some criticism that Access for All funding has been used in circumstances where accessibility improvements should have been funded from other sources.[20]

Train operators

In order to operate a passenger train, a train company must have a license from the Office for Road and Rail. Amongst another things, these licenses are contingent on the operator publishing an Accessible Travel Policy (previously called Disabled Person's Protection Policies) which "states how they will protect the interest of disabled people who use their trains and stations"[21] and that the trains and stations an operator is responsible for meet the *Design Standards for Accessible Railways: A Joint Code of Practice*, a mostly technical specification.[22] In practice, what this means is that train operators need to provide services and assistance that meet a minimum requirement for accessibility. These standards were enhanced at the beginning of 2020 by requiring the rolling stock train operators use to meet the "Persons with Reduced Mobility - Technical Specifications for Interoperability" accessibility specification, known as the PRM-TSI.

The majority of passenger journeys are operated by train companies who hold a franchise from the Government. The franchise is an agreement between the train company and the Government that details the service and investments that the train company will make whilst they operate a certain part of the railway. Often, these agreements will include improvements in stations, trains or procedures that make the franchisee's services more accessible.[23]

The Williams Rail Review

In September 2018, the Williams Rail Review was launched to look at the structure of the whole rail industry and the way passenger rail services are delivered.[24] The Review was described as a sweeping, root-and-branch exercise considering the roles and structures of all parts of the industry, looking at how they can work together more effectively to reduce fragmentation, improve passenger services and increase accountability. The rail regulator was also explicitly asked by Keith Williams, the chair of the review, to recommend action to improve accessibility for all users. We discuss data and recommendations from their subsequent submission[25] in relevant sections of this report.

The review was widely expected to contain significant proposals for reform of how the railway is both owned and managed. However, the results have not yet been published and the impact of COVID-19 has caused the largest structural reform of the rail industry in this country since privatisation. At the onset of the crisis the Government effectively temporarily nationalised the entire system by suspending normal franchise agreements and transfering all revenue and cost risk to the Government for a limited period, initially six months.[26] The temporary arrangements are unlikely to persist in the long-run, but neither is it likely the system will revert fully back to where it was pre-crisis. This creates a unique opportunity for large scale reform and ensuring that system-wide accessibility improvements can be made quickly and efficiently should be at the heart of this reform.

3. Why make the rail network fully accessible?

Full public transport accessibility should be a basic right, but it also delivers a wide range of individual and social benefits

Disabled people should have the same access to transport as everyone else. This is not only the Disabled Persons Transport Advisory Committee's vision, but Government policy as set out in the Inclusive Transport Strategy.[27] The widely accepted social model of disability says that people are disabled by barriers in society, not by their impairment or difference[28] and as such full public transport accessibility should simply be a basic right. Our purpose in putting a cost on delivering part of this right by ensuring a step-free rail system (to platform level) is to show that it is wholly deliverable by 2030 within existing levels of spending.

However, in addition to delivering this right there are a wide range of other benefits to making the rail system fully accessible including individual and societal benefits. Among the most important of these are ensuring that disabled people have the same access to transport as everybody else and are hence able to travel easily, confidently and without extra cost for a wide range of purposes – from business trips to accessing education, and from leisure to seeing family. People with mobility impairments travel a lot less overall than people without, travelling around 3,500 miles per year compared to 7,500 for those without mobility impairments.[29] Research by Transport for London finds over 70% of Londoners with mental health conditions, mobility impairments and long-term illnesses say they would travel more if they did not experience barriers such as access or cost constraints.[30]

A literature review from the Department for Transport[31] summarises a range of the benefits from improving transport accessibility, including:

- Increased access to the labour market and engagement with the local and national economy,
- Increased ability to access public services and education
- Improved health
- Increased public transport use and reduced need for special transport services
- Reduced boarding times for all passengers

Economic appraisal evidence suggests significant benefits

We have reviewed the evidence on the scale of these benefits. A major OECD/International Transport Forum review[32] found that "the economic benefits of improved accessibility are often overlooked and almost always not explicitly valued in traditional transport appraisal and evaluation practices". However, the report includes a detailed review of the benefits of the Access for All programme by Tony Duckenfield from Steer Davies Gleave and found three groups that benefit from improving accessibility:

i. People who already use the stations

ii. New station and rail users

iii. Non-Users:

The first two groups benefit directly from improved accessibility due to obstacle free access, better signage and information, trained staff etc. Non-users then also benefit indirectly because of the impacts on the wider transport network including a reduction in car trips that will lead to environmental benefits and lower congestion.

The review points out that "a good scheme to improve accessibility can actually benefit everyone, not only people with a disability", including older people and those with heavy luggage or young children. This is the key reason for the importance of inclusive design principles which say that the design of products and services should seek to cater to as many people as reasonably possible in the first instance.

The work looks at evidence from a representative sub-sample of six stations that had been upgraded under Access for All and finds that people say they increased their use of the rail stations due to the improvements. The study found that the proportion of people saying they had increased their usage varied across the population:

- 15% of those with mobility impairments
- 33% of wheelchair users
- 19% of those with hearing impairments
- 3% of those with visual impairments
- 10% of those who were encumbered by luggage
- 7% of those who do not fall in to one of the above categories.

The report uses this powerful evidence to apply standard transport appraisal techniques to quantify the value of the benefit that individuals get from the accessibility improvements. The benefit might be in terms of additional comfort, time savings, improved access to employment or leisure opportunities or all manner of other benefits – importantly these all come together in people's reported preference for using rail more following the improvements. The study also estimates the non-user benefits from increased rail usage and reports that **in total the quantified benefits exceed costs by on average 2.4 times, and in the case of one station (Vauxhall) by over 11 times.** In fact, the benefits are likely to be even higher because they do not include benefits to users without heavy luggage, the intrinsic value of inclusiveness, anticipation of future need including the aging population or the value of the ability to travel if temporarily mobility impaired.

It is still the case that the decision to deliver accessibility should not be driven simply by a narrow business case approach; this evidence is presented to show that even on this basis alone, there are substantial benefits. However, the primary reason remains that disabled people should simply have the same access to transport as everyone else.

The importance of public transport in improving labour market access

We carried out further analysis to extend the evidence for one particular type of benefit that accessible public transport brings, which is to improve labour market access for those with mobility impairments. Poor public transport accessibility acts as a barrier to employment and has a range of impacts for the individual and society. These include:

- **Personal impacts** – poor public transport accessibility may lead to a reduced likelihood of employment and hence both reduced earnings and potential knock-on health and wellbeing impacts such as an increased likelihood of social isolation and loneliness,
- **Societal impacts**: As poor public transport accessibility can affect employment prospects for people with mobility impairments, society as a whole also loses out due to reduced economic activity, and through the wider wellbeing and societal costs of economic inactivity; and

- **Exchequer impacts** – Accessibility should not be judged in terms of the benefits it could bring to the exchequer, but it is important to acknowledge that poor accessibility causes increased benefit spending and reduced tax revenue through acting as a barrier to employment.

A review carried for the Department for Work and Pensions found a range of evidence for these impacts, summarised in box 1. These problems contribute to what is known as the "disability employment gap".

Box 1: Findings from Department of Work and Pensions (DWP) on transport accessibility and employment

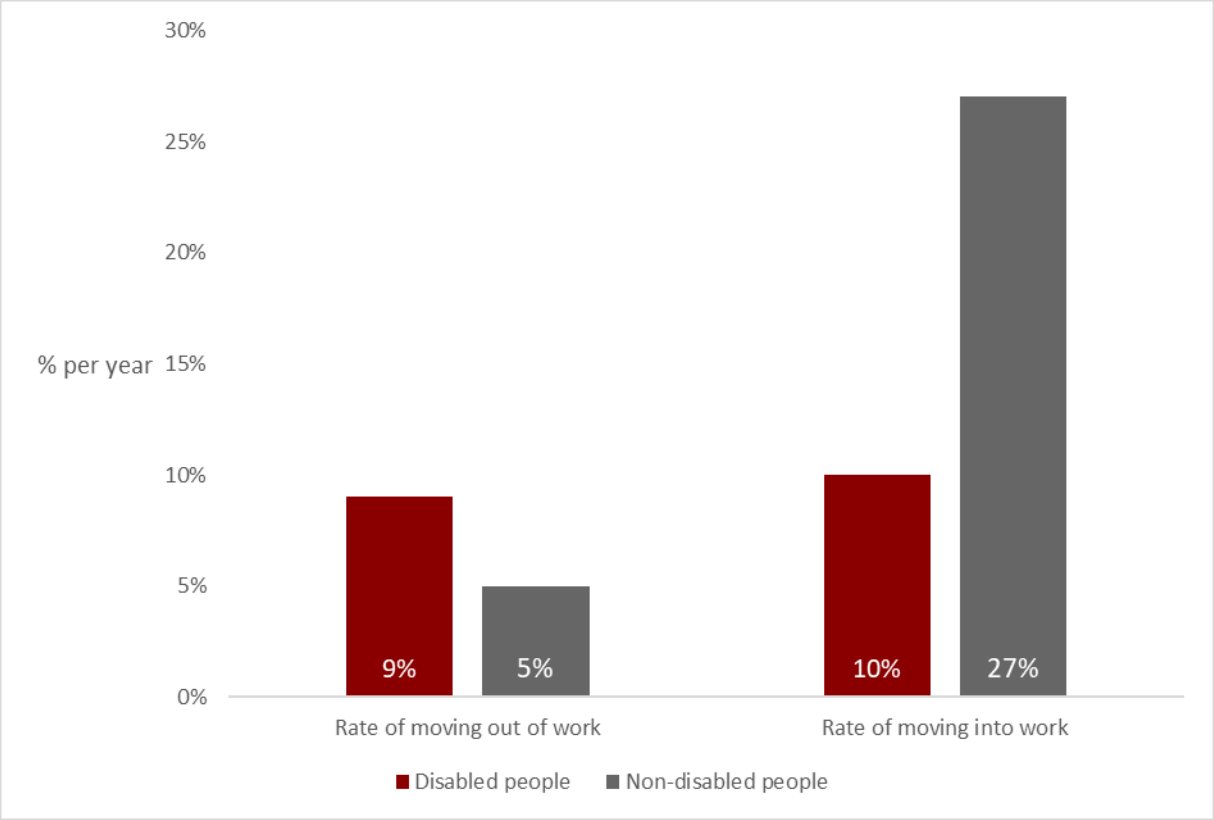
A review carried out for DWP found that:

