Transport-related social exclusion in the North of England

TRANSPORT FOR THE NORTH

Contents

Summary and key findings

Background and methods: This report sets out the causes, consequences, and extent of transport-related social exclusion (TRSE) in the North of England. This draws on primary research undertaken with over 3,000 members of the public, stakeholders, and experts across areas of the North, and on a data tool that measures the risk of TRSE across England. This tool combines accessibility analysis with a range of socioeconomic and demographic indicators to provide a systematic comparison of the risk of TRSE.

Defining TRSE: TRSE means being unable to access opportunities, key services, and community life as much as needed, and facing major obstacles in everyday life through the wider impacts of having to travel to access key destinations. These wider impacts include the cost and time entailed in using the transport system, and the impacts of stress and anxiety linked with using the transport system. Together, these impacts can contribute to a vicious cycle of poverty, isolation, and poor access to basic services.

Causes: TRSE is caused by the combination of fragmentation, unreliability, and high costs in the public transport system; poor conditions for walking, cycling, and wheeling in car-dominated environments; and the high levels of car dependency that result from this. This leads to poor access to key destinations for those primarily dependent on public transport and active travel, alongside forced car ownership, in which households are compelled to have access to a car, despite the costs of car access causing them significant hardship.

Extent and distribution: The data analysis presented in this report estimates that 3.3 million people in the North live in areas where there is a high risk of TRSE. These are areas in which there is poor access to key destinations by public transport, high levels of car dependency, and significant vulnerability to social exclusion. These areas are widely distributed across the North, but are particularly concentrated in manufacturing and mining legacy areas, in rural-urban fringes, in smaller cities and towns, and in coastal communities. On average, those in the North are more at risk of TRSE than those in the rest of England, with 21.3% of those in the North living in high-risk areas, compared with 16% of those in the South and Midlands.

Population impacts: TRSE has a disproportionate effect on people with disabilities and long-term health conditions, people with caring responsibilities, and those on low incomes and in insecure work. Underlying this are physical accessibility and cost constraints, transport planning and routing decisions that have prioritised commuter corridors, and increased exposure to fragmentation and unreliability. Differences in exposure to TRSE are also evident based on age, gender, ethnicity, and sexuality, with TRSE reflecting and reinforcing wider patterns of social and economic inequality.

Solutions: Reducing the level of TRSE in the North and the disproportionate impacts faced by specific population groups requires significant investment in local public transport services. These services should be integrated across boundaries and modes, and provide a viable and reliable access to opportunities, key services, and community life for those travelling outside of peak periods and core commuter routes. This, along with transforming car-dominated environments to enable active travel, should support a context in which having unconstrained access to a car is not a prerequisite for social inclusion.

A vicious cycle of transport issues and social exclusion

This report describes a vicious cycle of transport issues and social exclusion in the North of England. This cycle combines aspects of the societal context, the nature of the transport system, and the disproportionate impacts of these issues on specific population groups and geographical areas. The key elements of this cycle are:

A societal context of

Poverty, multiple deprivation, and income inequality.
Inequalities relating to disability, gender, caring, ethnicity, and LGBTQ identities.

Alongside a transport system that features

Car-dominated environments with poor conditions for walking, cycling, and wheeling.
Fragmented, infrequent, and unreliable public transport services.
High costs of public transport, particularly for multi-mode and cross-boundary trips.

The combination of which leads to

A large gap in access to opportunities, key services, and community life between those with unconstrained car access, and those relying on public transport and active travel.

Alongside

High levels of car dependency, including forced car ownership.

Which results in social exclusion through

Limited access to opportunities, key services, and community life for those reliant on public transport and active travel.

Alongside the wider impacts of

Using the transport system for key journeys causing significant stress and anxiety.
The money spent on transport causing significant financial hardship.
The time spent travelling for key journeys crowding out leisure & recreation.

Which reinforces and leads back to

Poverty, multiple deprivation, and income inequality.
Inequalities relating to disability, gender, caring, ethnicity, and LGBTQ identities.
Transport and spatial planning decisions that prioritise car use.

Principles of a socially inclusive transport system

The following principles bring together key aspects of the evidence on the causes, extent, and consequences of TRSE in the North of England, and how this evidence can be translated into practical steps towards a socially inclusive transport system.

One: The role of car access

Having unconstrained access to a car should not be a prerequisite for social inclusion; including accessing opportunities, key services, and community life. Safe, convenient, reliable, and affordable public transport and active travel should be available across the diverse place and population contexts of the North.

Two: Diverse travel patterns

Public transport services should function equally well for those travelling outside of peak periods and major commuter routes as for those who fit these conventional travel patterns.

Three: Integration

Public transport planning and ticketing should be integrated across administrative boundaries and modes of transport, such that those taking multi-modal journeys across these boundaries do not face excessive costs and complexities.

Four: Equality of access

Public transport and active travel infrastructure should be accessible to those with disabilities and limited physical mobility. This accessibility should be fundamental to the design of infrastructure, and offer equality of access.

Five: Technology

The introduction and use of technology in public transport should be inclusive of those with limited or no access to the internet and to banking services, both at the point of use and in the provision of information.

Six: Local access

Transport, spatial planning, and digital connectivity policies should combine to expand local access to services, opportunities, and community life, and thereby reduce the impacts of limited access to transport on social inclusion.

Seven: Affordability

The level of transport use necessary to access opportunities, key services and community life should be affordable to those on low incomes, those out of work, and those unable to access work and social welfare.

Eight: Safety

Using public transport and travelling to and from public transport access points should be safe and be perceived to be safe; particularly for women, LGBTQ people, ethnic minority communities, and people with disabilities.

Shared experiences of TRSE

This report demonstrates how the range of issues with the transport system in the North have widespread and fundamental impacts on everyday life, and are a cause of social exclusion. As well as quantitative data, this conclusion is supported by qualitative evidence of the lived experiences of TRSE across diverse population groups and area types. Below are five illustrative examples of the ways that TRSE is experienced. Each example combines the experiences of several of those who participated in the qualitative research.

Rob

Rob is in his early 20s, and lives in a small town in the North East. He has struggled to hold down regular work since leaving school, and while he has a driving licence, he cannot afford to own and run a car. Since COVID-19 restrictions eased, he has been looking for work in hotels and restaurants, most of which are a few miles away on the coast. While he has found a few vacancies, with the bus services available in his town it is impossible for him to make it in time for early morning shifts, and this is proving a major barrier to him finding work. He has lost work before after bus cancellations caused him to repeatedly run late for his shifts, and knows that with the insecure work available to him, there is a risk he could end up paying the bus fare only to find there is no work available if he is late.

Lakshmi

Lakshmi lives in a suburb of a city in Yorkshire, with her partner and two-year-old son. She is the main carer for her mother, who lives on the other side of the city. Her partner commutes in their car, so she balances her caring responsibilities using public transport most of the time. Her mother's house is only a few miles away, but getting there requires a bus to the city centre and then a tram out, with a typical wait of 20 minutes in between. It should only be a five-minute walk to the bus stop, but there are more and more cars parked on the pavement, and it can take a long time to safely cross the main road to her stop when she has the pushchair. Because of this, she often ends up leaving 15 minutes before the bus is due, to avoid missing her connection. This extra time really adds up, and she has recently had to give up her part time job to make these journeys work. She also has to buy two return tickets to complete the journey – one for the tram and another for the bus – which with the drop in her income is putting major pressure on her finances.

Mahomed

Mahomed lives in a town in the North West, and works on an industrial estate on the outskirts of the town. He starts work at 7AM, and with the public transport options in the area he has no option but to drive to work. His car recently failed an MOT, and while he was able to borrow a car from a friend while his car was off the road, the cost of the repairs have caused him major financial hardship. He had to cut down on his food shop and fall behind on bill payments to get his car back on the road, and knows he will have to do the same again when his car insurance is up for renewal. He can walk to see friends and family nearby, and only really uses his car for travelling to work, but it is almost impossible for him to lead an active social and community life with the money he has left after paying for his car.

June

June has lived all of her life in a rural village in the North West, and is in her 80s. Her husband has recently had to enter residential care after being diagnosed with dementia, and as her eyesight has worsened, she has reluctantly given up driving. She uses a community transport service to visit her husband, and has her shopping delivered, but she feels increasingly isolated from friends in the area. The bus service in her village only operates one return journey to the nearby town per day, and there are no connecting services out to other areas that she can use and still get the return bus home. She can afford to take a taxi some of the time, and uses these for hospital appointments, but her fixed income means this is not an option for most trips she would like to take. She is also finding the walk to the bus stop in her village increasingly difficult, as part of this involves crossing an unlit rural road with national speed limit, and no pavement on one side. Because of this, she does not feel able to use the bus during winter months.

Katie

Katie lives in a suburb of a city in Yorkshire. She has a progressive health condition which limits her mobility, and has recently started using a wheelchair. Katie moved to her neighbourhood because it was close to local shops and the train station, but she feels increasingly isolated. Cars parked on the pavement, increasing amounts of traffic on the roads, and a lack of safe pedestrian crossings in her area means that she is unable to access local services in her wheelchair – even though the distance itself is manageable. Her local rail station is wheelchair accessible, but many of the stations she would like to travel to are not, and the requirement to book assistance in advance restricts her from using rail at short notice. She has also faced anti-social behaviour from other passengers when travelling by rail, particularly when she has attempted to use the designated wheelchair space at busy times, and the lack of staff available while travelling makes her feel vulnerable. This stress and anxiety add to her feelings of isolation.

- One -

Introduction

Introduction

Transport for the North's (TfN) Strategic Transport Plan sets out a vision for an inclusive transport system, that delivers access to opportunities and key services for all across the North. In support of this vision, TfN has undertaken research to understand how issues with the transport system in the North leads some to be socially excluded. This report sets out the processes and results of this research on transport-related social exclusion (TRSE), covering the nature and causes of TRSE, the areas and population groups affected, high the risk of TRSE varies across England, and the solutions to this issue.

This report draws on a programme of mixed-methods research undertaken by TfN, Social Research Associates, and Temple. This included the development of a data tool to measure the risk of TRSE in the North and across England; surveys, interviews and focus groups with members of the public; and surveys and interviews with expert stakeholders. In total, this report draws on input from over 3,000 respondents across diverse areas and communities, and provides an in-depth empirical examination of TRSE across the North.

On the nature of TRSE, this report shows that TRSE reflects the combination of limited access to transport with the requirement for high levels of mobility in order to access opportunities, key services, and community life. Building on this, it shows how TRSE can manifest in both the inability to travel to key destinations as much as is necessary, and through the wider impacts of the level of transport use required for everyday life. This includes the cost impacts of travelling to the extent required, the impacts of the time spent travelling, and the stress and anxiety associated with using the transport system.

On the extent and distribution of TRSE, this report draws on a data tool that systematically estimates the risk of TRSE across local areas of England. This analysis estimates that 3.3 million people in the North – 21.3% of the population – live in areas in which there is a relatively high risk of social exclusion because of issues with the transport system. By combining this with primary research, it goes on to demonstrate how TRSE disproportionately impacts specific population groups. This includes people with disabilities and long-term health conditions, carers, and those on low incomes.

On the causes of TRSE, this report uses quantitative survey data and qualitative insights from members of the public and stakeholders to determine the issues with the transport system most relevant to TRSE. At the core of this is the combination of fragmentation between elements of the public transport system, the declining frequency of services, and poor conditions for active travel in car-dominated environments. It also demonstrates how these issues combine to cause a vicious cycle of car dependence and social exclusion.

Finally, this report presents a set of solutions to TRSE. This focuses on the key changes to the public transport system, to active travel conditions, and in private transport that would most mitigate this issue. Drawing on the range of evidence available, it argues that reducing TRSE in the North and the disproportionate impacts faced by specific population groups requires significant investment in local public transport services, and a transformation of active travel conditions. These services should be integrated across boundaries and modes, and provide reliable access to opportunities, key services, and community life for those travelling outside of peak periods and commuter corridors.

- Two -

Aim, objectives & methodology

Aim, objectives & methodology

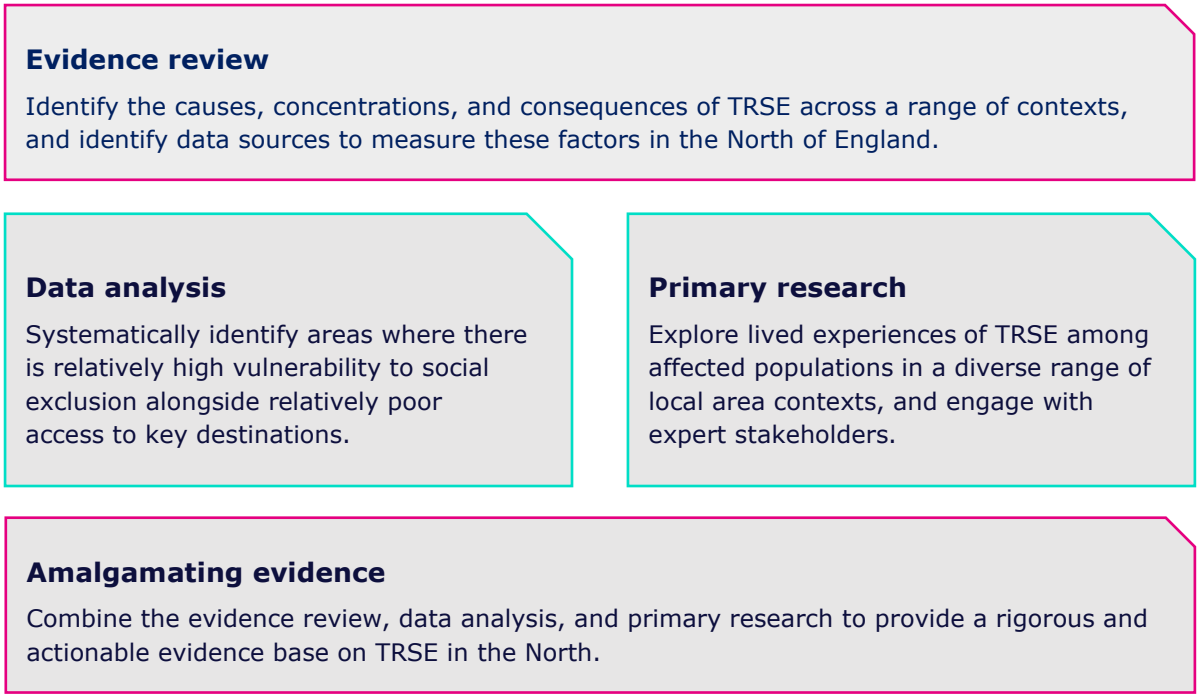
The link between limited access to transport and social exclusion has been demonstrated in a range of local contexts in the UK and internationally. As set out in Section 3, this literature provides a framework of the causes of TRSE, and the population groups most likely to be impacted by it. However, despite the well-documented transport challenges in the North of England, there is little empirical evidence on TRSE that is specific to the North. The diverse population and geographical context of the North also make it challenging to transfer findings from other contexts, particularly with the level of detail required to inform policy solutions to this issue. Reflecting this, TfN's aim in undertaking this research is to develop robust and actionable empirical evidence on TRSE that is specific to the North.

To fulfil this aim, this research has the following objectives:

1. Determine the nature and impacts of TRSE in the North
2. Determine the causes of TRSE across the diverse contexts in the North
3. Determine the population groups and areas that are most affected by TRSE
4. Develop a set of principles for a socially inclusive transport system

Reflecting these objectives, a mixed methods approach to researching TRSE was engaged, as summarised in Diagram 2.1. Within this, the data analysis was used to guide the selection of areas for primary research, and the outcomes of the primary research used to refine and expand the data analysis. TfN worked with Social Research Associates and Temple to implement parts of this methodology.

Diagram 2.1 – TRSE research methodology



Evidence review

The first stage of the research was an evidence review, with the aim of developing a general framework of the causes, concentrations, and consequences of TRSE. This involved searching academic publications, reports published by public sector bodies and research agencies, and a review of unpublished sources that were provided by Local Authorities. Sources were screened for relevance, empirical approach, context, and for sub-themes including the link between TRSE, disability, poverty, gender, and ethnicity. Reflecting the context in which the research was undertaken, searches were also undertaken on the impacts of COVID-19 on social exclusion, and on the impacts of transport decarbonisation on social exclusion.

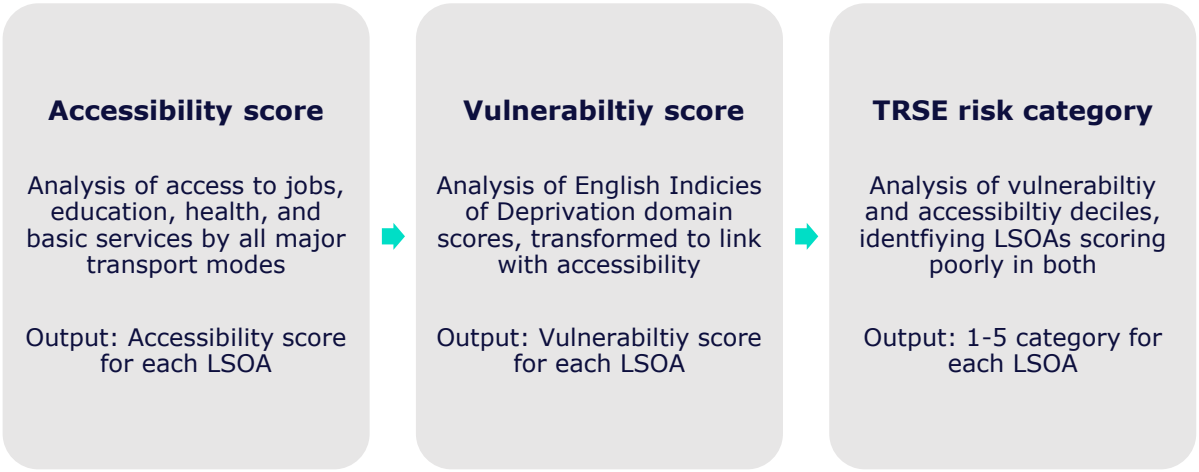
A summary of the key findings from this review are set out in Section 3. Based on these sources, a preliminary set of quantitative indicators of TRSE were identified, and formed the starting point of the data analysis. Additionally, a general framework of the causes, concentrations, and consequences of TRSE in a range of contexts was developed, and was used as the starting point for developing the primary research methods.

Data analysis

The data analysis had two key purposes: First, to identify a diverse set of areas of the North with a relatively high risk of TRSE, and to use this to select local areas to undertake primary research. Analysis of access to major employment centres and a range of socioeconomic and demographic indicators was used for this purpose.

Second, to systematically compare the level of risk of TRSE across England, including estimating the size of the population that has a high risk of exposure to TRSE, and the types of area that are relatively more at risk. The process used to achieve this is summarised in Diagram 2.2. This analysis provides an estimate of the risk of TRSE at the Lower Layer Super Output Area (LSOA) level - a common geographical unit for small area statistical analysis. LSOAs have a minimum resident population of 1,000, and an average population of 1,500.[1]

Diagram 2.2 – Data analysis process



[1] NHS, 2022

The first element of the data analysis – the Accessibility Score – engages journey time statistics published by the Department for Transport (DfT) to examine the relative and absolute level of access to the following four destination types:

1. Employment: Employment centres with more than 5,000 jobs.

2. Education: Primary schools, secondary schools, and further education colleges.

3. Healthcare: Hospitals and GP surgeries.

4. Basic services: Using town centres as a proxy for access to basic services, including a bank, post office, pharmacy, and a job centre.

Across these four destination types and for each LSOA, the analysis considers:

1. The proportion of the population able to access the destination within 30 minutes by public transport and by car. For access to employment this is also measured at a 45-minute travel time, in order to capture a greater proportion of likely journeys.

2. The difference in the proportion of the population able to access the destination within 30 minutes by public transport and by car. For access to employment this is also measured at a 45-minute travel time.

3. The time difference between accessing the closest destination by public transport and by car, up to a maximum 120-minute travel time.

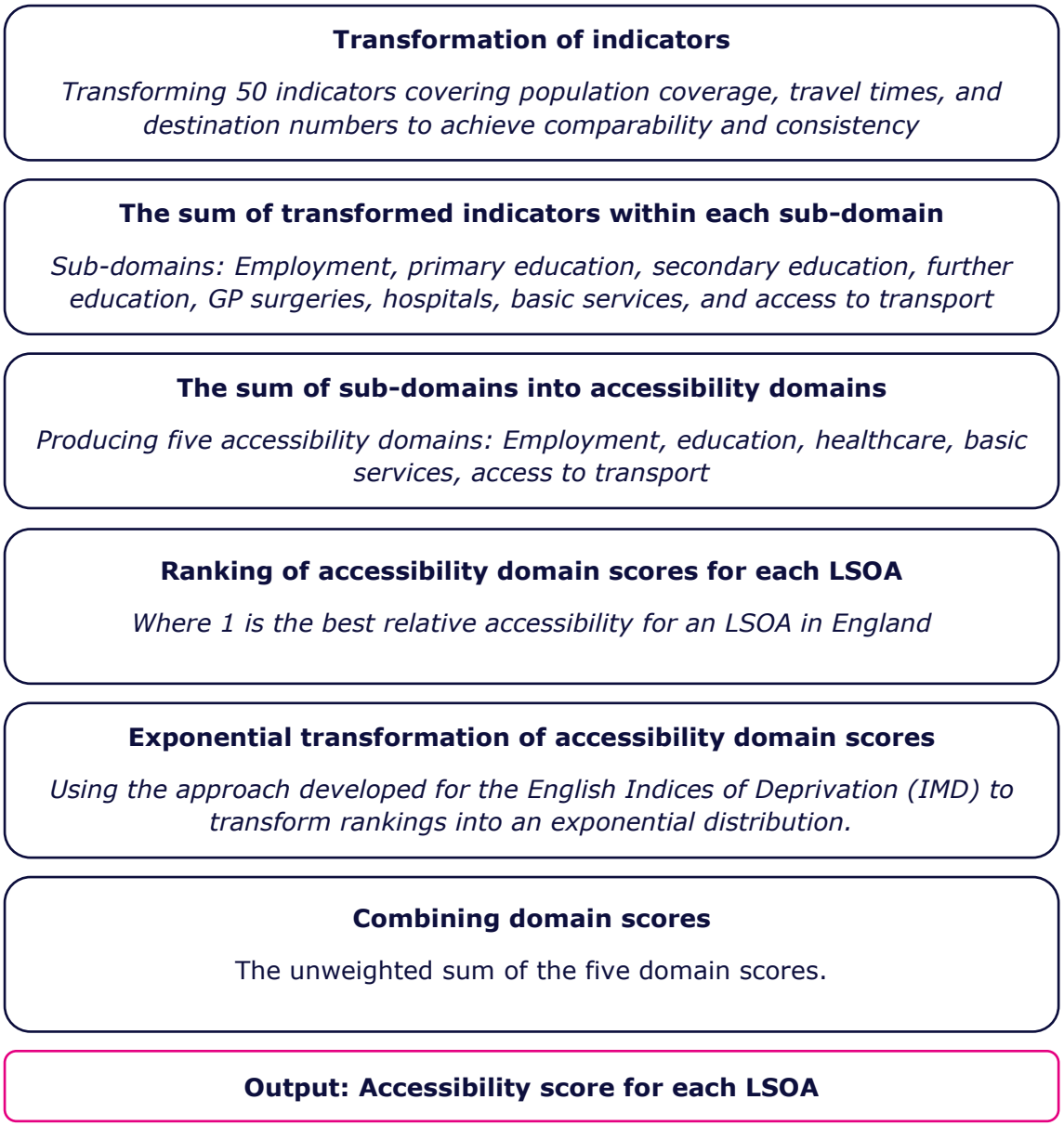
For employment and education, the analysis also includes two indicators of the number of destinations of these types accessible from each LSOA. These indicators were not included for hospitals, GP surgeries, and basic services – reflecting the relatively lesser importance of access to multiple destinations of these types. These indicators are:

4. The number of destinations accessible within 30 minutes by public transport and by car, up to a maximum of 10 destinations.

5. The difference in the number of destinations accessible within 30 minutes by public transport and by car, up to a maximum of 10 destinations.

In addition to measuring relative and absolute access to each of these four destination types, the Accessibility Score also examines access to transport resources. This includes the proportion of households with access to one or more cars, the total access gap between public transport and car travel across the four destination types, and the coverage of public transport access points across the LSOA. This coverage indicator measures the proportion of postcode points within each LSOA that are within a 10-minute walk of a public transport access point, regardless of type. This analysis engages the National Public Transport Access Nodes (NaPTAN) dataset, combined with routing on Ordnance Survey Open Roads. The analytical process applied to these data is summarised in Diagram 2.3.

Diagram 2.3 – Accessibility score analysis process



The analytical process summarised in Diagram 2.3 transforms the 50 input indicators into 5 domain scores. These are employment accessibility, education accessibility, health accessibility, basic service accessibility, and transport accessibility. As detailed further below, these domains of accessibility are combined with measures of vulnerability to produce the TRSE Risk Category. The use of the exponential transformation provides consistency with the vulnerability measures, and ensures that relatively good accessibility in one domain does not fully balance out relatively poor accessibility in another domain.

The second element of the data analysis – the Vulnerability Score – measures the vulnerability of the population to social exclusion. This was assessed using the transformed domain scores from the 2019 English Indices of Deprivation (IMD). These scores measure deprivation in the following domains: (1) income, (2) employment, (3) education, (4) health, (5) crime, (6) wider barriers, and (7) the outdoors living environment.

For domains 1-5, all underlying indicators in the 2019 IMD are used. However, for domains 6 and 7, indicators specific to travel distance to services and the quality of housing are not included. This reflects the overlap between these measures and the accessibility analysis, and the lack of relevance to TRSE of these measures, respectively. In these cases, the transformed domain scores were calculated using only the 'wider barriers' and 'outdoors living environment' components of the IMD. The analytical process applied to these data is summarised in Diagram 2.4

Diagram 2.4 – Vulnerability score analysis process

Matching IMD domains to domains of accessibility

Qualitatively assessing the relevance of each domain of deprivation to each domain of accessibility, and assigning it one of three categories (more relevant, as relevant, less relevant)

Adjusting IMD domain weights

Adjusting the weightings applied to produce the IMD based on the qualitative matching process. Weights were increased by 50%, remained the same, or decreased by 50%.

Calculating vulnerability scores

The reweighted data was combined to create vulnerability scores linked to each domain of accessibility (employment, education, healthcare, basic services, access to transport)

Combining domain scores

The weighted sum of the five domain scores. Weights were assigned as follows: Employment 0.35, Education, 0.2, Health, 0.2, Services 0.15, Transport Access 0.1.

Output: Vulnerability scores for each LSOA

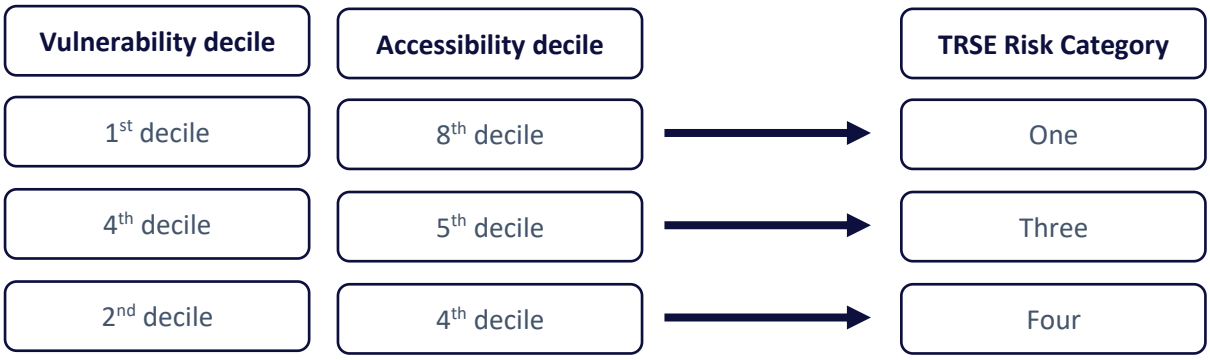
The final element of the data analysis was to combine the accessibility and vulnerability scores for each LSOA into the TRSE Risk Category. Here, LSOAs are categorised as being at high risk of TRSE only if there is both a relatively high level of vulnerability to social exclusion in combination with relatively poor accessibility. Reflecting this, a threshold approach was used to combine the two scores. Under this approach, each LSOA is categorised by the minimum and maximum Accessibility Score and Vulnerability Score, rather than on the simple sum of the two. This provides the main measure of the risk of TRSE engaged in this report. Table 2.1 shows the definitions used for each category.

Table 2.1 TRSE Risk Category definitions

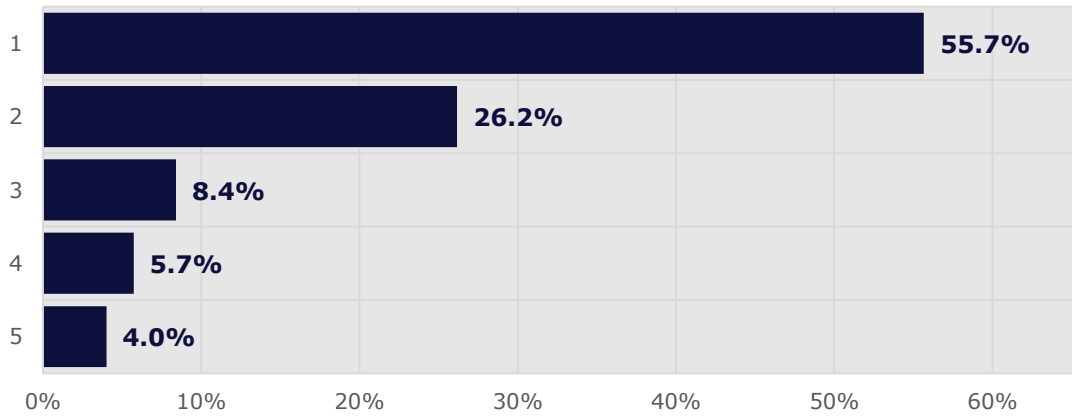
5 – Highest risk	3rd decile or lower in accessibility and vulnerability
4	4th decile or lower in accessibility and vulnerability
3 – Higher risk	5th decile or lower in accessibility and vulnerability
2	7th decile or lower in accessibility and vulnerability
1 – Lowest risk	All other LSOAs

The categories in Table 2.1 have been designed to provide greater differentiation between LSOAs that have a relatively higher risk of TRSE than it does for those with a lower risk. Across the analysis to follow, LSOAs in categories three to five are referred to as being at high risk of TRSE, as these are the areas that fall in the bottom half of the distribution for both accessibility and vulnerability. The categories within this range the provide differentiation between LSOAs with a high risk of TRSE, with those in category five having the highest risk. Diagram 2.5 gives three examples of TRSE Risk Category allocation, Graph 2.1 shows the distribution of LSOAs in the England by this category, and Maps 2.1 to 2.3 show how these elements combine in one area example.

