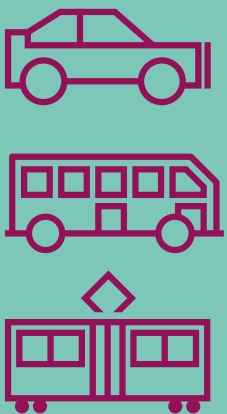Examining transport accessibility to key local services

Transport accessibility to local services: a journey time tool

We are the UK's independent public spending watchdog.

We support Parliament in holding government to account and we help improve public services through our high-quality audits.

Contents

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Overview

Part One

Introduction to the National Audit Office's transport accessibility tool

This section introduces the scope and rationale for the development of our tool. It explains:

- the background to our interest in this area;

- what we set out to achieve with this work; and

- what the tool could be used for and its functionality.

Part Two

Background on local transport

This section provides an introduction to local transport in England, including key facts, and roles and responsibilities.

Part Three

Key insights

By developing this tool, we have identified key insights on local transport:

1 Those who use or are reliant on public transport have longer average journey times to key local services than those with access to a car, although local variation exists.

2 Our metric of transport accessibility shows variation between and within regions.

3 Public transport and car journey times to services are markedly different in rural and urban areas.

4 For households without access to a car in a rural area, journey times to services are much longer.

Part Three *continued*

5   Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation.

6   When combined, data on service quality and journey time provide insight on equity of access to health and education services across England.

7   There is more that government could do to improve the data it collects on journey times and how it uses this information.

Part Four

Methodology

This section provides details of our data sources, how we developed our journey time tool, what the tool does and its limitations.

Our work involved combining data on modelled journey times to different local services with data on the quality of services, rurality and deprivation. We also developed a new 'transport accessibility metric', which shows transport accessibility in an area to multiple services compared with the national average. We used data from a range of sources, including the Department for Transport (DfT). Users can view our analyses and interrogate the data themselves, using our transport accessibility tool.

Part Five

Other work in the area

The journey time tool builds on previous National Audit Office (NAO) data visualisations and work on transport and local services.

This section highlights relevant NAO publications, as well as research by other organisations that may be of interest for further reading.

Preface

COVID-19

This document presents insights from our work exploring transport accessibility to key local services across England, using the latest available national journey time data. It accompanies our transport accessibility tool, which explores how access to different types of local services is enabled or restricted by local public transport provision.

During our fieldwork, the COVID-19 crisis led to drastic reductions in people making journeys, especially by mass forms of public transport such as buses and trains. The serious health and financial consequences for passengers, staff, operator companies and local authorities led to rapid financial and regulatory intervention by the Department for Transport. This included discouraging unnecessary travel by public transport during the lockdown period from March to August 2020 and encouraging interventions to support walking and cycling. It also led to changes in the way many public services were delivered, with virtual appointments replacing the need to physically travel to locations to access services. It is too early to say what the lasting impacts of both the COVID-19 crisis and the Department for Transport's interventions may be on local transport and access to services.

The insights presented in this document and the journey time data used to produce them pre-date the COVID-19 crisis. However, the findings and issues they highlight remain relevant. Departments across central government will need to work together and with local government to address these issues, make informed choices about the delivery of local transport networks and services, and agree how to manage the exit from the crisis response.

Contents

Part One

Introduction to the National Audit Office's transport accessibility tool

Background

This document introduces the National Audit Office's (NAO's) recent work exploring transport accessibility to key local services in England. The NAO examines the value for money of public spending. We consider that value for money involves achieving the intended outcomes for citizens in a way that is economical, efficient and effective, which includes being sustainable and delivering equitable services for users.

In the context of this work, local public transport influences how people can access the services they need. People's ability to access local services influences health, education, social and economic outcomes for individuals. As such, understanding how people travel sheds light on one of the factors influencing whether services meet people's needs.

This document presents insights created by combining datasets in new ways. This analysis and insight can support decision-making by those choosing where and how to allocate resources, deliver services and design transport provision.

This work is an analytical piece aiming to add insights, share knowledge and contribute to discussion around local transport provision and service delivery. It demonstrates new insights available to government through innovative use and analysis of data it collects. It is not a value for money assessment.

Through this work, we set out to:

- **understand** variation in public transport journey times, how these compare with journeys by car, and the interplay with service provision across England;

- **provide insight** into how local transport is an enabler or constrainer for people to access services, and how this may affect life outcomes and economic activity; and

- **facilitate conversations** across government about decision-making in this area.

Contents

We have produced a transport accessibility tool that visualises our analyses. This document is intended to support the use of our journey time tool.

A technical guide is also available with full details of our methodology, and the assumptions and limitations inherent in the data.

Background on local transport in England

- Local transport encompasses public transport services at a local level, including the local road network and other initiatives such as cycle lanes.

- DfT has overall responsibility for transport in England, but the services and infrastructure required are provided by a number of different bodies, including national and local government, and private sector organisations.

- DfT's published objectives are clear that investment in local transport supports economic growth, helps build sustainable communities and works to reduce congestion.

- Public transport provision has an impact on people's ability to access a range of services, including healthcare, education, employment, leisure and business facilities.

- The nature and availability of local transport services in England are locally determined and highly variable.

- DfT and local authorities need to consider the UK's carbon reduction agenda and commitments to net-zero, improved air quality and reduced congestion, as well as future mobility.

More details

Using our unique position and independence from government, we have done this work to add insight and facilitate discussion across government about the links between local transport and the value for money of public services, and to help drive improvement.

We are sharing this work widely with central and local government as well as other stakeholders in the hope of prompting questions and comments, and contributing to a community of interest in this topic.

If you have questions or comments about this work, please get in touch using the details below.

enquiries@nao.org.uk

The transport accessibility tool

The NAO has created an [interactive tool](#) that presents and compares *transport accessibility*[a] to key local services across England, using the latest available national journey time data. Our tool explores how access to different types of local services is enabled or restricted by the local public transport[b] provision in an area.[c] Some of the features of the tool include:

- a **transport accessibility metric** that shows transport accessibility in an area to multiple services compared with the national average. This metric allows for comparisons of local places' overall transport accessibility to the national average. See *Accessibility definitions* box for more;

- **journey time analysis** showing time taken to travel by public transport to schools (primary and secondary), further education establishments, acute hospital trusts,[1] GP surgeries, large employment centres and town centres;

- **quality ratings for health and education services,** enabling the user to filter the data to show journey times to all services, or only to good and outstanding services;

- the **impact on a journey time** when travelling by public transport to a good or outstanding rated service compared with any other rated service;

- **data on deprivation and rural-urban classifications,** allowing the user to look at the interplay between transport accessibility, rurality and deprivation; and

- the ability to interrogate journey times at **local authority, parliamentary constituency, clinical commissioning group** and **local enterprise partnership** level.

See pages 20 to 37 for our key insights

See pages 38 to 40 for more details on our methodology and limitations

See pages 40 and 45 for other research

1   Acute hospital trusts are NHS organisations providing acute hospital-based services.

Contents

a Accessibility definitions

This work considers just one aspect of accessibility: the journey time, by either car or local public transport, to a defined service location. We refer to this as *'transport accessibility'*. This is a key aspect of service access. It affects whether, and how often, citizens can travel to local services. But there are many other elements of accessibility not included in this analysis that are important to understanding the overall effectiveness of public service delivery. These include, but are not limited to:

● cost of travel or services themselves;

● cultural, age, gender or disability barriers;

● catchment areas for service eligibility, such as schools;

● ability to book an appointment;

● user choice;

● internet accessibility and connectivity;

● the service's capacity to meet users' needs in a timely way;

● service opening times; and

● inclusivity of services provided at a location.

We say more about this on .

b Modes of transport included

We used DfT's definition of public transport. It defines public transport journeys as those made by bus, train, tram, metro, light rail, underground and ferry, made in accordance with the local context. We also included walking journeys of up to 30 minutes.

We used the most recent journey time data available, modelled to represent journeys made in 2017.

c Geographical areas of analysis

We used lower super output areas (LSOAs) to present our analysis. LSOAs are small geographical areas containing similarly sized populations. There are 32,844 LSOAs in England, each containing an average population of 1,500 individuals.

Key questions ... answered

How do I access the tool?

Our tool is available on the NAO website and can be accessed using a desktop computer, mobile phone or tablet.

What data is already available?

There is a range of data and analysis on accessibility to local services and potential impacts. This includes data from government departments, as well as analysis undertaken by research organisations, academic institutions and the government. Published NAO value for money studies have previously explored trends in accessibility to specific local services – see pages 41 to 43.

DfT produces journey time statistics to key local services for England published at an aggregated level. Both our analysis and their statistics use the same input modelled journey time data. However, our analytical approach differed to ensure that we used the data in a way appropriate to our final use. Therefore, the outputs of our analyses are not directly comparable with the journey time statistics published by DfT. The table opposite outlines the differences between our and DfT's approach to producing journey times.

What makes our work different?

Most existing tools allow users to plan journeys to specific services, which is not the purpose of this tool. We have used time data to explore variation in access to different services across England and combined this with other publicly available data on quality of service, deprivation and rurality. As such, our journey time tool is designed to understand how journey times to multiple local services vary across England, and to explore relationships between journey times to services, deprivation and rurality.

How can our tool be used?

Our tool and the analysis presented in this document are intended to add insights and contribute to discussions around equitable access to services, quality of service provision and the provision of local transport across England. It is also designed to prompt government to use data in more innovative and informative ways in decision-making.