- an accessible transport system which empowers disabled people to access opportunities in the labour market was a foundation for success for an "enabling State" that (i) empowers individuals to seize employment opportunities and supports employers to tap into all available talent, and (ii) that develops the key drivers of employment, from skills to portable social care and housing
- some disabled people opt to work part-time in order to manage energy or concentration levels, treatment effects, inaccessible transport or other disability related issues.
- difficulty with transport was the second most common barrier to employment identified by adults with impairments (31%);
- Transport can be a key barrier to employment for disabled people – either because existing public transport is not accessible, welcoming or safe for disabled people, or where public transport is simply not available or not affordable locally to connect people to jobs.

Source: Sayce/DWP (2011)[33]

Statistics collected before the economic impact of COVID-19 had hit showed that the difference in the employment rate between disabled and non-disabled people had reduced from 34 percentage points in 2013 to 29 percentage points in 2019.[34] Although there is not yet hard evidence to show exactly how those with disabilities will be affected, unfortunately we can reasonably expect the gap to widen again due to COVID-19. We know that the rate of disabled people moving out of work is significantly greater than the general population,[35] as shown in figure 4. Previous Leonard Cheshire research has shown that 73% of disabled adults in the UK have stopped working due to their condition or disability.[36] As fewer jobs become available because of COVID-19, disabled people are likely to be doubly disadvantaged.

Figure 4: Annual rates of moving into and out of employment for disabled and non-disabled people (2019)



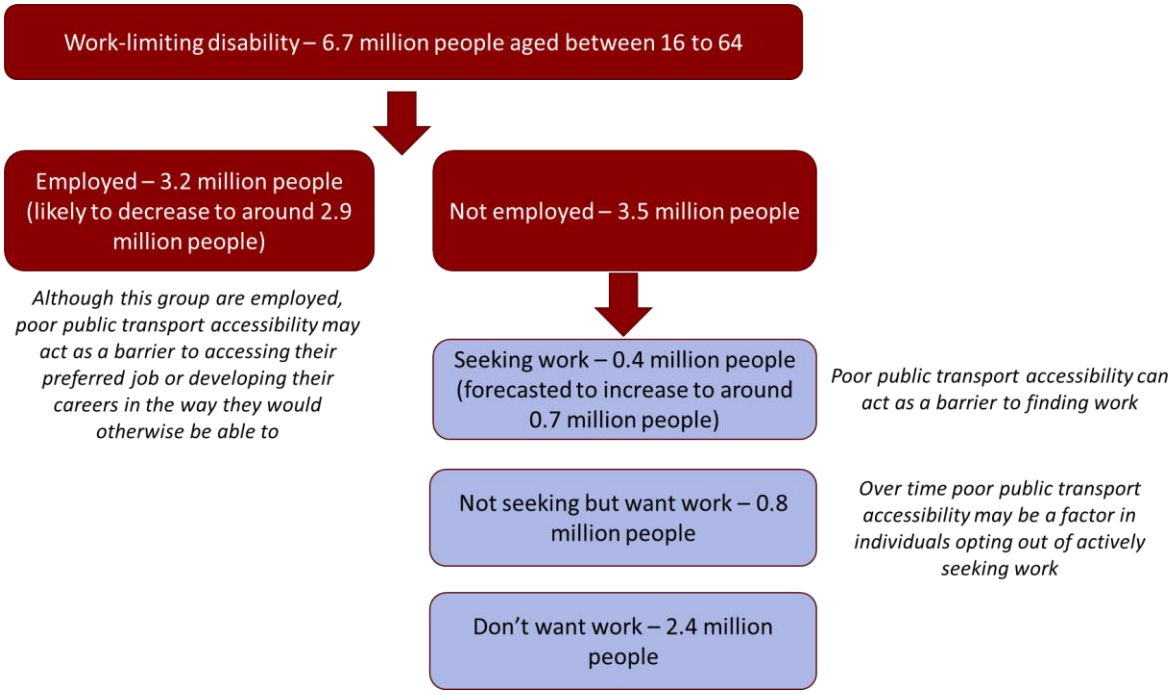
Source: WPI analysis of Disability and employment, UK (2019)

The scale of improvements to labour market access

In order to quantify the scale of the impact that improved rail accessibility might have on labour market access for disabled people, we have established a framework to understand the numbers of people who could be affected, and the different type of benefits that might arise. Figure 5 below shows the current labour market engagement among disabled people and the type of impacts that poor public transport accessibility can have for each group. Often the focus is on those people classed as unemployed, seeking to improve their access to the labour market. However, our framework shows that a wider perspective is needed; people in employment may not be in the job they would like to be in, and a number of those not actively seeking employment may still want work but have been discouraged by a range of factors which could include poor public transport accessibility.

Within this framework we have used the term "work-limiting disability" as this is based on how the Office for National Statistics refers to their calculation of the number of people who have a long-term disability which affects the kind or amount of work they might do.[37] This phrasing does not follow the social model of disability, as it does not acknowledge that it is the societal barriers that limit the work disabled people can do, not their disability.

Figure 5: How poor public transport accessibility could affect labour market engagement for disabled people (Jan-Mar 2020, with forecast adjustments for the economic impact of COVID-19)



Source: Labour Force Survey

As discussed above the scale of these negative impacts will worsen due to the impact of COVID-19, as many more people are becoming unemployed across the economy – as of May 2020, forecasters on average predicted that the national unemployment rate is set to roughly double from 3.8% to 7.3%.[38] We have adjusted our estimated populations of those employed and seeking work in figure 5 in line with the overall increase in unemployment rate to take account of the economic circumstances. This may well be an underestimate.

To estimate how many people's employment outcomes could be improved, we have reviewed the evidence on public transport accessibility and employment. We have found that:

- In an extensive survey by the rail regulator, 47% of disabled passengers and carers who use rail at all said that they use it less frequently than once a month. However, when asked how often they would use rail if there were no obstacles or barriers, only one in four (26%) said they would use the railways less frequently than once a month.[39]
- 5% of disabled adults polled by Leonard Cheshire in 2018 said they had to turn down a job due to public transport that did not accommodate their disability, with a further 5% saying they had missed an interview. We have analysed the detailed data from this survey to provide a breakdown by working status.

Table 3: Proportion of respondents to Leonard Cheshire's Disabled Adult survey reporting negative employment consequences due to public transport that did not accommodate their disability

In the past year, which of the following, if any, have been a negative consequence of public transport that did not accommodate your disability?

	All respondents	Working	Not working	Not working but seeking work
I had to turn down a job	5%	6%	4%	7%
I missed a job interview	5%	8%	3%	6%

Source: Leonard Cheshire Disabled Adult Survey 2018[40]

Using this evidence from the Leonard Cheshire survey, we can assess how many disabled people may have turned down a job or missed a job interview due to poor public transport accessibility; see table 4. We have used the most recent labour force engagement statistics and assumed the proportion of disabled people turning down jobs or missing interviews due to poor public transport accessibility has stayed broadly stable.