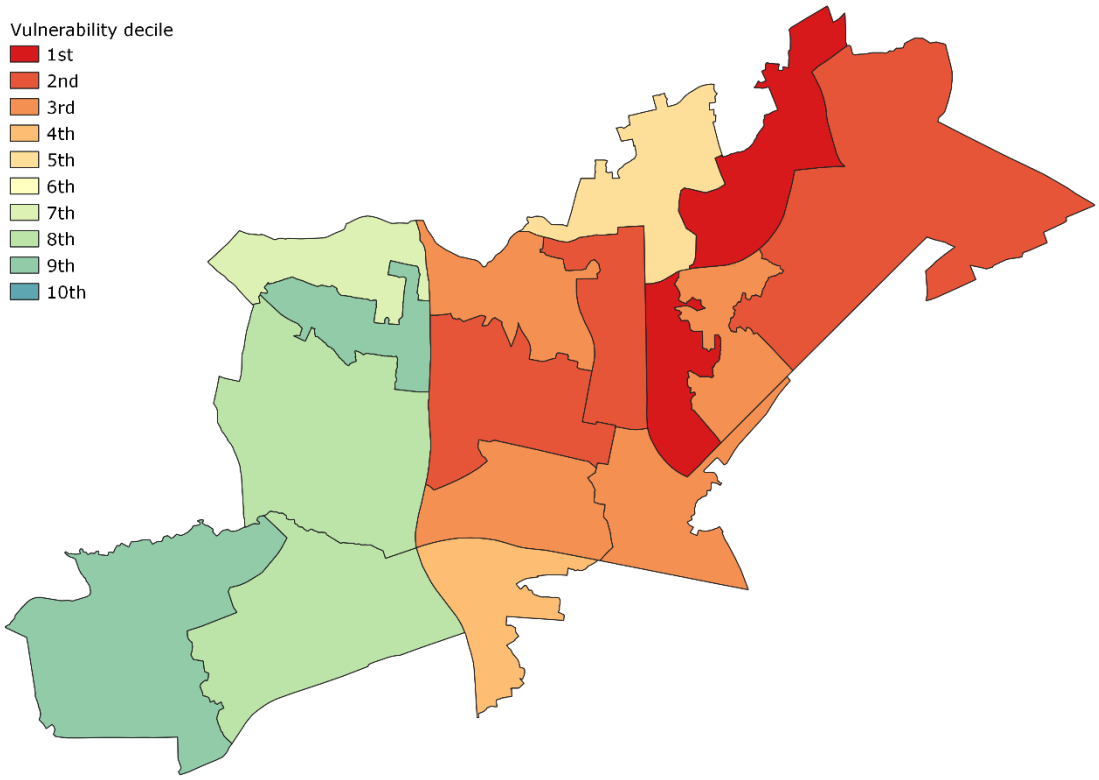
Diagram 2.5 – Examples of category allocation



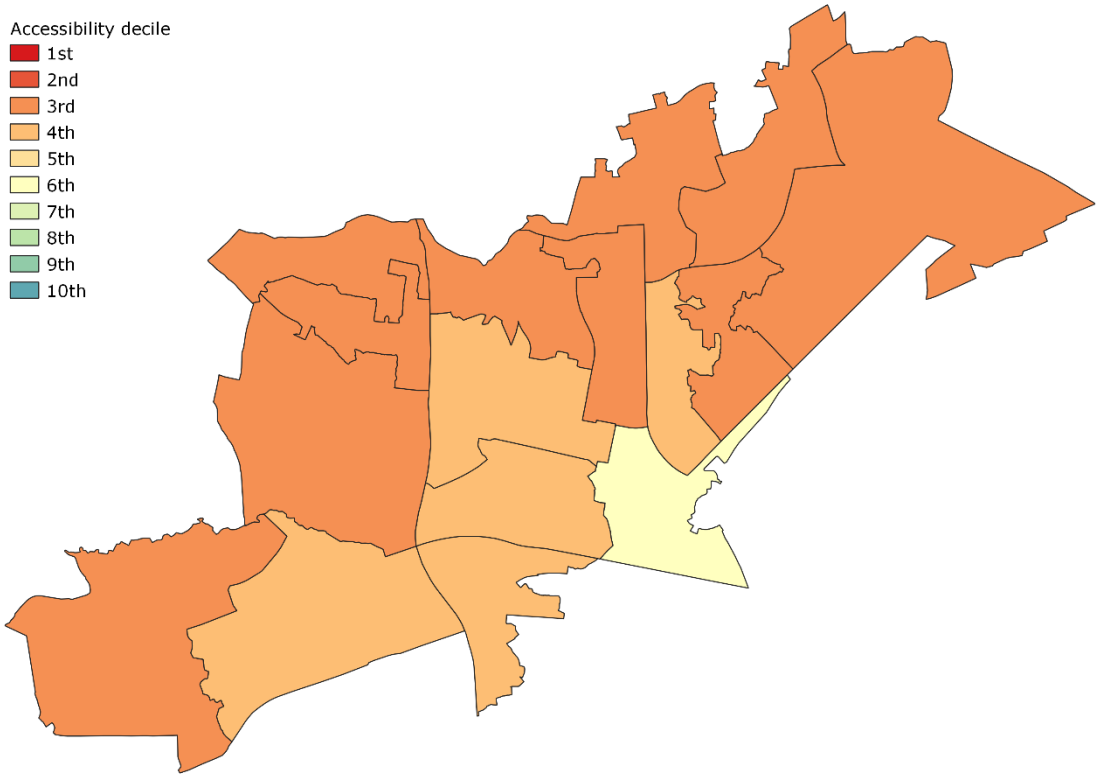
Graph 2.1 – Proportion of LSOAs in England by TRSE Risk Category



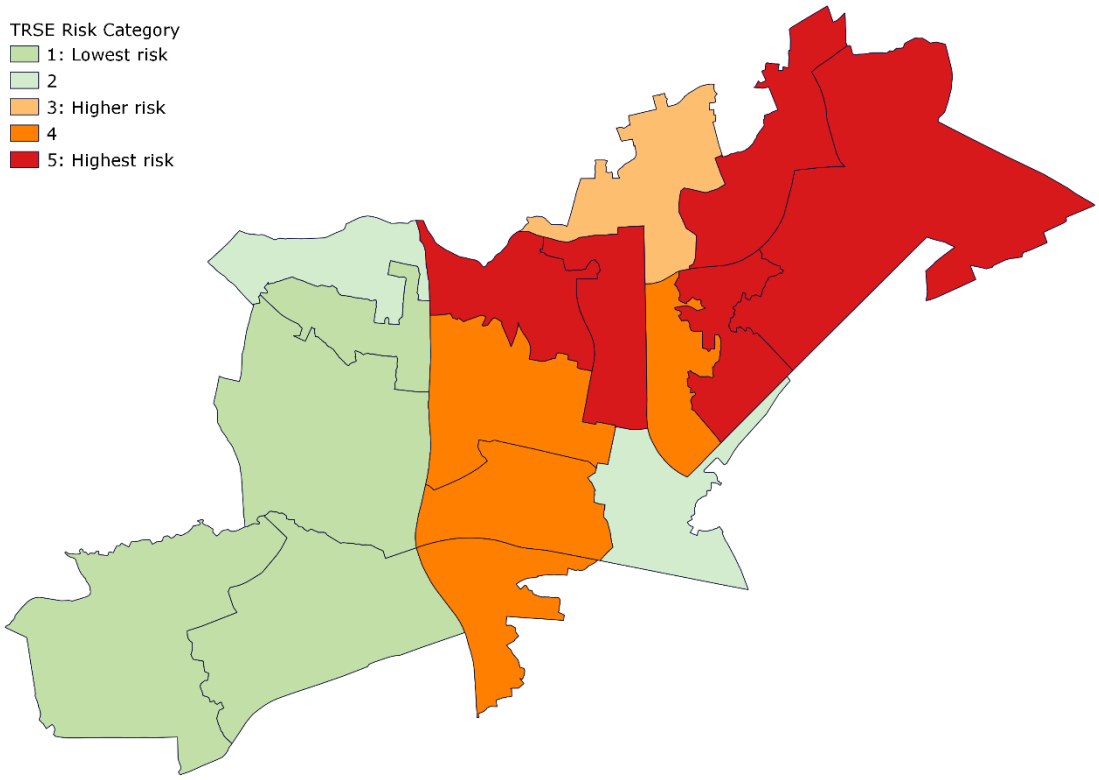
Map 2.1 – Example area: Vulnerability decile



Map 2.2 – Example area: Accessibility decile



Map 2.3 – Example area: TRSE Risk Category



Boundary data source for Maps 2.1-2.3: Office for National Statistics licensed under the Open Government Licence v.3.0. Contains OS data © Crown copyright and database right 2022

The TRSE Risk Category shown in the example above provides a systematic means of measuring variations in the risk of TRSE across England.[2] As well as this general measure that spans a number of domains of accessibility and vulnerability, this approach also facilitates analysis specific domains of TRSE. This includes the impacts of relatively poor access to employment, health services, and education, where this coincides with relatively high levels of vulnerability through poverty, poor health, and deprivation. The variations in these measure within the North and across England are explored in Section Six.

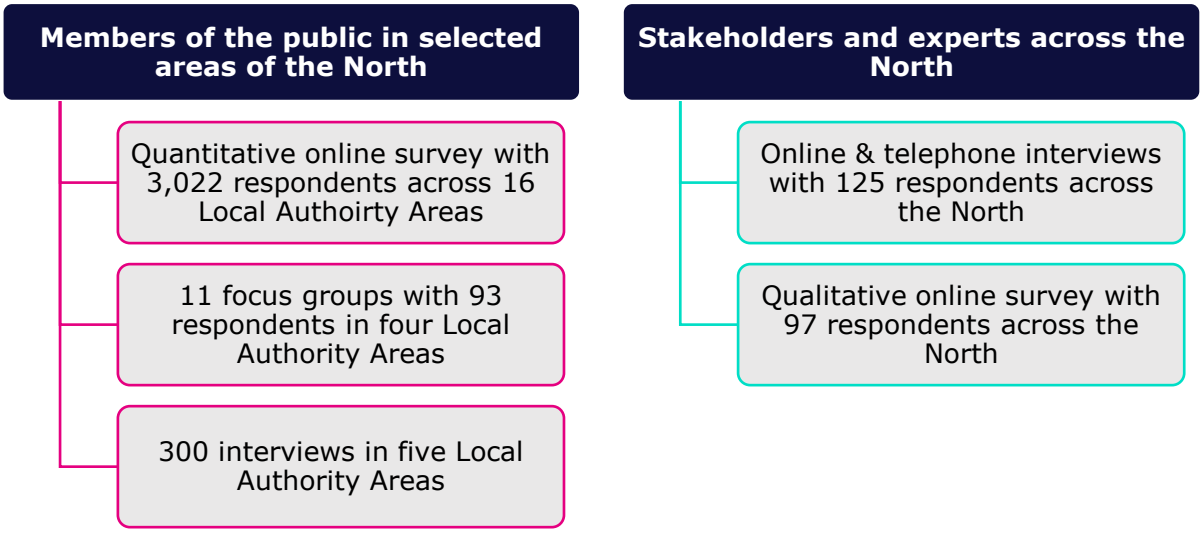
The analysis in Section Six and elsewhere in this report include estimates of the proportion of the population that are at a high risk of TRSE. This refers to the population ordinarily resident in LSOAs with a TRSE Risk Category of three, four or five. It should be noted that the TRSE Risk Category is a measure of risk associated with the characteristics of a place and population context, rather than measure of exposure to TRSE at any one point in time. This means that there are populations exposed to TRSE in the lowest risk areas, and population that are not exposed to TRSE in the highest risk areas. Indeed, as discussed further in Sections Four and Five, the exposure of a given individual to TRSE can vary significantly based on factors such as disability, gender, and income. The approach set out above is not intended to measure exposure, only the variations in risk.

[2] Comparable data are not currently available for other UK nations, meaning that the comparison is currently limited to England.

Primary research

The aim of the primary research was to examine how TRSE manifests in specific place and population contexts, and the lived experience of TRSE those affected. This has been achieved by engaging with members of the public in a diverse set of local area contexts, and by engaging with stakeholders and relevant experts across the North. The research methods used with these respondent groups are summarised in Diagram 2.5.

Diagram 2.5 – Primary research approach



Research with members of the public focused on Local Authorities with a relatively high risk of TRSE, as indicated by a preliminary version of the data analysis process described previously. To select these, researchers first highlighted Local Authorities with a high concentration of areas with a high risk of TRSE. From this list, researchers used indicators within the TRSE Vulnerability Score and Relative Accessibility Score to select a diverse set of areas across the three regions of the North. Through this process, researchers selected areas that included rural, town, and city contexts, and diverse population groups.

The Local Authority areas selected are shown in Table 2.2. Primary research was undertaken between April and October 2021, engaging the following research methods:

Quantitative online survey: A Panelbase online survey panel was used across the selected Local Authority Areas. This survey focused on the respondents' travel behaviours, and the constraints they faced when travelling to key destinations. Areas were included where they reached a threshold of 100 respondents. The data were weighted by age, gender, and ethnicity, and by the population of the Local Authority area in which they were responding. In total, 3,022 surveys were completed, of which 2,564 were from areas that met the response threshold, and have been included in the analysis.

Face to face interviews: 300 members of the public were invited to share their experiences of transport and social exclusion in a structured interview format. These questions focused on the respondent's experiences of particular aspects of TRSE, linked to the themes covered in the online survey, and on their broader experiences of transport in their area. This produced a qualitative dataset that was coded for key themes, and has been engaged to explain and verify statistical relationships in the quantitative dataset.

Focus groups: 11 focus groups were conducted; facilitated through community and voluntary sector groups. These groups allowed an in-depth discussion of the lived experience of TRSE, and focused on sections of the population that the literature review indicated are particularly at risk of social exclusion. Respondents were invited to discuss the transport issues faced in their everyday life, the impacts of these transport issues, and how they would prioritise different transport improvements in their area.

Table 2.2 – Primary research with members of the public by Local Authority Area

Local Authority	Online survey	Focus Groups	Interviews
Barnsley	●		
Bolton	●		
Bradford	●	●	●
Cheshire West & Chester	●		
County Durham	●		●
Doncaster	●		
Gateshead			●
Kingston upon Hull	●		
Kirklees	●		
Northumberland		●	
Oldham	●	●	
Rotherham	●		
Sheffield	●	●	●
Stockport	●		●
Sunderland	●		
Wakefield	●		
Wigan	●		
Wirral	●		

As well as engaging with members of the public, primary research was also undertaken with stakeholders. This engaged the following methods:

Online and telephone-based stakeholder interviews: 125 interviews were undertaken with stakeholders including transport providers, local authorities, community groups, and educational institutions. These interviews explored how stakeholders understood social exclusion, the impacts of the COVID-19 pandemic, and how social exclusion should be measured. These interviews improved access to under-represented population groups, and supported the development of solutions and policy recommendations on TRSE.

Online stakeholder survey: Researchers approached local authorities and third sector organisations via email to complete a qualitative online survey. Respondents to this survey were asked to provide a case study of an area where the population was affected by TRSE. 312 stakeholders agreed to take part in the survey and passed the initial set of screening questions. Of these, 120 were unique and provided an adequate level of detail to identify a TRSE-affected area, and 97 provided sufficient detail to be included in the qualitative coding stage. Data were then analysed using an inductive qualitative coding approach, and area profiles were developed through Geographic Information System (GIS) analysis.

Amalgamating evidence

The final stage of the research was the amalgamation of evidence. Diagram 2.6 shows how each element of the methodology set out previously was used to inform the four major themes of this research. These are:

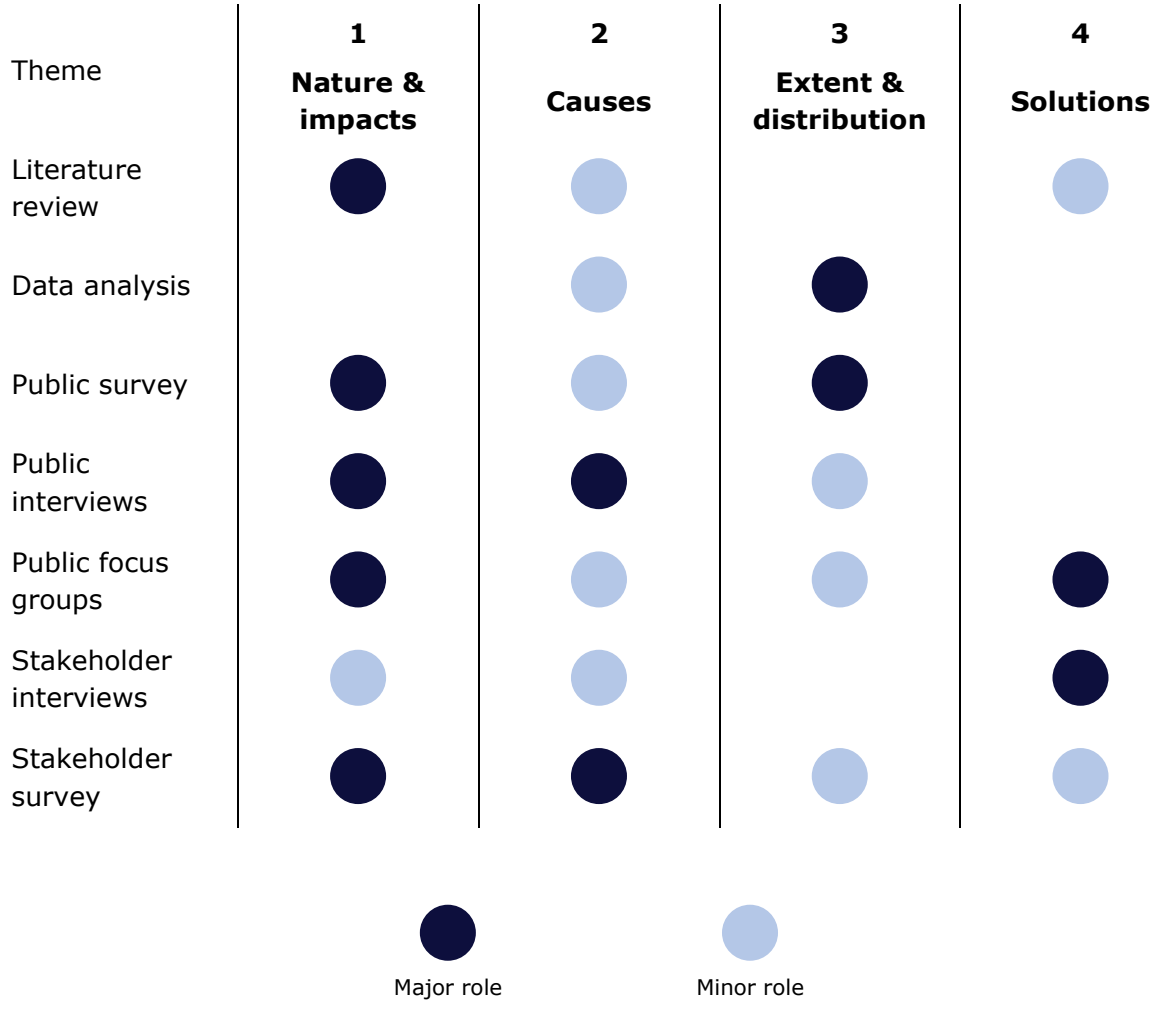
1. Nature & impacts: What TRSE means in the diverse place and population contexts of the North of England, including how it impacts specific population groups.

2. Causes: The issues with the public transport system, private transport, and active travel in the North that cause social exclusion.

3. Extent & distribution: The size of the population impacted by TRSE, and the concentration of TRSE among different population groups and area types.

4. Solutions: The transport and non-transport solutions to TRSE, and the principles of a socially inclusive transport system.

Diagram 2.6 – Use of evidence by theme



- Three -

Literature Review

Literature review

The capacity of issues in a transport system to limit the ability of some to participate fully in society has been the subject of empirical and theoretical work since the late 1990s. The research literature has evolved from a focus on transport disadvantage, which is concerned with variations to transport provision in itself, to directly linking the nature of transport systems with patterns of exclusion.[3] Indeed, the study of TRSE in the UK is linked to that of long-running inequalities between regions and between urban centres, peripheries, and rural communities, and to inequalities between social and demographic groups, to which transport is one of many contributing factors.[4]

In general terms, TRSE can be defined as the "…process by which people are prevented from participating in the economic, political, and social life of the community because of reduced accessibility to opportunities, services, and social networks, due in whole or in part to insufficient mobility in a society and an environment built around the assumption of high mobility".[5] Central to this definition is a context where a high level of mobility is required to participate fully and meaningfully in society. It is this combination of limited access to transport and the assumption or requirement of high mobility, rather than limited access to transport alone, that results in social exclusion.

This section sets out a framework of determinants of TRSE, and the socioeconomic and demographic groups that are disproportionately impacted by it, based on research published from a wide range of contexts in the UK and elsewhere. This framework formed the starting point of the empirical analysis in Sections 4 to 6. It also sets out the ways in which the COVID-19 pandemic could impact TRSE, as this formed a key part of the context in which this research has been undertaken.

A framework of determinants of TRSE

The literature on TRSE has developed through examination of a diverse range of empirical contexts and includes a broad range of determinants. These determinants vary across studies; but may broadly be grouped into the following five categories:

Geographical: Determinants that relate to the distribution of transport infrastructure, and of the destinations that are necessary for social inclusion. This is most directly associated with rural communities, in which both transport infrastructure and services are typically sparse. However, this is also increasingly observed in studies of urban communities where services have been relocated away from communities to 'out of town' centres, which are designed principally around access by car.[6]

Physical: Barriers within transport infrastructure and the wider environment that limit the level of mobility required for social inclusion. This includes physical accessibility of infrastructure, such as rail or bus station design that is insufficiently adapted for those with disabilities, physical accessibility in the pedestrian environment, such as a lack of

[3] Lucas, 2012
[4] Lucas et al, 2019
[5] Kenyon et al, 2003: 210
[6] Church et al, 2000; Miller, 2009.

suitable road crossings, and the related concept of severance. Severance occurs where transport infrastructure reduces the mobility of communities directly proximate to it, and is commonly linked to high road traffic volumes and speeds limiting the mobility of those walking, wheeling, and cycling.[7]

Economic: Economic determinants of TRSE relate to direct costs of transport access, and to the knock-on impacts of transport spending on household finances. Most directly, economic determinants of TRSE are observed where the cost of public transport fares limit key journeys, such as the ability to travel for a job interview or to access healthcare. However, this also includes the impacts of expenditure on some journey types for other forms of accessibility. For example, the cost of owning and running a car that is required for one member of a house to commute to work may inhibit others in the household from spending on travel for education or caring responsibilities.[8]

Time-based: Time-based determinants occur through the combination of the competing time pressures some face in their use of transport, and the varying availability of transport across times of day and days of the week. Commonly, the literature describes this as occurring where caring and household responsibilities, as well as irregular working hours and night shifts, limit travel to off peak periods in which public transport is less frequent. This can be exacerbated by the loss of car access during times where one member of a household is commuting. As discussed below, this aspect of TRSE is highly gendered.[9]

Spatial exclusion: Spatial exclusion is the impact of fear of using the transport options available, and the impact of perceptions of a lack of belonging in transport spaces. Most commonly, the literature describes this as stemming from experiences of harassment, anti-social behaviour, and violence when using public transport. Similarly, experiences and perceptions of road traffic danger can contribute to TRSE, particularly for those reliant on active travel. Alongside this, the sociological literature highlights how the impacts of securitisation of transport spaces can lead some to be excluded.[10]

Demographic and socioeconomic concentrations of TRSE

The determinants of TRSE set out in the literature are not inherent to any population group, and could potentially be applied to a broad demographic in areas of poor public transport provision. However, empirical work carried out in a number of contexts indicates that specific socioeconomic and demographic groups are disproportionately impacted by TRSE. The groups most commonly highlighted in the literature are set out below.

Gender: Gendered differences in the use and experience of public and private transport are a well-established theme in the transport studies literature. Of the determinants set out previously, the literature indicates that gendered differences in the allocation of caring responsibilities mean that women are disproportionately impacted by time-based constraints, and by physical constraints linked to caring. This is exacerbated by women being more likely to be in part time employment, requiring travel outside of defined peak commuter periods. The literature also demonstrates that, owing to gendered differences

[7] Church et al, 2000
[8] Oviedo Hernandez, 2016
[9] Lecompte & Pablo, 2017
[10] This refers to exclusion that occurs as a result of the concentration of police, security staff, and surveillance equipment in transport spaces. Baker & Lee, 2019; Delbosc & Curie, 2011

in experience of violence and harassment, women are more likely to be exposed to spatial exclusion – particularly in public transport spaces and when travelling actively.[11]

Ethnicity: The role of ethnic identity was identified as a key gap in the early development on the literature on transport and exclusion,[12] and is an issue around which there is still uncertainty.[13] However, the significant inequalities of income between ethnic groups in the UK and elsewhere means that the economic determinants of TRSE are likely to be unequal between ethnic groups.[14] The societal context of discrimination also means that those from ethnic minority communities are likely to be relatively more exposed to spatial exclusion. In the UK, relatively lower car ownership levels among ethnic minority communities may also be linked with greater exposure to geographical and time-based determinants of TRSE.[15] However, the extent to which this is balanced by the distribution of ethnic minority communities in urban areas is yet to be comprehensively explored.

Disability: The inaccessibility of transport infrastructure for people with physical disabilities and reduced physical mobility – particularly for wheelchair users – is perhaps the most visible manifestation of TRSE. This includes inaccessible bus and rail carriages, road crossings that are unusable or unsafe, and a lack of adapted ticketing services.[16] Increasingly, researchers have also highlighted the extent to which the provision of transport information and the design of transport access points can exclude those with a range of less visible disabilities and health conditions, including those who are neurodiverse.[17] Alongside this, higher levels of poverty among those with disabilities means that this population is also more at risk of TRSE through economic factors.[18]

Age: In addition to effects associated with greater exposure to disability and reduced mobility for older people, the literature indicates differences in exposure to TRSE across life stages. For those outside of working age, this is most commonly linked to time-based exclusion, owing to travel patterns that diverge from those of peak time commuters, as well as to greater levels of reliance on public transport. In addition to this, the literature indicates that those below and above typical working age are more likely to experience spatial exclusion, both through fear of anti-social behaviour and harassment, and though the externalities of securitisation and surveillance in transport spaces.[19]

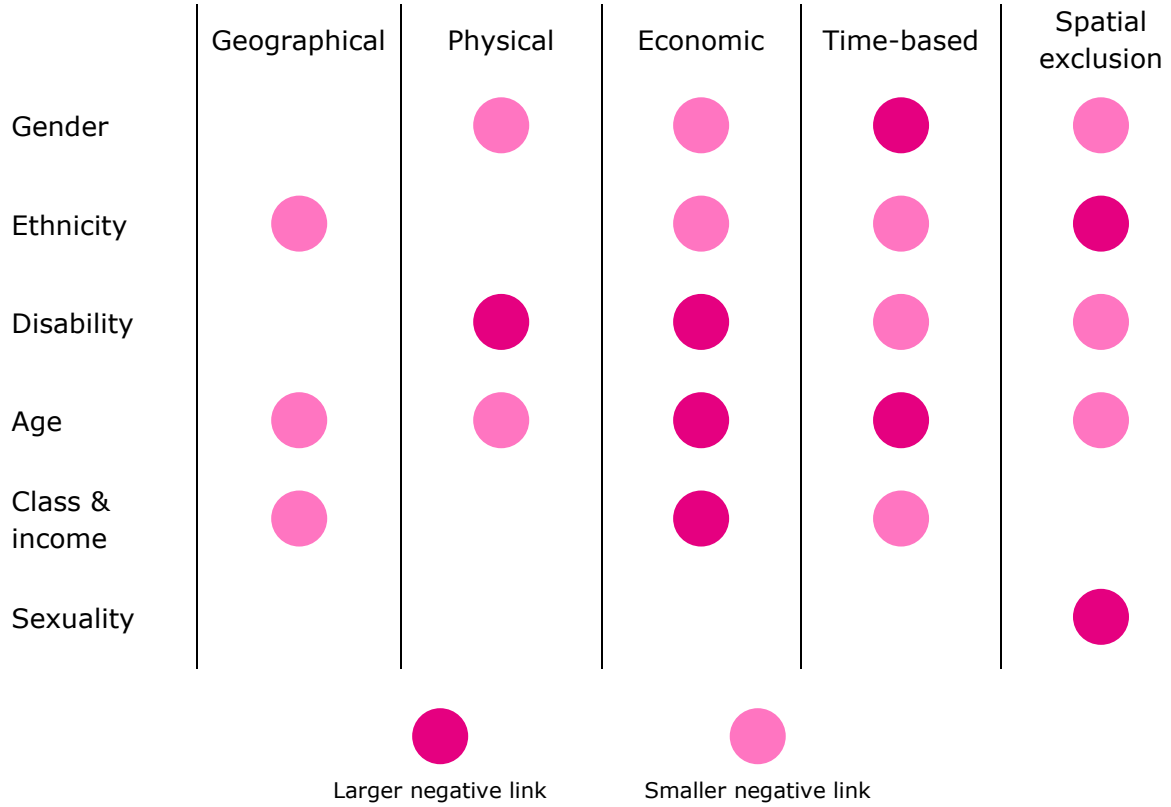
Class and income: While heavily overlapping with gender, disability, and ethnicity, the literature highlights disproportionate exposure to TRSE among those with lower incomes, and those in working class communities. As well as through economic determinants, this can reflect the greater prevalence of shift working and casual employment in peripheral locations among this group, and through this the link to time-based determinants of TRSE.[20] There is also evidence, collated through international examples, of poorer public transport accessibility among economically deprived and working-class communities, linked to the impacts of gentrification on residential rent prices.

[11] Hjorthol, 2008; Joelsson & Scholten, 2019
[12] Raje, 2004
[13] Churchill, 2020
[14] Ethnicity Facts and Figures, 2021
[15] DfT, 2020
[16] DfT, 2018
[17] Hersh, 2017; Tilly, 2019
[18] The UK has a significant and sustained disability pay gap. ONS, 2018.
[19] Graham et al, 2018; He et al, 2020; Titherage et al, 2009
[20] Nellthorp et al, 2019; Rogalsky, 2013

LGBTQ: The literature demonstrates that LGBTQ people are more likely to be exposed to TRSE through spatial exclusion. This reflects the greater experience of anti-social behaviour, violence, and harassment in public transport spaces, and with this fear and reluctance to use these services where they are available. The literature also highlights that those who are or are perceived to be transgender are particularly likely to face direct harassment, alongside intentional or inadvertent misgendering in public transport spaces – contributing to spatial exclusion among this population.[21]

Taken together, the set of determinants of TRSE and the demographic and socioeconomic concentrations in the literature indicate that TRSE can be produced by and reinforce wider patterns of social exclusion. To take one example, the structural inequalities in the labour market that produce the higher levels of poverty among people with disabilities also cause this population to be more exposed to the economic dimensions of TRSE. Diagram 3.1 summarises the link between these factors and the determinants set out previously, based on data drawn from UK and international examples.

Diagram 3.1 – Determinants of TRSE by socioeconomic and demographic characteristics



[21] Lubitow et al, 2017; Weintrob et al, 2021

TRSE and the COVID-19 pandemic

The COVID-19 pandemic formed a significant part of the context in which the primary research presented in this report was undertaken. However, given that the literature searches for this review began in the first half of 2021, there was not a significant body of published evidence on COVID-19 and TRSE to inform this review. Because of this, the impacts set out here reflects 'grey literature' as well as published sources.

Reductions of public transport: The legal restrictions used to control the COVID-19 pandemic in 2020 and 2021 significantly curtailed public transport provision across the UK. This included the cancellation of rail, bus, and light rail services, coinciding with home working requirements. While for many these restrictions were largely invisible given the broader context of legal restrictions on movement, there is evidence that those unable to work from home were significantly impacted by these public transport curtailments.[22] This includes those who, owing to shift working patterns, were already exposed to limited public transport provision, and who are least able to adapt to changes in public transport.

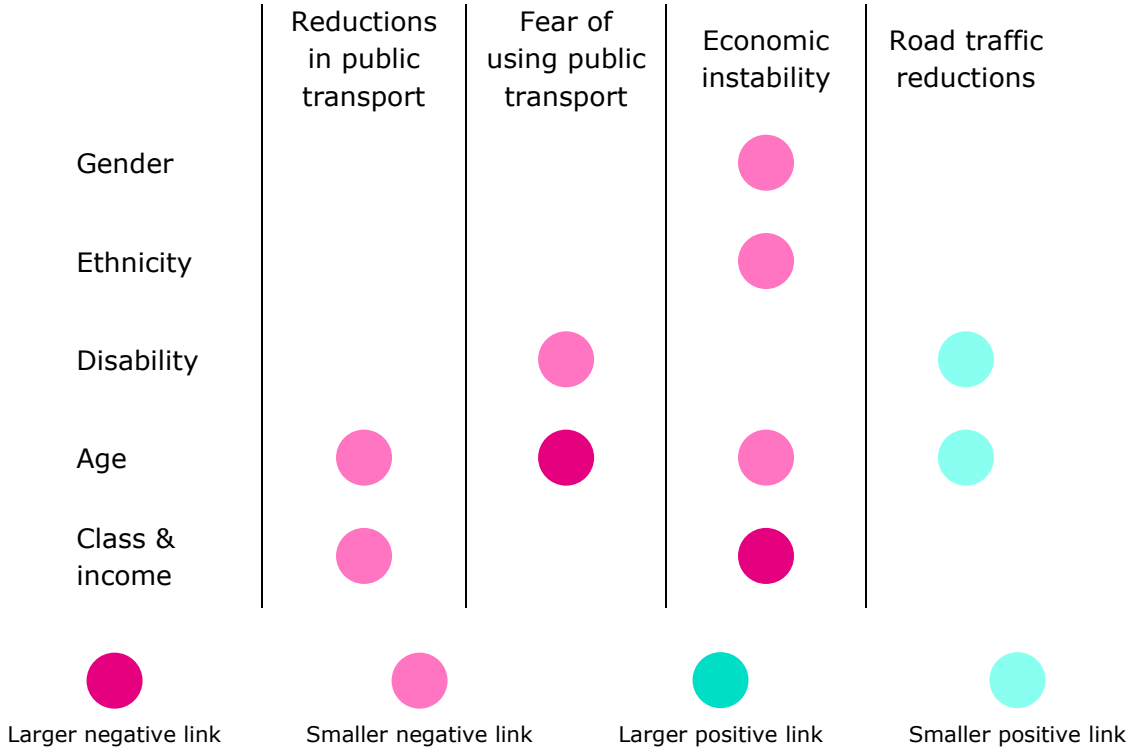
Spatial exclusion: As well as the reduction of public transport services, measures such as the mandated use of face coverings while using public transport was used in the UK during the COVID-19 pandemic, including where this was not required to the same extent in other spaces. While motivated by public health concerns, there is some evidence that this combination of measures and the crowding often associated with public transport use has generated reluctance or fear of using public transport.[23] While published evidence is limited at time of writing, it is reasonable to expect that those with disabilities and long-term health conditions may be disproportionately impacted by this.

Economic instability: Despite significant government intervention in the labour market, there is evidence that the economic instability associated with COVID-19 has disproportionately impacted already deprived areas. This reflects the particular impacts of the pandemic on retail, hospitality, and services, in which low-income work and insecure working conditions are more common than across the economy as a whole. These sectors also employ relatively more young people, people from ethnic minority communities, and women than the average.[24] Consequently, it is reasonable to expect that economic determinants of TRSE have worsened as a result of COVID-19, and that these impacts disproportionately fall on populations already affected by TRSE.

Active travel and road traffic: Restrictions on travel and the requirement for home working introduced during the COVID-19 pandemic resulted in significant reductions in levels of vehicle traffic. In response to this and the requirement for social distancing, the UK government implemented the Emergency Active Travel fund, to allow Local Authorities to reallocate road space towards those walking, cycling, and wheeling. This combination led to temporary improvements in active travel conditions, and an increase in uptake linked to this. While direct evidence is limited, it is reasonable to expect that these changes most benefitted those with limited mobility and disabilities, as well as children and young people, who are otherwise most impacted by poor active travel conditions.[25]

[22] Hung et al, 2021; Kim, 2021
[23] Harrington & Hadjiconstantinou, 2022; Vickerman, 2021
[24] Patel et al, 2020; Platt & Warwick, 2020; Hawkins, 2020
[25] Nurse & Dunning, 2020

Table 3.2 – COVID-19 impacts by socioeconomic and demographic characteristics



Applying the literature to the North of England

The literature on TRSE provides a framework of possible determinants and set of relevant socioeconomic and demographic population characteristics, based on empirical evidence from a range of contexts across the world. Published and grey literature supplements this by providing a set of possible impacts of the COVID-19 pandemic on TRSE. However, in both regards, little of this evidence is drawn directly from areas and populations in the North of England, and it is not clear from the literature how transferable these relationships are to this context. The empirical research set out in this report took these links as a general framework of potential causes and consequences, and expands on these.

- Four -

The nature and impacts of TRSE in the North

The nature and impacts of TRSE in the North

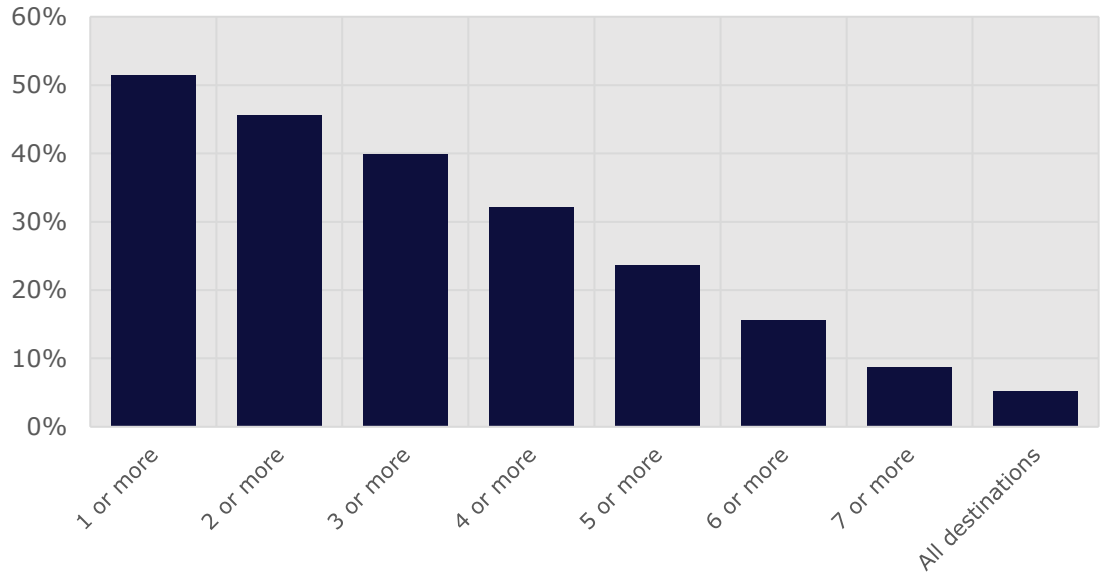
This section sets out the nature of TRSE in the North of England, and the consequences of TRSE for those affected. This first uses survey data to explore the travel constraints and knock-on impacts of using the transport system that respondents face. Following this, it engages the interview and focus group data to explain these aspects of the survey results, and to explore the lived experience of TRSE in the areas studied.