We see a number of different ways these insights could be used across central and local government – for example, in planning decisions, funding allocation and service delivery. We also want to build a community of interest in the work beyond government to include academia, research bodies, charities and relevant third sector groups.

Differences between our methodology and the Department for Transport's approach to producing journey time data

Difference	Our method	DfT's method
Population weighting for service users	Did not contain any user-specific population weightings to ensure that we combined journey times to different services in our transport accessibility index in a robust and fairly comparable way.	Uses user-specific population weightings to produce its journey time statistics.
Added penalties	None added.	A five-minute penalty added to all public transport journeys as an allowance for catching the first public transport service. A five-minute penalty added to all car journeys as an allowance for parking the car at the final destination.
Treatment of walking journey times	Walking journey times combined with public transport journey times during analysis. Walking journey times capped at 30 minutes.	Walking and public transport journey times dealt with separately. All walking journey times included up to 120 minutes.

Source: National Audit Office summary based on Department for Transport technical documentation and our own methodology

For more details on the data used, and the methods and limitations of this work, see our technical guide.

Information on the approach taken by DfT to produce the journey time statistics can be found in its published technical guide.

Part Two

Background on local transport

Key facts on local transport

807 billion km distance travelled each year in Great Britain by all modes of transport (including car)

8.2 billion journeys made on all modes of public transport in Great Britain. In England, 26% of all journeys made were for leisure purposes, with 18% made for commuting or business

83% of passenger kilometres in Great Britain were by car, van or taxi

4.3 billion journeys made by bus in England. This is down 4% nationally over the past decade (10% in England outside London). However, there is variation, with some areas showing an increase in the number of journeys per person between 2016-17 and 2017-18

59% of all journeys on public transport in Great Britain were made on local buses, 21% by rail, 17% by underground systems and 3% on light rail and trams

One region London is the only region in England where most residents travel to work by public transport. Outside London, the use of public transport for this purpose ranges from 19% (East Midlands) to 28% (South East)

51% of all bus journeys occurred in London; 2.12 billion (49%) journeys were taken on buses outside London, most in non-metropolitan areas

39% fewer trips were taken by adults with mobility difficulties (across all modes of transport) compared with those with no mobility disability

Notes

1   Figures are taken from statistical reports and provided for 2017-18 to match the journey time data and analysis presented later in this document. The journey time analysis presented later in this document used the most recent journey time data available, modelled to represent journeys made in 2017. More recent statistical reports on local transport are available from DfT.

2   Statistics for Great Britain are used where the Department for Transport do not publish England-specific data.

Contents

Recent developments in local transport include the following:

- DfT continues to devolve responsibility for transport planning and is supporting the development of sub-national transport bodies (STBs) at regional level to complement local authority transport planning. Only Transport for London and Transport for the North have statutory roles. Other STBs are developing.

- Announcements, in October 2018, of further investment to major local authority roads.

- In February 2020, the Prime Minister announced £5 billion over five years to "level up local transport connections throughout the country, making everyday journeys easier, greener and more convenient", by improving bus services and cycle lanes in England outside London. This followed a £220m announcement in September 2019 which included a range of actions for bus services including £30 million for restoring lost services. DfT plans to publish a national bus strategy for England by the end of 2020, and we have reported on its approach.[2]

- An update from DfT ahead of its *Transport Decarbonisation Plan* (to be published late in 2020). Accelerating modal shift to public and active transport and place-based, context-specific solutions are presented as strategic priorities for DfT in delivering a net zero emission transport system.

2 Comptroller and Auditor General, *Improving local bus services in England outside London*, Session 2019–2021, HC 577, National Audit Office, October 2020.

Roles and responsibilities in local transport

Decision-making for local transport is dispersed, with responsibility and accountability distributed among central government, local authorities and the private operators of services such as buses, light rail and metro (**Figure 1**). DfT has an overall responsibility to support the transport network and provides policy, guidance and funding to local authorities for local transport. In 2018-19, DfT spent 10% of its £24.8 billion net spending on funding English local authorities. This local authority funding was a mix of non-ringfenced funding that authorities can spend as they consider best (including on non-transport activities) and grants allocated for specific transport or local growth projects.

Figure 1
Roles and responsibilities for local transport in England

Service	Department for Transport
Bus services	Sets policy framework and regulation, and provides some funding for local buses.
	Local bus services outside London are delivered within a complex, deregulated arrangement involving:
Rail services	Sets strategic direction that influences local train lines. / Funds investments through Network Rail.
	Awards and manages rail franchising, including those providing shorter-distance journeys.
	Sets rail fares, impacting accessibility of services.
Road network	Sets policy framework for the road network.
	Maintains the strategic road network through Highways England.
	Provides policy, guidance and funding to local authorities to support road networks and local transport schemes.

Note

1   Local authorities also have a statutory obligation to provide home-to-school transport for eligible students in England. The Department for Education sets the policy framework and guidance for this service. The delivery mechanisms and funding of this service vary between authorities.

Source: National Audit Office analysis of Department for Transport documentation

Local authorities

Operators

Contract with bus companies to fund commercially unviable bus routes.

Mostly private operators.

Five large bus operators make up 80% of the market in England outside London.

Central government, local authorities, traffic commissioners and private or voluntary operators, some of whom do not operate for profit.

In some areas, voluntary community groups operate local bus services.

Some local authority provision of rail, such as light rail or suburban rail lines in London run by Transport for London.

Contribute to consultations on services.

Mixture of privately and publicly operated and owned organisations.

Maintain, manage and improve all roads except the strategic road network.

No specific operators because roads are a network, not a service.

The benefits of an efficient local public transport system are wide-reaching

While DfT has overall responsibility for transport in England, local transport infrastructure and service provision also support the objectives of other departments across government (**Figure 2**). Local transport supports the public's ability to travel to work, school, courts or health centres, connects communities and provides an important service to disabled people and those with health conditions. Local transport can displace cars, helping to reduce congestion, improve air quality and contribute to climate goals. The public's ability to access services when they need them, by local transport, affects the value for money achieved by those services.

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Figure 2

Local public transport and wider government objectives

An efficient and effective local public transport network can support the policy objectives of two thirds of government departments ...

DEFRA
Reduce car dependency

DHSC
Reduce inequalities, expanding choice in GP and hospital care

DEFRA
Improve air quality

DEFRA
Reduce the carbon footprint of transport and help meet the UK's climate goals

BEIS
Help deliver ambitious industrial strategies, supporting growth by connecting people and businesses, and by moving goods

DWP   HMT
Build a more prosperous society by supporting people into work and realising their potential through further education and apprenticeships

MHCLG   DEFRA
Create socially and economically stronger communities, providing access to local facilities, shops and businesses

And enable ...

DHSC
Access to healthcare

MOJ
Access to justice for all

BEIS
Access to employment opportunities

BEIS   DfE
Access to education, from primary school to further and higher education

DCMS
Disabled people to travel independently

MHCLG
New housing development access to existing services and jobs

DCMS
Participation in social action, culture, sport and physical activity

DWP   DCMS
Those from deprived backgrounds to be included and can facilitate social mobility

BEIS   Department for Business, Energy & Industrial Strategy
DCMS   Department for Digital, Culture, Media & Sport
DfE   Department for Education
DEFRA Department for Environment, Food & Rural Affairs
MOJ   Ministry of Justice

DHSC   Department of Health & Social Care
DWP   Department for Work & Pensions
HMT   HM Treasury
MHCLG Ministry of Housing, Communities & Local Government

Source: National Audit Office analysis of Departmental documentation

1 Those who use or are reliant on public transport have longer average journey times to key local services than those with access to a car, although local variation exists

Part Three

Key insights

1 **Those who use or are reliant on public transport have longer average journey times to key local services than those with access to a car, although local variation exists**

Across all seven services in 2017, the national average journey time by public transport was at least double that of the national average journey time by car (**Figure 3**).