Table 4: Estimated impact of poor public transport accessibility on labour market engagement for disabled people aged 16-64

	In employment	Seeking work	Not seeking but want work
Number of people with a work-limiting disability (Jan-Mar 2020)	3,200,000	360,000	770,000
Forecast number of people in employment/unemployed (2020)	2,870,000	690,000	770,000
Proportion of people who say they had to turn down a job because of public transport that did not accommodate their disability	6%	7%	7%
Estimated number of people who had to turn down a job because of public transport that did not accommodate their disability	170,000	48,000	54,000
Proportion of people who say they missed a job interview because of public transport that did not accommodate their disability	8%	6%	6%
Estimated number of people who missed a job interview because of public transport that did not accommodate their disability	230,000	41,000	46,000

Source: WPI calculations

These calculations relate to all public transport, not just rail. The latest National Travel Survey statistics[41] finds that 6% of distance travelled by people with mobility impairments in England is by surface rail, and another 6% of distance travelled by people with mobility impairments is by bus and the modes are used about equally for commuting purposes across the country as a whole.[42] Therefore, we assume that around half of the figures above would be due to accessibility on the rail system and can estimate the number of disabled people improved rail accessibility will help to access the labour market.

Table 5: The number of disabled people who could benefit from improved rail accessibility

	Employed	Seeking work or want work
Turned down a job	85,000	51,000
Missed an interview	115,000	43,500

Source: WPI calculations

Table 5 shows that a fully accessible rail system could help 51,000 disabled people who say that they have turned down a job because of public transport that did not accommodate their disability to get into work (24,000 of whom are actively seeking work and 27,000 of whom say they would like to work). There are clear benefits to doing this:

- Individuals moving into work would see their incomes rise - leading to significant wellbeing impacts. Around half of all people in poverty are disabled themselves or live in a family that includes a disabled person,[43] meaning this could be an important part of tackling poverty in the UK.
- Following a methodology developed by the Department for Work and Pensions to provide evidence for their disability employment strategy,[44] we can also show the potential economic and Exchequer benefits of this. Even if just half of those currently restricted from working by the transport system moved into work:
    - The Exchequer would benefit by around £450 million from reduced benefit spend and increased taxes (£900 million if all of the 51,000 found work)
    - The economy would see an output (GVA) boost of £1.3 billion (£2.5 billion if all of the 51,000 found work).

There are also potential benefits for those already in work, as improved accessibility could help around 85,000 employed disabled people who have turned down jobs because of poor rail accessibility into new, better jobs. Research has shown the significant earnings and productivity benefits from employees gaining new jobs, meaning that this is likely to lead to increased earnings and another economic boost[45].

A fully accessible railway could also help a further 43,500 unemployed people and 115,000 employed people to attend an interview that may lead to a new job.

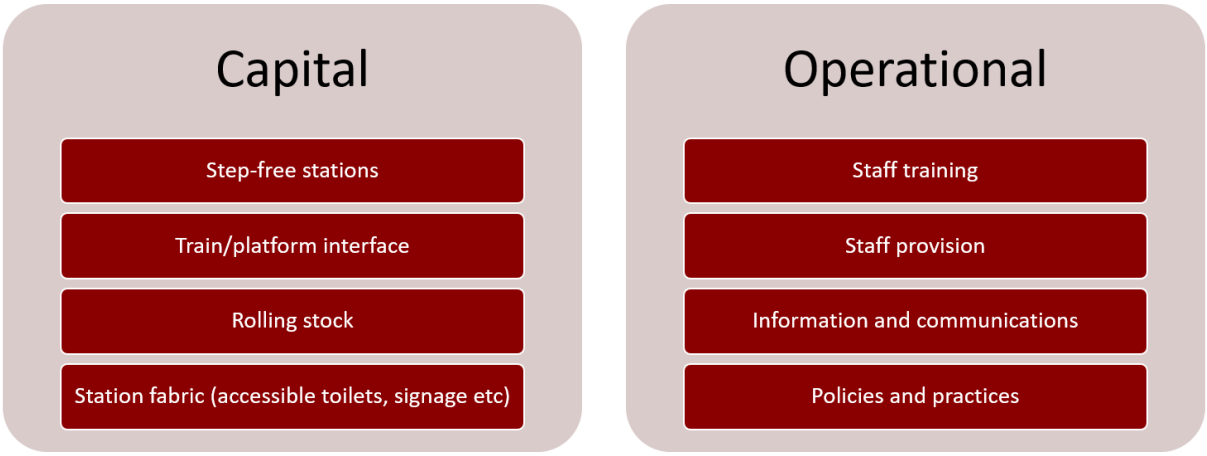
4. What will it take to make the rail network fully accessible?

Our modelling shows that it is likely to cost between £2.3 billion and £5.6 billion to make all railway stations in Great Britain step-free. We believe this improvement will bring us very close to the target of making all rail journeys accessible by 2030, but that it will take more to meet this goal than a single spending commitment.

In considering what is required to make the rail network full accessible by 2030, this chapter classifies the necessary changes as either "capital" or "operational", as shown in Figure 6:

- Capital improvements are one-off investments made today that will allow the railway to be accessible for many years to come.
- Operational changes are alterations and improvements in the way the railway is run that are needed for it to be accessible.

Figure 6: Capital and operational improvements needed to make all rail journeys fully accessible by 2030



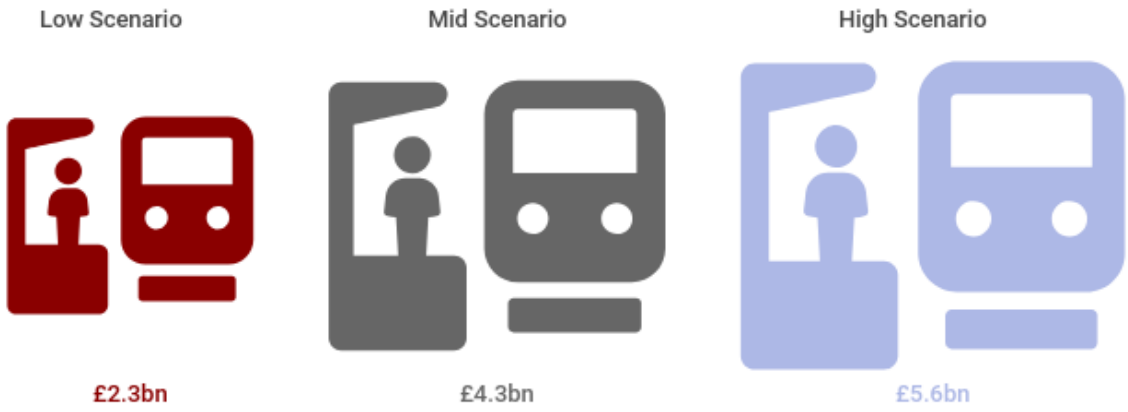
Our report focuses on the capital improvements needed, but it is important not to neglect the necessity for operational changes in order to provide full accessibility. This was highlighted by the rail regulator, the ORR, in their input to the Williams Rail Review.[46] The ORR recommended a 'whole-system' approach for the funding and decision-making of accessibility improvements, i.e. an approach that includes consideration of the station, the train and whether staff are available to assist a passenger from the station platform to the train itself and vice versa. They point out the importance of staffing in making many stations and trains accessible to some disabled passengers, and highlight a case where a station was made accessible under the Access for All Programme but the station was partially staffed and served by trains with no staff member on board other than the driver. The operator subsequently agreed to introduce mobile staff to help with accessibility. This illustrates how spending on infrastructure and operations must go hand in hand. We have focused on the capital spending requirement, but funding should be made available in a flexible way to ensure that accessibility is truly being delivered.

Of the various types of capital expenditure, our focus is on calculating the cost of making stations step-free from the street to platform level as the area where the most significant capital cost is likely to be incurred. However, we also discuss:

- Ensuring full accessibility on boarding and alighting from trains: accessibility to platform level is no good if getting on and off the train is not straightforward. In theory, the policies should be in place to achieve this through the provision of ramps deployed by train staff, however the assistance given by train companies can occasionally be of poor quality or entirely absent,
- Accessibility within train carriages such as accessible toilets, appropriate audio and visual communication and wheelchair spaces, and,
- Broader elements of accessibility at train stations including provision of information and fully trained staff.

We have used publicly available data to construct a cost model of the railway network, combining estimated costs of accessibility improvements with information on the stations that are not yet fully accessible. Our model suggests the total cost of making the entire railway network step-free to platform level would cost around £4bn. However, there is significant uncertainty around this figure due to the limited publicly available information on the cost of accessibility improvements. We have also tested alternative assumptions and are reasonably confident that the true cost lies somewhere in the range £2.3bn to £5.6bn. Figure 7 presents these scenarios, which we explore in more detail below and include an extensive description of the modelling in the Annex.

Figure 7: WPI modelling of the costs of making every station step-free



Source: WPI modelling

Whilst it is true that capital considerations – and step-free access to stations in particular – are of most importance when considering the deployment of funds over the next decade, it is vital that attention is not taken away from the operation of the railway. Just as it is impossible to run a railway without dedicated, well-trained staff and efficient and effective operators, so it is impossible for the railway to be accessible without the right people, policies and procedures. When thinking about making the railway fully accessible, it is important to recognise that this is an on-going commitment and that it is not possible for Government or the industry to commit a sum of money now, no matter how large, that will guarantee access in perpetuity.