Travel constraints and wider impacts in the survey data

The survey data provides a starting point in understanding the transport constraints faced by people in the North. Respondents to the survey were asked if, in the last four weeks,[26] they were able to travel to a range of destinations as much as they needed to, slightly less often than they needed to, or much less often than they needed to. The destinations included work, healthcare, childcare, and supermarkets, and were intended to cover a set of key destinations relevant to respondents of a range of backgrounds.

51.5% of respondents reported that they were not able to travel as much as needed to one or more of the destinations considered in the survey. For ease of reference, this is referred to as the number of 'constrained destinations'. For example, Graph 4.1 shows that 32.1% of respondents reported four of more constrained destinations, 15.6% reported six or more constrained destinations, and 5.2% reported that they were not able to access any of the eight destinations as much as they needed to.

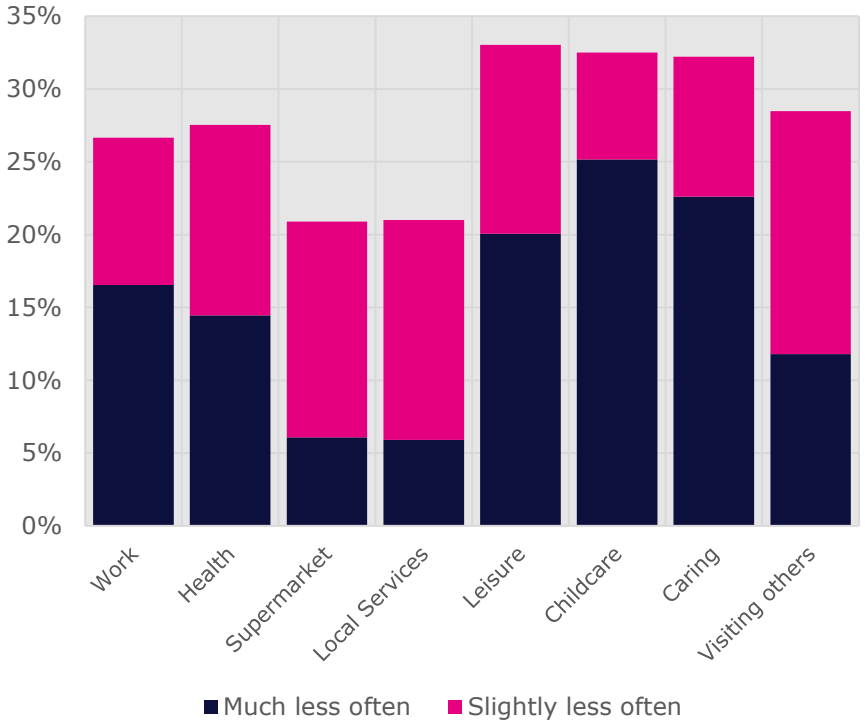
Graph 4.1 – Proportion of respondents by number of constrained destinations



Graph 4.1 shows that there are large variations in the number of constrained destinations that the respondents reported, with a significant minority being unable to access most of the destinations considered as much as they needed to. Graph 4.2 shows how common these constraints are across the eight destination types.

[26] This refers to a period in August and September 2021

Graph 4.2 – Proportion of respondents reporting constrained destinations by type

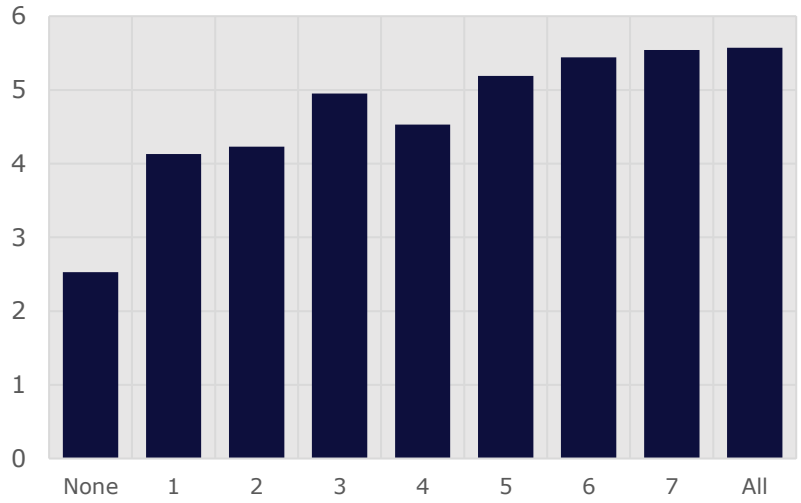


As shown in Graph 4.2, there are significant variations in the proportion of respondents who reported limited access across the destinations examined. Of these, travel to local services and to supermarkets was the least constrained, with only 5.9% and 6.1% of respondents respectively stating that they travelled to these destinations much less often than they needed to in the previous four weeks. By contrast, over 20% of respondents said that they travelled for childcare, leisure, and to fulfil caring responsibilities much less than they needed to in the previous four weeks.

While the survey focused on transport issues, the results presented in Graph 4.2 can be interpreted in several ways. For example, a respondent may have been unable to access a particular destination due to other time pressures unrelated to the transport system, or due to concern about exposure to the COVID-19 at that destination, which formed part of the context in which the research was undertaken. However, when combining responses on constrained destinations with other elements of the survey, it is clear that transport issues are a key part the constraints the respondents face.

Question 22 of the survey asked respondents the extent to which difficulties with transport limit their everyday life on a 0-10 scale, where 0 is no impact, and 10 is a very high impact. Throughout this report, this is referred to as the 'subjective TRSE score'. When comparing those who did and did not report at least one constrained destination, there is a strong and statistically significant difference in this subjective TRSE score. Graph 4.3 compares this score by the number of constrained destinations reported by the respondent. This shows, for example, that those respondents reporting 3 constrained destinations had an average subjective TRSE score of 4.95, compared with 2.53 for those reporting no constrained destinations.

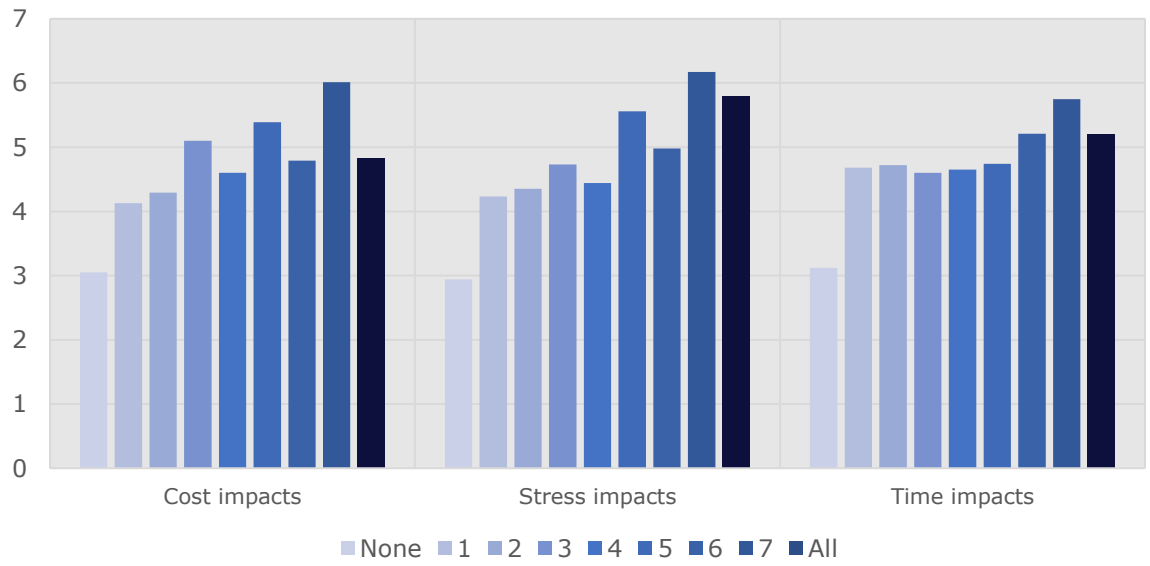
Graph 4.3 – Average subjective TRSE score by number of constrained destinations



While there is a large difference in the subjective TRSE score between those with different numbers of constrained destinations, there is also significant variation in responses within these categories. Indeed, 34.2% of respondents who reported one or more constrained destination also provided a subjective TRSE score of 3 out of 10 or less. Similarly, 9.8% of those who said they were able to access all destinations as often as they needed to gave a subjective TRSE score of 7 out of 10 or higher. This indicates that TRSE is not only the inability to access key destinations as much as needed, but also the wider consequences of the level of transport use necessary to access key destinations.

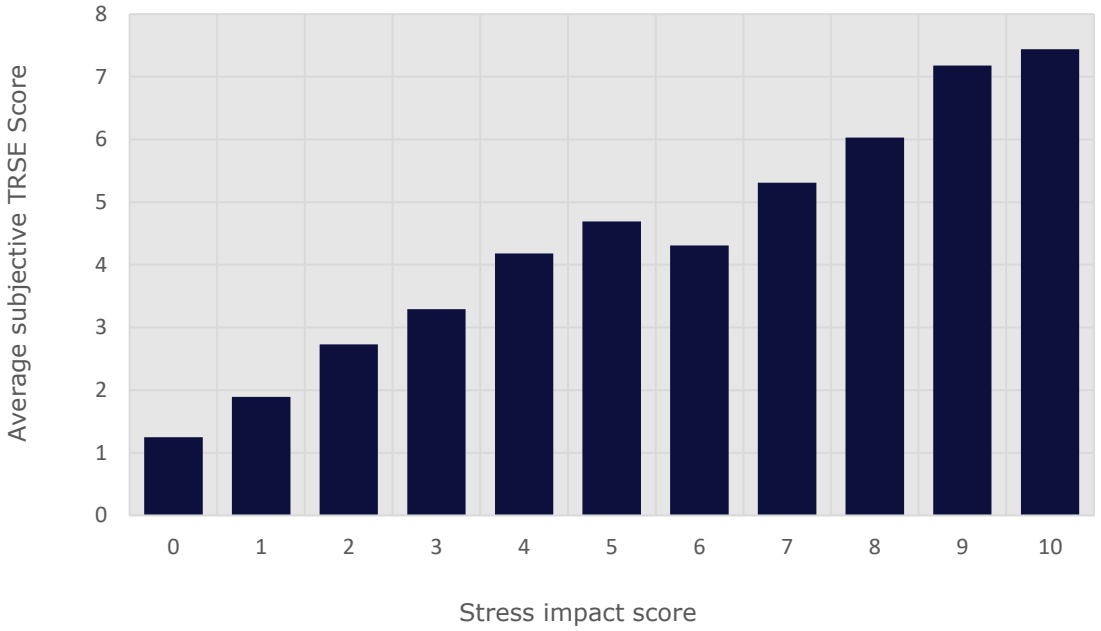
The survey explored three aspects of these wider impacts: First, if transport costs make it difficult for the respondent to afford other essentials; second, if using the transport system causes the respondent significant stress or anxiety; and third, if the time the respondent spends travelling made it difficult to see friends and family as much as they would like. Respondents were asked to rate each on a 0-10 scale, in which 10 indicated strong agreement and 0 strong disagreement. Graph 4.4 below shows the average scores for each statement, by the number of constrained destinations reported.

Graph 4.4 – Average cost, stress, and time scores by number of constrained destinations



Graph 4.4. shows that, as the number of constrained destinations reported by the respondents increases, their average level of exposure to cost, stress, and time impacts also increases. The scores provided by respondents on costs, stress, and time impacts of using the transport system also correlate strongly with the subjective TRSE score – as shown in Graph 4.5 for stress impacts. Positive correlations are also evident between scores for cost, stress, and time impacts of transport, suggesting that those facing greater impacts in one area are more likely to face greater impacts in the other two areas. For example, those respondents facing a high level of cost impact from using the transport system are also more likely to face a high level of time impacts.

Graph 4.5 –Average subjective TRSE score by stress impact score



Consistent with the literature set out in Section 3, the survey data demonstrates two broad aspects of TRSE. First, the inability to travel for key purposes such as work or education, accessing basic services, and meeting with family as much as needed. Second, the knock-on impacts of the costs, stress, and time requirements of travelling to access these and other key destinations. It also shows that there is some degree of overlap between these aspects of TRSE, with those reporting one or more constrained destinations significantly more likely to report cost, stress, and time impacts from the journeys they are able to take. However, these wider impacts also frequently fall on those who report being able to access key destinations as often as they need to.

Travel constraints and wider impacts in the qualitative data

The qualitative data collected from members of the public and stakeholders allows deeper insight into the travel constraints and wider impacts faced by those in the areas studied. As set out in Section 2, these data were gathered from members of the public across areas of the North in which demographic, socioeconomic and transport systems data indicated that there was a relatively high risk of TRSE. Qualitative data were also gathered from stakeholders across the North, including on the needs of specific communities and areas.

Constraints in accessing key destinations

Respondents to the focus groups and interviews were asked about the travel constraints faced in their everyday lives, and the impacts of these constraints on their access to key destinations. In interviews, this was linked to the constrained destination options set out in Graphs 4.1 and 4.2, while in focus groups and stakeholder engagement this was not tied to specific destination types, allowing a more open response.

The qualitative data provided by stakeholders and members of the public complement the set of constrained destinations examined in the survey. Across these data, limitations in access to employment and education, to childcare and caring responsibilities, and to health services are widely reported, and make clear the breadth of potential impacts of TRSE. The discussion below provides examples of how these constraints impact those affected. Section 5 then develops this by examining the causes of TRSE, and Section 6 by examining the population groups and areas that are most affected.

On employment and education, the qualitative data demonstrates that transport issues constrain both the ability to find suitable and high-quality work, and the ability to sustain work. Respondents describe that the transport options available to them meant that major centres of employment, such as out of town industrial and retail facilities, were out of reach, and that shift work also seemed largely out of reach. Underlying this is the limited coverage of the public transport system outside of peak commuter periods, and outside of city and town centre locations. Because of these issues, respondents reported turning down interviews, and constraining job searches to nearby locations with minimal transport requirements. This is particularly significant for those in areas of deprivation, where few nearby opportunities exist for secure and high-quality employment.

Respondents in the interviews and focus groups also described how issues with the transport system constrain their ability to maintain work, once they have overcome limited access to opportunities. These experiences are particularly significant in a context of insecure work, and the growth of the gig economy. For those with secure employment and regular hours transport issues can pose a significant inconvenience, but respondents in insecure work described how relatively minor disruptions in their journey have caused them to lose an entire day's pay, or to lose work entirely. Those in these conditions describe a vicious cycle, in which unreliability in public transport causes a significant loss of income, and in turn this loss of income limits their ability to search for more secure employment, meaning that they are even more exposed to transport issues.

> *"I did have a job cleaning caravans – a rotten job, seasonal with erratic pay and hours – no bus so had to book a taxi which often more or less added up to what I earned, so I jacked it in." (Focus Group, Northumberland)*

On caring responsibilities and childcare - the two most constrained destination types in the survey – the qualitative data makes clear that issues with the transport system constrain the ability to access a support network of friends and family, as well as the ability to access formal care facilities. As discussed further in Section 5, it is the fact that these journeys often involve trip chaining, in which a person combines journeys for a number of purposes, that make these journeys particularly vulnerable to disruption. Alongside this, the requirement to travel outside of peak times and to travel between neighbourhoods rather than into town and city centres exposes these trips to additional fragmentation and

unreliability. As with access to employment, respondents report a vicious cycle in which limited access to caring resources in the community constrains their access to work and education opportunities, and this lack of access to opportunities constrains the transport options open to them.

Finally, on access to healthcare, TRSE is evident in the ability of those affected to attend scheduled appointments, particularly where this requires travel to a hospital rather than a more local GP surgery. For example, respondents report missing appointments due to unreliable and late running bus and rail services, and because of this having to re-enter often extensive waiting lists for care. This has direct consequences for the health of those affected, in a context in which the COVID-19 pandemic has led to significant increases in NHS waiting times, and has broader consequences for healthcare provision.[27] Indeed, stakeholders from the NHS and wider healthcare sector reported that missed appointments placed a significant burden on the care they were able to provide.

> *"I booked a taxi but it didn't turn up and I missed the hospital appointment … they put me right back at the beginning on the waiting list" (Focus Group, Northumberland).*

As well as causing delays in accessing often long-awaited outpatient treatments, TRSE is also evident in how those affected make decisions about healthcare. In interviews and focus groups, respondents discussed delaying accessing their GP when they had concerns, or deciding not to do so entirely, because of the limited transport options available to them. In part, this reflects the concern about the risk of exposure to COVID-19 while using public transport, but also reflects the time and monetary costs of accessing healthcare with fragmented and unreliable public transport services. For example, respondents reported being unable to afford a return journey or only being able to arrive for an appointment several hours early, and because of this deciding not to access healthcare.

> *"I had a nine o'clock appointment at Sunderland RI. I could just about afford a taxi one way - £25 - but not back again." (Interview, Gateshead)*

The wider impacts of using the transport system

The inability to travel for key journeys such as work, caring responsibilities, and healthcare to the extent required is one key manifestation of TRSE. However, following on from the survey analysis, TRSE is also evident in the wider impacts of using the transport system. Of these wider impacts, the cost impacts of the minimum necessary levels of transport use on other aspects of everyday life is a key element of the interviews, focus groups, and stakeholder engagement. Alongside this, time costs, and the impacts of stress and anxiety accumulated through using the transport system, also widely feature in these data.

TRSE through cost impacts occurs where having to travel for key purposes consumes a large share of household spending, and causes significant unmet needs in other areas. This can manifest in transport constraints, for example if the cost of commuting means that someone is unable to afford to travel for leisure or to access further education, but is more commonly described by the respondents as affecting all aspects of household finances. This includes the ability to afford basic essentials such as heating and groceries.

[27] The Kings Fund, 2022

For some, this relates to the cost of public transport, with fares and season tickets requiring a large share of household spending. However, alongside this, the issue of forced car ownership is a significant and less immediately apparent manifestation of TRSE.

Forced car ownership occurs where the lack of suitable public transport and active travel provision requires a household to own a car in order to access work and basic services, and to fulfil caring responsibilities, but where the costs of owning and maintaining that car results in social exclusion.[28] Critically, it is the fact that expenditure on maintaining a car is often unpredictable, and that this is not directly tied to the extent of use, which makes this particularly significant. Respondents in interviews and focus groups reported that these unexpected expenditures forced them to make significant sacrifices in other basic essentials, or that they felt compelled to continue to drive despite being unable to afford repairs, an MOT, or car insurance.

> *"There were jobs going at the business park, but no bus for the early shift, and the manager said it wasn't up to him to deal with that. In the end six of us got there in my mate's old banger, with me in the boot" (Interview, Gateshead)*

Alongside financial impacts from the level of transport use required for key journeys, TRSE also occurs where the time spent travelling for these journeys means being unable to access family, community life, and social activities. While some respondents describe these impacts as occurring simply as a consequence of the distance that they are obliged to travel for these journeys, they are also commonly linked to the impact of delays and uncertainties when using public transport. For example, respondents describe that the unreliability of public transport services means that they aim to arrive at some destinations an hour or more earlier than needed, in order to guarantee being on time, and the time sacrifices this entails in other areas of their everyday life.

> *"The bus is late so often that I leave home an hour earlier just to be sure otherwise there'd be no one to open up the shop." (Focus Group, Northumberland)*

The final component of TRSE is the impacts of stress, anxiety and experiences of discrimination and harassment encountered when travelling. Here, respondents describe experiences such as verbal and physical harassment while using public transport, anxiety over being stranded by late running and cancelled public transport services, and fear of crime and anti-social behaviour. Respondents report that these experiences and perceptions have caused them to significantly alter how and where they travel, and having direct impacts on their mental health and wellbeing. As discussed in Section 5, this aspect of TRSE disproportionately impacts those from ethnic minority communities, women, people with disabilities, and LGBTQ people.

> *"For many LGBTQ+ people, using public transport can be a minefield of negotiating pitfalls, abuse, and outright violence … The minute we stand at bus stops or train stations, board a tube, train or wait in an airport, we are on high alert due to the statistical likelihood of verbal or physical abuse." (Stakeholder interview)*

[28] Mattioli, 2017

Summary: The nature and impacts of TRSE in the North

Together, the qualitative and quantitative data highlight the key elements of TRSE in the North of England: First, there are the constraints that residents in the North face in travelling for key purposes, such as accessing work and education, basic services, and community life. For some, this manifests as being unable to travel entirely with the options available, such as being unable to take up shift work because of timetable limitations on public transport, or being unable to access further education. For others, this manifests as having only partial access to some services, such as being able to access local shops and services, but being unable to access larger supermarkets clustered in car-accessible 'out of town' locations. This unmet demand can have a fundamental impact on the ability of those affected to fully participate in society in the way they would otherwise choose.

Second, there are the knock-on consequences of having to make key journeys, such as those for work, education, and caring responsibilities, on other aspects of everyday life. These impacts are often financial, such as being unable to afford travel for leisure because of the costs of travel for this narrow set of essential journeys, or having to make trade-offs between transport costs and other vital areas of household spending, such heating costs and food shopping. Alongside this is social exclusion through time costs, in which the time spent travelling for key purposes limits or prohibits access to social, family, and community life, and the impacts of stress, anxiety, harassment and discrimination experienced while using the transport system.

This section has focused on the nature and impacts of TRSE in the North in general terms, based on data gathered across a diverse set of areas and population groups. However, these two sets of impacts – the unmet need to travel and the knock-on consequences of having to travel for key purposes – are particularly significant because they coincide with other forms of social disadvantage, such as those based on ethnicity, gender, and income. The sections to follow go deeper into the transport issues that cause TRSE, and into the population groups and area types that are most affected by TRSE.

- Five -

The causes of TRSE

The causes of TRSE

Section 4 set out the nature and impacts of TRSE in the North of England. This section builds on this by setting out the aspects of the transport system in the North that cause and exacerbate social exclusion. This includes analysis of issues with the public transport system, with active travel, and with car travel. This section begins by discussing the set of causes that were examined in the survey, and then broadens this with the qualitative data gathered from members of the public and stakeholders.

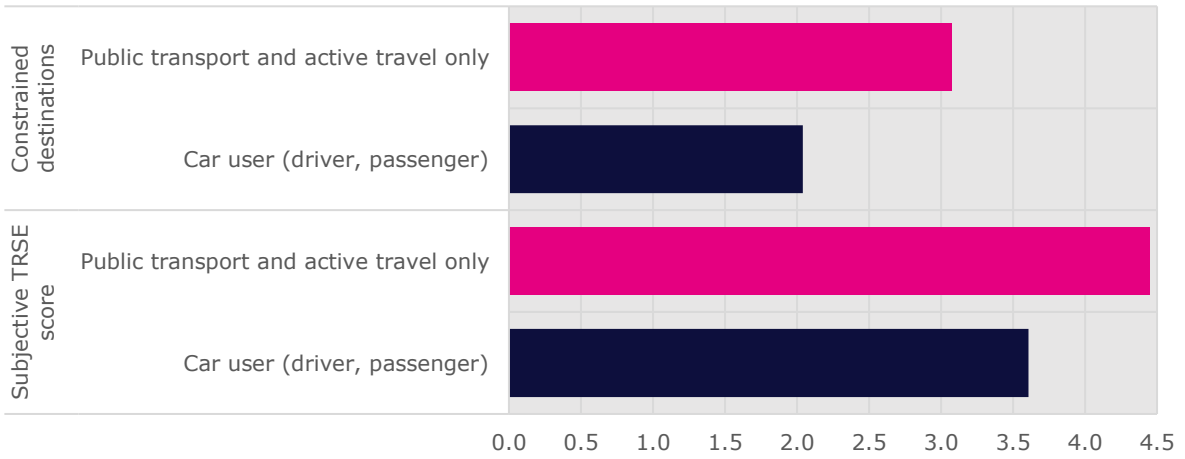
Causes of TRSE in the survey data

The survey asked respondents about the modes of transport they had used to access eight key destination types, including work, childcare, leisure, and recreation. It also asked respondents about the modes of transport that they used to access these destinations in the last four weeks, including their access to a vehicle, and if they held a driving licence. Combining these data with the constrained destinations faced by the respondents, and their subjective TRSE score, gives a first impression of the causes of TRSE.

Turning first to car access, there is a statistically significant difference in the average number of constrained destinations reported by those with and without access to a car. This difference is relatively large, with respondents without access to a car reporting an average of 2.78 constrained destinations, compared with an average of 1.97 for those with access to a car. A statistically significant difference is also evident in the subjective TRSE score, with respondents with access to a car scoring an average of 3.47 out of 10, compared to 4.37 for those without access to a car. This points to the key link between dependence on public transport and active travel and exposure to TRSE.

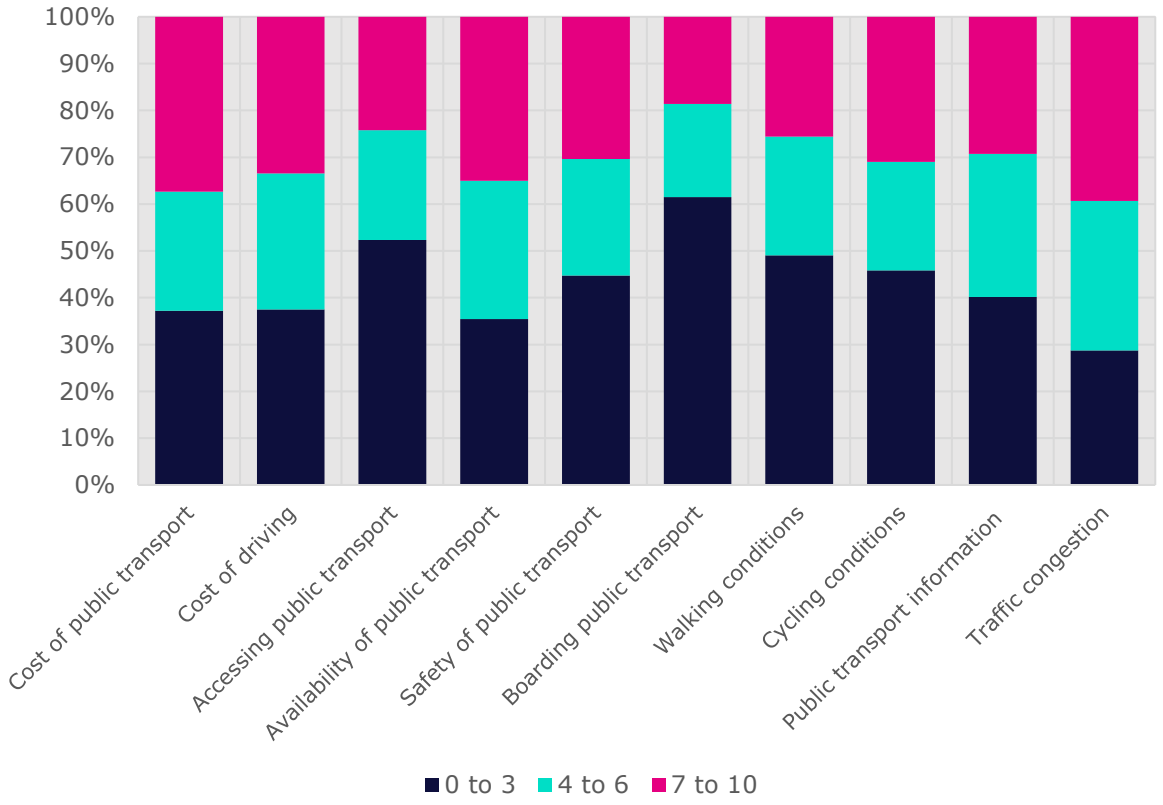
As well as car access as a driver, the survey asked respondents about their use of a car as a passenger. Comparing the same set of metrics as previous, a statistically significant difference is evident between those who used a car a to access at least one of the eight key destinations in the last four weeks, and those who were solely reliant on public transport and active travel. This is shown in Graph 5.1.

Graph 5.1 – Average number of constrained destinations and subjective TRSE score



The statistically significant difference in the subjective TRSE score and in the number of constrained destinations between those with and without access to a car point to the key role of reliance on public transport and active travel in TRSE. To further explore this, the survey asked respondents to rate the impact of a set of issues with the transport system on their everyday life. This included the costs and availability of public transport, conditions experienced while walking and cycling, and the impacts of costs and congestion associated with driving. Graph 5.2 below gives the grouped scores across the ten issues studied.

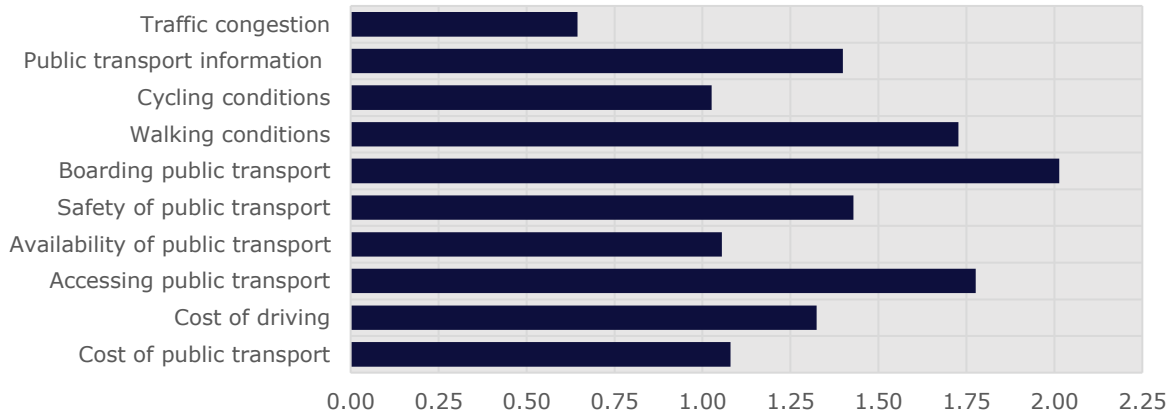
Graph 5.2 – Grouped rating of transport issues by proportion of respondents



Graph 5.2 demonstrates that the range of transport issues examined in the survey widely impact the respondents. Indeed, only around one in five respondents (21.6%) did not rate at least one of the issues examined in the survey as a 7 out of 10 or higher. However, while this demonstrates the broad significance of these transport issues to the respondents, this does not prove that these issues cause TRSE. To assess this, it is necessary to consider how these issues translate into constrained access to key destinations, and on the everyday lives of the respondents.

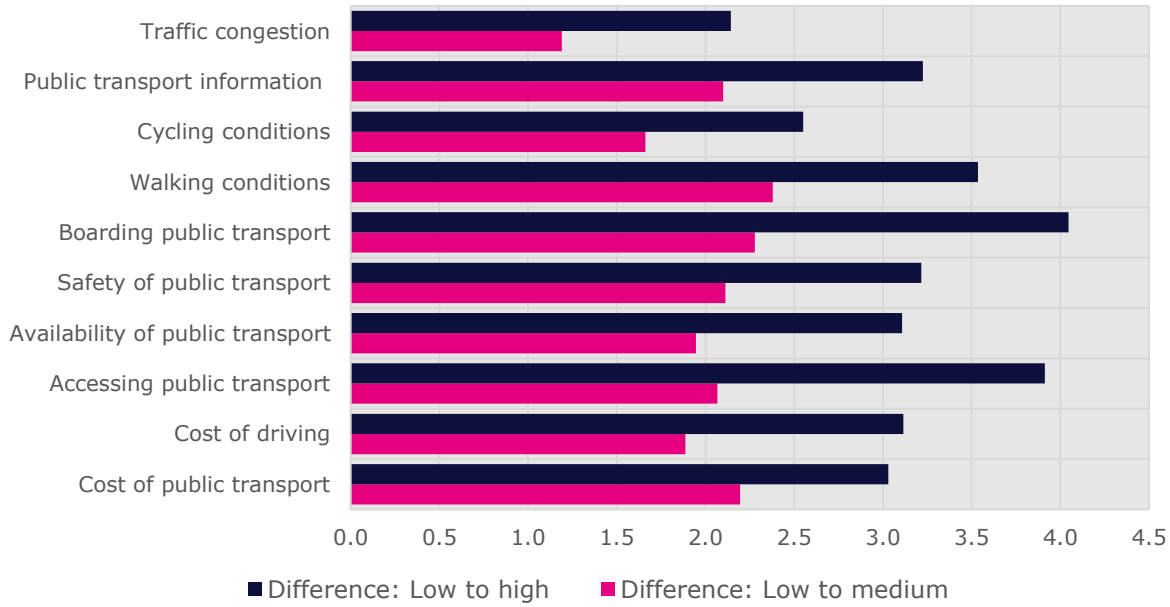
Of the ten transport issues studied in the survey, traffic congestion received the highest average score. The average score given to the impact of traffic congestion was 5.28, compared with 4.77 for public transport costs and 4.66 for driving costs – the second and third most highly rated options. However, when comparing the issues experienced by those who reported no constrained destinations with those that reported one or more constrained destinations, there is relatively little difference in this measure. By contrast, as shown in Graph 5.2, there are large differences in the scores for boarding public transport, in getting to and from public transport access points, and in walking conditions.

Graph 5.2 – Difference in average rating between respondents reporting no constrained destinations and respondents reporting one or more constrained destinations



Larger differences are evident when comparing those with a low subjective TRSE score (0-3) to those with a medium (4-6) or high (7-10) score. As shown in Graph 5.3 below, the largest differences in the mean score are evident in boarding public transport, getting to and from public transport access points, and in conditions experienced while walking. In all of these measures, the mean score for those reporting a high subjective TRSE score is more than 3.5 points higher than for those reporting a low subjective TRSE score.

Graph 5.3 – Difference in mean score between respondents with high, medium, and low subjective TRSE scores



These comparisons indicate that it is differences in exposure to issues in the public transport system that are critical to differences in exposure to TRSE, as measured both by constraints in journeys and in the respondents' perceptions of the impacts of transport difficulties on everyday life. Additionally, it indicates that walking conditions also influence the respondents' exposure to TRSE. However, as Graphs 5.2 and 5.3 show, those reporting a greater number of constrained destinations and a higher subjective TRSE score are on average more affected by all of the 10 transport issues studied in the survey.

Causes of TRSE in the qualitative data

The survey data indicate a range of transport issues that are relatively more concentrated among those who report being unable to access a range of key destinations as much as they need to. It also highlights that being solely or primarily dependent on public transport and active travel is a key differentiating factor in exposure to TRSE. Here, qualitative data gathered from members of the public and stakeholders is used to build on these themes in the survey data. Together, these data show that TRSE is caused by the following features of the transport system in the North:

- Fragmented and unreliable public transport services
- Exposure to harassment, discrimination, and anti-social behaviour
- Costs that exceed what is affordable for those on low incomes
- Poor active travel conditions combined with car-dominated environments
- High levels of car dependency, including forced car ownership

Public transport

The survey data indicate that those solely or primarily dependent on public transport feel that their everyday lives are more constrained by transport issues, and are less likely to be able to access the full range of key destinations as much as they need to. This points to the key role of issues in the public transport system in explaining exposure to TRSE in the North. The qualitative data explains and expands on these themes.