Figure 3 highlights that national average journey times to local services were longer by public transport than by car. However, there was variation in journey times to services across England. For example, travelling by public transport to the nearest acute hospital trust took 35 minutes on average, but could take as little as three minutes or over two hours.
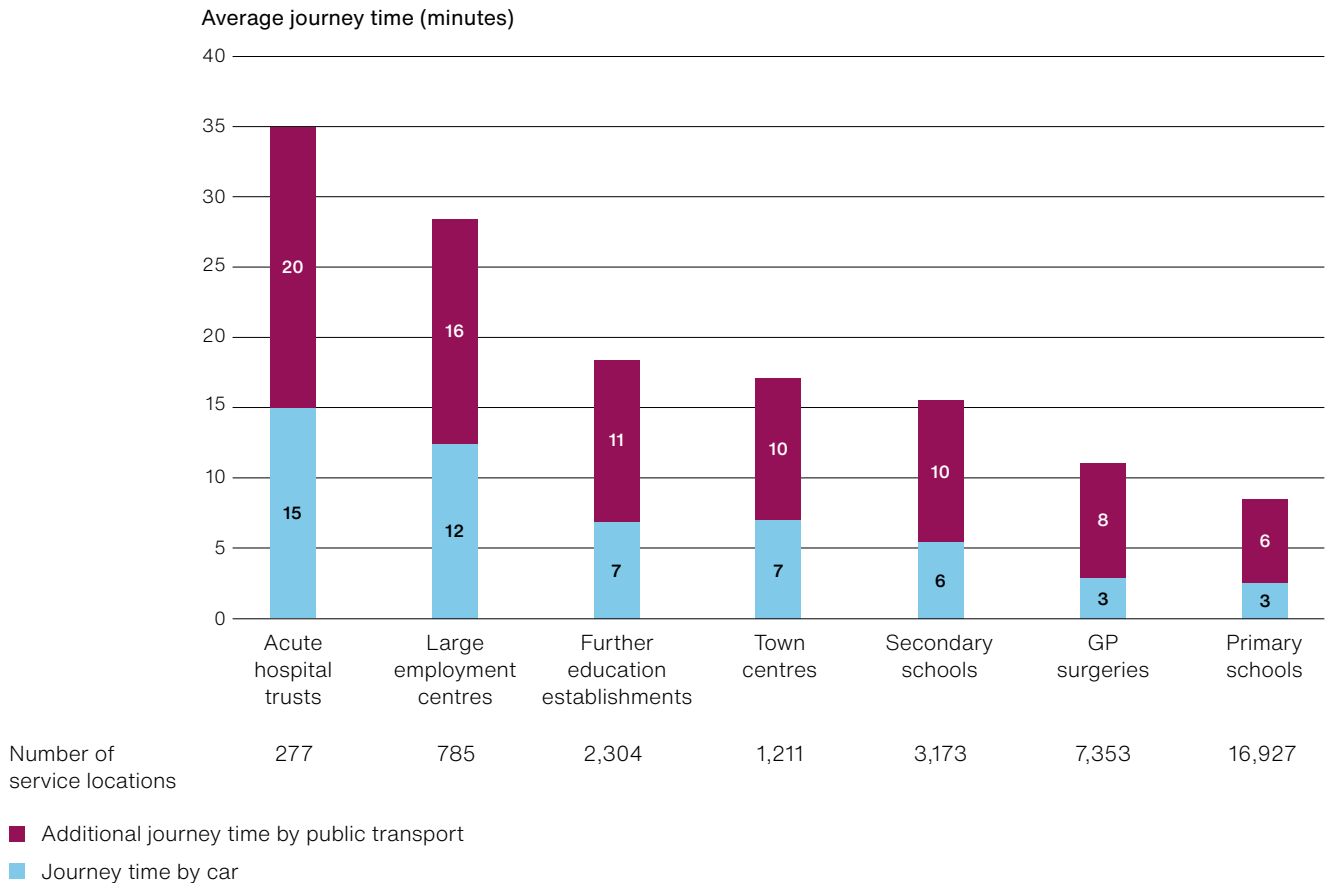
1 Those who use or are reliant on public transport have longer average journey times to key local services than those with access to a car, although local variation exists

Figure 3

National average journey times to local services, by public transport and car, in England

Average journey time (minutes)

| Number of service locations | 277 | 785 | 2,304 | 1,211 | 3,173 | 7,353 | 16,927 |

■ Additional journey time by public transport

■ Journey time by car
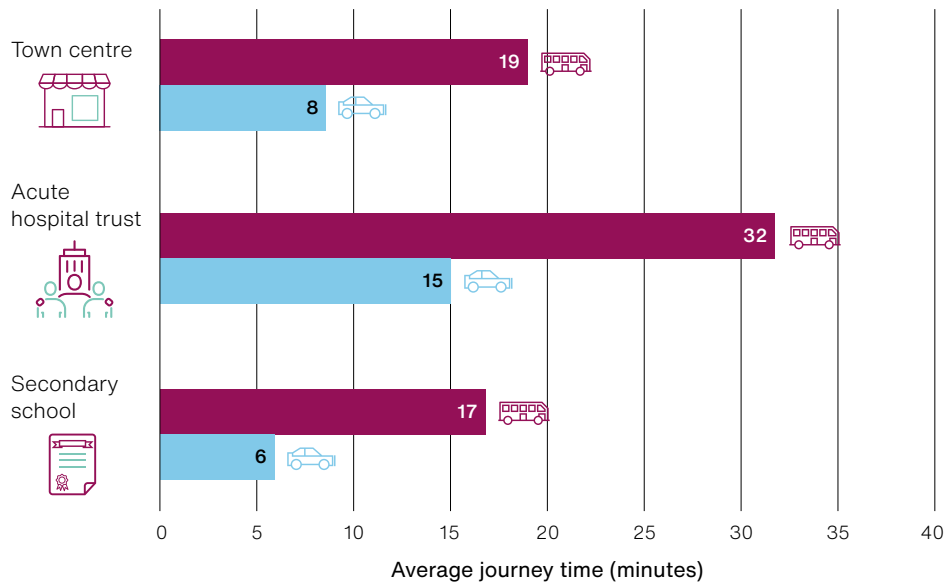
Notes

1   Journey times are modelled to represent journeys made in 2017.

2   Journey times are, in part, a function of the density of service locations. The number of service locations is provided in the table part of this figure. These locations were defined by the Department for Transport. For more information see our technical guide.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

1 Those who use or are reliant on public transport have longer average journey times to key local services than those with access to a car, although local variation exists

Figure 4

Example: Average journey times (minutes) in an area of Ealing, travelling to the nearest town centre, acute hospital trust and secondary school

■ Household using public transport

■ Household using a car

Notes

1 Journey times are modelled to represent journeys made in 2017.

2 The nearest service location may be different for journeys by car or by public transport.

3 Ealing 004A was used in this example.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

Understanding the national average journey time as well as the frequency and reliability of public transport provision are important considerations for modal shifts away from car dependency.

Contents

2 Our metric of transport accessibility shows variation between and within regions

The average number of services for which journey times by public transport were longer than the national average varied between 1 and 3 across English regions (**Figure 5**).

However, the granularity of the data provides a more nuanced picture and showed substantial variation in the transport accessibility to multiple services within regions (**Figure 6** on).

Figure 5

Average number of services for which the journey time, by public transport, was longer than the national average, by region

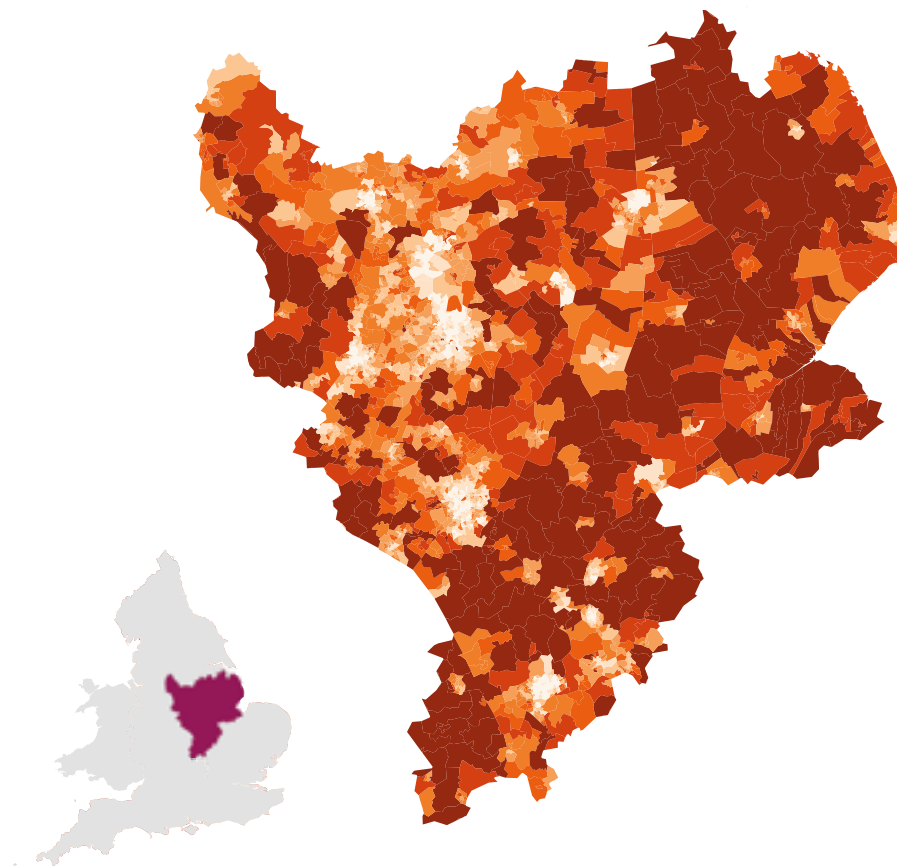| Average number of services (out of seven)	Region
1	London
2	North East, North West, West Midlands, Yorkshire and the Humber
3	East of England, East Midlands, South East, South West

Note

1   In our transport accessibility metric, an average of 1 service out of 7 is better than 2 or 3 out of 7.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

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Figure 6

Number of services for which the journey time, by public transport, was longer than the national average, in the East Midlands

Number of services (out of seven)

- 0 (Best – no journey times above national average)
- 1
- 2
- 3
- 4
- 5
- 6
- 7 (Worst – journey times to all seven services above national average)

Notes

1 Data are presented in lower super output areas (LSOAs). LSOAs are small geographical areas defined by the Office for National Statistics, containing similarly sized populations.