Step-free

Box 2: What is "step-free"?

This report does not endeavor to establish or make decisions about various standards of accessibility as this is beyond the scope of the research questions. We must, therefore, use pre-existing categorisations of step-free access. The best data that is available is a field in the Rail Delivery Group's Knowledgebase (the database that feeds the widely-used National Rail Enquiries website) which marks stations either as "Whole station" or "no part of station" step-free. There are no criteria for "step-free" used by the Rail Delivery Group, with Train Operating Companies responsible for defining "step-free", assessing their stations against this standard and reporting it to the Rail Delivery Group.[47] However, this is the only source of information about step-free access for all stations in the country and it has underpinned Leonard Cheshire's previous work.

A more detailed, but less comprehensive, accessibility classification system is available from the Office for Road and Rail. This system splits stations into 5 categories (A, B1, B2, B3 and C) ranging from full step-free access to no step-free access, with various degrees in-between depending on, for instance, the gradients of ramps and the extra distance of step-free routes.[48] However, the system does not appear to have yet been universally adopted and the information is only available for certain Train Operating Companies, meaning that it cannot be used for a review of the entire railway system such as this.

We also do not know to what extent disabled people would agree that all stations listed as accessible in Rail Delivery Group's Knowledgebase are truly accessible. A systematic approach to regularly testing the accuracy is needed.

Current step-free provision

At the start of its *Get on Board* campaign, Leonard Cheshire estimated that 38% of stations were not yet step-free and at the current rate of progress it would take until 2070 to make the entire rail system step-free.[49] Due to recent re-categorisation of stations, there are now over 1,000 stations in Great Britain that are not fully step-free, up from 868 at the time of the Leonard Cheshire analysis in October 2019. Stations that are not step-free are not evenly distributed in terms of location or characteristics. An important trend is that larger stations are more likely to be step-free. In fact, all 28 Category A stations (National Hubs like Birmingham New Street) are classed as fully step-free, whereas only 54% of Category E stations (small staffed stations) are. The apparent focus of previous accessibility efforts to make larger stations step-free is reflected in the fact that the average step-free station sees 1.5 million passengers a year, but the average station without step-free access sees 590,000.[50]

Table 6: Network Rail station categories

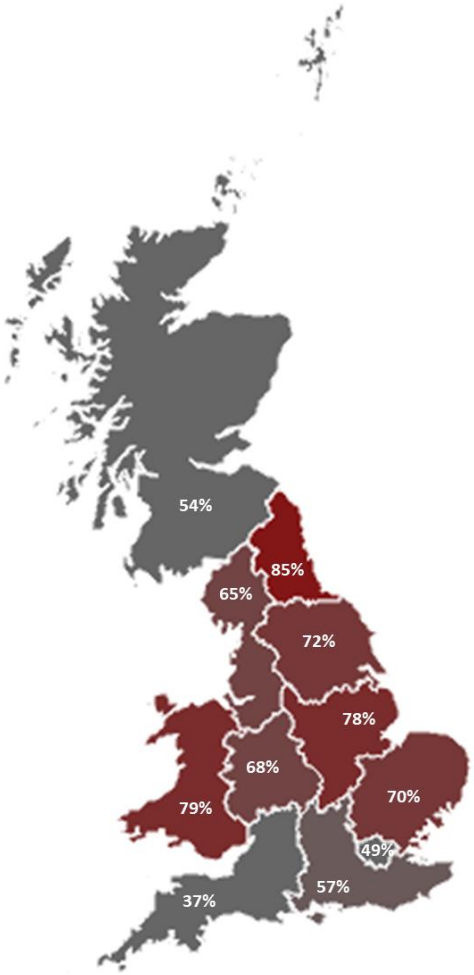
Category	Number	Proportion step-free	Description
A	28	100%	National Hub
B	64	97%	Regional Interchange
C	244	80%	Important Feeder Station
D	298	57%	Medium Staffed Station
E	656	54%	Small Staffed Station
F	1119	60%	Small Unstaffed Station

Sources: DfT Better Rail Stations Report 2009 and Rail Delivery Group Knowledgebase (accessed 2020)

The concentration of stations that need step-free improvements in lower categories has implications for the cost of making the railway fully step-free.

Step-free access to stations also varies significantly between regions, routes and operators. 85% of stations in the North East are step free, but this is true of only 37% of stations in the South West. There appears to be little relationship between the density of use of the railway in a region and the degree to which the stations in that region have step-free access. Both the North East and South West have relatively low rail usage, yet sit at opposite ends of the scale for step-free access. London, the region most with the highest density of rail stations, has 49% of its mainline stations (excluding Underground, DLR and tram) step-free. Typically, operators of intercity routes such as LNER on the East Coast Main Line (92%) and Avanti on the West Coast Main Line (94%) operate a higher proportion of step-free stations than operators of networks with large rural and/or suburban elements, such as GWR (35%) or Southern Western Railway (43%). This may well be related to the previous observation that larger, more central stations are more likely to be step-free than less heavily used stations.

Figure 8: Proportion of stations step-free by region



Source: WPI analysis of Rail Delivery Group Knowledgebase (extracted 2020)

Cost of making all stations step-free

We have modeled scenarios for the cost of making all stations in Great Britain step-free by combining information about how many stations are not currently step-free with benchmark costs on how much it costs to undertake the required work.

Scale of improvements needed

As is explained in Box 2, we are using information from the Rail Delivery Group's Knowledgebase to assess how many stations require step-free improvement work. There is some ambiguity in this data because 169 stations are not categorised as either "whole of station" or "no part of station" step-free. Equally, there is a possibility that some of the stations listed as "whole station" step-free may not be viewed as such by those with mobility impairments using the station. This gives us the three interpretations of the scale of step-free improvement works presented in Table 7. As it is not possible to produce justifiable estimates or assumptions about the number of stations incorrectly labelled as step-free, only the optimistic and neutral scenarios are used in the modelling.

Table 7: Interpretations of Rail Delivery Group Knowledgebase step-free information

Interpretation	Number and proportion of stations that are not step-free	Justification
Minimum	832 (32%)	Only stations that are listed "no part of station" step-free – assuming that all 169 stations with missing information are step-free
Central	1001 (39%)	All stations not listed "whole station" step-free – assuming that the stations with missing information are not step-free
Maximum	1001 + ? (>39%)	Assuming that a proportion of stations listed as "whole station" would not be perceived as such

Source: WPI analysis of Rail Delivery Group Knowledge Database

Benchmark costs per station

We have explored a range of data to provide benchmarked costs per station.

We have benchmarked costs in two main ways:

- Funding streams: Looking at historic and projected Access for All spending to calculate the average spend per station across different time periods.
- Station-level data: We collected data from 77 specific stations where accessibility work has either been completed or announced to create cost estimates for different station profiles.

Table 8: Costs of Access for All programmes per station

Access for All Programme	Number of stations	Cost (2018-19 £s) adjusted for optimism bias and inflation	Cost per station
Main Programme 2006-2015	150	£427m	£2.85m
Main Programme 2015-2020	42	£110m	£2.62m
Main Programme 2019-2024	73	£311m	£4.26m
Access for All and Welsh Government	5	£14m	£2.72m
High-level figure from Inclusive Transport Strategy	200	£550m	£2.75m

Source: WPI analysis

This data on overall funding includes all stations where accessibility work has either been completed or announced under the Access for All spending and allows us to create overall averages. However, it is possible that stations that still require work could be systematically different from those where work has been done so we collated station-level data to explore this question.

Table 9: Cost of accessibility improvements by Network Rail station category

Category	Average cost of accessibility work	Maximum cost of accessibility work	Number of stations not step-free
A	N/A	N/A	0
B	£5.9m	£16.4m	2
C	£3.0m	£6.3m	48
D	£3.5m	£6.4m	127
E	£3.3m	£7.9m	303
F	£2.4m	£3.7m	482
Unknown	N/A	N/A	39

Source: WPI analysis

This information is not exhaustive but allows us to explore how costs appear to vary by factors such as the Network Rail category of the station. We also explored categorising stations by region, train operator and route, but did not find variations that were useful for the cost model. Using the estimates in table 9, we can test whether our overall cost estimates would differ if we adjust for the type of station.

Constructing total cost scenarios

To calculate a total cost of providing step-free access to platform level, our cost model combines the benchmarked costs from both the funding stream approach or the station-level data with the number of stations that still require improvements. The funding stream approach gives us an estimate of between £2.3bn - £4.3bn depending on the assumptions we make on the number of stations that require work to make them fully accessible, and on which estimates of benchmarked costs we use. The station-level data approach gives us an estimate of £2.9bn - £5.6bn. The upper-bound value produced by the station-level approach is highly sensitive to whether we look at the highest cost for a category or some other measure (the second highest, or 75th percentile, for example). We have opted to use the maximum cost of each category to have an upper-bound number that the true cost will realistically sit below. Other measures would reduce the figure for our high-scenario estimate.