In general, the focus groups, interviews, and qualitative stakeholder survey did not point respondents towards specific forms of public transport, and allowed respondents to focus on the services relevant in their area. Despite this, issues with bus services dominate much of the qualitative data. This reflects both the relatively greater scale of issues with bus services compared with other modes, and the higher degree of reliance on bus services among those affected by TRSE. This is consistent with data from the National Travel Survey for the North of England, which indicates that, in 2019, those on lower incomes took over double the amount of annual bus trips as those on middle and higher incomes. Consequently, much of the analysis below focuses on issues with bus services.

Coverage and routing

The coverage and routing of public transport services, and of bus services in particular, is a common contributor to TRSE highlighted in the qualitative data. This issue contributes to TRSE both through the inability to access key destinations, and through the knock-on impacts of the additional time costs incurred by those reliant on these services.

The qualitative responses cover a large diversity of destination types that are seen as either impossible to access, or which can only be accessed with time costs that have a major impact on other aspects of everyday life. Across these, however, two destination types are particularly common: First, there are those in peripheral locations, typically on the edge of major urban areas, but outside of residential suburbs. With the growth of 'out of town' shopping facilities, and the growth of the logistics industry linked to online commerce, this commonly includes major centres of employment, leisure, and recreation. This, in combination with the loss of retail and services from local high streets, contributes to limited access to these services among those reliant on public transport.

Second, travel between neighbourhoods in urban and suburban areas is seen as particularly challenging. Underlying this, respondents widely discuss the lack of direct bus and other public transport options for journeys linked to caring and family responsibilities, even over short distances. Respondents describe this as limiting their ability to fulfil these responsibilities, and exposing them to significant additional time costs. This includes being unable to provide the level of care required for relatives, being unable to access support services, and being unable to take up work and education opportunities because of the time pressures associated with these trips.

For those in urban and suburban areas, the 'hub and spoke' approach to local public transport provision, and to bus service provision in particular, is a key driver of the issues faced. Under this approach, routes are concentrated along major corridors that serve commuter journeys between suburban areas and an urban centre. This is particularly the case with high frequency bus services. This approach means that journeys from neighbourhoods to peripheral areas, and journeys between neighbourhoods and local centres, will typically require a trip into a central location, and a second journey out.

> *"Even if we want to go to our local facilities, we can't get access to them. We'd need to go into the city centre, and get a bus back out, and then another connection after that, in order to get to the area. That takes an hour one-way. And that's if any of the buses actually come. We're literally stranded." (Focus Group, Sheffield)*

In addition to the issues associated with 'hub and spoke' routing of urban bus services, respondents in rural communities describe being increasingly isolated by reductions in coverage of services, and changes to routing. Respondents provide examples of villages being removed from bus routes, or circular routes between rural communities being changed to link only via a multistage trip to a larger centre. In these contexts, the requirement for multiple bus journeys to reach a destination is viewed as making a return journey impossible, or sufficiently time consuming as to exclude those reliant on them from other aspects of everyday life.

Frequency and reliability

The issues with the routing of public transport services, particularly local bus services, are compounded by the declining frequency of services and widespread experiences of unreliability. Respondents in the qualitative research commonly connect these two issues, with the declining frequency of bus services exacerbating the impacts of unreliability. This is both with regard to the direct knock-on impacts such as arriving late to work or missing healthcare appointments, but also through the added stresses associated with using a relatively low frequency service. As discussed further in Section 6, these impacts are particularly significant for those in insecure work, and on low incomes.

> *"I put my hands up and say I missed the 8.36 bus this morning. But the next bus didn't come until 9.10, and I was over 30 minutes late to work. They're supposed to be every 10 minutes." (Focus Group, Oldham)*

Low frequency services and poor reliability are particularly significant in the context of a 'hub and spoke' model of bus service delivery, in which there are few or no neighbourhood and orbital routes. Under this approach, a late running low frequency service can mean facing a long wait time in a central hub for a connecting service, or being unable to

complete a journey at all. For some, this combination of factors generates a fear of being stranded on a return journey home, if the first leg of their journey is delayed. For those who are vulnerable through age, disability, or limited mobility, this can result in feeling unable to risk taking some journeys by public transport, and instead choosing only to travel when lifts are available or when taxi services are affordable.

> *"I was called out several times recently to rescue my 80-year-old mother from the bus stop when the service was cancelled without warning or offer of help" (Interview, County Durham)*

The varying levels of frequency of public transport services throughout the day can also contribute to social exclusion. As with routing decisions, the qualitative research indicates that there are often significant differences in the frequency of services during traditional commuter peak hours, and those available throughout the rest of the day. These differences can mean that shift working jobs are unavailable to those reliant on public transport, and that trips for caring and family responsibilities take significantly longer than equivalent journeys for peak time commuters. As discussed further in Section 6, these impacts fall disproportionately on women, and those on low incomes.

> *"There's only one bus an hour and it didn't turn up – the children were cold and hungry, and we had no idea what was going to happen." (Interview, Gateshead)*

Outside of urban areas, respondents in rural communities report experiencing the extremes of low frequency bus services. This includes services that run once per day or once per week, and enable only a single return journey with no further connections possible in the time available. While offering a degree of accessibility, these services are seen as offering no alternative to access to a car for the vast majority of key journeys, particularly those for work, healthcare, education, and caring responsibilities. As discussed further below, this contributes to forced car ownership and a high degree of car dependency in rural communities in order to maintain basic levels of social inclusion.

> *"A lot of employment opportunities involve shift work or weekend work – the shops open on Sundays now and it's a good opportunity for me to work while my husband looks after the children – but the bus services don't fit and it's not worth getting a taxi for a half shift." (Focus Group, Gateshead)*

Fragmentation

The combination of declining frequency and availability of local bus services with a 'hub and spoke' approach to routing means that the respondents to the qualitative research often experience a fragmented service. The existence of multiple bus operators in a single area, with different ticketing and fare structures that preclude or limit using services from other operators, exacerbates this. This is both with regard to the cost impacts, with respondents reporting having to buy multiple return tickets in order to complete a single journey, and through the time costs of having to wait between services from different operators, arranged with largely independent timetables.

The lack of integration between bus operators is a widely highlighted issue, and is seen as particularly significant in the context of declining frequency of services, and the growing number of journeys that require trips in and out of a central hub. Declining frequency

means services across different operators that had previously interacted with minimal changeover time no longer do so, and the decline of neighbourhood and circular routes means that a greater proportion of trips require services from multiple operators. Fragmentation can also exacerbate the impacts of unreliability, particularly where the next available service following a delay or cancellation is with a different operator, and therefore requires an additional ticket in order to complete the journey in a reasonable time.

> *"It takes two or three buses to get to school and it takes ages. It also means that I can't stay on for after school activities and also reduced my choice for A levels." (Interview, Northumberland)*

In addition to fragmentation between bus operators and routes, the respondents also experience fragmentation when attempting to use multiple modes of public transport to complete a journey. This fragmentation is evident through cost, with the lack of transferability of tickets between bus, light rail and rail services rendering some journeys unrealistically expensive; through timing, with a lack of synchronisation between different operators across different modes requiring long wait times; and through routing decisions that means transfers between modes require a significant walk.

> *"To get to hospital I have to get a bus and then a train. The bus is unreliable which means I miss the train and a couple of times my appointment too - a wasted journey." (Interview, County Durham)*

Cost

Data published by DfT demonstrates that, across England, average public transport costs have consistently increased above the level of inflation and wage growth, and above equivalent costs for car use.[29] The qualitative data gathered across areas of the North demonstrate that these increases both prohibit necessary journeys, and have knock-on consequences for the social inclusion of those still able to travel. The fragmentation of services within and between modes in a multi-operator model of public transport provision exacerbates these issues, particularly for those with journeys requiring multiple trips, travel outside of commuter routes, and those travelling with children.

> *"I was earning £8 an hour four hours a day and the fare was £4.50 each way so a quarter went on fares. It wasn't worth it in the end." (Interview, Sheffield)*

The qualitative data demonstrates the extent of social exclusion that results from high relative public transport costs, in a fragmented context. Respondents describe giving up work because of the costs of commuting using the public transport options available, having to choose between the level of public transport use necessary to access work and caring responsibilities, buying sufficient food, and heating their homes. They also describe being unable to afford a minimum level of travel necessary to lead an active family and social life, once travel for work and caring responsibilities are accounted for. These effects can form a vicious cycle, with the costs of public transport preventing or significantly limiting access to work and education opportunities, and the lack of access to these opportunities confining those affected to insecure and low paying work.

[29] DfT, 2022

The qualitative data also demonstrates how the costs of public transport can fall disproportionately on those on low incomes. This reflects the fact that discounted and concessionary fares often require payment up front, in order to make a saving compared with the daily cost. These upfront costs may be unaffordable for those with little or no discretionary income, who are already having to sacrifice other essentials. Further, those requiring journeys across multiple operators and modes may be less able to benefit from savings designed around peak commuter travel. These and other effects on those on low incomes are discussed further in Section 6.

> *"I would love to see friends and family more, but the bus fare has gone up regularly, and now we have a family the cost means travelling less." (Interview, Sheffield)*

Safety, harassment, and discrimination

Concerns over safety and experiences of harassment and discrimination result in TRSE through changes in how those affected are able to travel, and through the accumulated stress associated with these experiences. In contrast to the focus on bus travel when discussing other transport issues, the respondents' experiences in this area are relatively balanced across modes of public transport, with respondents describing experiences when using rail, metro, tram, and bus services. These experiences relate both to using public transport services, and while waiting at public transport access points.

The concerns and experiences described across the qualitative data can be divided into three broad types. First, there are those linked to visible or perceived protected characteristics. Respondents who are, or are perceived by others to be, disabled, female, from a minority ethnic group, or LGBTQ report being targeted on the basis of these identities, or fearing that they are likely to be targeted. Those affected describe various forms of exclusion resulting from these experiences and perceptions, such as avoiding travelling through particular neighbourhoods, avoiding travelling at night or at peak times, or avoiding some modes of public transport entirely.

> *"People can get on the Metro without tickets, and I've been asked for money by drug addicts and drunks. I can't move away so easily and with limited sight it's really scary." (Focus Group, Sheffield)*

Second, there are broader fears and experiences of harassment that are not connected to specific characteristics or identities. These include experiences of anti-social behaviour while using or waiting for public transport, and using facilities and vehicles that have been vandalised. While often linked to other users, these fears can also result from design choices that make users feel unsafe, such as a lack of lighting, and the need to use underpasses or bridges to access stations and stops. A lack of staff, and the separation of staff and passengers, also contributes to this, with respondents feeling that no one is willing or able to act in response to anti-social behaviour.

> *"Lots get on without paying their fares and it makes me worried about what else they'd be allowed to do. One person was smoking on the bus last week and no one said anything." (Interview, Bradford)*

Finally, the COVID-19 pandemic added to the fears associated with using public transport. Respondents describe being concerned about the heightened risk of catching COVID-19

when using crowded services, in which social distancing was seen as impossible. The lack of adherence to rules on face coverings that were in place at the time the research was conducted also contributes to this, with respondents concerned that these restrictions were not enforced on public transport. These fears, and the consequences for the ability of those affected to travel how and where they need to, are particularly concentrated among those with long term health conditions and disabilities.

> *"Coronavirus has completely wrecked me – I've missed days of my student placement due to anxiety. I feel unsafe all the time and only go to uncrowded places I can walk to." (Interview, Sheffield)*

Accessibility

The qualitative data highlight three aspects of accessibility relevant to TRSE. First, there is the physical accessibility of public transport infrastructure and services. This includes the ability of those with disabilities and limited physical mobility to board, use and exit services, including buying and using tickets. On this subject, respondents with disabilities and limited mobility report a range of issues encountered in using or attempting to use public transport. These include a lack of basic inclusive design such as ramps and lifts that are necessary for those using mobility aids, and a lack of consideration from drivers and operators for the additional time required by those with limited physical mobility when boarding and existing public transport.

> *"[I]t is impossible at peak times with my disability. The train station has no lift or ramp, and the path around the opposite platform is very long, and the trains have two steps." (Focus Group, Northumberland)*

Second, there are a range of perceptual and experiential factors related to physical accessibility. Most commonly, the respondents express this as feeling unable or reluctant to inconvenience others when using facilities such as designated wheelchair spaces on buses and rail. These concerns are particularly acute at peak times on congested routes, and can result in those using mobility aids feeling unable to travel under these conditions. Comparable perceptions are also reported by those travelling with children in pushchairs, including the potential for clashes between the needs of those using pushchairs and the needs of those using mobility aids due to spatial constraints.

> *"Wheelchair user often has to wait for next bus due to no room – buggies don't make way and driver doesn't help - wish I could book a place" (Interview, Bradford)*

> *"Once I had three kids with me two in a double buggy and all the shopping and I had to get off for a wheelchair. And it was raining." (Interview, Sheffield)*

Accessibility constraints also exist through the additional requirements placed on those with limited physical mobility. In particular, the need to book assistance in advance in order to access many rail services and some bus services reduces the flexibility with which those with limited physical mobility can travel, and increases the consequences of delays and fragmentation. This is particularly evident for multi-modal journeys, where assistance requests can require multiple forms across different operators, with different timescales and evidence required for each. As well as the additional burdens on those with limited physical mobility, these requirements mean that delays in one part of a journey can then

mean being unable to access assistance in another part of the journey. This impacts the ability to complete a specific journey, but also results in those with limited mobility feeling unable to independently use public transport.

> *"[I]t can be very difficult when arrangements change at the last minute, as you can't book the assistance in time. You might be waiting for ages for a person to become free to guide you on to the train. You end up sweating over missing the train." (Stakeholder interview)*

Third, there is the broader aspects of accessibility for those with other disabilities and health conditions. This includes those with developmental conditions, those with anxiety or post-traumatic stress disorders, and those with sensory impairments. Respondents affected by these conditions and stakeholders from support organisations stress the range of additional issues faced by those affected when using or seeking to use public transport. This includes the lack of accessible information, the impacts of noise and overcrowding, and a lack of understanding and assistance from transport staff. This is in addition to the impacts of harassment and discrimination in public transport spaces.

> *"Due to anxiety disorders many people experience a sensation of being "trapped" on public transportation. The recent redesign of train carriages are 'airless' and 'sealed', which can cause stress for people who suffer from anxiety related disorders. Electronic doors add to these anxieties, as the inability to open things manually can create a sense of panic." (Stakeholder interview)*

Information

Issues with access to information regarding public transport are widely reported in the qualitative data. As with other issues above, these are present across modes of public transport, but are particularly concentrated among those using or seeking to use bus services. While the nature of bus travel, compared with rail and tram services, can mean that it is inherently more difficult to provide accurate information to passengers, this focus among the respondents represents a range of additional limitations in how and where information is provided, beyond these inherent issues. This is most acute with timetabling and arrival information, but also relates to routing and ticketing information.

The growth of digital information provision for bus services is widely discussed by the respondents. Typically, this involves timetable information being provided solely or primarily through mobile apps and online services, with minimal or no physical information being provided at many public transport access points. These digital services can be specific to a single operator, rather than providing information for all services running from a particular stop or area. However, the respondents discuss the increasing number of integrated apps available, that include live running information alongside timetables.

The focus on digital information accessed through mobile devices has a number of advantages, including reducing operator costs and the ability to access live information. However, the qualitative data makes clear that these benefits are far from universal. In particular, the responses demonstrate the limitations of a system that assumes that users have a smart phone, sufficient data to access the information when they need to, and sufficient knowledge of where and how to access this information. Despite the ubiquity of

smartphones, these three conditions are far from universal, particularly among older people, and those on low incomes.

> *"A lady at the bus stop had a phone and found out that the bus was cancelled after we'd been waiting for ages. I can't afford a phone, but they are handy when those sorts of things happen, which it does a lot." (Interview, Gateshead)*

The impacts of a lack of information provided at bus stops – particularly in the form of live digital information – are particularly significant in the context of low frequency services, the requirement for multiple bus trips to complete a journey, and services that are regularly delayed or cancelled. In these circumstances, the inability to access real-time arrival information exacerbates uncertainty and stress, and undermines the ability of those affected to use alternatives where these are available. Some of those without access to smartphone apps report attempting to phone bus companies to request information about late running or cancelled services, but appear to have limited success in doing so.

> *"When the bus doesn't turn up, I've no idea what's happening – sometimes there's someone with a phone who looks it up for me but usually I just stand there hoping. We need information at the bus stop, not just timetables which often don't match the service but those electronic times which say 'next bus'." (Focus Group, Gateshead)*

Beyond arrival and departure, respondents also cite a lack of routing information when using bus services. For many, there is an expectation that clear and up to date routing information should be provided at all bus access points, without the requirement for a smartphone. This is seen as particularly important where routes are altered and where bus stop locations are changed, but appears to be a common expectation among respondents more generally. As discussed further in Section 6, this is particularly significant for those with limited physical mobility and with caring responsibilities, who can face significant challenges in adapting to new routes. This applies to bus routes, and to interchange points between buses and other modes of public transport.

> *"The routes keep changing, and we're not told. It's fine if you can easily walk from one stop to another, but if you're counting every step because of reduced mobility, it's not possible." (Focus Group, Sheffield)*

The majority of comments on access to information focus on bus journeys, and on the interaction of buses and other modes of public transport. This in part reflects the greater reliance on bus journeys among those involved in the qualitative research, but also the greater potential for routing changes inherent to bus travel. However, the qualitative data also indicate the potential for misapprehensions about rail travel, that can also act as a constraint to public transport use. These include a lack of information about fares and options to make tickets affordable, misapprehensions about the requirement for railcards, and a lack of timetabling and routing information that combines rail with other modes. This is particularly evident among those who have limited or no access to the internet.

> *"The trains are for posh people. I was last on a train twenty years ago. They cost a lot and you have to get a railcard first." (Interview, Gateshead)*

"If you know the tricks you can get good public transport bargains such as advanced train fares or travel with three or more, but it's very complicated and takes a boffin to get your head round it." (Interview, Sheffield)

The set of informational constraints reported by the respondents are often long running, and represent experiences accumulated over many years. However, it is clear that these constraints and issues have been exacerbated by the COVID-19 pandemic. The suspension of many public transport services during the pandemic, the reduction of routes and service frequencies, and variations in advice over face coverings and social distancing have added to the uncertainty over public transport. As with many of the issues set out above, this is particularly relevant to those with long term health conditions and disabilities, and those affected by digital exclusion.

"Since Covid they took all the bus timetables down – at one point there was one bus an hour." (Interview, Bradford)

Summary

Together, the public transport issues described by members of the public and stakeholders in the qualitative datasets describe an often challenging and unpredictable public transport system. For many, exposure to one or more of these issues may be a cause of irritation or inconvenience, but does not cause fundamentally limit the ability to participate fully and meaningfully in society. However, as discussed further below, the combination of these issues with a poor environment for active travel reinforces car dependency and forced car ownership, and results in social exclusion for those primarily or solely dependent on public transport.

Active travel

Issues with the public transport system was by far the most common theme in the qualitative data – a reflection of the extent and depth of issues encountered by the respondents, and the extent of dependence on public transport among many. However, alongside these issues, many also discuss issues while walking, cycling, and wheeling that contribute to social exclusion. This includes the ability to use active travel to and from public transport access points, and the ability to travel actively to key destinations.

Street design & community severance

Many of the active travel issues highlighted in interviews, focus groups and stakeholder engagement relate fundamentally to the design of streets and urban spaces, and how this shapes the interaction between those travelling actively and those travelling by car. Most directly, the combination of a lack of safe pedestrian crossings, high traffic volumes and speeds, and the density of dual carriageways and A-roads in urban areas is seen as creating an environment in which active travel is complex, time consuming, and dangerous. The data indicate that this can lead to a vicious cycle, in which these poor conditions lead those affected to drive more, including substituting walking journeys for car journeys, and thereby contribute to severance linked to traffic volumes.

"The entire system of pavements are broken and the roads are all dual carriageways with few traffic lights or safe crossings. Life for me as a disabled person is totally excluding" (Interview, Northumberland)

These poor active travel conditions and community severance effects are most apparent in the urban areas described by the respondents, but also apply to rural communities. Respondents describe that, in these rural areas, poor active travel conditions reflect the combination of a lack of pavements, the widespread use of national speed limits on roads between communities, increases in traffic volumes on minor as well as major roads, and a lack of lighting on otherwise walkable routes. This undermines both the ability of those in rural communities to access local services without having to drive, and adds to the stress and time impacts of using rural public transport services.

> *"'Some of the children from the primary school live nearby, but they go on the bus because it's too dangerous to walk – no pavements." (Focus group, Northumberland)*

The effects of car-dominated urban and rural environments on active travel are made worse by exposure to dangerous and illegal driving behaviours. Respondents describe that drivers speeding, making illegal turns, and ignoring pedestrian crossings contribute to their unwillingness or inability to travel actively, even over relatively short distances. As discussed further in Section 6, these effects fall disproportionately on those with disabilities and reduced physical mobility, and on those travelling with young children. This serves to undermine access to public transport as well as direct access to key destinations among groups that already face significant challenges when using the transport system.

> *"After dark is a no-go area for me on this estate – it becomes like a racetrack. A lot of the cars are stolen or illegal." (Interview, Bradford)*

The set of issues that the respondents raise with active travel in their everyday journeys connect to broader issues regarding spatial planning, particularly of new housing developments. Respondents describe that housing developments are built with car access in mind, and equivalent consideration is not given to public transport access and active travel. This includes public transport access points that are on periphery of new developments, requiring an often indirect and difficult walking or wheeling trip in a car dominated environment. Further to this, some describe new developments that have little or no services within walking distance, and no public transport access alongside this.

> *"They're building houses down the road, but they've all got cars. Estates are popping up everywhere and it could help support a better bus structure, but they don't work with the people involved who use buses." (Focus group, Gateshead)*

Pavement conditions

In addition to the set of issues linked to street design and urban planning, the respondents also describe an additional set of issues with pavement conditions. Within this, three sets of issues are common. First, respondents describe the impacts of broken and uneven pavement surfaces. While of little consequence for many, for those using mobility aids such as wheelchairs and walking sticks, and those travelling with pushchairs, the poor state of repair of pavements can cause major disruption. Indeed, some describe that this issue is sufficient to prevent them travelling independently, even for short distances, and as inhibiting their ability to independently access public transport.

Second, there is the issue of pavement clutter. Within this, drivers parking on pavements is by far the most commonly discussed issue, and is seen as a major limiting factor in active travel. Across the interviews, focus groups, and stakeholder engagement,

respondents describe pavement parking as widespread, that there is little or no enforcement to prevent obstructions, and that this problem is increasing. These issues disproportionately affect those using mobility aids and those travelling with pushchairs, who report being unable to pass parked cars on the pavement, and instead are forced to walk or wheel in the road. As well as being inconvenient, respondents recognise pavement parking exposes them to additional danger, and acts as a major barrier to active travel. Alongside this, the added issue of bins, advertising boards, and other pavement clutter also serves to delay and obstruct active travel journeys. For those affected, this contributes to TRSE by constraining access to other forms of transport, by adding to the stress associated with travelling for key journeys, and by adding to the time costs of travel.

> *"I had to squeeze past a van on the pavement and the wheels of my buggy fell off the kerb with all the shopping and the baby falling over in the road." (Interview, Bradford)*

Finally, conflict with other users also affects those travelling actively. This includes conflict between those walking, wheeling, cycling, and using micro-mobility in often limited pavement space, particularly on shared use pavements. This conflict is commonly described in the form of near misses, in which a faster-moving user passes a slow-moving user, causing alarm or distress. Those with visual impairments and those using mobility aids describe these conflicts between users as having a particularly detrimental impact on their ability to travel actively, and that this compounds the issues relating to pavement parking, poor pavement conditions, and car-dominated environments.

> *"I'm deaf and with more and more of these electric scooters about I'm terrified – they think I can hear them shouting out to move over. What with that and Covid I've given up going out much." (Interview, Bradford)*

Cycling conditions

Issues experienced or anticipated while walking and wheeling form the majority of the respondents' comments on active travel, and recent experience of regular cycling for travel rather than leisure is relatively uncommon among the respondents. However, despite this, comments on experiences and perceptions of cycling were raised in focus groups, interviews, and stakeholder engagement. Consequently, these comments give a degree of insight into the conditions respondents encounter while cycling, but are most applicable to understanding why cycling is not seen as a viable option.

Many of the respondents' experiences and perceptions of cycling echo and expand on the issues of severance and car-dominated environments experienced by those walking and wheeling. This includes difficulty in crossing roads and making turns while cycling, the impacts of high traffic speeds and volumes on the safety and attractiveness of cycling, and the poor quality of surfaces. This is caused and compounded by the lack of safe cycling infrastructure across the areas studied, and road layouts that are hostile to those cycling.

> *"[I]t would be nerve-racking cycling round here. Ryton is relatively flat but still no cycling. The Derwent route is fine for leisure and outsiders but no use for local connections." (Focus group, Gateshead)*

Linked to the lack of cycling infrastructure and car-dominated environments are the impacts of poor driver behaviour. Respondents describe that their experiences of dangerously close overtaking by drivers, speeding, and aggressive behaviour undermines confidence while cycling, and for some this is sufficient for them to avoid or have given up cycling altogether. As with severance, this can contribute to a vicious cycle in which poor driver behaviour results in people switching from cycling to driving. The combined effect of multiple individual decisions to switch to driving contributes in turn to increased congestion and severance.

> *"I'd like to cycle but don't feel safe. [The] roads seem less safe – more speeding and aggressive behaviour" (Interview, Bradford)*

The perceived and experienced dangers and stresses of cycling, particularly when compared with driving, are central to the issues raised in this element of active travel. Alongside this, a small number of respondents also mention topography, with hilly areas seen as an impediment to cycling, and weather. However, unlike experiences linked to safety and infrastructure, it is not clear how significant these factors are to limiting or preventing cycling trips. Perceptions of the relative undesirability or lower social status of cycling compared with driving also appear in the dataset, but it is unclear how significant this factor is in limiting access to opportunities, key services, and community life.

Car travel

As discussed in Section 3, unconstrained access to a car is one of the key differentiating factors in exposure to TRSE. By unconstrained, this means that a person can access a vehicle at the times required, and can afford the running costs without significantly scaling back on other key expenditure. However, this does not mean that all of those with some degree of access to a car avoid TRSE. Indeed, the qualitative data demonstrate that car dependency and forced car ownership also contribute to social exclusion.

Car dependency and forced car ownership

The widespread and inter-connected issues with public transport and active travel set out previously are a direct cause of TRSE, with some of those solely reliant on these modes unable to access opportunities, key services, and community life, and faced with knock-on effects through costs, time, and stress. However, these issues also contribute to TRSE because they create conditions in which access to a car becomes necessary for accessing key destinations, even if this is at the expense of wider social inclusion.

Accounts of car ownership and car use in the qualitative data widely focus on the key role of this in supporting the respondent's everyday lives. This is often set in the context of awareness and perceptions of issues with the public transport system, poor conditions for active travel, and the requirement for trip chaining to fulfil childcare, work, and other responsibilities. Access to leisure, recreation, and retail – often concentrated in out-of-town locations that are designed around car access - also contributes to this. In this context, respondents widely view public transport and active travel as unable to meet their needs with a reasonable level of time and convenience.

> *"I simply can't manage my life without the car – work in one direction, looking in on Mum, and back to collect the kids to a deadline by 3:15" (Interview, Braford)*

The respondents' accounts of their levels of car dependency raise the issue of forced car ownership. This exists where a basic level of access to key services, work and caring responsibilities can only be fulfilled through access to a car, but where the costs of car access result in social exclusion. This includes being unable to afford to travel for other purposes such as leisure and recreation, and having to cut back on other essential expenditure. Respondents express this in relation to the regular costs of running car, including fuel costs, the often unexpected and unpredictable costs of maintaining their car, and the costs of car loan repayments. This latter set of costs are particularly significant because they are fixed, and continue even a respondent is out of work.

> *"[The] pandemic has completely changed my transport habits – switched to a car and having forked out, now stuck with paying for it, so no choice" (Interview, Sheffield)*

The extent of car dependency and forced car ownership among the respondents is also expressed in respondents feeling compelled to continue to drive, even when they are aware that it is dangerous or illegal for them to do so. In a context of limited public transport and active travel accessibility, respondents describe feeling sufficiently compelled to drive that they continue to do so with a vehicle without an MOT, or after losing their driving licence. It is important to note that this is not something that the respondents do lightly, or because of a lack of regard for the consequences. Instead, this reflects the lack of alternatives for key journeys, particularly those for work and childcare.

> *"I lost my licence last year and I'm still driving in emergencies – can't afford a taxi and there's no bus I can get to the [Alcoholics Anonymous] meeting." (Focus Group, Gateshead)*

In addition to sacrificing other areas of spending and continuing to drive despite dangerous or illegal conditions, high levels of car dependence also result in car sharing between multiple households. While this provides a degree of car access, and can avoid many of the unexpected costs associated with car ownership, respondents report that this restricts their ability to access key destinations to the days and times when they are able to borrow a car. While for some this is a predictable and stable, this is often described as an ad-hoc arrangement, that can support access to basic services and shops, but is not sufficient to support access to work or education. Respondents also report being unable to insure the car for all users, but nonetheless feeling compelled to drive.

> *"We share the cost of the car – take turns – but earnings vary and [its] often off the road. Not insured either" (Interview, Sheffield)*

The majority of qualitative data on car dependence and forced car ownership relate to the impacts the respondents see in their own lives. However, it is also evident from a small number of responses that this issue also contributes to TRSE among younger people. In particular, respondents note that their children are dependent on them for lifts in order to travel outside of their immediate area, due to the lack of public transport and active travel alternatives. As well as impacting on the time and costs to those driving, this is seen as constraining the opportunities for independence among young people – limiting them to the times and destinations that others are willing to drive to. Extensive primary research with young people was not undertaken as part of this project, and represents a significant area for further research on TRSE in the North.

Traffic and congestion

As set out in Section 3, traffic congestion is among the most highly rated transport issues in the survey data, and is also widely discussed by the respondents in the qualitative elements of the research. The respondents' experiences of congestion appear particularly common in commuting journeys and journeys to and from schools – largely mirroring the set of issues highlighted in delays with public transport. The respondents associate this congestion with a range of issues including road works, high volumes of traffic, and poor road layouts and conditions. Parking issues are also linked to the congestion experienced by the respondents, both with regard to the impact of poor parking behaviour by other drivers, and issues in accessing appropriate parking close to a destination.

> *"Traffic on route to hospital. It is very congested, and I try to avoid rush hour. I have even turned down shifts because the time taken to get there in the morning isn't worth a few hours pay." (Interview, Northumberland)*

The potential for social exclusion through the time costs associated with driving is clear from the qualitative data, and has the potential to operate similarly to that described for public transport. This includes the potential for time spent on key journeys, such as those for work and caring responsibilities, crowding out time for leisure, community, and family life, and limiting the ability to gain further education and training. However, despite the frequency with which this issue is cited in the qualitative dataset and the relatively high priority given to this issue in the survey results, the link between road traffic congestion and TRSE is less direct than may be expected.

The relatively indirect link between traffic congestion and TRSE reflects two conditions. First, even where journey times experienced by drivers are longer than expected, the respondents widely view and experience car travel as significantly faster and more direct than the public transport and active travel alternatives available to them. Indeed, even where respondents describe that reasonably regular public transport services are available, the additional time required for a public transport journey compared with a car journey is one of the principal reasons why there is a high degree of car dependency.

Second, with the declining frequency and fragmentation of public transport services experienced by the respondents, the extent of delays encountered by those who are dependent on these services has increased. Several respondents report experiencing delays of an hour or more caused by one part of a multistage journey being delayed or cancelled, or as abandoning journeys after experiencing delays of this duration. Despite clear evidence in the qualitative data of impacts of congestion on access to key destinations, delays of this duration and the inability to complete journeys because of road congestion while driving is not widely reported by the respondents. This combination of issues means that, while congestion experienced while driving can contribute to TRSE, and is clearly of inconvenience to many respondents, the link between congestion and TRSE is lesser than may be expected.

> *"Roadworks and school run traffic causes uncertainty – worried being late to pick up kids. [My] car essential though for caring for mother and others" (Interview, Sheffield)*

Summary

The qualitative and survey data highlight the limitations of public transport and active travel provision across a diverse set of areas in the North of England, and the challenges this poses for accessing opportunities, key services, and community life. It also demonstrates the knock-on stress, financial, and time impacts associated with accessing these key destinations. This includes the issue of forced car ownership, in which car access is necessary to maintain a minimum level of access to work and caring responsibilities, but leads to financial difficulties that also contribute to exclusion.

The evidence available suggests that these issues are engrained and widespread in the areas studied. However, it is clear that not all of those who experience these issues face social exclusion. Many are instead able to mitigate or avoid the transport issues they would otherwise face by changing how, when and where they travel. This is most evident in the case of traffic congestion while driving which, despite being widely experienced by the respondents, far from universally translates into TRSE. To further develop the link between transport issues and social exclusion, the following section sets out the socioeconomic and demographic groups that are disproportionately impacted by these transport issues, and through this are exposed to TRSE.

- Six -

The distribution and risk of TRSE in the North

The extent & distribution of TRSE in the North

Section 5 set out the challenging context experienced by many of the respondents across a range of areas contexts in the North. This spans an inter-connected set of issues across public transport, active travel, and car transport. Building on this, this section sets out how these issues disproportionately impact specific population groups, drawing on the survey and qualitative datasets collected in the areas studied. This section then uses a range of secondary datasets to estimate how the risk of TRSE varies across the North, and how this compares to other areas of England.