2 Urban LSOAs, which tend to be better connected and therefore a lighter colour according to our index, are relatively smaller because of their higher population densities when compared with rural LSOAs. Better connected urban areas may therefore be less visually prominent on this map.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

2   Our metric of transport accessibility shows variation between and within regions
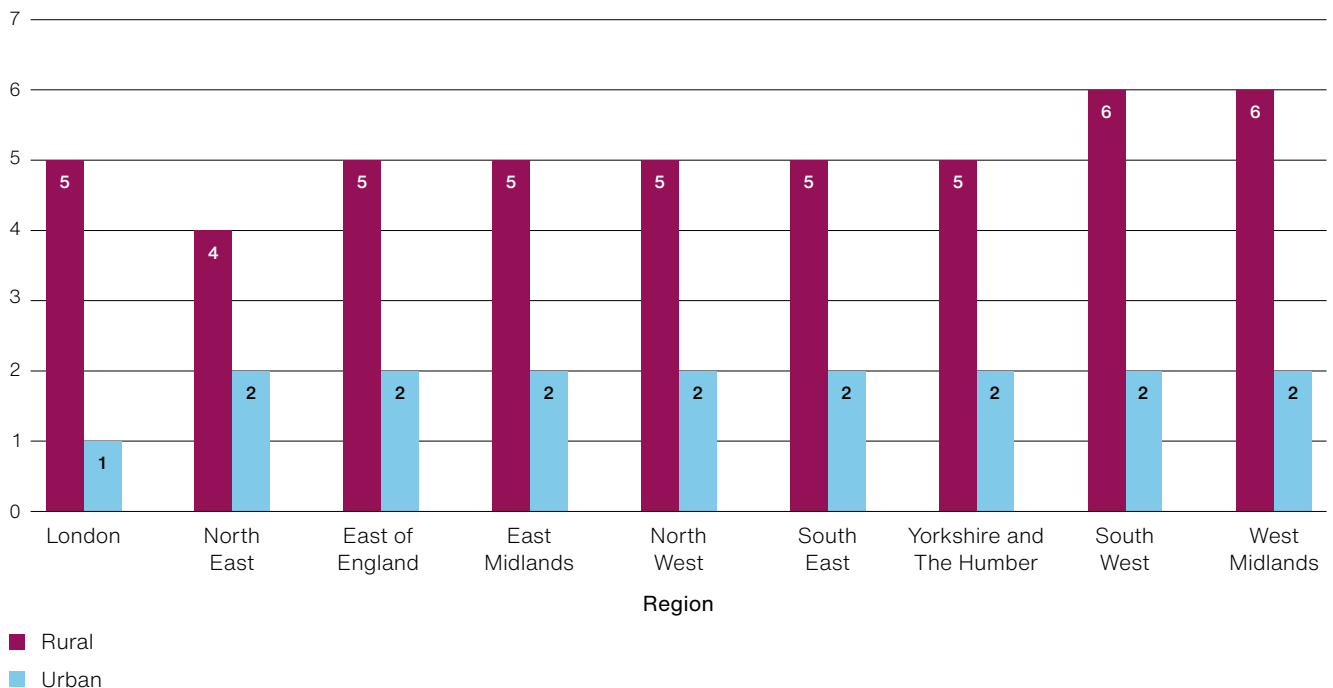
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Within each region of England, we found rural areas tended to have the poorest transport accessibility to multiple services (**Figure 7**).

Figure 7
Average number of services for which the journey time, by public transport, was longer than the national average, in urban and rural areas within regions

Average number of services (out of seven)

■ Rural
■ Urban

Notes
1   Journey times are modelled to represent journeys made in 2017.

2   0–7 ratings of transport accessibility were calculated using deviation from national average journey times. More information on this metric is presented in our published technical guide.

3   Rural and urban area classification are published by the Office for National Statistics. Classifications categorise lower super output areas in England into subsets of either 'rural' or 'urban' based on physical settlement and related characteristics.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport and rural-urban classification information published by the Office for National Statistics

Using data to understand the local transport accessibility context, alongside other information such as income and rates of unemployment, could help **identify the areas in need and improve value for money in delivery of local transport services**, allowing targeted interventions in the areas that would benefit most.

### 3 Public transport and car journey times to services are markedly different in rural and urban areas

Our analysis finds that public transport journey times are shorter in cities. It has been widely reported that public transport provision is better in urban areas as higher population densities make services more commercially viable, allowing for more frequent services. For all seven local services, we found that it took longer to travel by public transport in a rural area than it does in an urban area (**Figure 8**).

However, even in urban areas, average public transport journey times are at least double average car journey times for each service.

Figure 8

Comparing rural and urban journey times to services by car and public transport

Average journey time (minutes)

Service type and rurality
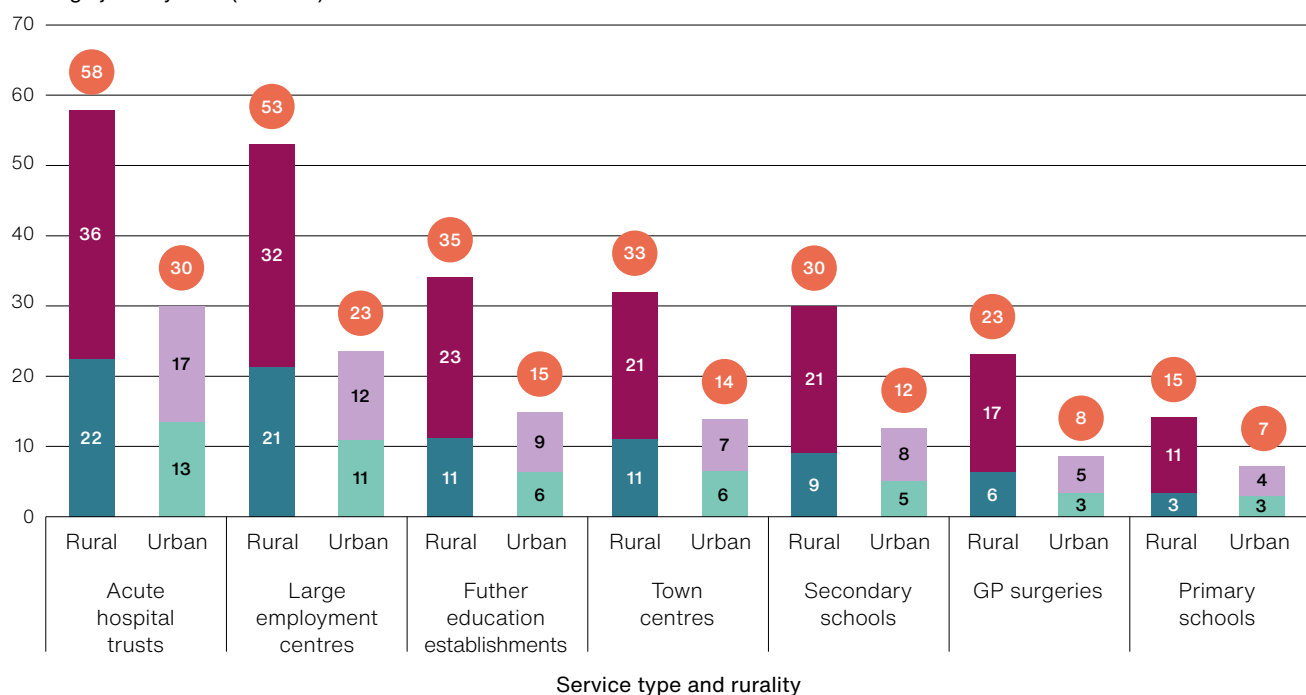
■ Rural – Additional average journey time by public transport
■ Rural – Average journey time by car
■ Urban – Additional average journey time by public transport
■ Urban – Average journey time by car
● Average journey time by public transport

Notes

1   Journey times are modelled to represent journeys made in 2017.

2   Figures may not sum due to rounding.

3   Rural and urban area classifications are published by the Office for National Statistics. Classifications categorise lower super output areas in England into subsets of either 'rural' or 'urban', based on physical settlement and related characteristics.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport and rural-urban classification information published by the Office for National Statistics

4 For households without access to a car in a rural area, journey times to services are much longer

There are positive effects on quality of life from living in rural areas and some people choose to live there and accept longer journey times. In 2018, 14% of households in 'rural areas' and 7% of households in 'very rural areas' did not own a car. For people who have less choice as to where they live or are reliant on public transport, longer journey times may have a negative impact on their lives, limiting employment opportunities and choices in healthcare and education.

In 2018:

- the rural population had a higher proportion of people aged 65 and over (25%) than the urban population (17%);

- 21% of the rural population were under 19; and

- 28% of rural households in the bottom fifth of incomes did not have access to a car.

Longer journey times to public services in rural areas have been reported extensively. We found average differences between 8 and 29 minutes in journey times to services by public transport in rural areas, compared with urban areas (**Figure 9** on page 28).

On average, people living in a rural area would need to spend 2.7 times as long travelling to get to a GP surgery than those living in an urban area, if they used or relied on public transport.

These longer journey times reflect the longer distances that rural dwellers typically live from service locations. In 2017-18, DfT's National Travel Survey found that people living in the most rural areas travelled 9,665 miles on average across all their journeys compared with 5,113 in the most urban areas.

However, we found public transport in rural areas had a compounding effect, making long journey times longer. We compared car and public transport journey times in rural areas and found that, for all services, it took substantially longer to reach the nearest service by public transport than by car (**Figure 10** on page 29). If you do not have access to a car in a rural area, journey times to services are much longer.