For clarity in presenting results, we have chosen three scenarios that represent a low, middle and high estimate, shown in table 10 below.

Table 10 Methodology of step-free model scenarios

Scenario	Value	Methodology
Low	£2.3 billion	The 832 stations listed as "no part of station" step-free in the Rail Delivery Group Knowledgebase (a realistic best-case scenario, see table 8) multiplied by £2.75m, the median cost per station of Access for All funding trances (see table 8)
Mid	£4.3 billion	The 1001 stations not listed as "whole station" step-free multiplied by the cost per station of the most expensive Access for All funding tranche.
High	£5.6 billion	Stations split into Network Rail categories (see table 9). For each station that remains to be improved, we apply the highest recorded cost of improvements from within our dataset of specific station accessibility works.

Source: WPI modelling

This range is fairly large, but reflects the uncertainty created by the limited publicly available data about the costs of step-free improvements and the scale of work that needs to be undertaken. However, the fact that both approaches produce a similar range gives us confidence that the true figure is likely to be in this range. In consulting with experts from the rail industry, we gathered a number of rule-of-thumb estimates about the cost of making stations cost-free, and these tended to range between £3m and £6m, which is similar to our cost per station estimates above. A report from the Liverpool City Region Combined Authority likewise presented an average cost of lift installations of £3m.[51]

A wide range of possible costs is appropriate, because there are several factors that mean that there may well be a different cost profile of step-free improvement work over the next decade than historically. Most obviously, the 1,000 or so stations that need improvements made over the next ten years are different to the 1,500 or so that have already been made step-free. As is noted above, the remaining stations tend to be smaller, belonging mostly to Network Rail categories D, E and F. This might result in lower costs, because smaller stations need fewer lifts etc installed, or higher costs because they are in more remote locations and do not enjoy the economies of scale a larger project at a major hub might. Equally, it is possible that costs will be lower if the way access improvements are delivered is improved. The 'Barriers to Accessibility' chapter of this report explores some of the barriers that have stood in the way of making the railway fully accessible, such as the piecemeal, stop-start nature of the Access for All programme. Were the funding recommended by the scenarios to be accompanied by a restructure of how accessibility work is delivered – or even the whole rail industry– it might be possible for costs to be lowered.

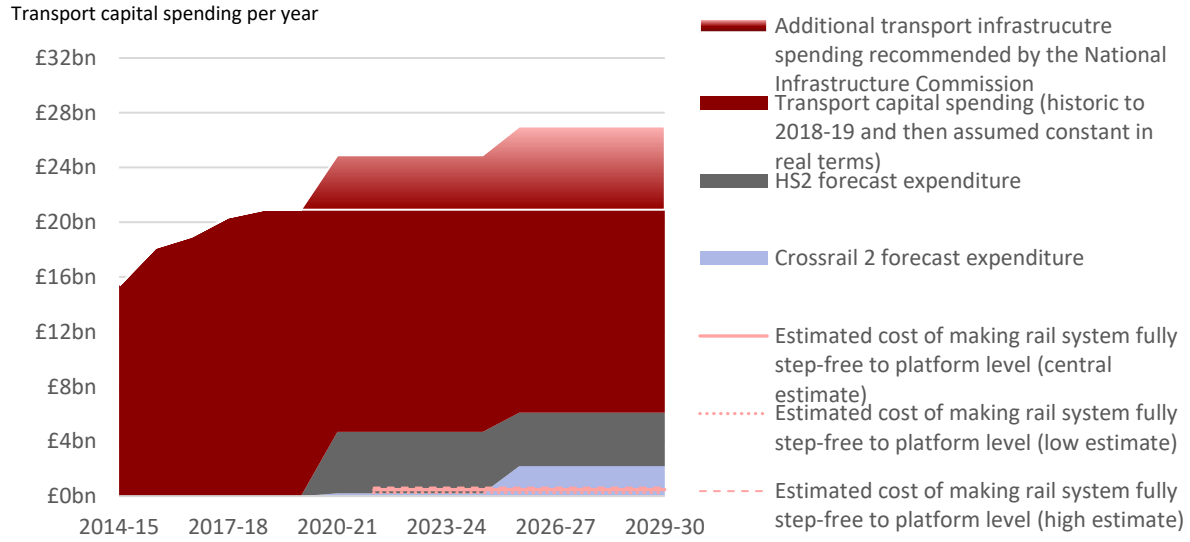
The Appendix contains a detailed explanation of how these scenarios were calculated.

Setting accessibility cost estimates in context

The three scenarios of the potential cost of making all stations in Great Britain step-free should be seen in the context of other transport capital expenditure. The upper estimate of £5.6 billion sounds very expensive but transport, and rail in particular, is expensive. In 2018/19, £21 billion was invested in UK transport assets.[52] The National Infrastructure Commission advocates for this to rise to £25 billion in the coming 5 years[53]. With the £600 billion promised over the next 5 years at the 2020 Budget[54] and a commitment made to High Speed 2,[55] it appears (in a world before COVID-19, at least) that transport capital investment is indeed set to increase.

Figure 8 shows the spending from the three scenarios spread over the 9 financial years from 2021/22-2029/30 in order to meet the 2030 target and compares this to total transport capital spending and estimates for the annual expenditure on the High Speed 2 and proposed Crossrail 2 megaprojects. The required annual expenditure for our scenarios is between £0.3-£0.6bn per year, only just visible on the chart.

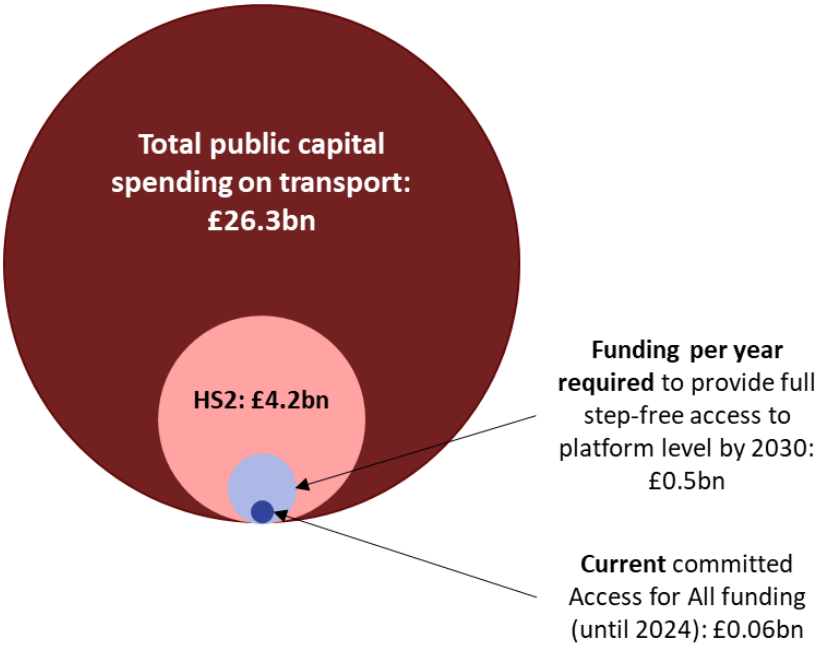
Figure 9: Cost estimates of making rail system fully step-free compared to transport capital spending per year and other major rail schemes



Source: WPI Modelling

During this time period we estimate the step-free scenarios will cost between 1.2% and 3.0% of the 2018/19 level of transport capital investment. If the Government moves to the higher levels proposed by the National Infrastructure Commission, these proportions will be even lower. Put another way, the *total* cost of our central estimate is equivalent to *a single year* of funding for High Speed 2 – the high scenario is only fractionally more expensive. For context of a single project with a similar level of spending as the high scenario for making stations step-free, the Lower Thames Crossing, a project to supplement the existing Dartford Crossing of the Thames Estuary is estimated to cost between £5.3 billion and £6.8 billion for 14.3 miles of road.[56] Figure 9 illustrates both the significant increase in funding required, but also sets this in context of overall transport spending over the next decade.