The distribution of TRSE

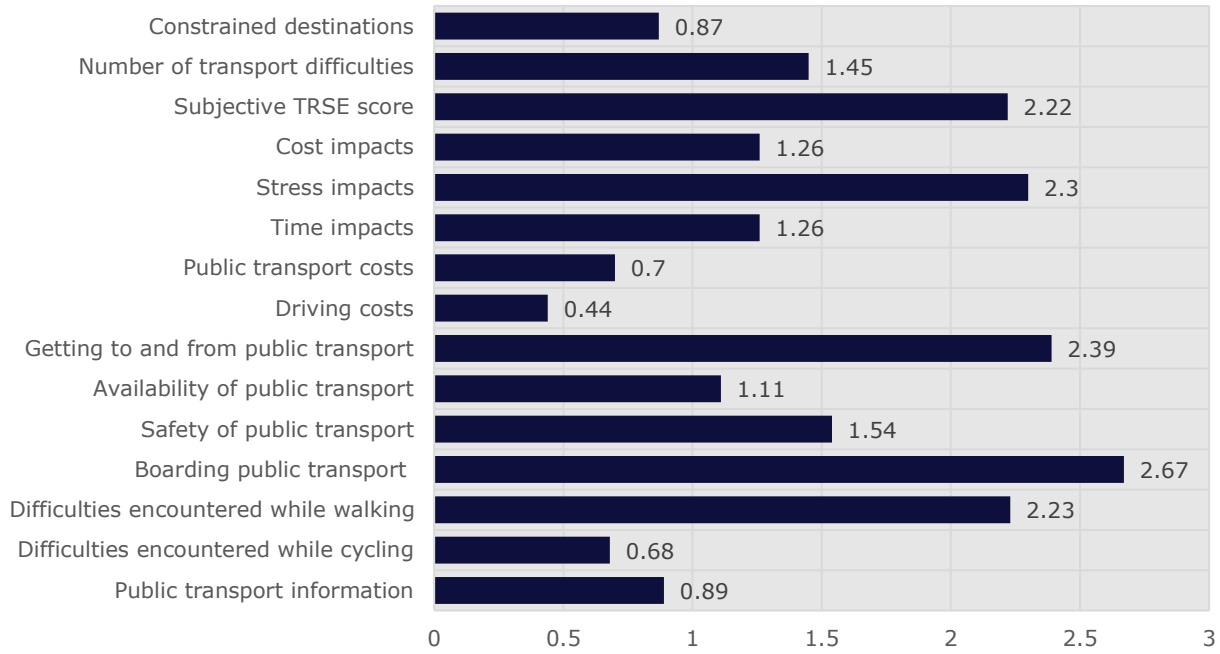
The literature review set out in Section 2 provides a set of demographic, socioeconomic, and identity groups that are relatively more exposed to issues in the transport system, and who are more likely to be socially excluded as a result of exposure to these issues. The survey and qualitative data have been analysed to identify differences in exposure to TRSE linked to these characteristics. Below, the focus is on seven broad population groups that the survey and qualitative data indicate are most exposed to TRSE. These are: People with disabilities and long-term health conditions, people with caring responsibilities, those on low incomes and in insecure employment, women, ethnic minority communities, younger people and those of working age, and LGBTQ people.

For six of the seven population groups discussed below, a comparison of survey data is presented to indicate the scale of the difference observed, and qualitative data used to verify and explain these differences. The exception to this is TRSE among LGBTQ people, for which sampling limitations in the survey means a statistical comparison is not possible. The graph presented for each population group shows the differences observed between those in and outside of these population groups for two types of variables. First, there are six variables that measure the different dimensions of TRSE, including the number of constrained destinations, the subjective TRSE score, and the cost, stress, and time impacts of using the transport system. Second, there are ten variables that measure exposure to a broad set of issues with public transport, driving, and active travel.

Disability and long-term health conditions

Of the population groups analysed in the survey and qualitative research, the largest observed difference in exposure to TRSE is between those with and without disabilities and long-term health conditions. Indeed, within the survey data, there are large statistically significant differences between those with and without disabilities and long-term health conditions across 15 of the 16 variables tested. As shown in Graphs 6.1, these differences are evident in the measures of exposure to TRSE such as access to key destinations, stress impacts and time impacts, and in how respondents rate the difficulties they face in using the transport system. Differences are also evident in the respondents' experiences of getting to and from public transport access points, boarding public transport, and difficulties encountered while travelling actively. The only variable where a statistically significant difference is not observed is in the effects of road traffic congestion.

Graph 6.1 – Statistically significant differences in mean scores: Disability and long-term health conditions



The differences observed between those with and without disabilities and long-term health conditions in the survey data, and the size of these differences relative to those for other population groups, resonates with accounts provided in the qualitative data. Respondents with disabilities and those that support people with disabilities and long-term health conditions describe additional exposure to a range of transport issues, and the data make clear that exposure to these transport issues is more likely to result in TRSE for those affected than for the population in general. The reasons for this are set out below.

Most directly, those with disabilities and limited physical mobility describe difficulties in boarding and using public transport because of a lack of appropriately adapted facilities. This includes step-free access, reserved space for those with mobility aids, accessible information, and the availability of staff to provide support and assistance where required. For some, this is exacerbated by experiences of a lack of understanding and consideration among staff operating public transport, including experiences of discrimination and of negative attitudes. These experiences contribute to stress and uncertainty accumulated while travelling, and provide an accessibility barrier.

> *"Transport staff can mistake sufferers of Dementia or Alzheimer's for alcoholics, and treat them poorly when routes are forgotten, or they ask too many questions." (Stakeholder interview)*

Increased exposure to harassment and discrimination, and more broadly to feeling unsafe while using public transport, is also relatively more common among those with disabilities and long-term health conditions. Respondents report experiences of active discrimination from other users while travelling, and through this feeling unable to use public transport and active travel at specific times and areas. Several respondents connect this issue to crowding and congestion on public transport, which they see as increasing tension between users, and reducing their access to support from staff.

"I've been left behind several times because the people in the wheelchair space wouldn't move. Once the bus was held up for ages and it was only solved when the next bus turned [up]. It's humiliating." (Interview, Sheffield)

Poor active travel conditions also disproportionately impact those with disabilities and long-term health conditions. The qualitative data provides a wide set of examples of respondents that describe either being entirely prevented from completing their journey by active travel, or as encountering significant additional difficulties, beyond those affecting the population as a whole. Of these, obstructive pavement parking is a particularly significant issue, with the capacity to prevent those using mobility aids from travelling independently, or exposing them to additional danger and inconvenience when travelling actively. This affects both the capacity of those affected to access local destinations by active travel, and their ability to access and use public transport.

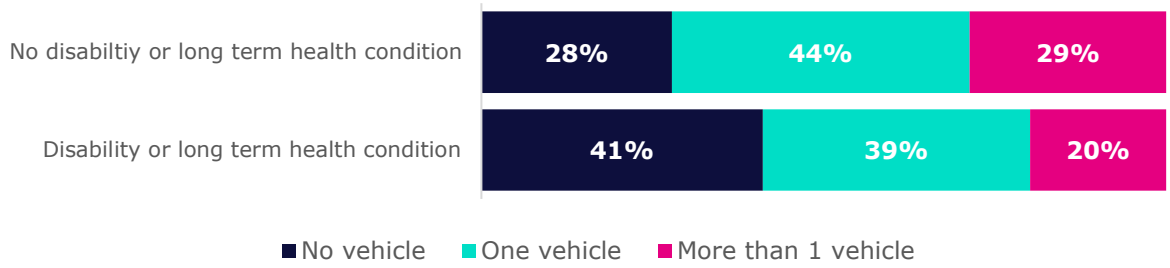
"Suddenly the path was blocked, and I was supposed to go along a bit fenced off in the road which wasn't wide enough for my wheelchair … [T]o add insult to injury they had a sign up saying they were considerate!" (Interview, Northumberland)

Respondents also highlight the additional travel requirements that can be associated with disabilities and long-term health conditions, particularly with regard to accessing healthcare services. This means that these populations are relatively more exposed to public and private transport costs, and are more likely to have to take journeys outside of peak commuter times and routes. Building on the issues set out in Section 4, this means that they are relatively more exposed to fragmentation and unreliability in the public transport system. In this context, respondents report feeling compelled to travel much earlier than would otherwise be required in order to guarantee being able to attend healthcare services at the required time, and as resorting to using taxi services despite the availability of public transport, even where these are largely unaffordable. This adds to the cost and time aspects of TRSE, to which these users are already more exposed.

As well as increased exposure to issues while using the transport system, exposure to these issues is more likely to result in TRSE among those with disabilities and long-term health conditions. In part, this reflects the fact that these populations are often less able to mitigate difficulties encountered in their journeys through travelling by a different mode. For example, the requirement for a wheelchair user to book assistance before using a train restricts these users to their booked service, and can limit their ability to change services and routes in response to delays and disruption. More broadly, the fact that access to private transport is also relatively more restricted among those with disabilities and long-term health conditions also significantly limits the transport options available. As shown in Graph 6.2 below, this is consistent with the survey data.

"If you haven't got a disability, you can just get up in the morning and decide to travel. And even when you book accessible travel in advance, there's no guarantee you'll get it." (Focus group, Sheffield)

Graph 6.2 – Access to vehicles by disability and long-term health condition status

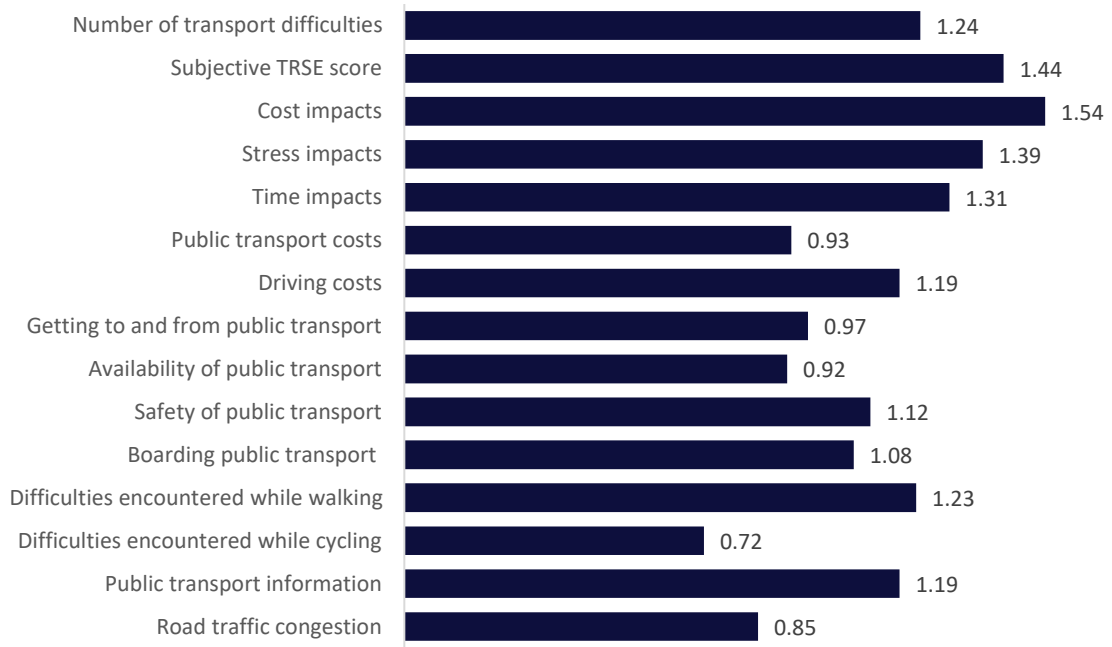


Finally, the additional impacts of common transport issues on those with disabilities and long-term health conditions reflects the structural context that these populations face. This includes the increased exposure to poverty and deprivation among these populations, the increased exposure to unemployment, and a lack of adaptation of key facilities outside of the transport system. These structural factors mean that, where transport issues limit access to opportunities, causes delays or unreliability, or cause significant stress, the consequences for those with disabilities and long-term health conditions are often significantly greater than for the population in general.

Caring

Respondents to the survey were asked if they provide care for others within or outside of their household, including providing care for children. For the purpose of this analysis, all of those who identified as having these responsibilities were grouped into a single category, regardless of if they provide care for those within or outside of their home. When comparing those with and without these responsibilities, there are statistically significant differences in 15 of the 16 variables tested. While these effects are generally smaller than that for those with disabilities and long-term health conditions, they are relatively large compared to others tested, and cover a wide range of impacts.

Graph 6.3 – Statistically significant differences in mean scores: Caring responsibilities



As shown in Graph 6.3, the differences in transport issues faced by those with and without caring responsibilities are relatively similar in size across the 10 issues studied. Indeed, there are no statistically significant differences between the size of these differences with a 95% confidence interval. However, the qualitative data does allow insight into the nature of these effects, and a degree of insight into their relative significance among the members of the public and stakeholders engaged in this part of the research.

Respondents with caring responsibilities and stakeholders linked to those caring for adults and young people cover a diverse range of travel behaviours. However, what is common among these respondents is the emphasis placed on trip chaining, in which multiple destinations are accessed in a single journey, and the requirement for travel along routes and at times that differ from peak commuter journeys. With this comes greater exposure to fragmentation and unreliability in the public transport network, and the greater risk of forced car ownership in order to reliably fulfil caring responsibilities. Indeed, having caring responsibilities is one of key reasons cited by those who discuss the financial strain associated with car ownership, or feeling compelled to drive an uninsured or faulty vehicle.

> *"Roadworks and school run traffic causes uncertainty – worried [about] being late to pick up kids. [C]ar essential though for caring for mother and others" (Interview, Sheffield)*

Greater exposure to active travel issues is also evident among those with caring responsibilities. As with the relatively greater challenges faced by those with disabilities and long-term health conditions, pavement parking and associated issue of cracked and uneven pavement surfaces is commonly discussed by those with caring responsibilities. Exposure to these issues is exacerbated by travelling with a pushchair or while accompanying those using mobility aids. Car-dominated urban environments, including a lack of safe crossings, exposure to high traffic speeds and poor driver behaviour is also commonly discussed, and is seen as a significant impediment to accessing local destinations and public transport access points. This in turn serves to reinforce car dependence, and with this the knock-on impacts on other areas of household spending.

> *"Getting children to school is not a good experience. Pavements are uneven, cars are parked, and no space for pushchairs to pass." (Interview, Bradford)*

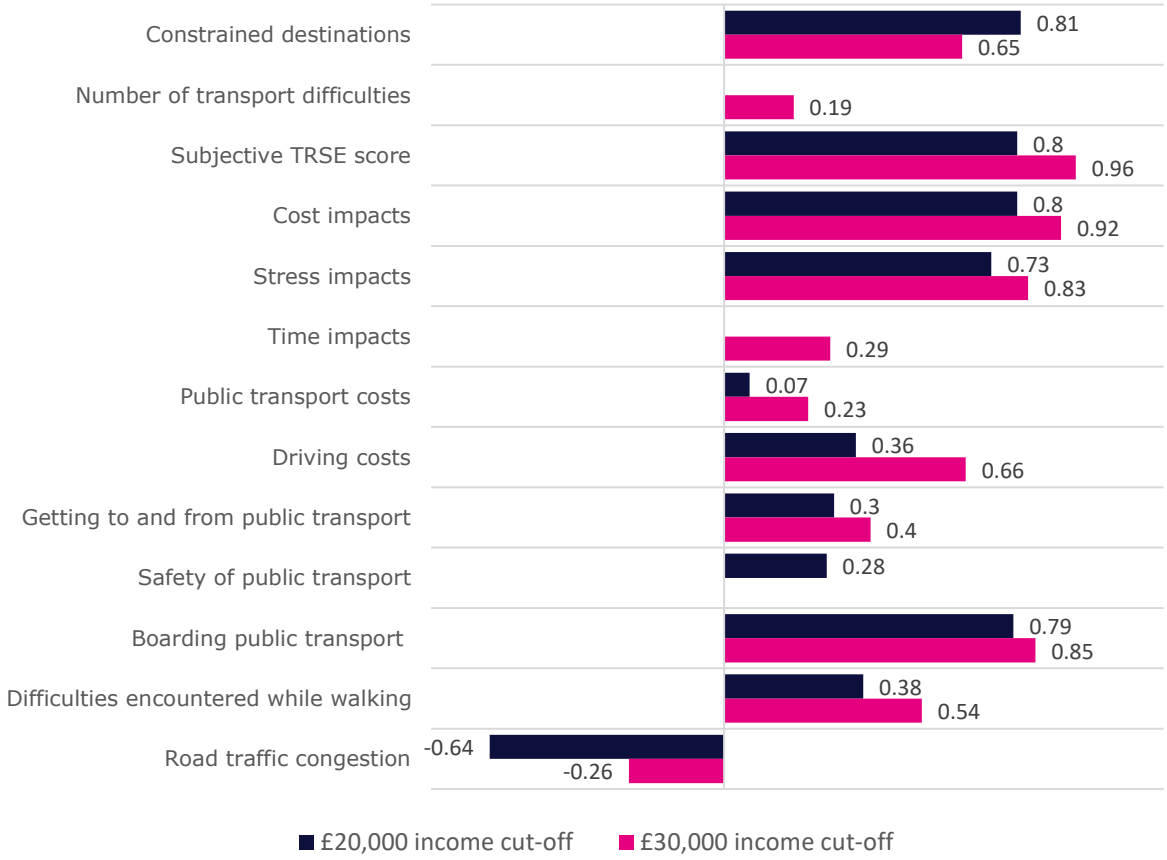
The impacts of poor active travel conditions are evident across respondents with a wide range of caring responsibilities, but is particularly relevant to parents and carers with school age children. Respondents in these circumstances describe that traffic conditions and poor pedestrian facilities mean that it is unsafe for their children to walk or cycle to school. This in turn means that the parent or carer feels obliged to drive their child to school, or accompany them on public transport, rather than travelling actively. As well as financial costs, this can have significant impacts on the time available to those affected, with respondents describing being unable to take up work opportunities because of the need to travel with their child. Reflecting this, there is a relatively large and statistically significant difference in experiences of traffic as a pedestrian between those with and without caring responsibilities.

Income and employment

Survey respondents were asked to provide an estimate of their annual household income in five income bands. Graph 6.4 compares exposure to different manifestations of TRSE and to a range of issues in the transport system based on two income cut points: those with annual household incomes above and below £20,000, and those with annual household incomes above and below £30,000 a year.

Across both of these cut off points, Graph 6.4 shows greater exposure to TRSE among those with lower incomes, and greater exposure to a range of issues in the transport system among those on lower incomes. The only exception to this is exposure to road traffic congestion, with a small but significant lower mean score on this issue reported among those on low incomes. This is likely to reflect lower levels of car access and increased reliance on active travel and public transport among those on lower incomes. Indeed, 49.9% of respondents with a household income of below £20,000 reported having access to a car, compared with 87.6% of those with a household income above £20,000.

Graph 6.4 – Statistically significant differences in mean scores: Income and employment



While there are statistically significant differences in the majority of the variables shown in Graph 6.4, there are no significant differences in the scores on the availability of public transport, difficulties encountered while cycling, and access to public transport information between those above and below the income thresholds examined. This does not mean that those on lower incomes are not exposed to these issues, but rather that there are no statistically significant differences between those above and below the thresholds tested. However, as is clear from the qualitative data, being on a low income can exacerbate the consequences of these transport issues.

The relatively greater impact of the common set of transport issues examined in the survey on those with low incomes reflects three inter-connected differences with those with middle and higher incomes. First, those on low incomes are significantly less likely to have access to a car and, even where they do have access to a car, are more likely to face constraints in their access to it. In part, this latter difference reflects the cost constraints on fuel purchases associated with low incomes, but it also more broadly reflects the impacts of maintenance and insurance costs on those on low incomes and, for some, having to share a car with others within and outside the household.

> *"Last month it was a tossup between paying the gas bill or getting the car MOT." (Interview, Bradford)*

Second, and in part because of differences in car access, those on lower incomes are more reliant on public transport and active travel, and less able to mitigate unreliability and fragmentation in their journeys. As well as the ability to use a car when needed, this includes the ability to switch modes of public transport in response to issues encountered in key journeys, and to use taxi services where necessary. Underlying this is the lack of transferability of tickets and passes between operators and modes of public transport, meaning that those on low incomes are less able to adapt to delays and cancelations in key journeys, compared with those on higher incomes. Linked to this, those on low incomes are less able to adapt to changes in routing of bus and other public transport services, particularly where this creates the need to travel by more than one operator.

Third, differences in the types and location of work types undertaken by those on lower and higher incomes mean that the same transport issues are more likely to contribute to TRSE among low-income households. This includes increased prevalence of shift work, which requires travel at times when public transport services are less frequent and less integrated. Increased propensity of working in 'out of town' facilities and industrial areas also exposes more of those on low incomes to fragmented and infrequent public transport services, and makes those affected more vulnerable to routing and timetables changes. More broadly, greater exposure to insecure work means that the financial consequences of delays in journeys can be significantly greater for those on low incomes.

> *"My son works in an office and if his train's late nothing happens to him, but I lose pay." (Interview, Stockport)*

The differences in working location and patterns between those on higher and lower incomes, and the link from this to TRSE, has been exacerbated by the shift towards home working during the COVID-19 pandemic. Of employed respondents, 48% of those with a household income below £30,000 said that it was not at all possible for them to work from home, compared with 32.2% of those with higher household incomes. This increases to 51.7% of those with an income below £20,000. This means that, where public transport services have reduced or become increasingly fragmented as a result of the COVID-19 pandemic, those on low incomes are likely to have been disproportionately affected.

The issue of digital exclusion among those on low incomes is also described by respondents to the qualitative research. Here, respondents link being unable to afford smartphones, home internet access, or mobile data as limiting their ability to access information about public transport. Similarly, stakeholders describe how the increased use of contactless payments for public transport has benefitted many, but has the potential to reinforce social

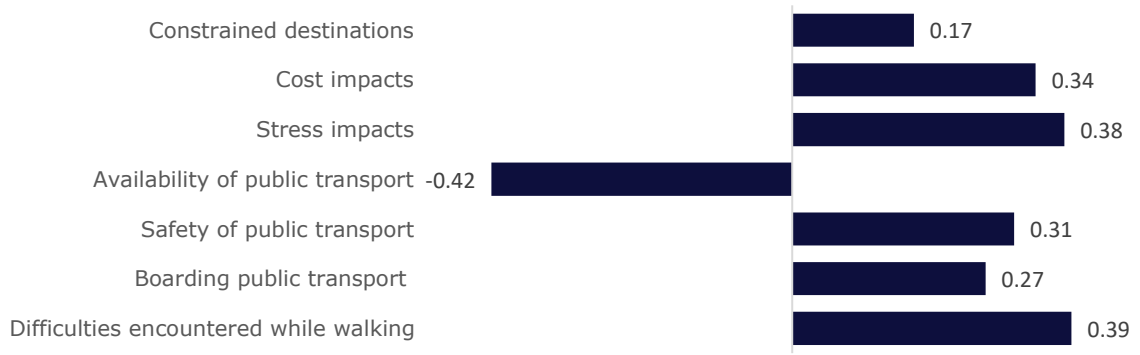
exclusion among those who lack access to banking facilities and smartphones. However, while this issue clearly has the potential to contribute to TRSE, this does not translate into statistically significant differences in access to public transport information among those on lower incomes. In part, this is likely to reflect the online engagement approach used in this survey, which necessarily limits participation from the digitally excluded.

> *"All of the timetables at stops have been vandalised – I've never heard of an app" (Interview, Bradford)*

Gender

Gendered differences in transport behaviours and experiences, and the consequences of this for TRSE, are well documented in a number of contexts. However, as shown in Graph 6.5, the survey data shows only relatively small differences in exposure to TRSE and to the range of transport issues examined between male and female respondents. These statistically significant differences are evident in the number of constrained destinations; the greater cost and stress impacts reported by female respondents, and in a small number of issues with public transport and active travel. However, there are no significant differences in the subjective TRSE score, the number of transport issues encountered, and in the impact of public transport and driving costs. This is despite statistically significant differences in access to private vehicles between male and female respondents.

Graph 6.5 – Statistically significant differences in mean scores: Gender



The statistically significant differences between male and female respondents on stress impacts of using the transport system, of feeling unsafe when using public transport, and on difficulties experienced while walking resonates with accounts in the qualitative research. In particular, respondents provide examples of experiences of harassment and gendered discrimination while using public transport and while travelling actively. The respondents that discussed this indicate that this translates into TRSE both through the direct stress and anxiety impacts of the journeys they feel compelled to take, and through changes they feel they have to make in how and where they travel. These experiences can therefore act as a constraint on the transport options available to women, exacerbating the impacts of fragmentation and unreliability.

> *"The bus route has changed so now I have to push the buggy over the park to get to the new stop and it's not safe" (Interview, Stockport)*

Gendered differences in the survey data are also evident in issues faced when boarding public transport. This difference is relatively small, particularly when compared with the

equivalent difference for those with disabilities and long-term health conditions, but is statistically significant. Linking this with the qualitative data and survey evidence on the experiences of those with caring responsibilities, this is likely to in part reflect the increased number of public transport journeys and active travel journeys taken by women with pushchairs, compared to the number taken by men. This exacerbates the impacts of issues such as pavement parking, severance and poor pavement conditions when travelling actively, and of crowding and a lack of adapted facilities when using public transport.

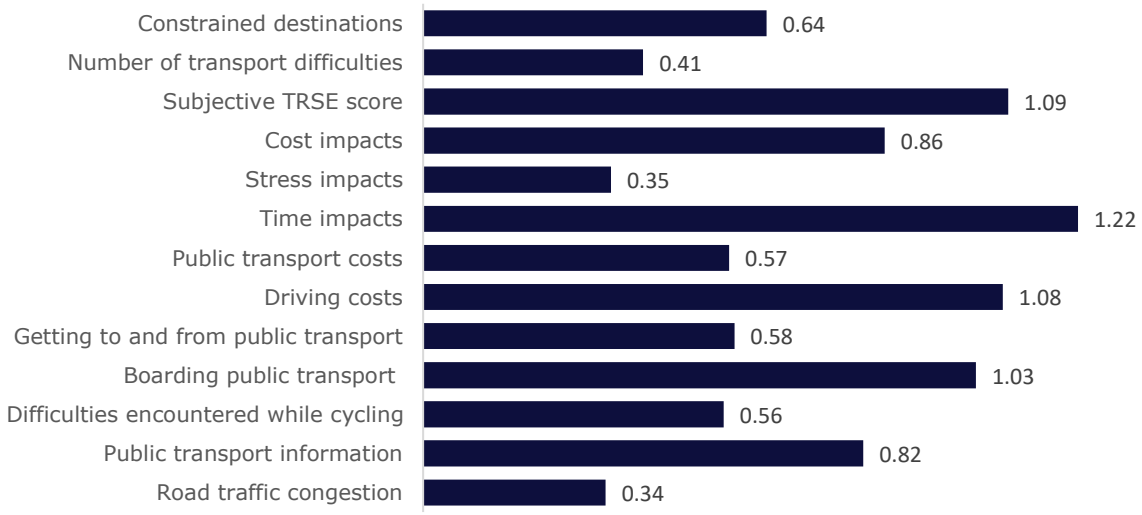
> *"Sometimes we can't get on the bus with a pushchair if it's busy – not fair that the wheelchairs get priority when we are on the bus first." (Interview, Bradford)*

The qualitative data and the wider literature on TRSE also provide strong evidence that women are more likely than men to be in part time or insecure work. Through this, it may be expected that women are relatively more exposed to time and cost elements of TRSE, particularly where work leads to the need to travel outside of peak commuter routes, and where work is combined with caring responsibilities. This reflects the increased need for trip-chaining using public transport and active travel, and is associated with higher costs and increased waiting times between journeys. However, the survey shows only relatively small differences in the cost aspects of TRSE, and is not able to demonstrate differences in trip chaining. This should not be seen to disprove differences in exposure to TRSE in this area, and points to the need for further research on TRSE and gender.

Ethnicity

Of the 16 variables included in the demographic socioeconomic analysis, there are statistically significant differences between White British and ethnic minority respondents in 13 cases. Across these, on average ethnic minority respondents report more constrained destinations and a higher subjective TRSE score, higher time and cost impacts from using the transport system, and greater difficulties boarding and using public transport. However, there are no statistically significant differences in average ratings given to the availability of public transport, the safety of public transport, and to difficulties encountered while walking. This is despite expectations from the qualitative data that safety concerns have a greater effect on ethnic minority respondents.

Graph 6.6 – Statistically significant differences in mean scores: Ethnicity



The survey data offers three key insights into the underlying reasons for these differences. First, public transport use is relatively higher among ethnic minority respondents than White British respondents, with 35.8% of ethnic minority respondents having used public transport to access at least one of the key destinations examined in the survey, compared with 26.2% of White British respondents. Second, there is a small but statistically significant difference in the proportion of ethnic minority respondents in the lowest two income categories in the survey – that is with an annual household income of less than £20,000. This is consistent with national statistics on exposure to poverty among ethnic minority communities in the North.[30] Finally, there is a large statistically significant difference in the proportion of respondents who identify as carers, with 54.9% of ethnic minority respondents and 32.9% of White British respondents identifying as carers.

Given the scale of differences in exposure to TRSE and to issues with the transport system associated with income and caring responsibilities, these underlying differences between White British and ethnic minority respondents is likely to explain a significant portion of the differences observed. Indeed, when selecting only those respondents with an annual household income below £20,000, all but three of the differences in Graph 6.6 above drop out of statistical significance, including the number of constrained destinations and the subjective TRSE score. A similar effect is observed when selecting only those respondents with caring responsibilities, which reduces the number of statistically significant differences to 6. Across both, access to information regarding public transport, difficulties while cycling, and the cost impacts of car use remain significant.

The fact that some of the differences observed in the survey data between White British and ethnic minority respondents can be explained by differences based on income and caring responsibilities does not diminish the significance of ethnicity as a factor in TRSE. Rather, it demonstrates that broader structural issues in society, including the impacts of discrimination in the labour market and in access to services, also influence TRSE. Owing to sampling limitations, the survey data are not able to provide insights into how these issues affect the diverse ethnic minority populations in the North of England, but nonetheless to affirm the significance of structural ethnic inequalities for TRSE.

Across the comparisons between ethnic minority and White British respondents, there are no statistically significant differences in concerns over the safety of public transport. However, while relatively small in number, the qualitative data contradict this aspect of the survey data; evidencing greater exposure to harassment and discrimination while using public transport among ethnic minority respondents. This includes respondents with lived experience of being targeted on the basis of their ethnic and religious identities, and respondents describing fears over being targeted by others. This is both a direct cause of TRSE through stress impacts, and can limit the transport choices available to those affected. As is common across the causes of TRSE, this is particularly significant for those on low incomes, who face greater general constraints in their travel choices.

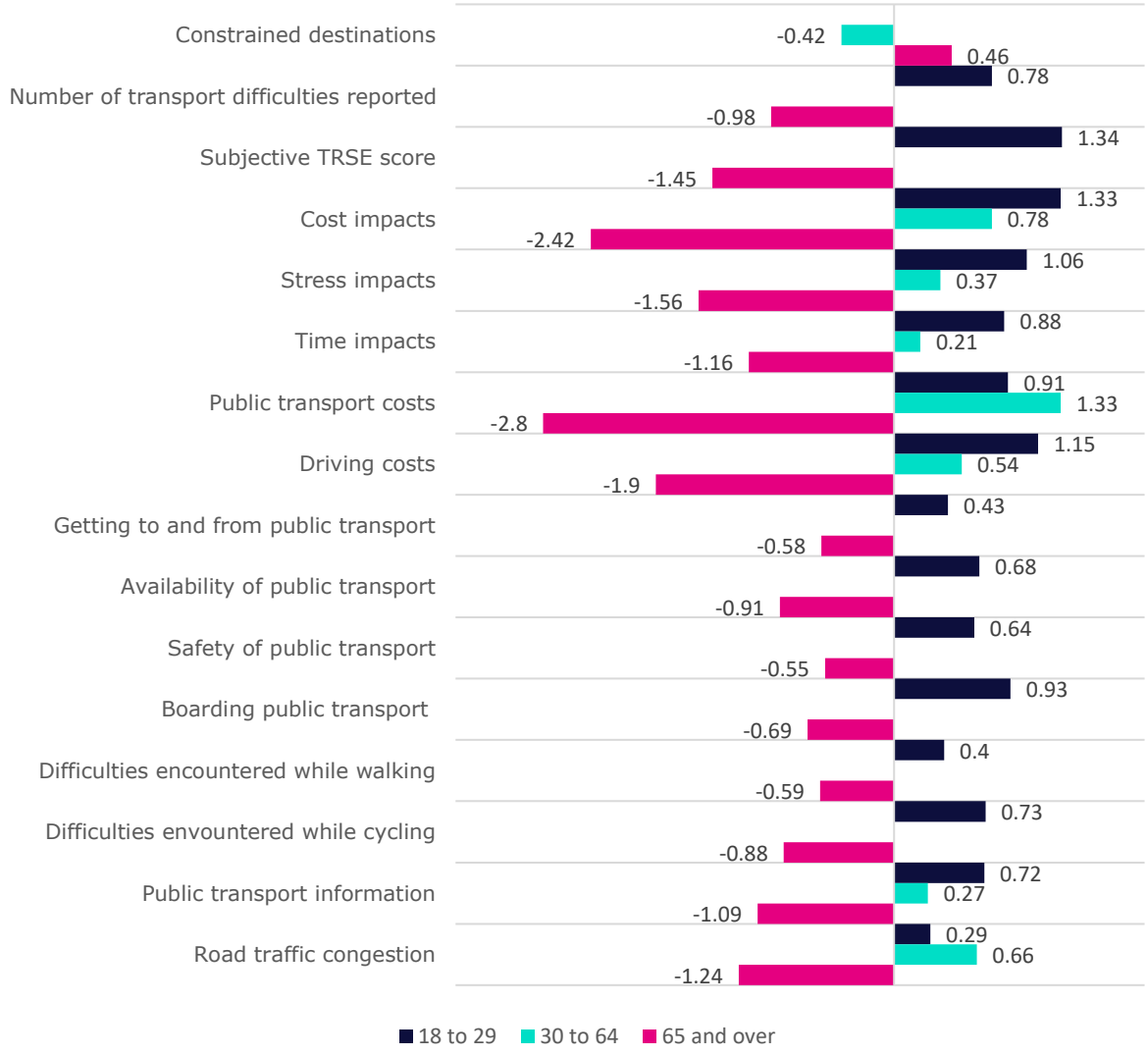
> *"My headscarf was deliberately pulled off." (Interview, Bradford)*

[30] Ethnicity Facts and Figures, 2021

Age and life stage

The relationship between TRSE and age is not linear. Rather, the survey and qualitative data demonstrates that the causes and nature of TRSE vary across life stages. These stages are broad, and relate to life events as well as age, but in general should be seen as: (1) early adulthood, in which people are transitioning from full time education into the labour market, and whose main caring responsibilities are typically for children below school age; (2) mid and late working age, with caring responsibilities for school age children and adults within and outside of the home, and (3) retirement. In the survey data, age is used as a proxy for these life stages, with comparisons made between those 18 to 29, 30 to 64, and 65 and over. Graph 6.7 compares the exposure to TRSE and to issues in the transport system across these three broad age categories.

Graph 6.7 – Statistically significant differences in mean scores: Age



Turning firstly to those 18-29, Graph 6.7 shows that, in general, those in this age category are relatively more exposed to TRSE, and to the range of transport issues tested. This includes a higher average number of constrained destinations, exposure to more issues in the transport system, and higher average cost, time, and stress impacts. Three factors are key to these differences.

First, compared with those in the middle age category, those age 18 to 29 are significantly more likely to be on a low income. Indeed, 38.5% of respondents aged 18-29 have an annual household income of £20,000 or less, compared with 27.2% of those aged 30 to 64. Consistent with national statistics, [31] the survey data show that these respondents are also more likely to be unemployed, and the qualitative data indicates greater exposure to insecure work. This means that there is a greater level of exposure to the set of transport issues linked with being on a low income, discussed previously. In addition to this, factors linked to the transition into the labour market, including participation in additional education and training, comparatively lower levels of work experience, and the ability to secure a role matching their skill level, mean that this group are more likely to rely on lower-paid roles, to experience longer spells of unemployment, and to face constraints in the locations of the employment opportunities they are able to pursue.