4 For households without access to a car in a rural area, journey times to services are much longer

Figure 9

Rural and urban average public transport journey times to services across England

Average journey time (minutes)
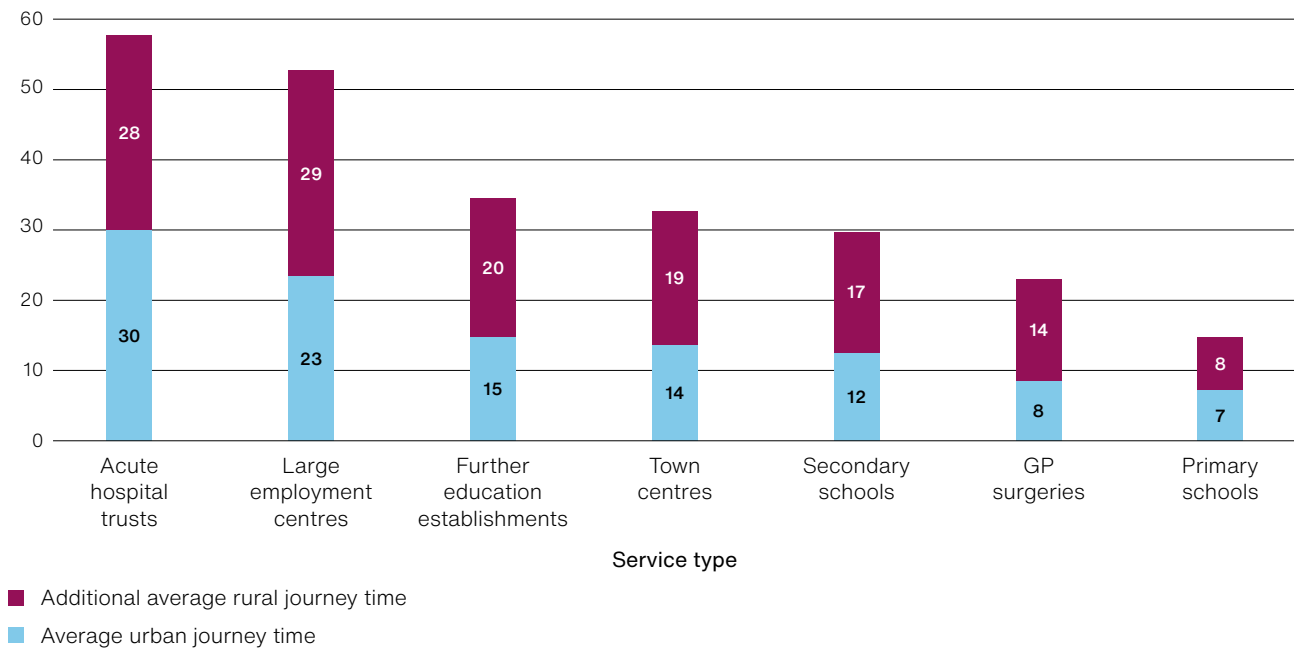
Legend:
- ■ Additional average rural journey time
- ■ Average urban journey time

Service type

Data values by service type:

Service type	Additional average rural journey time	Average urban journey time
Acute hospital trusts	28	30
Large employment centres	29	23
Further education establishments	20	15
Town centres	19	14
Secondary schools	17	12
GP surgeries	14	8
Primary schools	8	7

Notes
1   Journey times are modelled to represent journeys made in 2017.
2   Rural and urban area classification are published by the Office for National Statistics. Classifications categorise lower super output areas in England into subsets of either 'rural' or 'urban', based on physical settlement and related characteristics.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport and rural-urban classification information published by the Office for National Statistics

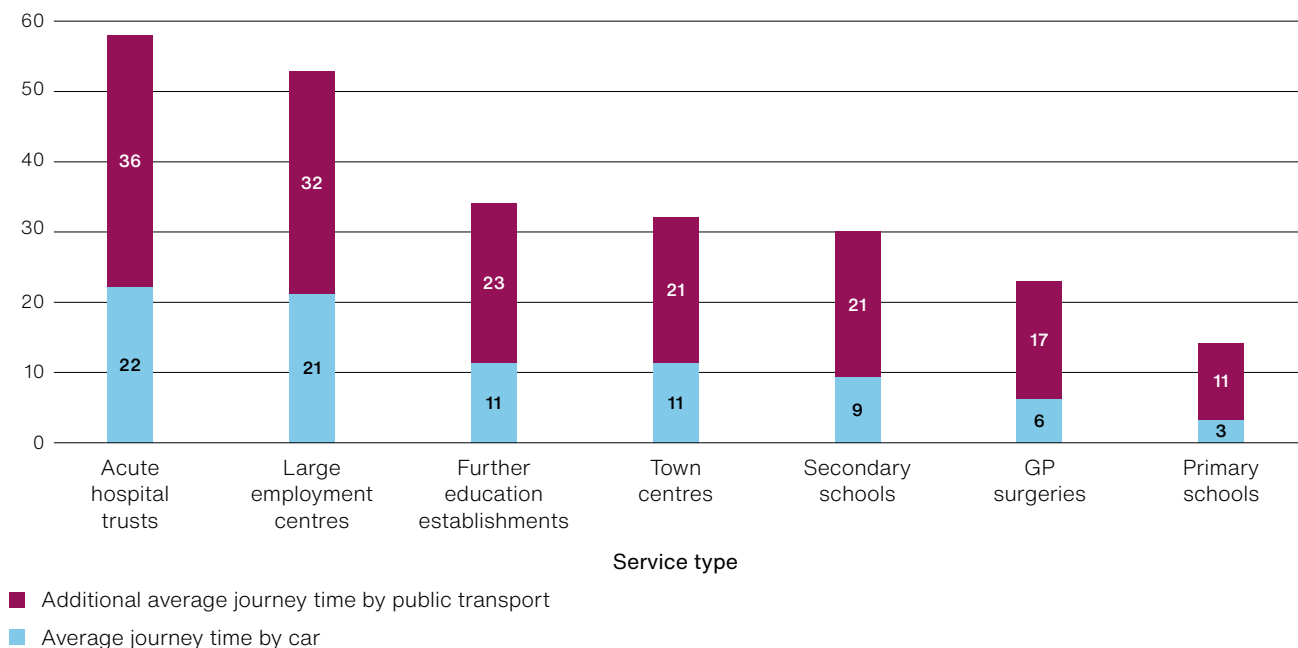**4** For households without access to a car in a rural area, journey times to services are much longer

Figure 10
Rural average journey times to services by public transport and car across England

Average journey time (minutes)

■ Additional average journey time by public transport

■ Average journey time by car

Notes

1   Journey times are modelled to represent journeys made in 2017.

2   Rural and urban area classification are published by the Office for National Statistics. Classifications categorise lower super output areas in England into subsets of either 'rural' or 'urban', based on physical settlement and related characteristics.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport and rural-urban classification information published by the Office for National Statistics

People's ability to travel to local services influences health, education, social and economic outcomes for individuals and multiple government objectives (page 19).

In rural areas where the population is more widely spread out, deciding where and how to provide public services for the best outcomes can be a challenge.

However, good decisions cannot be made without information. Insights like these on how people are able to travel to services can be valuable in helping government bodies allocate resources and design services at the local level.

5 Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation

5 Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation

In 2017, urban areas consistently had shorter public transport journey times to services compared with rural areas. Urban areas are typically better connected and better served by public transport. To explore variation in journey times further, we compared journey times with Index of Multiple Deprivation rank quintiles.

In England in 2017, 97% of the 'most deprived' areas were categorised as urban. These most deprived areas had the shortest journey times to all services in urban areas than any other deprivation quintile (**Figures 11 and 12**).

However, journey times are only one part of accessibility to services. Other aspects of accessibility may be more significant for people living in deprived areas or with access requirements (**Figure 13 on** pages 32 and 33).

Figure 11

Public transport journey times to services in the most deprived, compared with the least deprived, urban areas in England
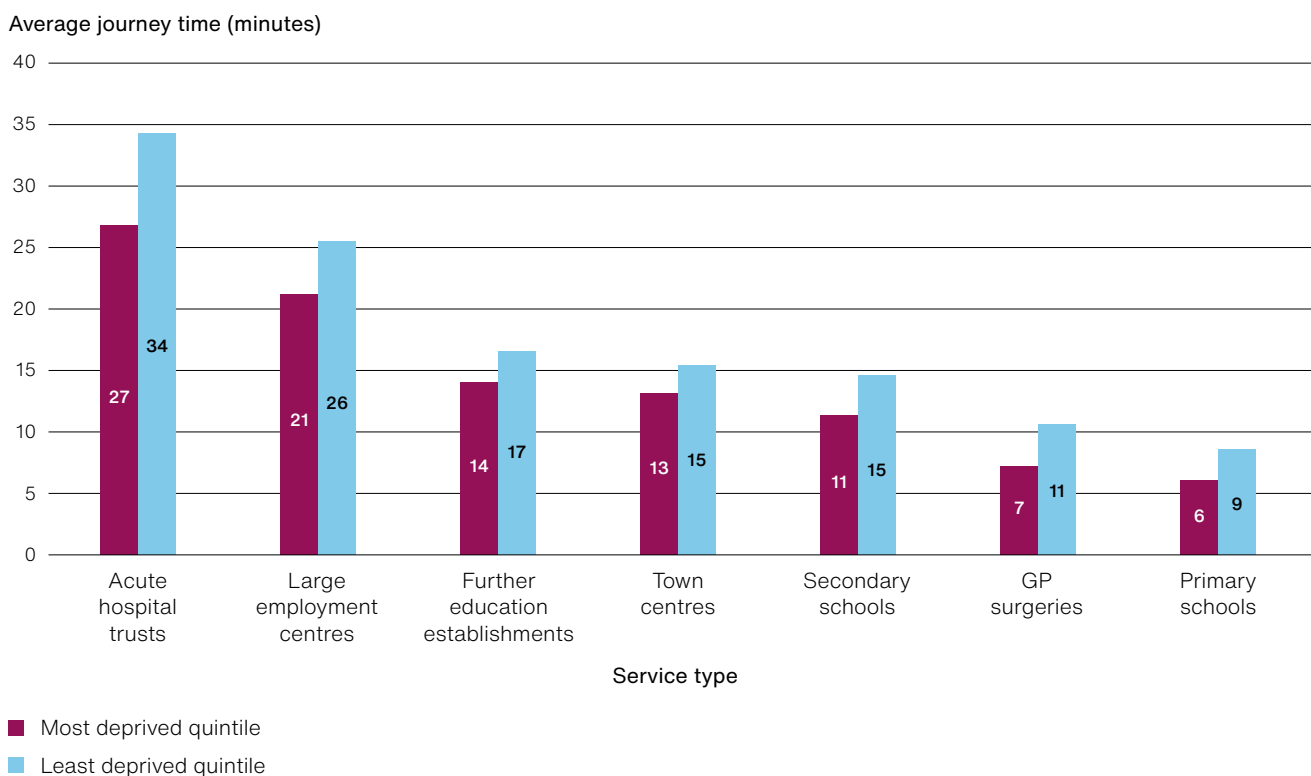
Average journey time (minutes)