Figure 10: Annual funding required to provide full step-free access to platform level (central estimate) compared to UK average annual expected transport funding between 2020-2030



Source: WPI Calculations, DfT Inclusive Transport Strategy, Transport Statistics GB Table TSGB1303 and National Infrastructure Assessment 2018

Platform-train interface

Britain has a very old railway network that was developed by multiple competing companies. As such, there is a lot variation in the profile of platforms, meaning that there can often be sizeable distance – both horizontally and vertically – between the door of a carriage and the edge of the platform. How wheelchair users or people with reduced mobility navigate this gap is a question of both how the railway is operated and capital investments in accessibility. Currently, the main way that people for whom the gap is too wide or high get on and off trains is by using ramps deployed by train staff. The commitments train companies make about the availably of staff and how much notice is required must be detailed in their Accessible Travel Policies.[57] However, it is preferable that rather than people needing assistance because of design decisions made a century ago, the railway can be built in such a way that everyone can use it as independently as they wish. This is especially the case given that the assistance given by train companies can occasionally be of poor quality or entirely absent. A quarter of passengers booking Passenger Assist do not receive all the assistance they booked.[58]

This does not need to be the case because there are several possible capital investments that can make it easier for people to get on and off trains independently, including:

- Rebuilding platforms: All the platforms on a line can have their height adjusted so they are all the same level as each other and match the rolling stock used on that line.
- Low-cost platform height alterations ("Harrington Humps"): Small sections of platforms can be raised to provide level access to a train. They are typically pre-fabricated and made of lightweight materials. These only provide accessibility on the section of platform that is raised.

- Rolling stock innovations: It is possible for carriages to either have retractable steps that make the height differences between the train and the platform smaller (such as Greater Anglia's new Class 745s and 755s[59]) or a 'gap filler' ramp that moves to bridge the gap between the train and the platform edge.

These improvements are not universally applicable. It is hard to adjust the platform heights at stations where lots of different types of train call and concerns about freight operations can make it difficult to narrow the gap too far. A combination of these capital measures as well as continued staff assistance is likely to be needed.

Given this complexity we have not estimated a total figure for the investment needed to improve the platform-train interface. In terms of a rough scale of the costs, rolling stock innovations are either the cheapest or most expensive depending on whether trains need to be retrofitted or if changes can be gradually introduced as the fleet is renewed – a process that takes several decades. It is difficult to compare the costs of different rolling stock because of different specifications, but comparing the cost of the Class 745s and 755s used by Greater Anglia against two other recent rolling stock orders implies that the price may be in a similar range, meaning that an enhanced standard for the platform-train interface should not impose significant extra costs. As the solution of sliding steps is a new innovation, we have not identified existing information sources on which we could base a calculation of retrofitting existing trains. 'Harrington Hump' style solutions are likely to be relatively cheap; evidence from historic funding decisions suggest that they cost in between £55,000 and £70,000 per platform.[60] Rebuilding platforms, on the other hand, appears to cost in the region of £300,000 per platform.[61] If a large proportion of the platforms on the network could be rebuilt, this implies a cost in the billions.

The Department for Transport, the rail regulator and the rail industry should undertake to estimate the scale of costs for significant capital improvements to the platform-train interface to increase the scope for independent use of the railway.

Rolling stock

Rolling stock – the trains that operate services – is another area of capital investment vital for accessibility. To be used by everybody, carriages need to incorporate many design features, including space for wheelchair users, accessible toilets and appropriate visual and audio communications. The current legal standard of accessibility for rolling stock is the Persons with Reduced Mobility Technical Specifications for Interoperability[62] (PRM-TSI), a European standard incorporated into British law. The Railways (Interoperability) Regulations 2011 placed a deadline of 31 December 2019 by which to comply with the standard. This deadline was not met and the Government was required to give the industry an extension or else certain types of train could not legally operate on 1st January 2020.[63] One of the main reasons that this deadline was not met was that new stock to replace old trains were delivered late.

In terms of costs, it is reasonable to assume that there is little, if any, new money that needs to be committed to making all rolling stock meet the PRM-TSI standard. Train operators and leasing companies had been working towards the 2020 deadline for some time and it seems unlikely that large amounts of new capital are needed.

Although PRM-TSI is the current legal standard, there is some evidence to suggest that it falls short in certain areas. For instance, rolling stock conforming to the standard often has a limited amount of space for wheelchair users with carriages too cluttered for wheelchair users to easily move about the train.

Certain parts of the railway appear to have opted for a higher standard than PRM-TSI when ordering new rolling stock. It is beyond the scope of this report to consider what standard is correct. Of course, if what is accepted as "accessible" in terms of rolling stock becomes more stringent and applied retrospectively, then rolling stock will need to be adapted and there will be a cost associated.

Other capital investment

Lifts, bridges and trains are the most noticeable pieces of capital accessibility improvements. However, on their own they cannot make the railway fully accessible. Other necessary investments include:

- Induction loops
- Appropriate signage and wayfinding information
- Tactile paving
- Accessible toilets
- Onward travel and interchange facilities

It is difficult at this stage to estimate the scale of work that is required, however with only 19% of stations hosting an accessible toilet and 61% an accessible ticket machine, there appears to be some way to go. However, we do not think that including these improvements would change our headline cost estimate significantly because:

- We are likely to have captured a number of these improvements in our costings, as schemes delivered under Access for All often deliver such improvements too.
- The costs involved tend to be relatively small (roughly £42,000 for an accessible toilet[64] and £21,000 for tactile paving on platform edges[65]).
- Some improvements can and should be rolled into regular station maintenance and refurbishment that is already within transport budgets.

Operational spending

No matter how much is invested in capital accessibility improvements, how railways are operated will continue to be vital to ensuring accessibility. Areas of operation the train companies must continue to improve for the sake a fully accessible railway include:

- Training and provision of staff
- Systems for booking passenger assistance or, ideally, a turn-up-and-go service
- Communication
- Fair and understandable fares

Any costs of providing these services should be seen as part of the normal costs of operation for a train company because disabled people have a right for the railway to be run in such as a way that they can access it.

5. Barriers to full accessibility

This report does not seek to make policy recommendations, but we have been able to identify some of the barriers that slow or prevent progress in improving accessibility. The two significant barriers identified here were highlighted in interviews we conducted with experts from the rail sector. As well as providing sufficient funding, the Government and industry should systematically identify and tackle key barriers.

Structure of the railway

Britain's railway is like a miniature solar system with different bodies responsible for rolling stock, services and infrastructure and the whole thing kept spinning by the gravity of the rules, funding and instructions coming out of the Department for Transport. The widespread recognition of its fragmentation and inefficiency led to the establishment of the Williams Rail Review. The wider problems faced by the industry appear to hamper accessibility capital improvements. In Access for All, we see a single pot of funding provided by central government that different stations must bid to access. This does not allow for a strategic approach to providing accessibility improvements or ensuring efficient delivery of a programme of work. For example, it is very difficult to make all of the stations on a line accessible as part of a single project and hence to benefit from economies of scale or from operational efficiencies in terms of closing the line for the minimum overall time.

Fragmentation has an even greater impact on the operational side of accessibility. Each train company and Network Rail have their own policies and procedures regarding passenger assistance. A simple journey might include passing through a station operated by Network Rail to board a train operated by one train company and getting out at a station operated by another.

The chair of the Williams Review has spoken about the goals of the review:

> *"a new industry structure, reducing fragmentation, better aligning track and train, creating clear accountability and a greater distance between government and running the day to day railway. What has come through strongly in our call for evidence is consensus for a more rational and effective way of organising the industry" (Keith Williams)*[66]

Changes in line with these goals should make the delivery of accessibility improvements easier.

A perceived lack of business case

We heard from some of the experts that in parts of the rail industry there can be a perception that spending money on accessibility improvements is a regulatory cost of doing business and that there is no independent business case for doing so. Some of our interviewees suggested this could stem from the concessionary fares that many disabled people are entitled to and the costs of providing passenger assistance; e.g. providing exemplary service to disabled people could increase demand for passenger assists requiring more staff and extra cost. This view persists despite there being only 222,000 Disabled Person Railcards in circulation[67] and they only offer slightly better benefits than other Railcards. It is also incorrect that investing in accessibility measures does not lead to an increase in revenue; there is some evidence that providing step-free access to platforms can increase the patronage of a station by 20%.[68] Furthermore, our modelling has shown that a fully accessible rail system could provide a Gross Value Added benefit to the wider economy of £1.3 billion, as well as increased exchequer benefits.

Ultimately, it should not matter whether or not there is a narrow business case for accessibility improvements because disabled people should simply have the same access to transport as everyone else by right. This could be baked into how the railway operates by the adoption of a universal service obligation, as recommended by The Office for Road and Rail in their submission to the Williams Review. This would make explicit the cross-subsidisation of accessibility by all passengers, potentially through some sort of levy on tickets. Whilst this model might be best suited for the operational side of the railway (it solves the perceived issue of good assistance services leading to higher costs by providing independent funding for passenger assists) it might also be appropriate for capital improvements on the railway, especially given that when accessibility improvements such as lifts are installed , they are mostly used by people without disabilities.[69] That said, a universal service obligation is unlikely to completely replace public funding, especially if there is a period of concentrated investment over the next decade to make the railway fully accessible by 2030.