Second, and linked to the prevalence of low incomes and insecure work, those aged 18-29 are significantly more reliant on the public transport and active travel, and are less likely to have unconstrained access to a car. When combined with lower average incomes, this means that those in this age group are relatively more exposed to issues in the public transport system, and are less able to mitigate these issues when they occur. This is particularly significant in the context of increased exposure to insecure work, with unreliability in the public transport system having greater potential to result in losses of earnings and employment than for those with more secure working conditions.

> *"I got a job but only possible with a car and [I] couldn't afford it – chicken and egg, eh?" (Interview, Gateshead)*

Third, respondents report experiencing a sharp drop off in the affordability of public transport services as they reach early adulthood. This is linked to the loss of concessionary travel for students and young people, coinciding with an increased need to travel in order to find and access work. This is particularly significant because, for those affected, significant increases in the need to travel to access work opportunities does not necessarily coincide with increases in income. This means that some young people find themselves in a vicious cycle of being unable to afford the level of transport access necessary to find and sustain work, and having their use of transport for this and other purposes severely constrained by their lack of access to secure employment.

> *"[I] have not been on a bus since my school pass ended - no part of transport public or car is affordable" (Interview, Northumberland)*

The combination of limited access to employment, increased exposure to insecure work and limitations in access to transport means that, even when controlling for differences in income between the three broad age groups, those ages 18 to 29 still report higher than average exposure to TRSE, and to most of the transport issues tested. The exceptions to this are getting to and from public transport access points and difficulties encountered while walking, both of which drop out of significance when controlling for income differences across age groups. However, given that these income differences are linked closely to skills and employment experience, these should not be seen as fundamentally separate from age-based differences.

[31] ONS, 2022

Moving to those of mid to late working age, Graph 6.7 shows greater exposure to cost and stress aspects of TRSE among this age group, as well as increased exposure to road traffic congestion. By contrast, there is also a small but statistically significant difference in the number of constrained destinations, with those aged 30 to 64 reporting on average 0.42 fewer constrained destinations than other respondents. This should not be seen as indicating that this age group are inherently less exposed to TRSE, but rather that they can experience TRSE differently to younger and older respondents.

The survey and the qualitative data provide complementary accounts of the differences in exposure to TRSE between those of early, mid, and late working age. Within the survey data, those of mid and late working age have higher levels of access to private transport than those aged 18 to 29, and are consequently less reliant on public transport and active travel. Indeed, 74.4% of respondents aged 30 to 64 did not report using public transport to access any of the 8 key destination types considered in the survey, and 30.5% did not use active travel to access any of these destinations. This compares with 62.2% and 20% of those 18 to 29 respectively.

Greater levels of car use and higher average incomes compared with younger people means that a greater proportion of those of mid and late working age are able to mitigate issues in their journeys by using alternatives, and are less exposed to sharp fluctuations in their ability to pay to access public and private transport. However, for those with school aged children and caring responsibilities in particular, this coincides with the increased need to access a range of additional destinations. Central to this is the impacts of transporting or accompanying children to and from school and other activities. As discussed under caring responsibilities above, this places a particular time pressure on those with these responsibilities, and can reinforce the need for car ownership.

> *"It's not safe for kids to walk on their own to school – a walking taxi would be ace. The school run is horrendous – traffic everywhere and lots of pollution" (Interview, Sheffield)*

The relatively high transport use requirements among those of mid to late working age – often combining commuting, caring responsibilities for others in and outside of the household, and access to key services – means that those on low incomes in this age group are particularly affected by the knock-on impacts of their required level of transport use. Indeed, focusing on those respondents with a household income of less than £30,000, on average those aged between 30 and 64 report similarly high cost and time impacts as those ages 18 to 29, and higher levels of stress impacts. Large and statistically significant impacts are also evident when comparing those with and without children living in the household, particularly with regard to exposure to TRSE through cost impacts.

> *"My job is one way and the school the other way … with no bus to either. Before Covid my Mum used to collect the kids but now she doesn't go out so after furlough I jacked my job in." (Interview, Bradford)*

Complementing the effects observed in the survey, the qualitative data makes clear that the issue of forced car ownership is particularly significant for those of mid working age. Respondents describe being unable to balance the trips necessary for childcare with those necessary for work and to access key services without a car; owing to a combination of issues in the public transport system, barriers to active travel, and the distances between

destinations often required on a single day. For those on low incomes, the need to own and maintain a car to balance key necessary journeys linked to work and childcare can mean that journeys for leisure, recreation and community life are unaffordable.

> *"I'm not supposed to use the firm's van for private use, but it's become the neighbourhood taxi for everything you could think of, including taking things to the dump." (Interview, Northumberland)*

Turning finally to respondents aged 65 and over, the survey data indicates a lesser degree of exposure to TRSE among this group. Indeed, across the variables measuring TRSE itself and those measuring the issues in the transport system linked to this, those aged 65 and over consistently indicate lower exposure and significance. The differences observed with those aged under 65 are particularly large with regard to cost impacts, both for public transport and driving costs, but are present across the variables analysed.

The relatively lower exposure to TRSE, and to issues in the transport system, among those aged 65 and over can be explained in part by the four features of the transport behaviours and experiences of this group. First, levels of car ownership and car access among those aged 65 in the survey is significantly higher than for other age groups, with 26.7% of those age 65 and over having no access to a car, compared with 32.8% of respondents under the age of 65. As discussed previously, the consequence of this is relatively lower reliance on active travel and public transport, and the increased capacity to mitigate issues encountered in the public transport system.

Second, among respondents to the survey, significantly fewer of those age 65 and over have caring responsibilities than those under 65 – with 39% and 21.4% of respondents identifying having caring responsibilities respectively. Given the increased exposure to transport issues and to TRSE associated with caring responsibilities, these differences are likely to account for some of the differences in exposure to TRSE observed between age groups. Indeed, controlling for differences in caring responsibilities significantly reduces the size of the difference between those age 65 and over and other respondents, however significant differences still remain.

Third, the significantly lower levels of employment among those aged 65 and over removes a key trip linked to TRSE. Of those surveyed, 85.9% of those aged 65 and over listed their employed status as retired, and 11.8% in full or part time work. As discussed with regards to differences based on income and caring responsibilities, journeys to access employment have a particular role in TRSE. This reflects the significance of these journeys for income, the time constraints common to these journeys, and the extent to which time spent at work constrains transport for other purposes. While highly time constrained journeys remain common, particularly in relation to health care, the lack of these constraints mitigates some of the issues that are central to exposure to TRSE among other age groups.

> *"To make a hospital appointment on time means setting off 3 hours earlier" (Interview, County Durham)*

Finally, the availability of discounted and concessionary travel to some of those aged 65 and over further mitigates some of the cost-related drivers of exposure to TRSE. This is despite those over 65 reporting on average significantly lower household incomes than younger age groups in the survey. Access to discounted rail travel, the comparably greater

ability to time journeys to coincide with lower fares, and access to free or heavily discounted bus travel all contribute to this effect. This means that, for a comparable level of income, cost typically acts as a significantly lesser constraint on the transport behaviours of those aged over 65 than those under 65.

While in general the survey data indicates a lesser degree of average exposure to TRSE and to the range of transport issues tested among those aged 65 and over, the qualitative and quantitative data makes clear that there remains significant potential for TRSE among this group. Indeed, 26.2% of respondents aged 65 and over reported significant constraints in access to four or more of the key destinations included in the survey, 25.9% report being highly affected by four or more of the transport issues examined, and 12.8% rated the impacts of transport difficulties on their everyday life as a 7 or more. While these are lesser than the equivalent figures for those aged 18 to 29 and 30 to 64, they nonetheless demonstrate significant exposure to TRSE among this group.

Of the issues cited by older respondents and stakeholders that work with older populations in the qualitative data, issues with accessibility when using public transport and when travelling actively are particularly common. These comments closely align with those provided by respondents with disabilities and limited physical mobility across ages, and include both the limitations faced while travelling, and the impacts of uncertainty over accessibility on the ability to confidently plan journeys. As well as a lack of accessible public transport infrastructure, this includes the widespread issue of pavement parking, which has a disproportionate impact on those with reduced mobility.

> *"Not enough ramps for scooters – [I] have to rely on someone helping me and can only go on some routes which limits my choices." (Interview, Stockport)*

> *"I started out walking to the doctors, but cars were parked all over the pavement and I had to keep going round them and then my stick got stuck in a crack and I fell over." (Interview, Stockport)*

The issue of car dependence also appears among older respondents. Across the examples provided, respondents describe that having few or no feasible alternatives to using a car to access key destinations means that they feel compelled to drive. As well as the potential for financial difficulties linked to car ownership, including the issue of forced car ownership described previously, respondents connect this to feeling compelled to ignore medical advice and driving licence conditions when their eyesight or other aspects of their health impacts their ability to drive.

> *"Since I was 70, I had to declare I was medically fit to renew the license, but I know I wouldn't meet the criteria for eyesight … It's coming up again, after three years, next year and I know it's gotten worse. However, I'm quite safe since I drive slowly and only locally with roads and parking places I know well. I shall carry on." (Focus group, Northumberland)*

Constraints and transport difficulties faced in accessing healthcare services is a further point of emphasis among older respondents. As well as the significance of access to healthcare compared with other trips, and the context of potentially long waiting lists for NHS treatments, this reflects the lack of flexibility regarding these journeys, both in time and destination of travel. In this context, experiences of unreliability and fragmentation in

the public transport network can cause particular stress, with respondents reporting feeling compelled to use taxi services, even where these are unaffordable. Patient transport services do appear to offer an alternative to some, particularly in rural areas, but this nonetheless remains a significant aspect of TRSE among older respondents.

> *"[I] have to walk to the bus stop, take one bus and then change to get to hospital in Cramlington - takes ages and I've often cancelled my appointments as I don't know if I can get there in time, and would have to spend lots of money on taxis." (Interview, Northumberland)*

LGBTQ

Owing to sampling limitations, LGBTQ identities were not explicitly examined in the survey data, and as such the type of comparisons possible with other aspects of identity examined in the survey cannot be undertaken for these identities. However, it is clear from the qualitative data that, in general, LGBTQ people are more likely to be exposed to TRSE. At the centre of this, is increased exposure to harassment, discrimination and anti-social behaviour while using public transport and active travel. The qualitative data also includes accounts of discrimination experience while using taxi services, including an unwillingness to drop passengers at locations associated with LGBTQ identities.

> *"It's fine in the gay area but getting the tram back afterwards especially late at night when there aren't any staff about can be threatening. I always check to see there aren't any groups of drunks before I get in." (Stakeholder interview)*

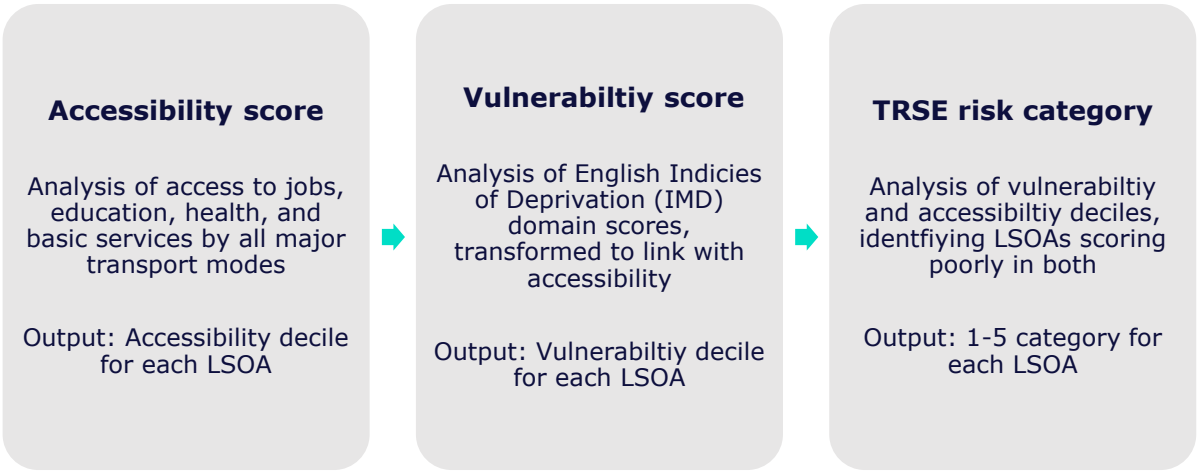
> *"Nonbinary people like myself face abuse and violence and assault on local public transport around here, not from gangs of hooded youths but from older people over 60 who unfortunately hold racist views and are openly homophobic and transphobic" (Focus group, Northumberland)*

The increased exposure to harassment, discrimination, and anti-social behaviour from others while using the transport system among those with LGBTQ identities contributes directly to TRSE through the stress and anxiety associated with travel. Alongside this, it also contributes to TRSE to the extent that it constrains the times and areas that those within these identities feel able to safely travel. This is particularly significant where it coincides with the other contributory factors to TRSE set out in this section, particularly disability, caring responsibilities, and low incomes and insecure work. These findings point both to the need for further quantitative research on LGBTQ experiences of TRSE, and for targeted policies to address the causes of TRSE among this group.

Regional variations in the risk of TRSE

Together, the survey and qualitative data demonstrate the nature of TRSE in the North, the transport issues that cause it, and the population groups that are particularly impacted by it. However, given that these data were gathered from a selection of areas in which the risk of TRSE was judged to be relatively high, it is not possible to systematically estimate variations in the risk of TRSE with these data alone. To build on this, this section sets out the results of the data analysis process summarised in Diagram 6.1. This engages a range of indicators of access to key destinations and the vulnerability of the population to social exclusion to measure variations in the risk of TRSE across England.

Diagram 6.1 - Data analysis process



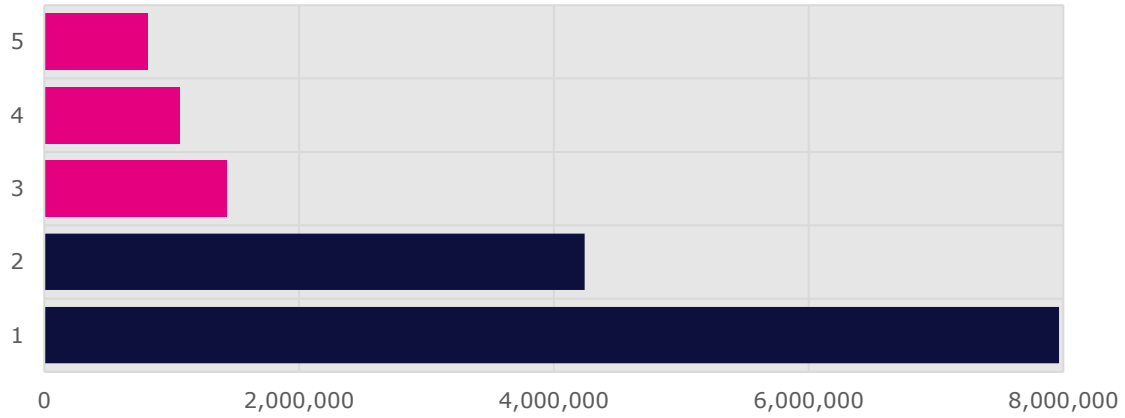
The TRSE Risk Category identifies LSOAs – small areas of approximately 1,500 residents – in which there is the combination of relatively poor access to key destinations, and where there is relatively high vulnerability to social exclusion among the population. As shown in Table 6.1, LSOAs are only considered at high risk of TRSE if they have both of these factors in combination, as this indicates that transport issues are likely to have a significant role in the level of social exclusion, rather than this being caused primarily by other factors. It should also be noted that the TRSE Risk Category is a measure of risk rather than exposure at a given point in time, and that exposure to TRSE is not limited to high-risk areas.

Table 6.1 TRSE Risk Category definitions

5 – Highest risk	3rd decile or lower in accessibility and vulnerability
4	4th decile or lower in accessibility and vulnerability
3 – Higher risk	5th decile or lower in accessibility and vulnerability
2	7th decile or lower in accessibility and vulnerability
1 – Lowest risk	All other LSOAs

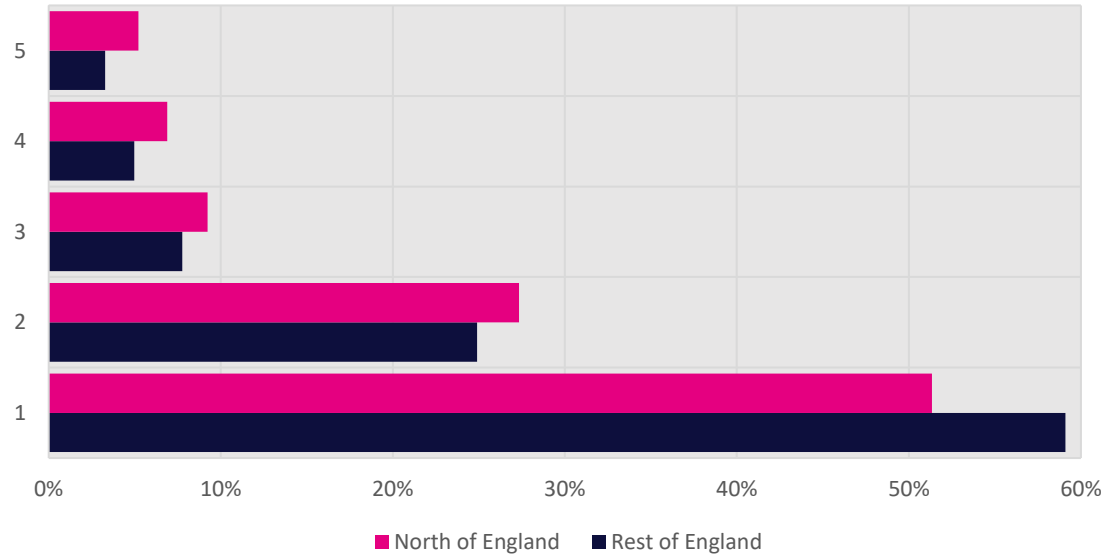
Graph 6.8 shows the distribution of the population of the North by TRSE Risk Category. Here, LSOAs in categories three, four, and five are considered to be at high risk of TRSE, with those in category five having the highest risk. On this basis, 3.3 million people in the North live in areas in which there is a high risk of TRSE. These are areas with both poorer than average access to key destinations, and higher than average vulnerability to social exclusion. Within this, approximately 800,000 people in the North live in areas with the highest risk of TRSE. These are areas in the highest 30% for vulnerability for all LSOAs in England, and the poorest 30% of accessibility.

Graph 6.8 – Population of the North by TRSE Risk Category



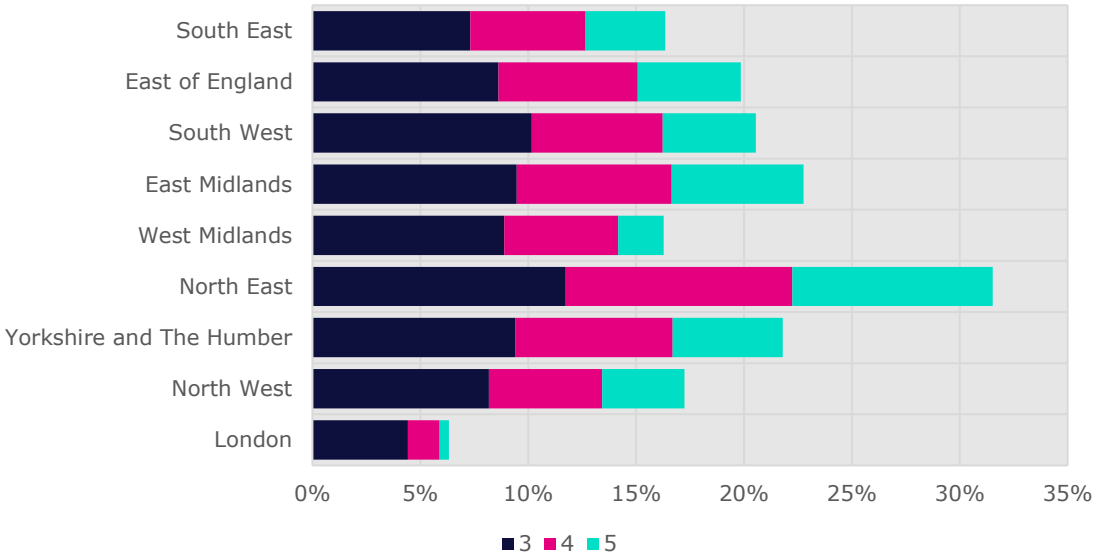
Graph 6.9 compares the distribution population of the North of England and the rest of England across the five TRSE Risk Categories. This shows the relatively higher levels of risk of TRSE in the North compared with the rest of England, with 21.3% of the population of the North living in areas with a high risk of TRSE, compared with 16% of the population of the Midlands and the South of England. Proportionally, the largest difference is in the proportion of the population in the highest risk category (TRSE Risk Category 5), with 5.2% of the population of the North living in the highest risk areas, compared with 3.3% of the population of the rest of England.

Graph 6.9 – Population of the North and rest of England by TRSE Risk Category

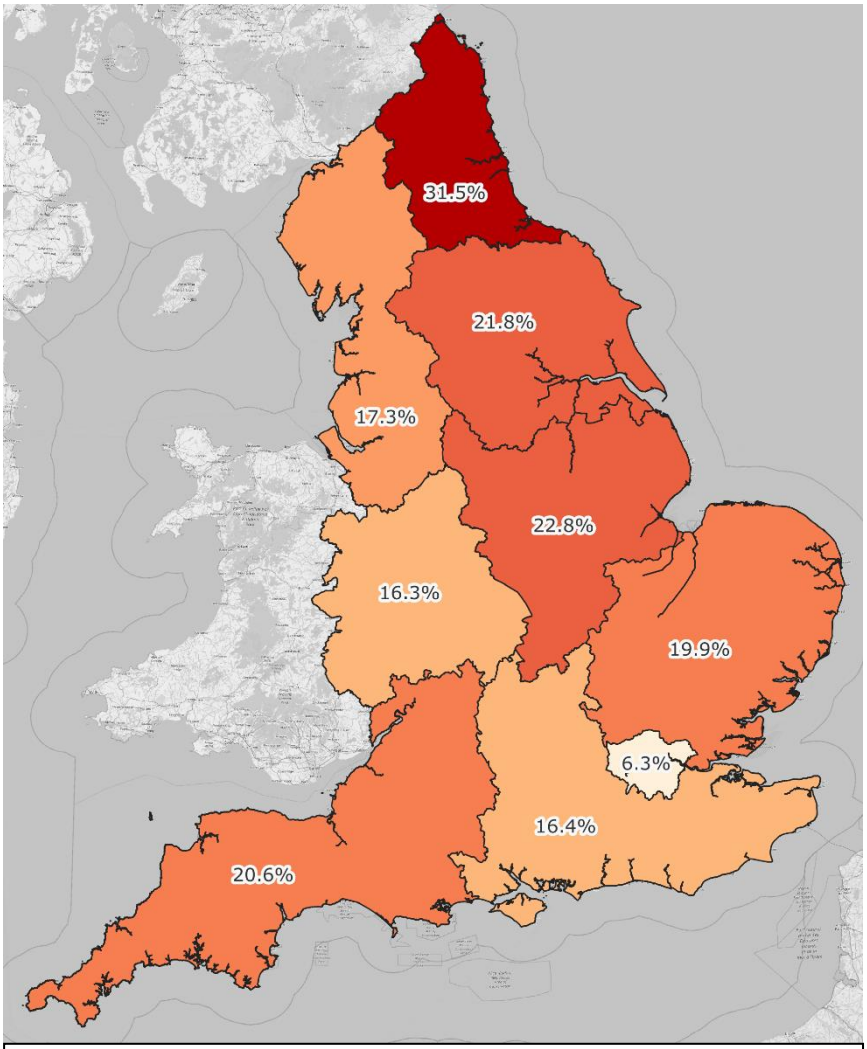


Underlying the differences in the risk of TRSE between the North and the rest of England are significant regional differences. As shown in Graph 6.10, key to this is the significantly higher levels of risk of TRSE present in the North East, and the significantly lower levels of risk present in London. Indeed, when comparing the North West and Yorkshire and the Humber with the rest of England excluding London, the difference in the proportion of the population living in areas with a high risk of TRSE reduces to 0.5%. Map 6.1 highlights these regional differences across England.

Graph 6.10 – Population of the regions of England by TRSE Risk Category



Map 6.1 – Population at high risk of TRSE by region



Boundary data source: Office for National Statistics licensed under the Open Government Licence v.3.0. Contains OS data © Crown copyright and database right 2022. Map data source: OpenStreetMap © OpenStreetMap

Underlying the TRSE Risk Category are measures of accessibility and vulnerability across four domains – employment, education, health, and basic services. LSOAs are only considered at high risk of TRSE if they have both relatively poor access to these key destination types with the transport options available, in combination with relatively high levels of vulnerability to the impacts of this poor access. For example, having poor access to healthcare services is more significant if it occurs in combination with high levels of vulnerability through poor population health. Consequently, the regional variations in the TRSE Risk Category reflect variations in both the quality of the transport system and the level of vulnerability to social exclusion.

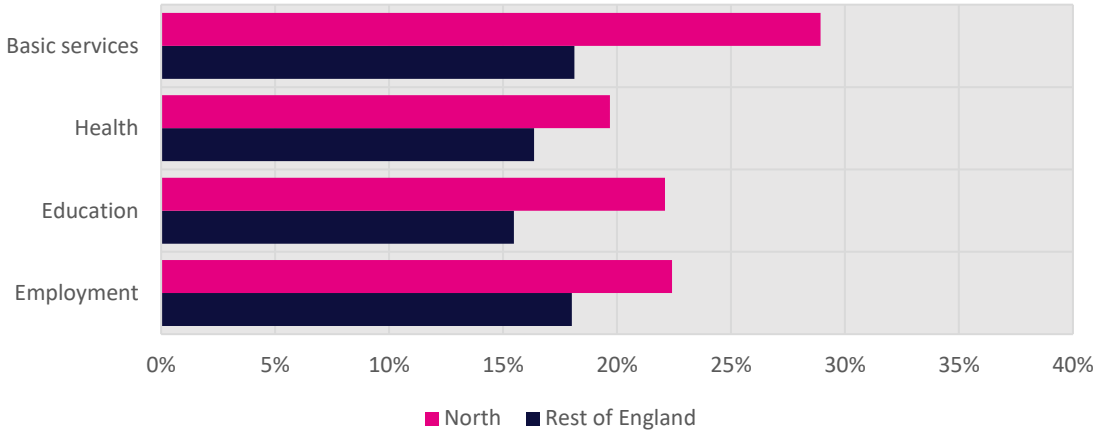
Graph 6.11 shows the proportion of LSOAs within each region of England that fall into the lowest three deciles for accessibility and vulnerability. This shows that the relatively low levels of risk of TRSE in London is caused by the greater quality and extent and transport options available, rather than lower levels of vulnerability to social exclusion. Indeed, only 2% of LSOAs in London fall into the lowest three deciles for access to employment, education, health, and basic services. By contrast, 29% of LSOAs in Yorkshire and the Humber and 50% of LSOAs in the South West fall into the lowest three deciles nationally.

The factors underlying the relatively high risk of TRSE in the North East are also evident in the comparison. As shown in Graph 6.11, the North East in not exceptional in exposure to poor transport conditions. Indeed, it is comparable to the West Midlands and Yorkshire and the Humber in the proportion of LSOAs in the lowest three accessibility deciles. However, in the North East, poor accessibility is consistently present in areas with a high level of vulnerability to social exclusion. This means that, rather than a significant inconvenience, the issues with the transport system translate into social exclusion.

Graph 6.11 – Proportion of LSOAs in the lowest three deciles by region

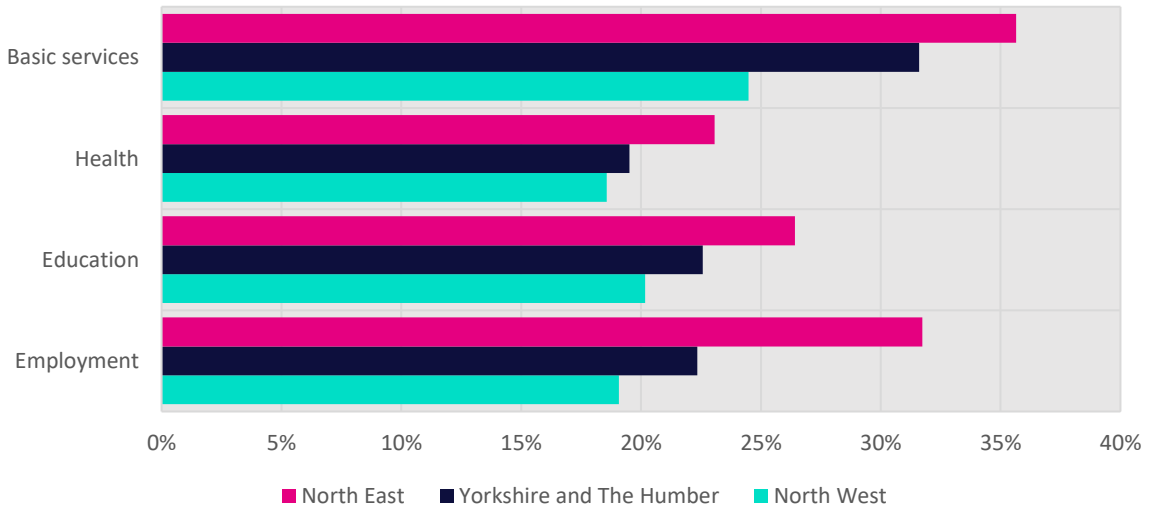
As well as variations in the overall TRSE Risk Category, significant differences between the North and the rest of England are also evident in the four domains of TRSE. As shown in Graph 6.12, some degree of difference is evident across all four domains, but there is a particularly large distinction between the North and the rest of England in the level of access to basic services among populations vulnerable to social exclusion. 28.9% of the population of the North live in areas with a basic services domain score of 3 or higher, compared with 18.1% of the population of the rest of England. This indicates that access to basic services has a significant role in the differences observed between the North and the rest of England, alongside the proportionally smaller but significant differences in the health, education, and employment domains.

Graph 6.12 – Population at high risk within each domain of TRSE



Turning to the differences observed within the North, the particularly high level of risk of TRSE in the North East is driven by differences across employment, health, education, and basic services. As shown in Graph 6.13, the North East has the highest share of the population in categories 3 to 5 across all four domains. The largest of these differences is in employment, suggesting that relatively poor access to secure and well-paid jobs has a key role in the concentration of risk in the North East. This is alongside relatively greater vulnerability to the effects of these transport issues through poverty and deprivation.

Graph 6.13 – Population at high risk within each domain of TRSE by region



The risk of TRSE across place and population contexts

Map 6.1 demonstrates the significant variations in the risk of TRSE between the regions of the North, and the particular concentration of this risk in the North East. Here, this is expanded by considering how the risk of TRSE varies across different area types and population contexts within the North and across the rest of England. This focuses on differences between rural and urban areas, between ONS area types, and between coastal and non-coastal communities.

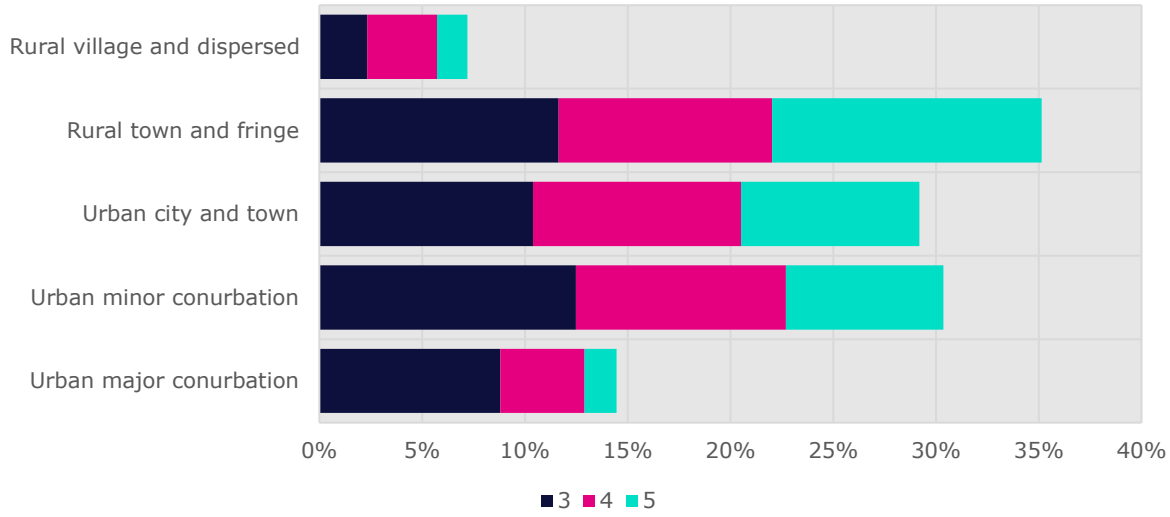
The first point of comparison is the extent to which risk of TRSE is concentrated in rural and urban areas. To assess this, LSOAs have been categorised using a modified version of the Rural Urban Classification developed by the Office for National Statistics (ONS), which considers the nature of settlements and the broader setting. Owing to the small number of LSOAs in the North in some area types, these eight classifications have been grouped into five categories in order to allow more rigorous comparison. This is shown in Table 6.2.

Table 6.2 ONS Rural Urban area classification of LSOAs in the North

ONS classification	LSOAs	Group	LSOAs
Urban major conurbation	4,293	Urban major conurbation	4,293
Urban minor conurbation	705	Urban minor conurbation	705
Urban city and town	3,164	Urban city and town	3,193
Urban city and town in a sparse setting	29		
Rural town and fringe	746	Rural town and fringe	808
Rural town and fringe in a sparse setting	62		
Rural village and dispersed	384	Rural village and dispersed	472
Rural village and dispersed in a sparse setting	88		

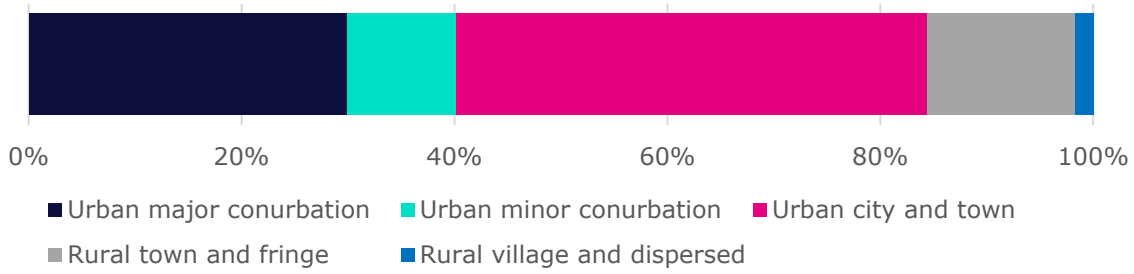
Graph 6.14 demonstrates significant variations in the risk of TRSE between area types. However, rather than a linear change in risk as an area becomes more or less urban, this indicates significant variations between rural and urban area types. Broadly, the proportion of the population at a high risk of TRSE is lowest at the two ends of the classification – rural villages and dispersed communities and major urban conurbations. Comparatively, a greater proportion of the population of minor conurbations and smaller cities and towns are in areas with a high risk of TRSE, and rural town and fringe areas have the greatest proportion of the population in high-risk LSOAs. In general, this reflects the better than average transport links present in major conurbations, and the lower-than-average levels of deprivation present in rural villages and dispersed communities.