Most deprived quintile
Least deprived quintile

Note

1   Journey times are modelled to represent journeys made in 2017.

Source: National Audit Office analysis of journey time modelled data provided by the Department for Transport and Index of Multiple Deprivation rankings published by the Ministry of Housing, Communities & Local Government

5   Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation

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Figure 12

Northampton: an example of an urban area where a large number of the most deprived areas were ranked as 0, indicating that they had transport accessibility to services better than the national average

Number of services (out of seven) with a mean journey time
by public transport longer than the national average

- 0 (Best – no journey times above national average)
- 1
- 2
- 3
- 4
- 5
- 6
- 7 (Worst – journey times to all seven services above national average)
- Most deprived areas

Notes

1   Lower super output areas (LSOAs) are small geographical areas defined by the Office for National Statistics, containing similarly sized populations. There are 32,844 LSOAs in England, each containing an average population of 1,500 individuals.

2   Journey times are modelled to represent journeys made in 2017.

3   0–7 ratings of transport accessibility were calculated using deviation from national average journey times. More information on this metric is presented in our published technical guide.

4   'Most deprived' areas are based on rankings from the Index of Multiple Deprivation 2019.

Source: National Audit Office analysis of journey time modelled data provided by the Department for Transport and Index of Multiple Deprivation rankings published by the Ministry of Housing, Communities & Local Government

Our previous work highlights the risk of government departments using journey times as the primary indicator of access to a service. While we acknowledge the complexity and challenge of considering the full range of factors that affect accessibility to a service, a more holistic view is important if government is to improve outcomes.

5 Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation
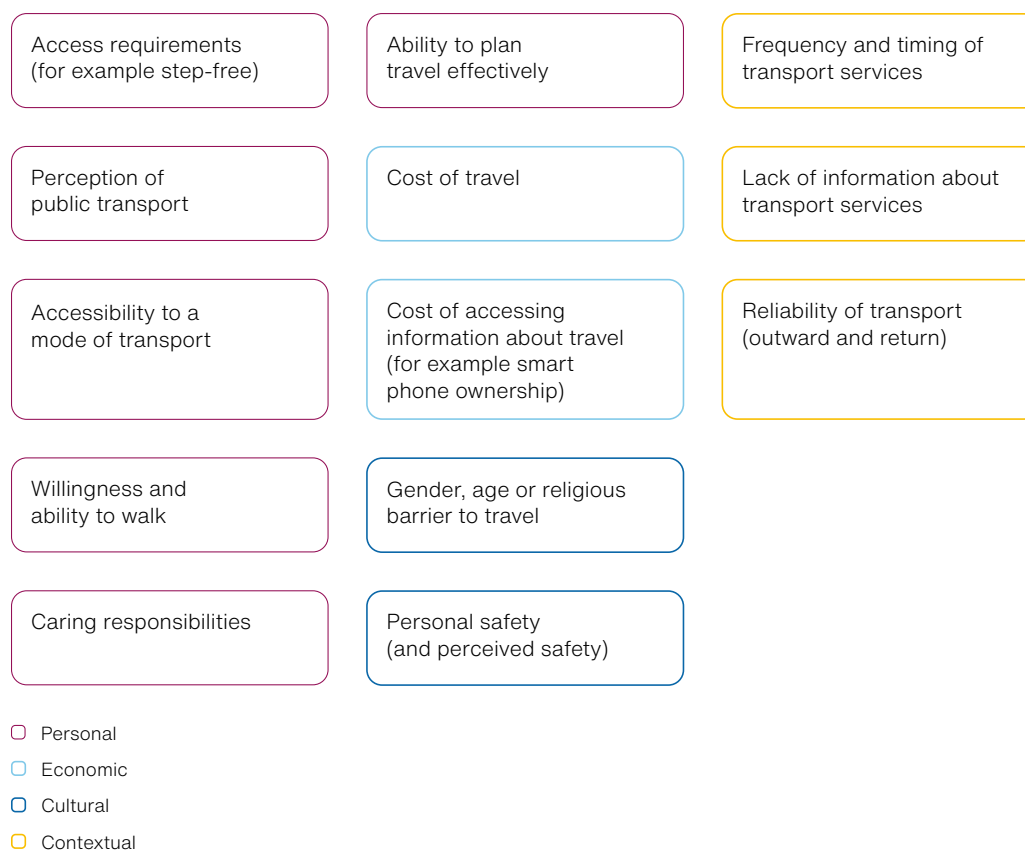
There are a number of factors, in addition to journey times, which may hinder a user accessing a service

Journey time to a service (which we have defined as 'transport accessibility') is just one aspect of 'accessibility'. Research has identified many other aspects of accessibility (**Figure 13**), not included in this analysis, that are important to understanding the overall effectiveness of public service delivery.

Figure 13
Other aspects of service accessibility

Barriers to travel

Access requirements (for example step-free)

Ability to plan travel effectively

Frequency and timing of transport services

Perception of public transport

Cost of travel

Lack of information about transport services

Accessibility to a mode of transport

Cost of accessing information about travel (for example smart phone ownership)

Reliability of transport (outward and return)

Willingness and ability to walk

Gender, age or religious barrier to travel

Caring responsibilities

Personal safety (and perceived safety)

- Personal
- Economic
- Cultural
- Contextual

Note

1   This is not an exhaustive list.

Source: National Audit Office analysis of research papers and departmental documentation

5 Journey times cannot tell the whole story on accessibility of services. In deprived urban areas, where journey times are shorter, they need to be viewed alongside the effects of high deprivation

Understanding the multiple components of service accessibility is potentially valuable for government, providing a comprehensive awareness of whether services are equally accessible and informing decisions about how best to remove barriers to access for some groups.

Wider barriers to accessing a service

Perception of the service (including service quality)	Language barriers
Need to travel (for example, where appointments can be accessed online from home)	Ability of service to meet users' needs in a timely way
Cost of service (for example paying for prescriptions)	Capacity of service (for example number of users served, ability to book an appointment)
Cultural taboos around use of certain services	Catchment area for service eligibility
Inclusivity of services provided at a location	Service opening times

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6 When combined, data on service quality and journey time provide insight on equity of access to health and education services across England

6 When combined, data on service quality and journey time provide insight on equity of access to health and education services across England

In 2017, journey times were longer to *good* or *outstanding* healthcare or education services in comparison to services with all ratings. On average, journey times were:

- 54% longer to the nearest *good* or *outstanding* healthcare service than the nearest service.[3] Differences ranged from less than a minute (3% longer) for GP surgeries to 24 minutes (70% longer) for acute hospital trusts.

- 23% longer to the nearest *good* or *outstanding* education service than the nearest service. Differences ranged from under a minute (6% longer) for primary schools, 3 minutes (17% longer) for secondary schools and 7 minutes (36% longer) for further education establishments.

Government and the bodies delivering health and education services are interested in the quality of these services and outcomes for service users, and may set policy goals and targets for both at local or national level. The good quality services included in our analysis are not evenly spread across the country. Longer journey times may compound this unevenness, putting better services out of reach of some users. For example, in 2017, people in 9% of English LSOAs were unable to reach acute hospital trust services rated *good* or *outstanding* in under two hours by public transport (**Figure 14**).

In some parts of England, journey times were longer in 2017 because of the scarcity of acute hospital trusts then rated *good* or *outstanding*, rather than an inherent issue with transport accessibility to those acute hospital trusts – for example, areas such as the South West, West Midlands and East of England (Figure 14).[4]

Considering service quality alongside travel time to the service gives decision-makers more information on equity, so they can decide how best to improve outcomes for users and, therefore, overall value for money.

This might be by improving the quality of current service locations; providing services in different locations; or improving transport access to good-quality services. It could also, increasingly, involve finding innovative ways for people to access services without travelling at all, such as online patient services or home visits.

3   Our analysis did not include care provided in the community by these healthcare locations, because this does not require individuals to travel from their home to access this service.

4   Our analysis did not consider any organisational changes affecting health and care service delivery and quality since 2017. One of these is the creation of Strategic Transformation Partnerships (STPs) and, more recently, Integrated Care Systems (ICSs) which bring together local authorities and NHS organisations to coordinate and improve health and care planning and delivery. STPs were announced in 2015 and are forerunners to Integrated Care Systems. The NHS Long Term Plan published in January 2019 stated an intention for every local area in England to have an ICS by April 2021. In some areas, STPs have evolved into ICSs, which have greater devolved, collective powers and responsibilities.