Box 3: Merseyrail case study

Merseyrail is the commuter/metro network serving the Liverpool City Region. It operates two lines that run from the suburbs of Merseyside and the Wirral into an underground core in Liverpool and Birkenhead. The system is currently undertaking an ambitious upgrade worth £460 million[70] with the goal of securing Merseyrail's status as the most accessible railway in the UK.[71] There are several pioneering elements of the project:

- Space on trains: the new Class 777 rolling stock that has been ordered includes dedicated space for wheelchair users and is open enough that wheelchair users can move throughout the whole train,[72]
- Platform-train interface: the height of around 100 platforms of the network has been altered so that they are compatible with the new trains, which come with sliding-step technology that allows wheelchair users to board them without assistance,[73]
- Step-free stations: the Liverpool City Region is matching funding from the Access for All programme to install lifts at stations.[74]

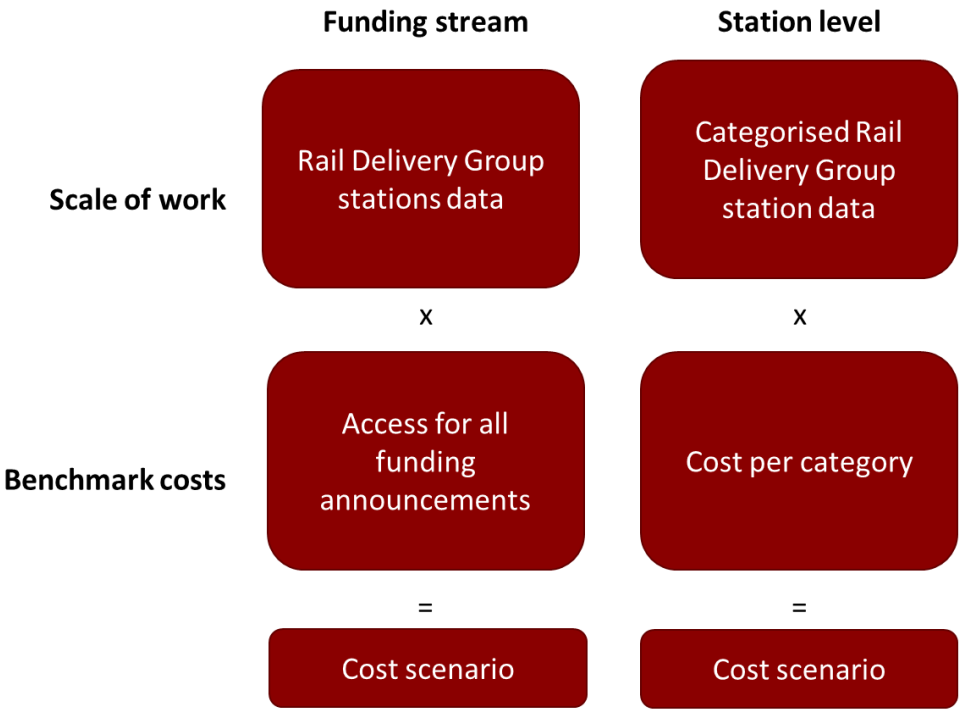
Combined, these elements will deliver a level of accessibility on the network far above what is currently legally required. Merseyrail has several advantages over other parts of the railway: they have a self-contained network with only one type of train and no freight services, and the network is managed by the Combined Authority, not central government. However, this case study shows that with a single vision, co-ordination and funding, there can be transformational changes in accessibility.

Annex: Modelling methodology

A high-level overview of the modelling undertaken for this report is presented in Chapter 4. This Annex supplements that explanation with a detailed description of how the scenarios were calculated.

As explained in Chapter 4 we have modeled scenarios for the cost of making all stations in Great Britain step-free by combining information about how many stations are not currently step-free with benchmark costs on how much it costs to undertake the required work. We took two modelling approaches; one based on funding streams and the other looking at station-level information. The two approaches use a similar technique: they take data about the scale of work that is required and multiply it by a benchmark for the costs of undertaking step-free improvement works, as shown in figure 11.

Figure 11: Approach to cost modelling



By using both a lower-bound and an upper-bound interpretation of the data for both the funding stream and station level approaches, the modelling produces four scenarios. For the sake of simplicity, only three of these are presented in this report (the lower-bound station level scenario is not included because it falls firmly within the range created by the other three scenarios). The outcomes of the scenarios are recorded in table 11.

Table 11: Results of step-free cost modelling

	Funding stream	Station level
Lower-bound	£2.3 billion (low scenario)	£2.9 billion (not quoted in main report)
Upper-bound	£4.3 billion (mid scenario)	£5.6 billion (high scenario)

Source: WPI analysis

To explain how these results were derived, this annex details the data used, how it was manipulated, the assumptions that needed to be made and how the model could be improved further in future.

Data sources

This section presents the data used in the cost model, and a description of relevant sources that may be useful in future. The cost model needs two types of data:

- Scale of work: how many step-free improvements need to take place. The same source data is used for both approaches.
- Benchmark costs: how much these improvements are likely to cost. Different data is used for the two approaches:
    - Access for All funding: the average cost per station of the Access for All programme; we use this data for the "Funding Stream" approach
    - Station level data: actual cost of improvements at specific stations; we use this data for the "Station level" approach

Scale of work

Box 2 in Chapter 4 explores in some detail the data contained in the Rail Delivery Group's Knowledgebase, how we have interpreted it and in what ways it is limited. From a technical viewpoint, the data was accessed through the Rail Delivery Group's National Rail Datafeeds service in May 2020. As mentioned in Chapter 4, the data is liable to change as Train Operating Companies update their submissions, but the order of magnitude of our estimates is unlikely to be changed by revisions. Table 12 details the number of stations that are and are not step-free.

Table 12: Estimates of the number of stations that require investment to be made step-free to platform level

Estimate of number of stations requiring investment to be made step-free to platform level		Definition
Minimum	832	Only stations that are listed "no part of station" step-free. This scenario assumes that all 169 stations with missing information are step-free
Central	1001	All stations not listed "whole station" step-free. This scenario assumes that the stations with missing information are not step-free
Maximum	1001 + ?	All stations not listed "whole station" step-free, plus an unknown number of stations which are listed as "whole station", but would not be perceived as such

Source: Rail Delivery Group Knowledgebase (May 2020)

We are not certain on the number of stations to be included in the maximum estimate because we do not know to what extent disabled people would agree that all stations listed as "whole station" step-free in Rail Delivery Group's Knowledgebase truly have level access from street to platform.

Access for All funding

Access for All is the main government funding scheme for accessible stations. The average cost of stations improved under the Access for All programme is used for the funding stream approach. Access for All has been running since 2006 and has been extended to at least 2024 so there is information about several tranches of the programme. To get the average cost of each tranche, we collected information on the total budget for the tranche and how many stations were covered by that tranche.

Cost of tranches

Our key source for the cost of Access for All funding streams is the Inclusive Transport Strategy,[75] apart from the figure for a scheme part-funded by the Welsh Government which was sourced from a BBC news article.[76] In the Inclusive Transport Strategy, there is a single source outlining the cost of all the parts of the programme, including a high-level figure for the whole programme. We adjusted these costs for inflation and optimism bias, as presented in table 13.

Table 13: Costs of Access for All programmes per station

Access for All Programme	Number of stations	Cost (2018-19 £s) adjusted for optimism bias and inflation	Cost per station
Main Programme 2006-2015	150	£427m	£2.85m
Main Programme 2015-2020	42	£110m	£2.62m
Main Programme 2019-2024	73	£311m	£4.26m
Access for All and Welsh Government	5	£14m	£2.72m
High-level figure from Inclusive Transport Strategy	200	£550m	£2.75m

Source: WPI analysis

Number of stations

The information about how many stations were funded through the Access for All tranches came from a variety sources that we have matched to the funding tranches detailed in the Inclusive Transport Strategy.

Table 14: Source for estimates of number of stations covered by Access for All funding tranches

Access for All tranche	Source for number of stations
Main Programme 2006-2015	https://www.gov.uk/government/collections/access-for-all-programme
Main Programme 2015-2020	https://www.gov.uk/government/news/government-funding-to-make-stations-accessible-to-all
Main Programme 2019-2024	https://www.gov.uk/government/speeches/access-for-all-73-stations-set-to-benefit-from-additional-funding
Access for All and Welsh Government	https://www.bbc.co.uk/news/uk-wales-26671806
High-level figure from Inclusive Transport Strategy	Inclusive Transport Strategy (2019)

Station-level data

Station-level data was found and recorded manually, primarily from press releases by Network Rail announcing planned or completed accessibility improvement works. We used several search terms to find relevant information, including:

- "Access for All"
- "Lift"
- "Accessibility"
- "Ramp"

This technique has its limitations and we were only able to find 76 stations that are partly, but by no means wholly, representative of the over 2,500 stations in the country. As shown in table 15, the stations are not evenly distributed across the Network Rail categories and some categories have very few stations. However, with limited data available this approach is able to offer valuable new insight.

Table 15: Scope of manual station-level data collection

Network Rail category	Stations with cost data
A	0
B	8
C	28
D	16
E	17
F	4
Unknown	3

Source: WPI analysis of publicly available data

For the 76 stations our dataset includes:

- Cost of the project,
- Date of the cost estimate,
- Information on whether costs were projected or outturn.