Graph 6.14 – Population of rural-urban area types in the North by TRSE Risk Category



Graph 6.14 indicates a particular concentration of areas with a high risk of TRSE in rural towns and fringe areas, smaller cities and towns, and in minor conurbations. However, as shown in Graph 6.15, owing to the significant differences in the size of the population across rural and urban areas in the North, major urban conurbations still contain the second largest population at a high risk of TRSE. This population-based comparison also highlights the particular significance of smaller cities and towns for TRSE in the North, with 65.4% of those in the highest risk category (category 5) living these areas. This includes towns and cities such as Burnley, Hartlepool, and Rotherham.

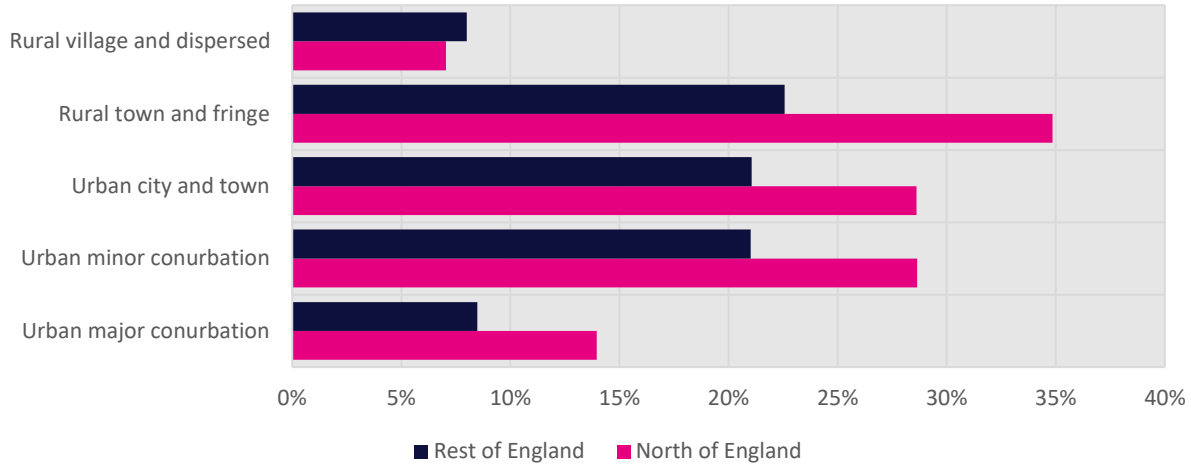
Graph 6.15 – Population at high risk of TRSE in the North by rural-urban area type



The patterns of concentration of TRSE in rural and urban areas evident in the North of England are somewhat distinct from those evident elsewhere in England. As shown in Graph 6.16, the largest of these differences is evident in rural town and fringe areas, with 34.9% of the population of these areas in the North at high risk of TRSE, compared with 22.6% in the rest of England. Underlying this are significantly higher levels of vulnerability to social exclusion present in these areas in the North compared with the rest of England.[32] By contrast, a slightly lower proportion of the population of rural villages and dispersed areas of the North are at a high risk than is the case for the rest of England. This is despite the proportionally higher level of risk of TRSE in the North.

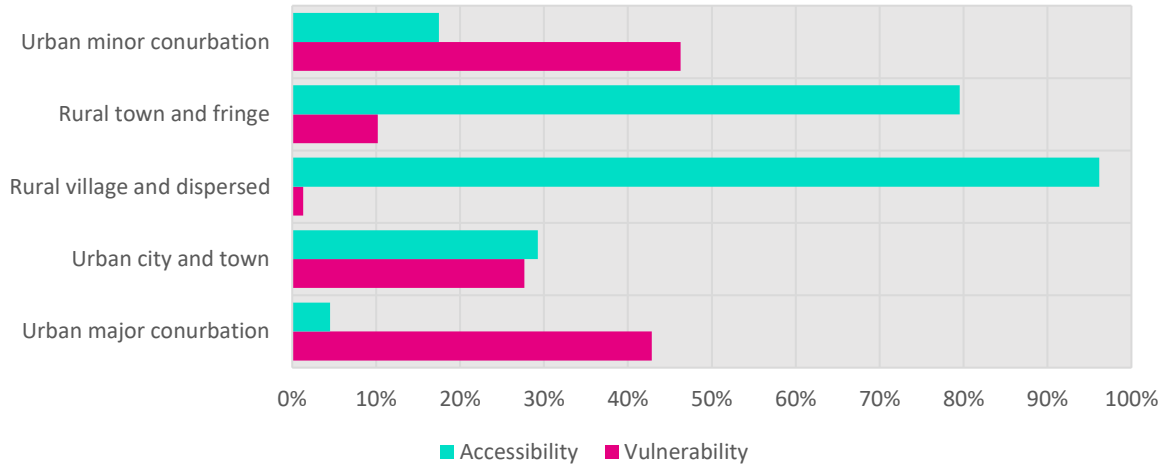
[32] 21% of rural town and fringe LSOAs in the North fall in the lowest three deciles for vulnerability, compared with 6% of rural town and fringe LSOAs in the rest of England.

Graph 6.16 – Population at high risk of TRSE by rural-urban area type



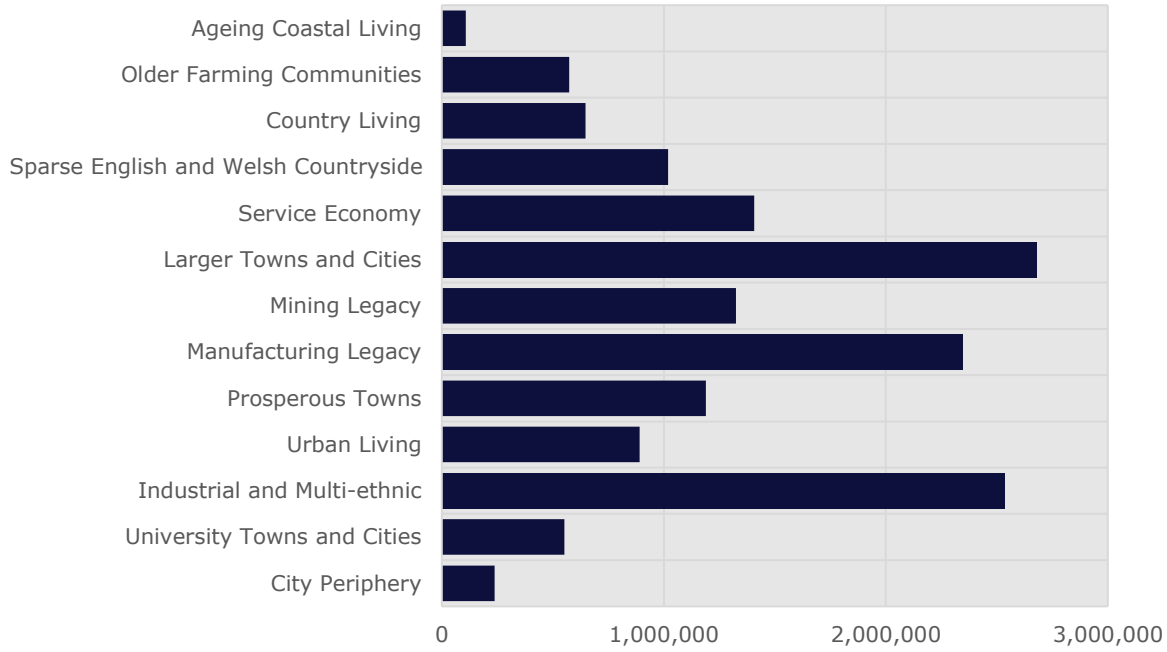
As with the regional variations, underlying these differences in the risk of TRSE between rural and urban area types are significant variations in accessibility and vulnerability. As shown in Graph 6.17, across England rural villages and dispersed communities are at the extremes of both measures, with 96% falling in the lowest three deciles for accessibility, but only 1% in the lowest three deciles for vulnerability. By contrast, in smaller urban cities and towns, poor accessibility is far more frequently found in LSOAs with a high level of vulnerability to social exclusion. Consequently, despite only 29% of LSOAs in this category falling into the lowest three deciles for accessibility, in general urban cities and towns have a far higher risk of TRSE than rural villages and dispersed communities.

Graph 6.17 – Proportion of LSOAs in the lowest three deciles by rural-urban area type



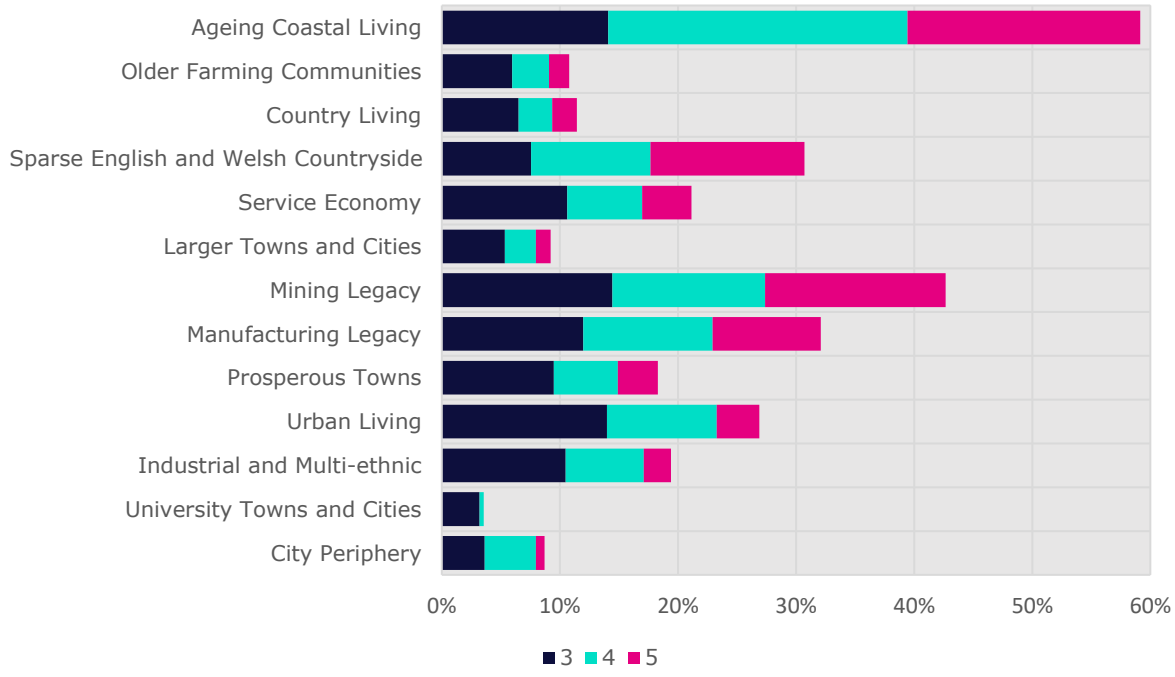
In addition to rural-urban distinctions within the North, and between the North and the rest of England, differences in the risk of TRSE are also evident when comparing by the place and population groups developed by the ONS. These groups combine data on the nature of the population and geographical area, producing 21 subgroups for areas of England. Of these, 13 are present in the North of England, of which three contain nearly half of the population of the North - Larger Towns and Cities (17.3%), Industrial and Multi-Ethnic (16.3%), and Manufacturing Legacy (15.1%). Graph 6.18 shows the distribution of the population of the North by these 13 subgroups.

Graph 6.18 – Population of the North by ONS area classification subgroups



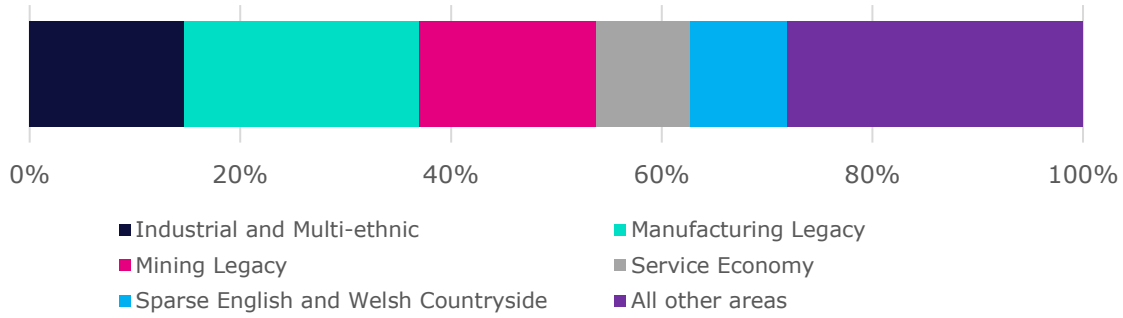
Across the 13 subgroups present in the North, there are significant variations in the level of risk of TRSE. As shown in Graph 6.19, the Ageing Coastal Living and Mining Legacy subgroups are particularly distinct, with 59% and 43% of the population in these subgroups having a high risk of TRSE. This compares with 21.3% of the population of the North as a whole, and 16% of the rest of England. Beyond this, three subgroups contain broadly similar proportion of the population at a high risk of TRSE – Manufacturing Legacy (32%), Sparse English and Welsh Countryside (31%), and Urban Living (27%).

Graph 6.19 – Population of ONS area subgroups in the North by TRSE Risk Category

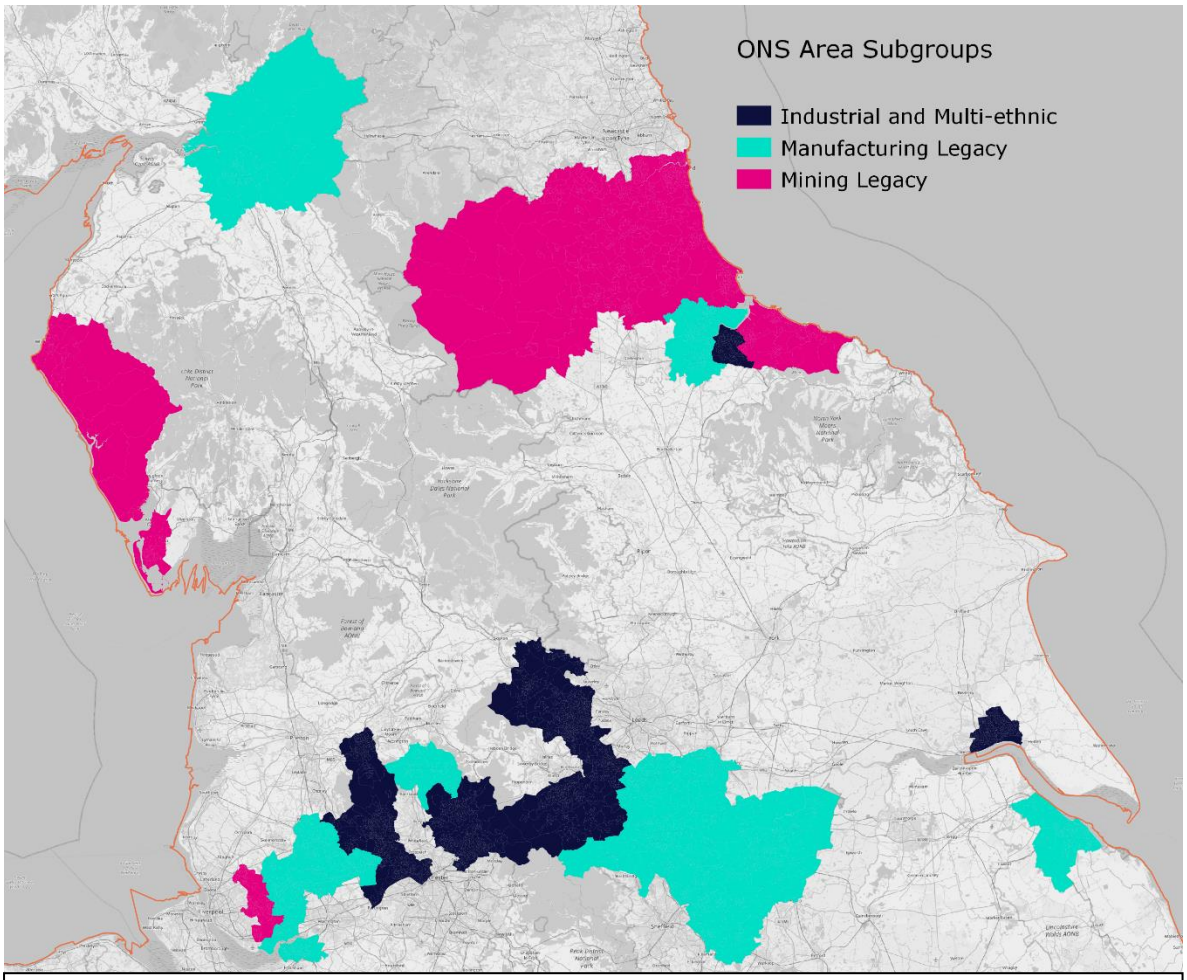


While the Ageing Coastal Living subgroup is unique in the level of risk of TRSE in the North, less than 2% of those at a high risk of TRSE in the North live in this area type. Underlying this are significant differences in the population between these area categories. As shown in Graph 6.20, when combining this population and prevalence data three area categories are particularly significant – Manufacturing Legacy, Mining Legacy, and Industrial and Multi-Ethnic. These three area categories contain 54% of the population of the North at a high risk of TRSE, including 58% of the population in the highest risk category. Map 6.2 shows the location of these subgroups across the North.

Graph 6.20 – Population at high risk of TRSE in the North by ONS area subgroups



Map 6.2 – LSOAs in the North by selected ONS subgroups



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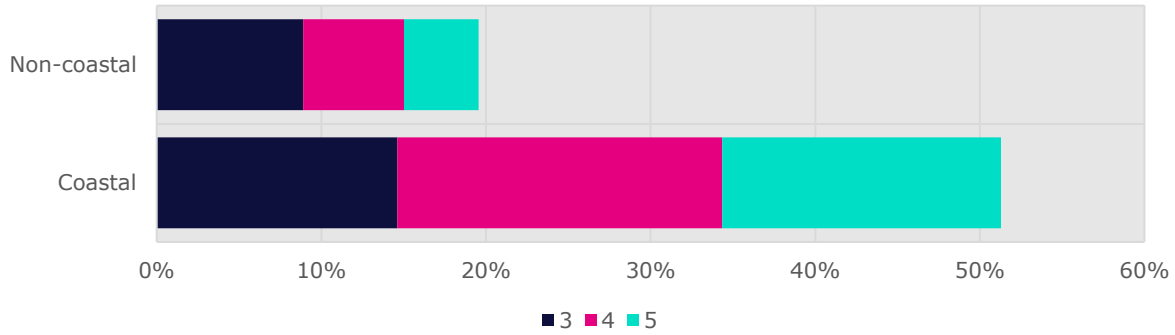
The ONS Ageing Coastal Living subgroup captures one population context present in coastal areas – namely an ageing population, often with relatively high levels of economic and health deprivation. These conditions, along with relatively poor levels of transport accessibility, lead to the concentration of risk of TRSE evident in Graph 6.19. However, even without the challenging conditions that define this category, there is evidence of higher levels of risk of TRSE in coastal areas of the North when defined on a purely geographical basis. For the purpose of this comparison, an LSOA is defined as coastal if the population-weighted centroid falls within 2KM of the UK coastline – which includes 5.9% of LSOAs in the North and 6.1% of LSOAs in the rest of England.

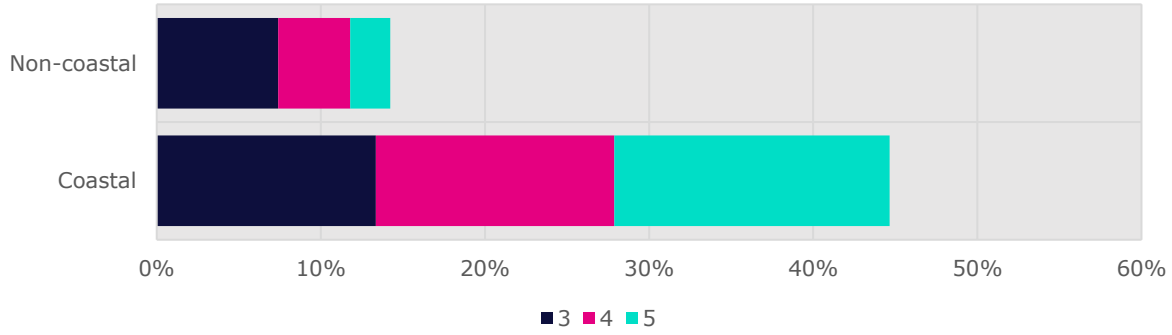
Graph 6.21 shows the proportion of population of coastal and non-coastal areas of the North with a TRSE Risk Category of 3 or above. Within this, there is evidence of a high concentration of risk of TRSE in coastal communities, with over half of LSOAs in coastal areas having a TRSE Risk Category of 3 or above. This compares to under 20% for non-coastal areas, and 21.3% of the North as a whole. Proportionally, there is also a greater concentration of LSOAs in the highest risk category, with nearly 1 in 5 LSOAs in coastal areas having a TRSE Risk Category of 5, compared 1 in 25 across England.

Graph 6.21 – Population at high risk of TRSE in the North by coastal status



The relatively higher levels of risk of TRSE present in coastal areas of the North are consistent with the pattern across the rest of England. As shown in Graph 6.22, there is a large gap in the overall proportion of the population living in areas with a TRSE Risk Category of 3 or higher between coastal and non-coastal areas, and a significantly greater proportion of the population living in LSOAs with a TRSE Risk Category of 5. However, consistent with the broader pattern of concentration, there is relatively higher risk of TRSE in coastal areas of the North than in coastal areas in the rest of England.

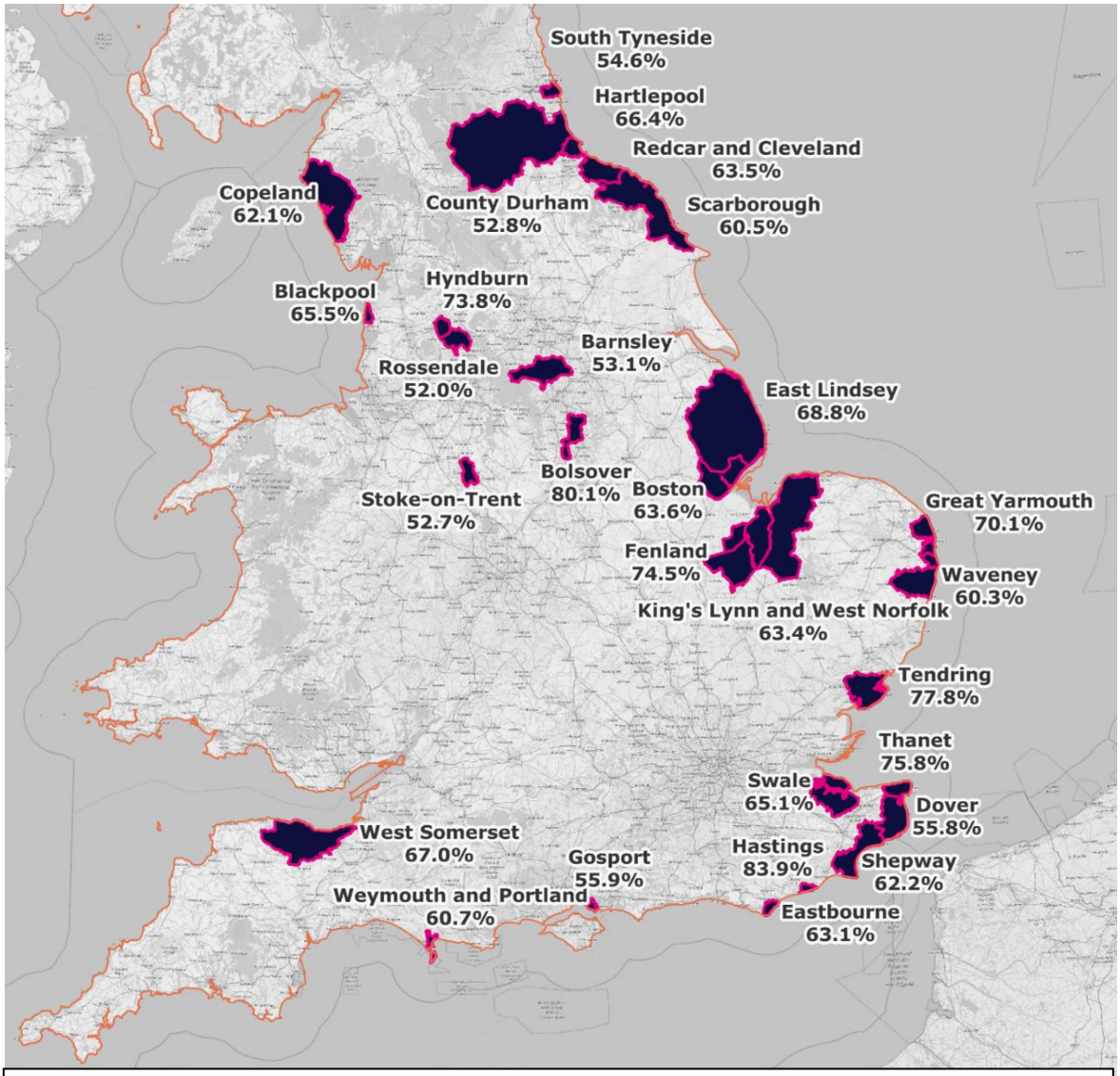
Graph 6.22 – Population at high risk of TRSE in the rest of England by coastal status



The significance of coastal locations for TRSE is further evident when comparing variations in the risk of TRSE across Local Authority Districts (LADs). Across England, there are 28 LADs where over half the population are in areas with a high risk of TRSE. Of these, 22 are in least in part coastal, and in 10 of these most affected LADs more than half of LSOAs are within 2km of the coast, based on the population weighted LSOA centroid and a 2km buffer of the UK coastline. Map 6.3 shows these 28 LADs across England, including the proportion of the population living in areas with a TRSE Risk Category of 3 or above.

Comparing the four domains of TRSE – employment, education, health, and basic services – indicates the key underlying differences that contribute to the concentration of TRSE in coastal areas. As shown Graph 6.23, there are large differences in the proportion of the population at high risk in the education and employment domains, with over double the proportion of the population in coastal areas scoring in the high-risk categories in these domains. Significant differences are also evident in the health domain, indicating both relatively poor access to hospitals and GP surgeries, and higher vulnerability to exclusion in these domains due to poor health.

Map 6.3 – LADs where more than 50% of the population is at a high risk of TRSE



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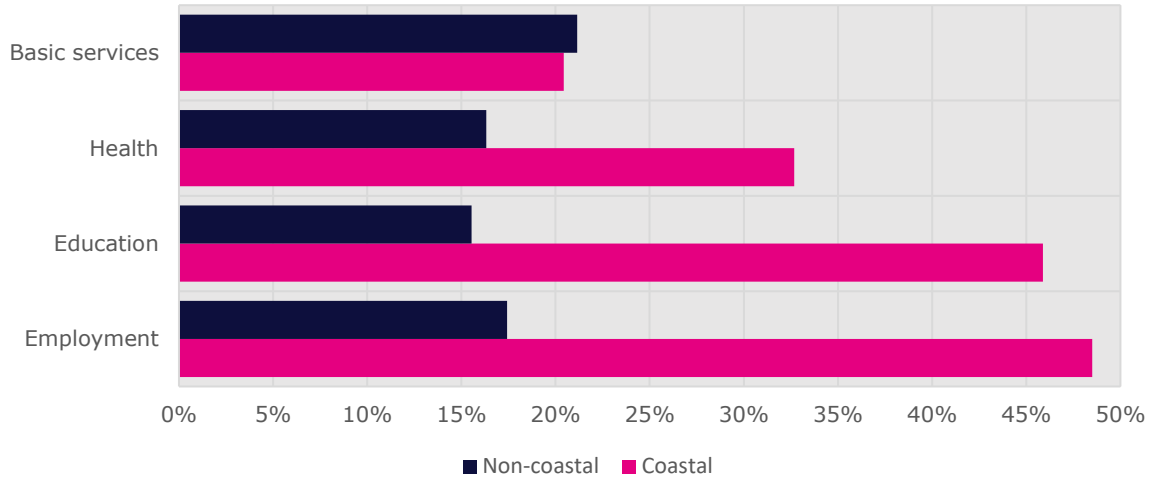
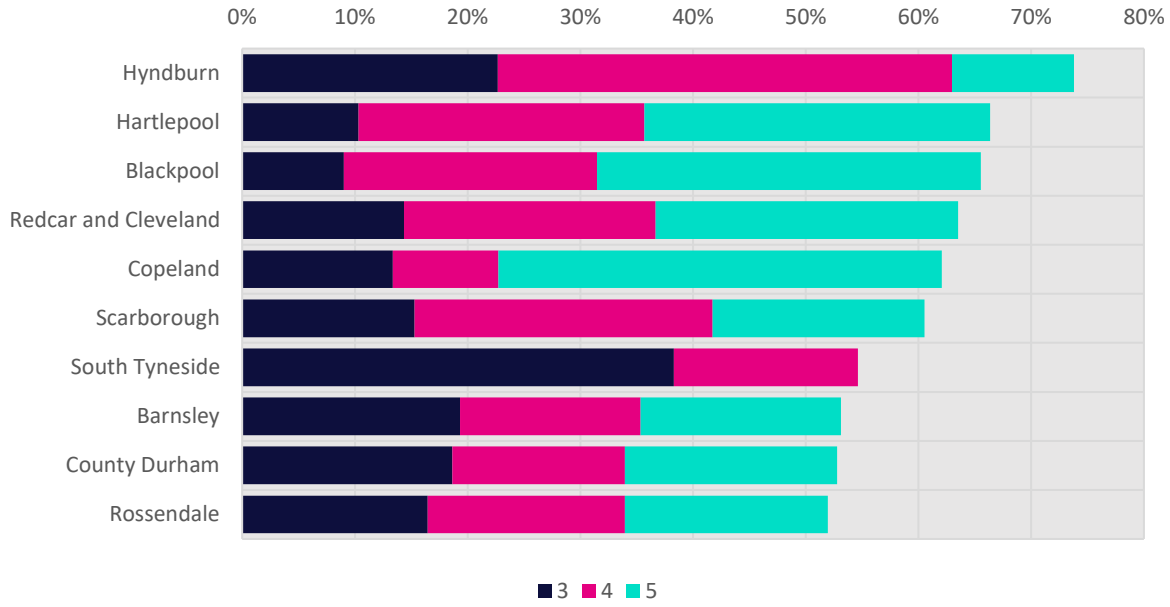
Graph 6.23 – Population at high risk of TRSE by domain and coastal status



Beyond the variations evident between rural and urban areas, ONS area types, and coastal communities, significant variations in the risk of TRSE are also evident between and within Local Authority Districts. A comprehensive examination of variations within LADs, beyond those associated with these area and population contexts, is beyond the scope of this report. Appendix 1 provides these data for all LADs in the North and all domains of TRSE, and TfN's online TRSE Tool provides interactive access to these data at the LSOA level across the North and the rest of England. The final part of this section compares the risk of TRSE across LADs in the North.

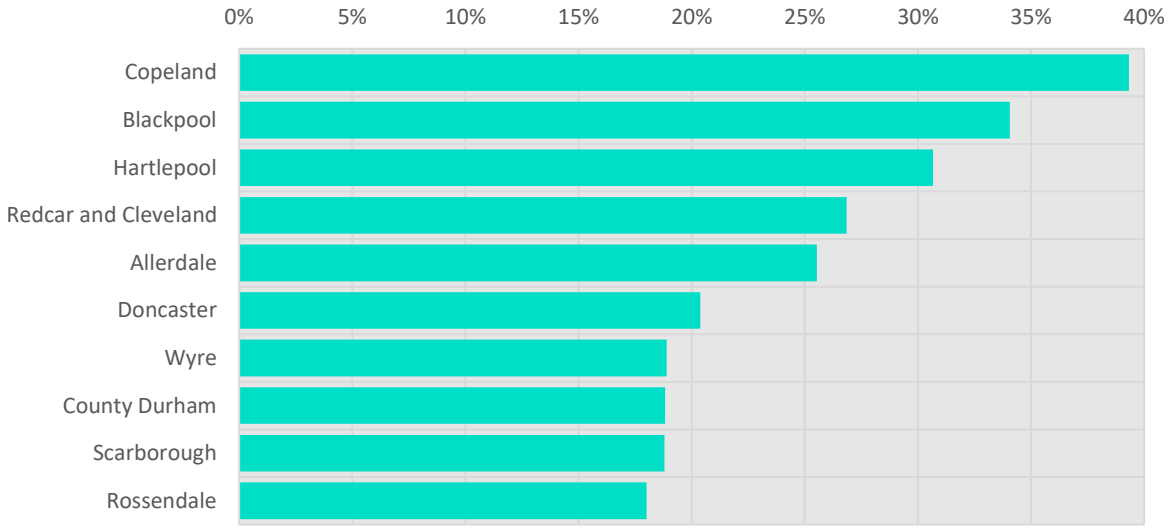
Graph 6.24 – LADs in the North where over half the population is at a high risk of TRSE



Graph 6.24 shows the LADs in the North in which more than half of the population is at a high risk of TRSE. This provides one means of highlighting areas of the North in which the policy interventions set out in Section Seven could provide most benefit to those at high risk of TRSE. While the distribution of the population across TRSE Risk Categories 3 to 5 varies significantly between these LADs, it also largely follows that these LADs have the

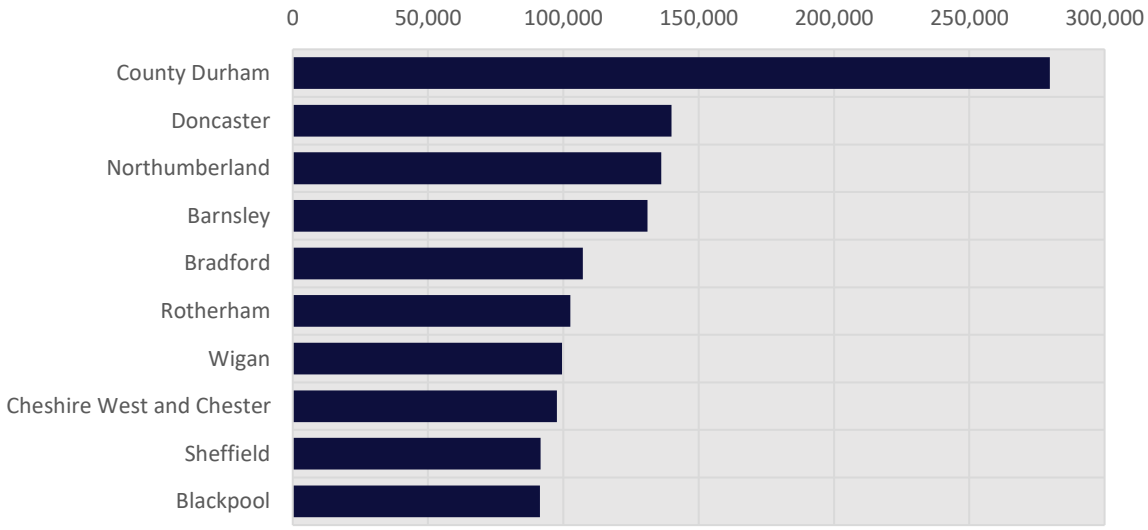
highest concentration of the population in category 5 – the highest level of risk. Indeed, when sorted by the proportion of the population with a TRSE Risk Category of 5, seven of the LADs shown in Graph 6.24 remain in the ten highest risk LADs in the North. The most significant exception to this is Allerdale, in which 25.5% of the population live in LSOAs with the highest level of risk.