6   When combined, data on service quality and journey time provide insight on equity of access to health and education services across England

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Figure 14

Public transport journey times to acute hospital trust locations rated as *good* or *outstanding* in 2017, across England

Average journey time

- 0 to 30 minutes
- 31 to 60 minutes
- 61 to 90 minutes
- 91 to 120 minutes
- Over 120 minutes

Care Quality Commission (CQC) rating of acute hospital trust

- Outstanding (12)
- Good (91)
- Requires improvement (164)
- Inadequate (10)
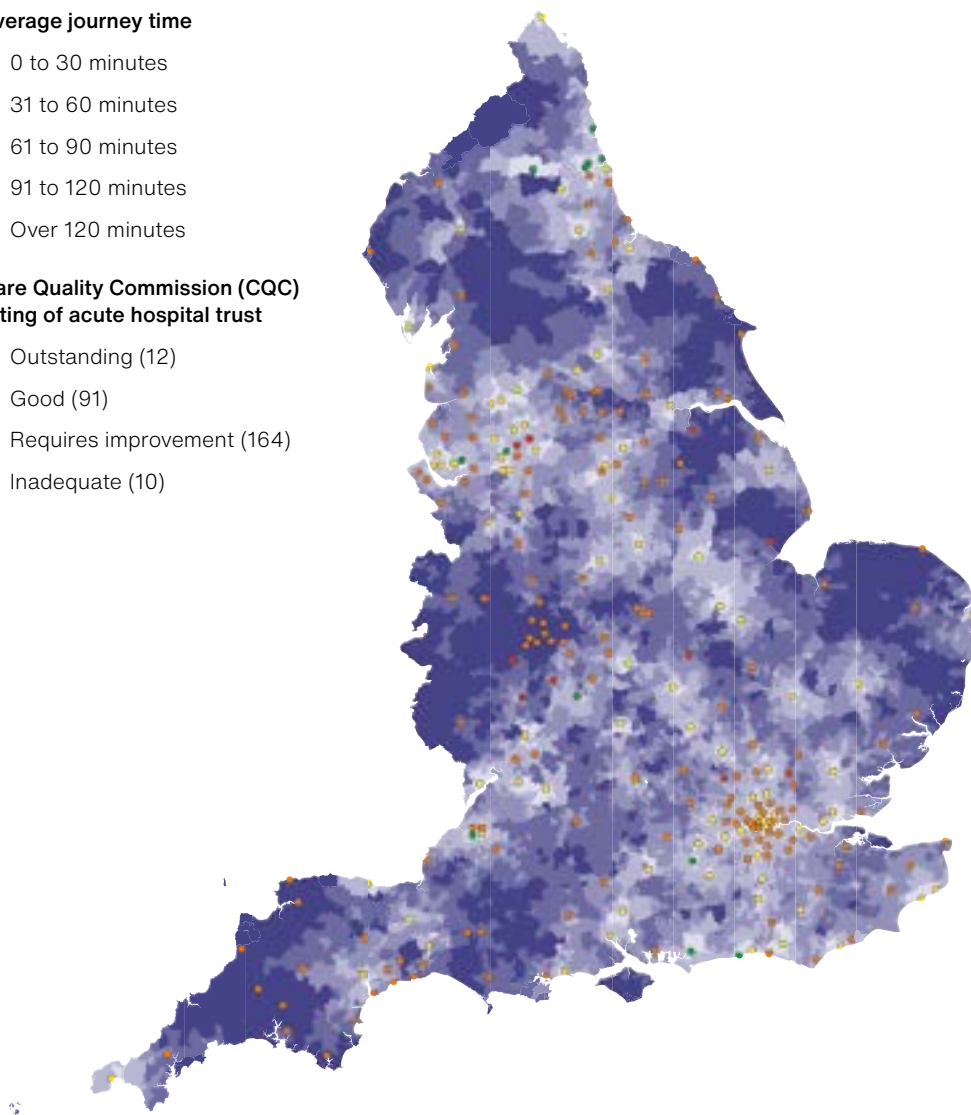
Notes

1   Lower super output areas (LSOAs) are small geographical areas defined by the Office for National Statistics, containing similarly sized populations. There are 32,844 LSOAs in England, each containing an average population of 1,500 individuals.

2   The 277 acute hospital trust locations included in the journey time model were defined by the Department for Transport.

3   CQC identified 37% of acute hospital trust locations rated as *good* or *outstanding* in 2017.

4   CQC ratings presented reflect inspection ratings given between 2013 and 2020. CQC provided us with the nearest inspection rating to 2017 as possible. Please see our published technical guide for more information on how CQC ratings were matched to acute hospital trust locations.

5   Journey times are modelled to represent journeys made in 2017.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

7 There is more that government could do to improve the data it collects on journey times and how it uses this information

7 There is more that government could do to improve the data it collects on journey times and how it uses this information

There is opportunity for central government to do more with the data it already collects. DfT publishes statistics on journey times to key services each year but makes limited use of them itself. DfT publishes statistics on journey times to key services and makes these and underlying data available as open data sets. As demonstrated by our tool, there are opportunities to produce insights that have not previously been explored when these are combined with other data sets (**Figure 15**).

Central government could combine and share datasets to produce more useful information. This could include adding in data on demand responsive services, patient transport services and home-to-school transport; and improving the sharing of data and insights between the multiple departments with oversight responsibilities for local services.

Departments across government collect, record and manage information on services in a variety of different ways. Data sharing to support analysis could be improved with the use of consistent geolocation information on service locations and the range of services provided at those locations within and between departments.

Travel time and other accessibility data can support better decision-making about both public services and transport, when shared between local authority transport planners and other bodies providing, say, health and education services. But the quality and quantity of such data are highly variable across the country.

> Journey time data offer significant potential to enable more informed decision-making across government about the provision of public transport and the location and quality of other key services.
>
> Better collection and use of data on public transport journey times and access to key services can be used to develop an integrated local transport system that meets the needs of its users, as well as unlocking multiple benefits and supporting value for money across the provision of public services.

7   There is more that government could do to improve the data it collects on journey times and how it uses this information

Figure 15

Our 'transport accessibility metric' created using government data. It shows for each area how many services have a mean public transport journey time longer than the national average

Number of services (out of seven)
with a mean journey time by public
transport longer than the national average

- 0 (Best – no journey times above national average)
- 1
- 2
- 3
- 4
- 5
- 6
- 7 (Worst – journey times to all seven services above national average)
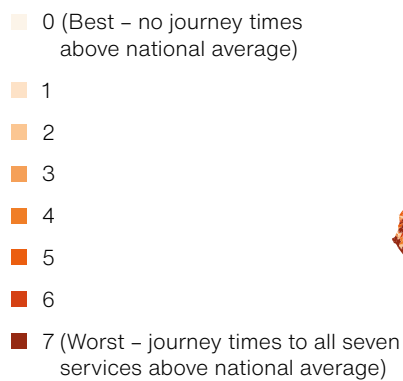
Notes

1   Lower super output areas (LSOAs) are small geographical areas defined by the Office for National Statistics, containing similarly sized populations. There are 32,844 LSOAs in England, each containing an average population of 1,500 individuals.

2   Journey times are modelled to represent journeys made in 2017.

3   Urban LSOAs, which tend to be better connected and therefore a lighter colour according to our index, are relatively smaller because of their higher population densities when compared with rural LSOAs. Better connected, urban areas may therefore be less visually prominent on this map.

4   Our approach to creating this transport accessibility metric is outlined in our published technical guide.

Source: National Audit Office analysis of journey time modelling data provided by the Department for Transport

Contents

Part Four

Methodology

How we did this work

Data sources

Our analysis used modelled journey times between 7am and 10am, via the public transport network or by car, to various locations in England. Journey times represent the situation in 2017 as this was the most recent data available. These journey times were produced by DfT using a commercial software package called TRACC owned by Basemap. DfT defined the parameters of this model.

DfT uses this model to develop its own journey time statistics. Our analytical approach differed to ensure that we used the data in a way appropriate to our final use. Therefore, the outputs of our analyses are not directly comparable with the journey time statistics published by DfT.

Journey time data

DfT provided modelled journey times (to the 10 nearest service locations) for seven services, for 2017. We included journey times to:

- state-funded primary and secondary schools and further education establishments (plus 16 to 19 schools and school sixth forms);

- acute hospital trusts and GP surgeries; and

- town centres and large employment centres.

DfT also provided the geographic location of each destination (the service location) it included in the network, against which it had calculated journey times to each service.

Service quality data

For five of the services, we also obtained data on service quality at each location point. The data sources were:

- primary and secondary schools and further education: inspection ratings from Ofsted; and

- acute hospital trusts and GP surgeries: inspection ratings provided to us by the Care Quality Commission (CQC).

Other data

In addition, we compared journey times with two other publicly available datasets:

- The English Index of Multiple Deprivation 2019 published by the Ministry of Housing, Communities & Local Government: the official measure of relative deprivation in England.

- The 2011 Rural-Urban Classification published by the Office for National Statistics, that categorises England into subsets of either 'rural' or 'urban', based on physical settlement and related characteristics.

Method

Single layer journey times

For each service and transport mode, we ran a minimisation calculation to calculate the shortest journey time to a destination for every output area. We then aggregated up to lower super output area (LSOA) level, based on an average of the journey times for the output areas included in the LSOA.