Often accessibility work is funded alongside other renovations, but publicly available cost information does not split out the costs of the accessibility improvements. We therefore included only those stations where it was clear that accessibility improvements constituted the most substantial part of the work.

Methodology

As established in figure 11, there are two approaches to our modelling. The first takes information about how much previous tranches of Access for All has cost and the second uses station-level data.

Funding stream

The funding stream approach takes typical costs per station from previous Access for All tranches and multiplies them by the number of stations that require work. We took the following steps for each tranche of Access for All funding in order to produce an average spend per tranche:

- **Adjustment for inflation:** The Inclusive Transport Strategy does not state whether costs are in real or nominal terms. We have made the assumption that these costs are nominal (as they are presented as financial expenditure figures) and hence are from when the programme was implemented. We have therefore adjusted these estimates using the HM Treasury GDP deflator.
- **Optimism bias:** We have been able to calculate a specific optimism bias estimate of 11% for accessibility improvements based on our dataset (more detail below). We have used this to adjust Access for All cost estimates that included announced funding.
- **Distribution of spending:** all of the tranches of the Access for All programme took in place in a series of several years. In the absence of other publicly available information, we have assumed that funding was split evenly in real terms in these years and have adjusted for inflation accordingly.

The result of these adjustments in terms of the average cost per station can be seen in table 16.

Table 16: Cost per station of Access for All accessibility improvements

Access for All Programme	Status	Number of stations	Cost (nominal prices)	Cost (2018-19 prices)	Cost (2018-19 prices adjusted for 11% optimism bias	Cost per station (2018-19 prices)
Main Programme 2006-2015	Outturn	150	£378m	£427m	£427m	£2.85m
Main Programme 2015-2020	Outturn	42	£110m	£110m	£110m	£2.62m
Main Programme 2019-2024	Projected	73	£300m	£280m	£311m	£4.26m
Access for All and Welsh Government	Projected	5	£12m	£12m	£14m	£2.72m
Entire programme 2006-2019	Outturn	200	£500m	£550m	£550m	£2.75m

Source: WPI analysis of Inclusive Transport Strategy (2019) data

The Funding Stream model produces a lower-bound and an upper-bound figure (presented in table 17), which in the main report we include as our Low and Mid scenarios:

- Lower-bound: We calculate the lower-bound funding stream figure by taking the minimum number of stations that require work (as shown in table 12) and multiplying it by the median cost per station of the Access for All funding streams. This assumes that the cost of constructing accessibility improvements in future will be, on average, the same as they were in the past. The median figure, of £2.75m per station, comes from the average across the entire Access for All programme.
- Upper-bound: We calculate the upper-bound funding stream figure (which is our mid estimate when we report results from both models) by taking the central estimate of the number of stations (1,001) and multiplying this by the most expensive Access for All funding tranche. We use the central estimate for the number of stations because we had no basis on which to assess how many stations that were listed as step-free may not be perceived as such. Using the most expensive Access for All funding tranche assumes that stations in future are likely to be at the expensive end of those funded through Access for All. This could be the case because Access for All is likely to have funded stations with a lower cost first (in order to maximise value for money) and because future stations may lack certain economic of scale or the central locations of previous Access for All funded station improvements. Table 17 shows the number of stations, cost per station and total costs of the two interpretations of the Access for All funding streams data.

Table 17: Funding stream approach input and output figures

Interpretation	Number of stations	Cost per station	Total cost
Lower-bound (Funding Stream approach)	832	£2.75m	£2.3bn (low scenario)
Upper-bound (Funding Stream approach)	1001	£4.26m	£4.3bn (mid scenario)

Source: WPI analysis

Station-level data

The station-level data approach calculates typical costs for different station categories and applies those costs to the stations that still are not step-free. As explained above, the station-level data was collected manually. Several steps had to be taken to adjust the information for each station before it could be used to calculate averages:

- Adjustment for inflation: the values were turned into 2018/19 prices using the HM Treasury deflator. This assumes that the values gathered in the manual process are in the price year of the press release.
- Adjustment for optimism bias: Projects that were not complete were adjusted for optimism bias (that is, assuming works will cost certain amount more than expected). As explained below, we were able to estimate an optimism bias rate of 11% for accessibility improvements.

We then combine these typical costs with the number of stations not classified as "whole station step-free" (the central interpretation of the number of stations that require investment to be made step-free) to produce two interpretations of the total cost of making all stations step-free: a lower-bound estimate that uses the average costs of the station-level data (assuming that work in the future will cost a similar amount to work in the past) and an upper-bound estimate that uses the maximum cost (assuming that work in the future will be at the upper end of work carried out in the past). These are shown in table 18.

Table 18: Estimated costs of making different categories of stations step-free

Category	Average	Maximum	Number of stations not step-free	Lower-bound cost estimate (not used as a scenario)	Higher-bound cost estimate (High scenario)
A	n/a	n/a	0	£0m	£0m
B	£5.9m	£16.4m	2	£12m	£33m
C	£3.0m	£6.3m	48	£146m	£304m
D	£3.5m	£6.4m	127	£443m	£817m
E	£3.3m	£7.9m	303	£995m	£2,401m
F	£2.4m	£3.7m	482	£1,166m	£1,769m
Unknown (average of other categories)	£3.6m	£8.2m	39	£142m	£318m
Total	-	-	1,001	£2,903m	£5,642m

Source: WPI analysis

The cost profiles for the different stations broadly matched expectations. All Category A stations are classified as already step-free and based on our data collection it appears that they received no Access for All funding. Category B stations were therefore the most expensive, with categories D-F sitting within a fairly narrow range. Given that after a certain level, most stations are broadly the same (1 or 2 platforms), it seems right that they require a similar amount of work.

Assumptions

We needed to make a number of assumptions to construct the model:

Optimism bias

Optimism bias is the tendency for the cost of projects to be underestimated before they are carried out. Following HM Treasury appraisal guidance, we have adjusted costs for individual stations and Access for All tranches that were projected/predicted (as opposed to outturn data for completed projects) for optimism bias. The HM Treasury appraisal guidance gives optimism bias estimates for broad categories of project; however, we have been able to create a specific estimate for accessibility projects using the station level data gathered from press-releases. Nine projects had information from both the beginning of the project and the end. Using this data we found an average rate of optimism bias of 11.2%. This is the optimism bias we have applied throughout the model.

Relevance of data

We have taken information from Access for All – both individual projects and total funding tranches. Access for All funds different types of accessibility improvements at different scales. Our approach assumes that all Access for All funding transforms a given station from not being fully step-free to being fully step-free. Whilst we know that is not the case (with mid-tier Access for All funding individual projects like Harrington Humps and accessible toilets), a sufficiently large proportion of spending was dedicated to making stations step-free that the information can be used for our modelling. The fact

that the cost per station estimates from the funding steam approach and the station level approach (which includes only stations where the vast majority of spending concerns step-free improvements) gives us confidence that this does not have a significant impact on the overall estimates.

How to improve the model

We are confident that with the data currently available, our model presents a reasonable estimate of how much it will cost to make all stations in Great Britain step-free to platform level. However, the range we have presented is large so it is helpful for us to state approaches we considered but were not able to explore further as well as what it would take to refine the model as it currently stands.

Refining the model

In its current form, the main way that the model can be improved is by the inclusion of more data. With costs information about only 76 stations – and only 4 of the Category F stations that make up the largest part of stations that are not step-free – the more information about how much it cost to undertake previous improvement works, the better. Equally, a better understanding of the number of stations that require improvements works – particularly the 169 that currently do not have a step-free status recorded in the Rail Delivery Group's Knowledgebase – would enable the range presented by the model to be narrowed.

Other potential approaches

We considered a number of alternative modelling approaches but could not pursue them further, mostly because of limited or inconclusive data:

- Control period uplift: In certain areas of rail infrastructure investment, there is a trend that costs increase overtime. This can be made particularly apparent when comparing the control periods that divide up cycles of investment on the railway. We wanted an estimate for how much more expensive accessibility improvement works were likely to be in future. To do so, we attempted to identify a trend in historic station costs data stretching back to the start of the Access for All programme in 2006, but we did not have enough information to conclusively come up with a figure for the increase in costs between control periods.
- More sophisticated categorisations: there were a range of other ways to categorise stations that could have been used. Categories we identified data for include: the region, route, operator and passenger numbers of the station as well the Station Stewardship Measure (an index quantifying the material condition of the station). If we were able to identify a pattern between some of this information and the costs of accessibility improvement work, we could have improved the accuracy of our estimates. This was not possible, mostly because there was not enough information about costs.
- Estimated costs: A full estimate of the costs would require a station-level audit of step-free access and a costing based on individual station estimates. The Department for Transport and the rail industry should set out a programme to make such an assessment to confirm the investment needed to make all stations in Great Britain step-free

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