For the five services where quality indicators could be applied, we matched inspection ratings from Ofsted or CQC to service destination locations provided by DfT before re-running the above minimisation, using only 'good' or 'outstanding' rated destinations.

Our 'transport accessibility metric'

For this metric, we rated each LSOA from 0–7 based on the number of services for which the mean journey time to a service was longer for that LSOA than the national average. In short, our **metric is a count of the number of services for which the mean journey time in the relevant LSOA is greater than the national average**.

Limitations

The journey time data we used was produced by DfT. There are a number of limitations inherent in the data and their modelling approach, which we discuss in our technical guide. As the data provided by DfT reflects the situation in 2017, we considered it appropriate to use the nearest available inspection ratings to 2017, obtained from published Ofsted inspections and provided to us by CQC. Our technical guide explains our methodology in more detail.

Our analysis does not take into account any organisational changes affecting health and care service delivery and quality since 2017. One of these is the creation of Strategic Transformation Partnerships (STPs) and, more recently, Integrated Care Systems (ICSs)[5] which bring together local authorities and NHS organisations to coordinate and improve health and care planning and delivery. STPs were announced in 2015 and are forerunners to Integrated Care Systems. The NHS Long Term Plan published in January 2019 stated an intention for every local area in England to have an ICS by April 2021. In some areas, STPs have evolved into ICSs, which have greater devolved, collective powers and responsibilities.

Technical notes

We did not produce any journey time data for this work. We undertook quality assurance on the data we received from the DfT to ensure, as far as possible, its completeness and accuracy. We undertook quality assurance on our own analysis by using internal experts and obtaining a peer review from DfT's vehicle statistics team.

Our technical guide provides full details on:

- how the journey time data were produced and the assumptions of the model;

- the other data sources we used, and our methods; and

- the limitations of this work.

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5   More information on ICSs is available here.

Contents

Part Five

Other work in the area

Our previous work on access to public services

The analysis in this work on local transport accessibility builds on an existing knowledge base within the National Audit Office from studies across government departments. Variation in access to public services has been a recurring theme in our reports, for example:

Health

Patients' proximity and accessibility to GP surgeries, the geographical distribution of midwives and health screening programmes, and variation in waiting times for elective and cancer treatments.

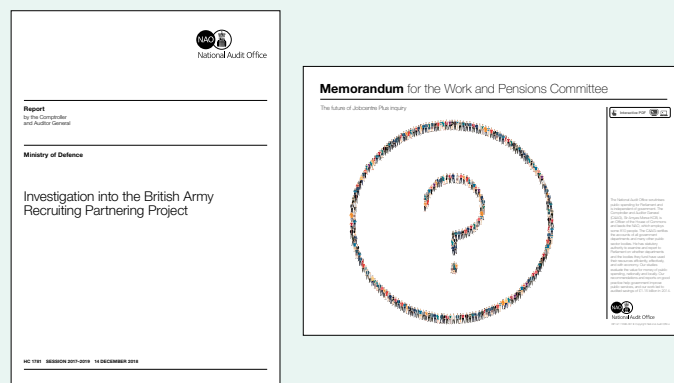|		
NAO National Audit Office Report by the Comptroller and Auditor General Department of Health and NHS England Stocktake of access to general practice in England HC 605 SESSION 2015-16 27 NOVEMBER 2015	NAO National Audit Office Report by the Comptroller and Auditor General Department of Health and NHS England Improving patient access to general practice HC 913 SESSION 2016-17 11 JANUARY 2017	NAO National Audit Office Report by the Comptroller and Auditor General Department of Health & Social Care and NHS England NHS waiting times for elective and cancer treatment HC 1989 SESSION 2017-2019 22 MARCH 2019
NAO National Audit Office Report by the Comptroller and Auditor General Department of Health & Social Care Investigation into the management of health screening HC 1871 SESSION 2017-2019 01 FEBRUARY 2019	NAO National Audit Office Report by the Comptroller and Auditor General Department of Health Maternity services in England HC 794 SESSION 2013-14 8 NOVEMBER 2013	

Education

Conversion of maintained schools to academies and geographical isolation, as well as geographical variation in the teaching workforce.
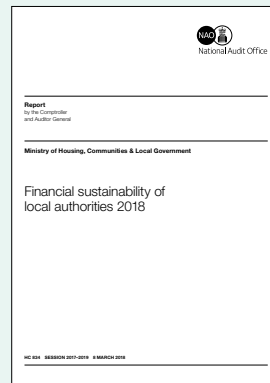
NAO
National Audit Office

Report
by the Comptroller
and Auditor General

Department for Education

Capital funding for schools

HC 1014 SESSION 2016-17 22 FEBRUARY 2017

NAO
National Audit Office

Report
by the Comptroller
and Auditor General

Department for Education

Converting maintained
schools to academies

HC 720 SESSION 2017-2019 22 FEBRUARY 2018

NAO
National Audit Office

Report
by the Comptroller
and Auditor General

Department for Education

Retaining and developing
the teaching workforce

HC 307 SESSION 2017–2019 12 SEPTEMBER 2017

NAO
National Audit Office

Report
by the Comptroller
and Auditor General

Department for Education

Supporting disadvantaged families
through free early education and
childcare entitlements in England

HC 104 SESSION 2019-2021 13 MARCH 2020

Employment

Journey times to job centres and major centres of employment as well as to local recruitment centres for the British Army.
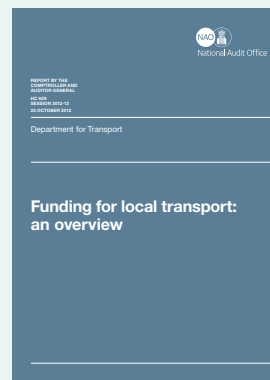
NAO
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Report
by the Comptroller
and Auditor General

Ministry of Defence

Investigation into the British Army
Recruiting Partnering Project

HC 1781 SESSION 2017-2019 14 DECEMBER 2018

Memorandum for the Work and Pensions Committee

The future of Jobcentre Plus inquiry

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National Audit Office

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Local authorities

The financial sustainability of local authorities.

NAO
National Audit Office

Report
by the Comptroller
and Auditor General

Ministry of Housing, Communities & Local Government

Financial sustainability of
local authorities 2018

HC 834   SESSION 2017–2019   8 MARCH 2018

Transport

Local transport funding.

NAO
National Audit Office

REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL
HC 629
SESSION 2012–13
25 OCTOBER 2012

Department for Transport

**Funding for local transport:
an overview**

What have others done in this area?

We are adding to a substantial body of work on local transport, accessibility to services and outcomes. A list of selected resources can be found below.

I'm interested in finding out more from ...

Government resources

Atkins and CRSP [for DfT], *Accessibility Planning Policy: Evaluation and Future Direction Final Report*, June 2012.

DfT, *Valuing the social impacts of public transport: Final report*, March 2013.

Government Office for Science, *A time of unprecedented change in the transport system*, January 2019.

Government Office for Science, *Inequalities in Mobility and Access in the UK Transport System, Future of Mobility: Evidence Review*, March 2019.

Ministry of Housing, Communities & Local Government, NR TWG 19-02 *Review of local authorities' relative needs and resources: Area Cost Adjustment*, June 2019.

NatCen, *Transport, health and wellbeing: An evidence review for the Department for Transport*, July 2019.

NatCen, *Transport and inequality: An evidence review for the Department for Transport*, July 2019.

NatCen, *Access to Transport and Life Opportunities*, August 2019.

Social Exclusion Unit, *Making the Connections: Final Report on Transport and Social Exclusion*, February 2003.

TRL [for DfT], *Sustainable travel towns: An evaluation of the longer term impacts*, July 2016.

Urban Transport Group, *Submission to the 2020 Budget*, February 2020.

Parliament

HC Environmental Audit Committee, *Transport and accessibility to public services*, Third Report, Third Report of Session 2013-14, HC 201, June 2013.

HC Transport Committee, *Bus services in England outside London: Government response to the Committee's Ninth Report of Session 2017-19*, First Special Report of Session 2019-20, HC 110, October 2019.

Contents

I'm interested in finding out more about …

Rural issues

Action with Communities Rural England, *Transport. Affordable transport solution for rural communities have never been more essential*, 2014.

Campaign for Better Transport, *The future of rural bus services in the UK*, December 2018.

Department for Environment, *Farming & Rural Affairs, Overall measure of accessibility of services*, 2017.

Department for Environment, Farming & Rural Affairs, *Transport and travel*, 2017.

Local Government Association & Public Heath England, *Health and wellbeing in rural areas*, February 2017.

Rural England, *State of Rural Services 2018*, February 2019.

Affected groups

Age UK, *Missed opportunities: the impact on older people of cuts to rural bus services*, May 2013.

A Curl et al., Household car adoption and financial distress in deprived urban communities: A case of forced car ownership?, *Transport Policy*, July 2018.

Centre for Transport Studies, *Building Confidence – Improving travel for people with mental impairments*, November 2017.

Campaign for Better Transport, *Transport and Poverty: A Literature Review*, May 2012.

Campaign for Better Transport, *Transport deserts: The absence of transport choice in England's small towns*, February 2020.

House of Commons Library, *Access to transport for disabled people*, October 2018.

R Crisp et al., *Tackling transport-related barriers to employment in low-income neighbourhoods*, Joseph Rowntree Foundation, August 2018.

Women's Budget Group, *Public transport and Gender. Briefing from the UK Women's Budget Group on public transport and gender*, October 2019.

Local Trust, Oxford Consultants for Social Inclusion, *Left behind? Understanding communities on the edge*, 2019.

National Audit Office