Graph 6.25 – LADs with the highest proportion of the population in TRSE Risk Category 5

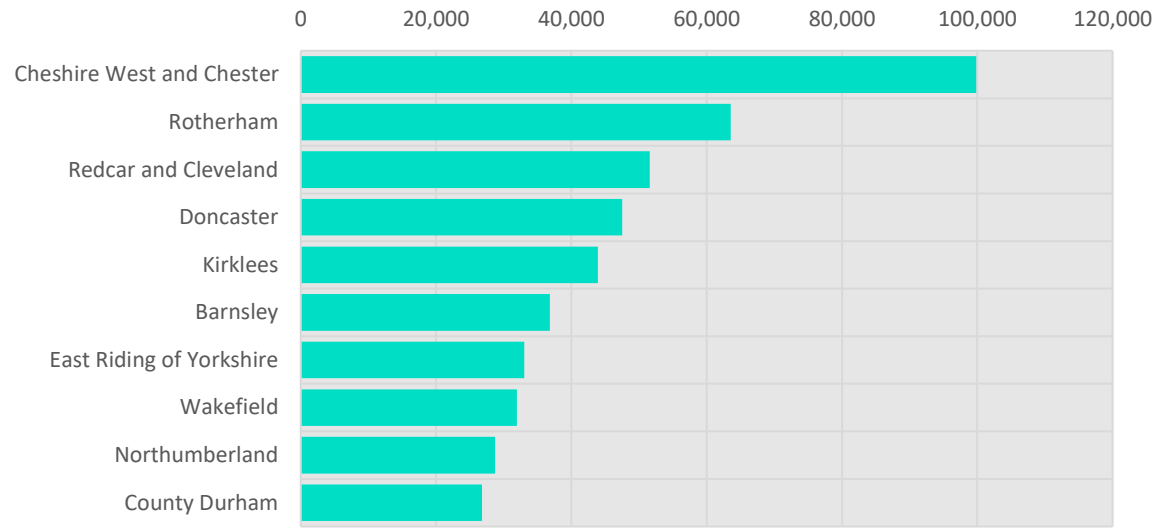


Returning finally to the pan-northern level, the significant variations in the size of populations between LADs means that the distribution of the population at high risk of TRSE is distinct from the concentrations shown in Graph 6.24. Graph 6.26 shows the 10 LADs in the North with the largest populations in LSOAs with a TRSE Risk Category of 3 or above. These 10 LADs collectively account for 39% of the population of the North in these categories. Of these, County Durham is particularly distinct, with a population of 280,000 living in areas with a high risk of TRSE – 8.5% of the total for the North. An even greater degree of concentration is present when comparing populations in the Category 5, with 10 LADs containing 57% of the total population of the North in this category.

Graph 6.26 – LADs with the largest population in TRSE Risk Category 3 or above



Graph 6.27 – LADs with the largest population in TRSE Risk Category 5

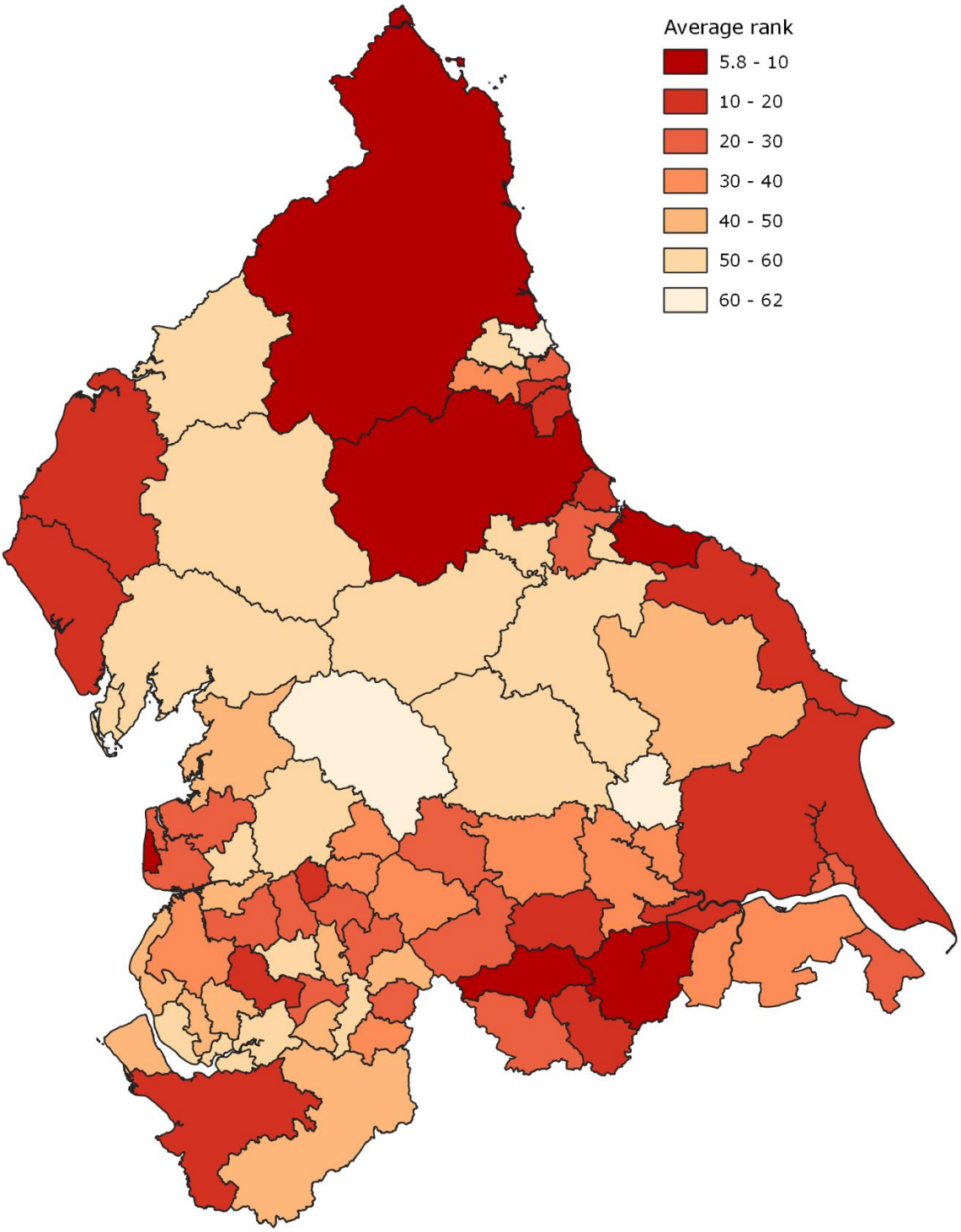


Collating the measures shown in Graph 6.24 to 6.27 provides a more rigorous basis in which to compare variations in the risk of TRSE across LADs than any single measure. Table 6.3 shows the 10 LADs in the North which rank most highly when ranking by the size and proportion of the population living in areas with a TRSE Risk Category of 3 and above, and by the size and proportion of the population living in areas with a TRSE Risk Category of 5. Appendix 2 provides these rankings for all LADs in the North.

Table 6.3 – Rank of selected LADs in the North by multiple measures of TRSE risk

Local Authority District	Rank of the size of the population in TRSE Risk Category:		Rank of the proportion of the population in TRSE Risk Category:		Average rank
	3-5	**5**	**3-5**	**5**	
Doncaster	2	4	11	6	5.8
Redcar and Cleveland	12	3	4	4	5.8
County Durham	1	10	9	8	7.0
Barnsley	4	6	8	11	7.3
Blackpool	10	19	3	2	8.5
Northumberland	3	9	12	12	9.0
Rotherham	6	2	16	17	10.3
Hartlepool	21	17	2	3	10.8
Scarborough	18	11	6	9	11.0
Cheshire West and Chester	8	1	22	15	11.5

Map 6.4 – Average rank of the proportion and size of the population at high risk of TRSE for Local Authority Districts in the North



Summary: The risk and distribution of TRSE

The analysis of accessibility and vulnerability datasets shows the significant concentration of the risk of TRSE in the North of England, with 21.3% of the population of the North living in areas with a high risk of TRSE, compared with 16% of the population of the Midlands and the South of England. This indicates that, were the accessibility and vulnerability conditions in the North equivalent to that of the rest of England, 820,000 fewer people in the North would be living in areas with a high risk of TRSE. Underlying the differences between the North and the rest of England is the significantly higher risk of TRSE present in the North East, and the significantly lower risk present in London.

Beyond the regional level, the data demonstrates significant variations in the risk of TRSE between different types of urban and rural communities. This includes the particular concentration of risk of TRSE in rural town and fringe areas, in smaller urban cities and towns, and in smaller urban conurbations. While these differences are consistent across England, it remains the case that areas of these types in the North are more likely to contain LSOAs with a high risk of TRSE. Moving from rural-urban differences to ONS place types, the analysis also shows the particular concentration of risk of TRSE in mining and manufacturing legacy areas. Collectively, these area types include over half of the LSOAs in the north with a high risk of TRSE.

Coastal areas across the North and the rest of England have a heightened risk of TRSE. The proportion of LSOAs in coastal areas with a high risk of TRSE is nearly triple that of non-coastal areas, and the majority of the Local Authority Districts with the highest levels of risk include significant coastal communities. Underlying this is significantly lower levels of access to employment and education in many coastal areas, in combination with higher levels of vulnerability through poverty and deprivation. There is also evidence of poorer access to healthcare services in these areas, combined with poorer than average health.

At the Local Authority District level, there are ten LADs in the North where over half of the population resides in LSOAs with a high risk of TRSE. While TRSE is relatively more concentrated in specific place and population contexts, these areas are spread across the North – with four in the North East, four in the North West, and two in Yorkshire and the Humber. Combining these proportions with the corresponding size of the population provides a rigorous means of comparing LADs across the North, data for which is provided in Appendix 2. More broadly, all LADs in the North have at least one LSOA where the population is at a high risk of TRSE, and the data therefore indicates need for policy interventions on this issue across areas of the North. Section Seven draws together the data presented here with the findings from the primary research to set out the policy interventions most likely to deliver significant progress in addressing this issue.

- Seven -

The solutions to TRSE

The solutions to TRSE

This section sets out the solutions to TRSE, based on the primary research and data analysis. This focuses on the broad policy themes and interventions that are supported by this pan-northern evidence base, rather than solutions for specific local contexts. To do so, it first provides a set of eight principles of a socially inclusive transport system. Second, it sets out the transport policies that are most directly relevant to TRSE, spanning bus, rail, active travel, and car travel. Finally, it sets out solutions that fall outside of the transport system, acknowledging the interconnectedness of TRSE with other policy areas.

Principles of a socially inclusive transport system

The following principles summarise the key common aspects of the evidence presented throughout this report, and how this evidence can be translated into practical steps towards a socially inclusive transport system.

One - The role of car access: Having unconstrained access to a car should not be a prerequisite for social inclusion; including accessing opportunities, key services, and community life. Safe, convenient, reliable, and affordable public transport and active travel should be available across the diverse place and population contexts of the North.

Two - Diverse travel patterns: Public transport services should function equally well for those travelling outside of peak periods and major commuter routes as for those who fit these conventional travel patterns.

Three - Integration: Public transport planning and ticketing should be integrated across administrative boundaries and modes of transport, such that those taking multi-modal journeys across these boundaries do not face excessive additional costs and complexities.

Four – Equality of access: Public transport and active travel infrastructure should be accessible to those with disabilities and limited physical mobility. This accessibility should be fundamental to the design of infrastructure, and offer equality of access.

Five - Technology: The introduction and use of technology in public transport should be inclusive of those with limited or no access to the internet and to banking services, both at the point of use and in the provision of information.

Six - Local access: Transport, spatial planning, and digital connectivity policies should combine to expand local access to services, opportunities, and community life, and thereby reduce the impacts of limited access to transport on social inclusion.

Seven - Affordability: The level of transport use necessary to access opportunities, key services and community life should be affordable to those on low incomes, those out of work, and those unable to access work and social welfare.

Eight - Safety: Journeys on, to, and from public transport access points should be safe and be perceived to be safe, particularly for women, LGBTQ people, ethnic minority communities, and people with disabilities.

Transport solutions to TRSE

The evidence presented in this report indicates that reducing TRSE in the North requires the following priorities in public transport, car travel and road investment, and active travel. Responsibility for these actions span a diverse set of stakeholders, including central and local government, transport delivery bodies, and the private sector. TfN will consider these recommendations in its next Strategic Transport Plan, and in the development of a Socially Inclusive Transport Strategy for the North in 2022/23.

Public transport priorities

- Levels of investment in local public transport across the North that significantly narrows the gap in access to opportunities, key services, and community life between those primarily dependent on public transport, and those with unconstrained access to private transport. Significant increases in investment in local bus services is a necessary and key part of this, given that those exposed to TRSE are far more likely than the wider population to use buses, and to have little or no alternative to these services when they face disruption.

- Prioritising investment in local public transport – particularly bus services – to areas of the North where there is relatively greater risk of TRSE. This investment should, at a minimum reverse the significant declines in services and real terms increases in fare levels seen in the last decade.

- Greater connectivity between neighbourhoods and communities, particularly through the expansion of orbital bus routes that do not require journeys into and out of a central hub. This should address the significant imbalance that is common between routes serving traditional commuter journeys from suburban areas to urban centres, and those serving journeys between neighbourhoods and local centres.

- Greater connectivity between deprived communities and peripheral employment and service locations, including industrial areas and out of town retail and service centres that are commonly designed around car access. This should address the imbalance that is common between routes serving traditional commuter journeys, and those linking deprived communities with the industrial and service sectors.

- Acknowledging the key role that active travel routes play in access to public transport, and giving greater priority to those walking, cycling, and wheeling than is currently common across public transport infrastructure. This acknowledges the extent to which car-focused public transport approaches, such as park and ride schemes, can increase the accessibility gap between those with and without access to private transport.

- Reallocating road space to give greater priority to public transport, particularly local bus services. This is both to improve the reliability and viability of services in congested areas, and to address the significant gap between car and public transport accessibility common across the North.

- Integrating ticketing, fares, and routing across modes of public transport, and removing the significant additional costs faced by those travelling across local boundaries. This should include efforts to rebalance services between neighbourhood

routes and the most commercially lucrative commuter corridors, and to target areas where there is currently a marginal service.

- Maintaining and improving ways to pay for public transport and access public transport information that do not require a smartphone with internet access. This includes the ability to pay by cash at public transport access points, digital information screens showing live running service information, and up to date printed material.

- Expanding frequency of services in areas where there is a relatively high level of multi-modal and multi-service journeys, and in areas of poverty and deprivation. This is necessary to reduce the significant disruption that is common where one part of a multi-stage journey is delayed or cancelled.

- Improving accessibility to public transport spaces and vehicles to those with physical disabilities, and those with reduced mobility. This should provide equality of access when using public transport and when transitioning between public transport modes, and avoid placing additional burdens on those with disabilities that are not faced by others. This includes improving the quality and quantity of space that is dedicated to those using mobility aids, and improving public transport information.

- Extending the affordable ticketing options currently available to children and to older people to those on low incomes, people with disabilities and long-term health conditions, and those seeking work. This should mitigate the vicious cycle that is currently evident between poor access to opportunities with the transport options available, and low income and insecure work.

- Working with population groups that are disproportionately impacted by safety concerns, harassment, and discrimination in public transport spaces to develop practical solutions. Increased staff presence, improved use of lighting, and increasing passenger numbers are all likely to contribute to resolving this issue.

- Expanding the level of consultation, engagement, and access to decision-making power among people with disabilities and long-term health conditions, people with caring responsibilities, young people, women, people on low incomes, and other groups that are disproportionately exposed to TRSE in public transport investment decisions.

Car travel and road investment priorities

- Placing greater emphasis on the significant gap between public transport and car accessibility when considering road investment priorities, particularly where road investment encourages services and opportunities to locate in peripheral areas that are principally or solely accessible by car.

- Placing greater emphasis on severance effects for those walking, cycling, and wheeling in road investment decisions, and on the extent to which the expansion of the road network is likely to increase levels of car dependency. This is relevant both to the expansion of existing roads, and the development of new roads.

- The use of underpasses and pedestrian bridges that place significant inconvenience on those walking, cycling, and wheeling in order to increase traffic flow should be avoided.

This is particularly significant given the disproportionate impact of such measures on people with disabilities, women, and those with caring responsibilities.

- The rollout of electric vehicle charging infrastructure should reduce rather than reinforce car dependency, and mitigate issues such as pavement parking and additional pavement clutter. Vehicle charging infrastructure that is placed on pavements is likely to a have a disproportionate impact on the ability of those with disabilities and those travelling with young children to access public transport and local destinations.

- Transport decision-makers should engage the opportunity presented by the broader transition to a net zero carbon transport network to enable modal shift away from private car use, and to close the significant accessibility gap between public and private transport common across the North. This includes transitioning from a 'predict and provide' model of road investment to a 'vision and validate' approach, with social inclusion a core part of that vision.

- Improving public transport accessibility and active travel conditions, rather than increasing levels of vehicle capacity, should increasingly become the primary means of resolving traffic congestion. This is particularly significant in areas where there are high levels of car dependency, and high risk of TRSE.

- Consider how the relative pricing of different travel choices could more accurately reflect both the direct, but also wider costs of those travel options on society as a whole, including on health and wellbeing and local economies.

- Reviewing and managing levels of on and off street car parking in urban areas in a manner that consistent with reducing car dependency in urban environments. This should be used in combination with investment in public transport and active travel, and incorporate both levels of provision and pricing.

- Expanding the level of consultation, engagement, and access to decision-making power among people with disabilities and long-term health conditions, people with caring responsibilities, young people, women, people on low incomes, and other groups that are disproportionately exposed to TRSE in road investment decisions.

Active travel priorities

- Reducing the high levels of obstructive pavement parking common across areas of all types, including in residential areas. This reflects the disproportionate impacts that pavement parking has on those with disabilities and long-term health conditions, on children and young people, and on those with caring responsibilities.

- Increasing the number of pedestrian crossings in areas with a high risk of TRSE, areas surrounding schools and key services, and areas with high traffic flow and speeds. Crossing should be provided on desire lines for those travelling actively, not impose significant waiting times, and provide sufficient time for people with disabilities and limited mobility to cross safely.

- Reducing the widespread use of national speed limits on rural roads, particularly on roads that connect communities over relatively short distances, and where no space is

dedicated to active travel. This reflects the significant barrier that high traffic speeds can pose to active travel under these conditions.

- Considering access by walking, cycling, and wheeling as a fundamental part of the design and development of public transport and major road schemes, particularly in areas where there is a high risk of TRSE in combination with high levels of car dependency.

- Expanding and targeting measures such as dedicated cycling and wheeling infrastructure, low traffic neighbourhoods, 20 MPH zones, and school streets in areas where there is a high risk of TRSE, and in which there are high levels of community severance and car dependency.

- Identifying and removing obstacles to active travel such as gates, chicanes, and access barriers that prohibit or obstruct access by those using mobility aids, and which introduce conflict between those walking, cycling, and wheeling.

- Expanding the level of consultation, engagement, and access to decision-making power among people with disabilities and long-term health conditions, people with caring responsibilities, young people, women, people on low incomes, and other groups that are disproportionately exposed to TRSE in active travel investment decisions.

Non-transport solutions to TRSE

The evidence indicates that reducing and resolving TRSE in the North requires the following priorities in the planning system and in digital connectivity.

Reforming the planning system

- Requiring that new residential developments are served by public transport, are designed to make public transport accessible, and that safe and convenient routes for walking, cycling, and wheeling are a core part of the planning of new developments.

- Enabling and incentivising mixed development, in which services, employment and housing are developed in close proximity, and connected by active travel and local public transport.

- Giving greater consideration in the planning process to how new developments induce and lock in high levels of car dependency, particularly in areas with a high risk of TRSE.

- Reducing the requirement or expectation of significant additional car parking provision as part of major new developments in urban areas; substituting this with public transport and active travel investment.

- Developing and implementing minimum standards for public transport access and active travel for new developments, including the full implementation of Local Transport Note 1/20 guidance on active travel.

Improving digital connectivity

- Targeting improvements in digital connectivity to areas in which there is a high risk of TRSE, as a way of improving access to opportunities and services. This reflects the overlap between poor digital connectivity and the risk of TRSE, particularly in rural areas and among populations affected by poverty and deprivation. This should be used alongside, rather than in place of, the set of transport solutions set out previously.

- Addressing limited access to mobile internet connections, particularly on the grounds of cost and lack of access to smartphones, and the knock-on impacts of this on access to transport. The provision of free Wi-Fi connections and digital information screens at public transport access points could form part of this solution.

- Tackling the cost and informational barriers to fast and reliable home internet connectivity that widely exist in areas with a high risk of TRSE, alongside the infrastructure and technical barriers that remain in some areas.

- Eight -

Appendix & References

Appendix and references

Appendix 1: Proportion of the population of Local Authority Districts in the North at high risk of TRSE by domain

Local Authority District	TRSE Risk Category 3-5	Employment Category 3-5	Education Category 3-5	Health Category 3-5	Basic services Category 3-5
Hyndburn	73.8%	73.8%	20.9%	61.5%	30.4%
Hartlepool	66.4%	71.5%	51.6%	13.5%	41.4%
Blackpool	65.5%	73.7%	78.9%	48.4%	50.4%
Redcar and Cleveland	63.5%	58.4%	48.3%	54.6%	51.7%
Copeland	62.1%	63.9%	56.3%	20.7%	34.1%
Scarborough	60.5%	62.7%	49.2%	23.2%	21.6%
South Tyneside	54.6%	76.9%	12.1%	17.4%	45.6%
Barnsley	53.1%	52.1%	64.1%	43.0%	56.9%
County Durham	52.8%	51.2%	46.4%	37.0%	35.8%
Rossendale	52.0%	56.4%	51.2%	18.9%	15.1%
Doncaster	44.9%	45.9%	37.7%	39.6%	49.8%
Northumberland	42.2%	42.3%	29.3%	23.9%	22.4%
North East Lincolnshire	40.3%	30.7%	54.4%	22.2%	32.9%
Allerdale	39.6%	41.4%	33.7%	38.5%	17.3%
Pendle	39.0%	58.2%	37.8%	20.5%	7.8%
Rotherham	38.7%	32.8%	23.5%	37.5%	56.3%
Wyre	35.6%	35.6%	35.6%	34.3%	15.5%
Blackburn with Darwen	33.0%	45.8%	6.9%	23.9%	44.7%
Wigan	30.3%	35.7%	32.6%	33.7%	17.5%
Chorley	29.7%	32.6%	35.0%	5.4%	11.8%
Rochdale	29.2%	48.6%	20.6%	12.7%	29.4%
Cheshire West and Chester	28.4%	23.1%	27.4%	21.2%	15.0%
Fylde	27.3%	21.3%	29.8%	29.6%	8.4%
Tameside	27.2%	20.4%	28.6%	29.4%	20.9%
West Lancashire	25.1%	19.3%	32.3%	18.5%	9.9%
Sunderland	24.9%	14.8%	19.2%	24.3%	56.7%
Stockton-on-Tees	24.7%	18.4%	36.6%	22.4%	35.5%
East Riding of Yorkshire	23.8%	25.3%	24.2%	9.7%	14.0%
Kingston upon Hull, City of	23.4%	23.9%	16.2%	37.4%	49.7%
Salford	22.3%	22.0%	29.0%	17.1%	29.1%
Selby	22.0%	23.7%	27.6%	20.3%	3.7%
Wakefield	21.5%	26.2%	32.9%	16.6%	32.8%
Burnley	21.5%	21.5%	58.3%	26.3%	20.3%
Kirklees	20.3%	26.6%	29.2%	15.1%	23.0%
Bradford	19.9%	23.2%	6.9%	13.3%	56.1%
Ryedale	19.1%	19.1%	19.1%	16.5%	0.0%
North Lincolnshire	17.2%	13.3%	30.9%	10.9%	16.1%

Local Authority District	TRSE Risk Category 3-5	Employment Category 3-5	Education Category 3-5	Health Category 3-5	Basic services Category 3-5
Calderdale	17.2%	14.0%	22.4%	18.6%	23.1%
Sefton	16.0%	16.6%	14.5%	23.0%	33.2%
Sheffield	15.7%	15.4%	11.3%	23.3%	32.5%
Gateshead	15.0%	9.5%	12.3%	16.6%	46.4%
Barrow-in-Furness	14.3%	11.6%	56.5%	6.9%	28.2%
Lancaster	13.6%	24.0%	19.4%	8.2%	8.9%
Eden	12.8%	12.8%	15.5%	12.8%	2.4%
Stockport	11.6%	4.8%	26.4%	24.1%	13.8%
Knowsley	11.6%	8.8%	26.4%	26.9%	56.5%
South Ribble	11.5%	6.2%	9.5%	20.1%	13.9%
Bury	10.5%	19.9%	13.0%	14.1%	24.4%
Wirral	10.5%	17.2%	6.9%	17.8%	20.7%
Preston	10.1%	3.6%	14.1%	3.3%	49.9%
Oldham	9.5%	20.4%	5.7%	12.3%	17.3%
St. Helens	9.5%	4.4%	26.4%	22.1%	43.0%
Carlisle	9.5%	5.9%	37.3%	16.5%	26.6%
Hambleton	9.2%	9.2%	16.3%	5.7%	0.0%
Leeds	8.9%	9.8%	10.7%	14.2%	28.0%
Darlington	8.9%	1.4%	23.4%	15.6%	24.1%
Middlesbrough	8.8%	7.8%	25.0%	14.0%	32.9%
Trafford	8.8%	5.8%	12.7%	4.9%	15.7%
Ribble Valley	8.6%	8.6%	8.6%	2.2%	2.7%
Halton	8.1%	12.5%	14.0%	22.0%	7.3%
South Lakeland	8.0%	5.8%	8.7%	4.0%	2.2%
Cheshire East	7.1%	6.1%	13.4%	7.3%	9.5%
Newcastle upon Tyne	6.5%	13.0%	6.6%	8.9%	24.9%
Bolton	5.9%	6.4%	11.2%	19.6%	37.6%
Harrogate	4.8%	3.8%	10.6%	2.7%	4.2%
Craven	4.0%	0.0%	8.8%	4.0%	2.3%
Richmondshire	3.7%	6.2%	6.9%	3.7%	3.7%
Warrington	3.4%	0.0%	7.9%	17.1%	23.0%
Manchester	3.0%	11.7%	6.1%	11.5%	35.4%
North Tyneside	2.2%	13.5%	0.7%	9.8%	20.5%
Liverpool	1.8%	1.5%	2.4%	12.8%	35.1%
York	1.3%	0.6%	15.0%	4.4%	9.8%

Appendix 2: Ranking of Local Authority Districts in the North by the size and % of population in selected TRSE Risk Categories

Local Authority District	Rank of the size of the population in TRSE Risk Category:		Rank of the proportion of the population in TRSE Risk Category:		Average rank
	3-5	**5**	**3-5**	**5**	
Doncaster	2	4	11	6	5.8
Redcar and Cleveland	12	3	4	4	5.8
County Durham	1	10	9	8	7.0
Barnsley	4	6	8	11	7.3
Blackpool	10	19	3	2	8.5
Northumberland	3	9	12	12	9.0
Rotherham	6	2	16	17	10.3
Hartlepool	21	17	2	3	10.8
Scarborough	18	11	6	9	11.0
Cheshire West and Chester	8	1	22	15	11.5
Wigan	7	14	19	14	13.5
Hyndburn	24	20	1	13	14.5
East Riding of Yorkshire	14	7	28	18	16.8
Copeland	29	33	5	1	17.0
Allerdale	31	25	14	5	18.8
Wakefield	15	8	32	21	19.0
Sunderland	17	13	26	24	20.0
North East Lincolnshire	20	22	13	29	21.0
Blackburn with Darwen	26	21	18	20	21.3
Bradford	5	12	35	35	21.8
Kirklees	11	5	34	39	22.3
Rossendale	32	38	10	10	22.5
Wyre	30	37	17	7	22.8
Sheffield	9	15	40	33	24.3
South Tyneside	13	26	7	53	24.8
Kingston upon Hull, City of	23	23	29	26	25.3
Chorley	35	18	20	30	25.8
Rochdale	19	31	21	36	26.8
Tameside	22	36	24	25	26.8
Stockton-on-Tees	27	28	27	27	27.3
Salford	25	24	30	31	27.5
Fylde	43	35	23	16	29.3
Calderdale	33	16	38	34	30.3
Pendle	34	32	15	41	30.5
Gateshead	38	40	41	23	35.5
Selby	46	49	31	19	36.3
West Lancashire	40	43	25	38	36.5
Leeds	16	30	55	47	37.0
North Lincolnshire	39	29	37	44	37.3
Burnley	49	47	33	22	37.8

Local Authority District	Rank of the size of the population in TRSE Risk Category:		Rank of the proportion of the population in TRSE Risk Category:		Average rank
	3-5	**5**	**3-5**	**5**	
Stockport	36	34	45	45	40.0
Sefton	28	42	39	53	40.5
Lancaster	47	27	43	46	40.8
Bury	45	39	48	49	45.3
Wirral	37	52	49	53	47.8
Trafford	44	41	58	50	48.3
Knowsley	50	46	46	53	48.8
South Ribble	55	53	47	40	48.8
Cheshire East	41	50	62	43	49.0
St. Helens	51	45	52	48	49.0
Oldham	42	51	51	53	49.3
Ryedale	57	53	36	53	49.8
Hambleton	63	53	54	32	50.5
Newcastle upon Tyne	48	44	63	51	51.5
Carlisle	59	53	53	42	51.8
Barrow-in-Furness	60	53	42	53	52.0
Preston	54	53	50	53	52.5
Bolton	52	48	64	53	54.3
Eden	67	53	44	53	54.3
Ribble Valley	68	53	59	37	54.3
Middlesbrough	56	53	57	53	54.8
Richmondshire	72	53	67	28	55.0
Darlington	61	53	56	53	55.8
Halton	58	53	60	53	56.0
Manchester	53	53	69	53	57.0
South Lakeland	64	53	61	53	57.8
Harrogate	65	53	65	53	59.0
Liverpool	62	53	71	52	59.5
Warrington	66	53	68	53	60.0
Craven	71	53	66	53	60.8
North Tyneside	69	53	70	53	61.3
York	70	53	72	53	62.0

Appendix 3: Online survey questions

Do you currently hold a full UK car or motorcycle licence?
Options: Yes; no.

How many cars, vans, and motorcycles do you currently have access to? (This includes cars, vans, or motorcycles that you use, but are owned by others)
Numerical response

In the past month, how often have you travelled for the following reasons?
Destination types: (1) Work, education, or training; (2) GP or hospital appointment; (3) Grocery shop or supermarket; (4) Local shops and services (e.g. bank, Post Office, Hairdresser); (5) Leisure or sports (e.g. cinema, theatre, leisure centre, gym, park); (6) Taking a child to school or day care; (7) Visiting friends or family.
Options: 3 or more days a week, 1 or 2 days a week, 2 or 3 days in the last month, one day in the last month, not at all.

In the past month, what modes of transport did you use to travel for the following reasons? Please select all that apply.
Destination types: (1) Work, education, or training; (2) GP or hospital appointment; (3) Grocery shop or supermarket; (4) Local shops and services (e.g. bank, Post Office, Hairdresser); (5) Leisure or sports (e.g. cinema, theatre, leisure centre, gym, park); (6) Taking a child to school or day care; (7) Visiting friends or family.
Options: Walk, cycle, car, car as passenger, bus, tram, rail, taxi, other.

In the past month, have you been able to travel as often as you needed to or less often than you needed to for the following reasons.
Destination types: (1) Work, education, or training; (2) GP or hospital appointment; (3) Grocery shop or supermarket; (4) Local shops and services (e.g. bank, Post Office, Hairdresser); (5) Leisure or sports (e.g. cinema, theatre, leisure centre, gym, park); (6) Taking a child to school or day care; (7) Visiting friends or family.
Options: As many times as I needed to, slightly less often than I needed to, much less often than I needed to.

The following have been identified as potential barriers to travelling in your area. To what extent do each of these transport difficulties limit your everyday life.
Options: 0 to 10 scale; with 0 'not at all' and 10 'to a great extent'.
Sub-questions: (1) Cost of using public transport; (2) Cost of owning and running a car, van; (3) Difficulty getting to and from bus, tram and rail stops; (4) Availability of suitable bus, tram, and rail services; (5) Feeling unsafe when travelling by bus, tram, and rail; (6) Difficulty getting on and off buses, trams, and rail; (7) Difficulties whilst walking, such as cluttered pavements or high traffic speeds; (8) Difficulties whilst cycling, such as dangerous roads or a lack of cycle lanes; (9) Lack of good information about bus, tram, and rail services; (10) Traffic congestion while travelling by road.

To what extent do you agree or disagree with the following statements.
Sub-questions: (1) "The money I spend on public transport and car travel makes it difficult to afford other essentials"; (2) "I would struggle to travel for a job interview if I was offered one"; (3) "The Coronavirus Pandemic means that public transport is not safe for me to use at the moment"; (4) "When walking, I feel intimidated by traffic in my local area"; (5) "The journeys I take cause me significant stress or anxiety"; (6) "I have a choice over the mode of transport I use to get to the places I need to go"; (7) "The time I spend travelling makes it difficult to see friends and family as much as I would like"; (8) "I often feel lonely".
Options: 0 to 10 scale, with 0 'strongly disagree' and 10 'strongly agree'.

To what extent do transport difficulties limit your everyday life on a scale of 0 (not at all) to 10 (to a great extent)
Options: 0 to 10 scale; with 0 'not at all' and 10 'to a great extent'.

Postcode
Format: First part and first number of second part.

How long have you lived at your current address?
Options: Less than 1 month, 1-12 months, more than 12 months

Age
Options: Under 18; 18 or 19; 20 to 29; 30 to 44; 45 to 59; 60 to 64; 65 to 74; 75 to 84; 85 to 89; 90 or over.

Which of the following best describes your gender?
Options: Male; female; other; prefer not to say

Do you have a long-standing illness, condition or impairment which causes difficulty with your day-to-day activities?
Options: Yes; no.

In the last month, has your condition or illness meant that you have:
Sub-questions: Been unable to board a bus or train; Chosen to drive or take a taxi instead of taking public transport; Decided not to travel when you otherwise would have; Been unable to travel to a GP, hospital, or vaccination appointment.
Options: Yes; no.

Ethnicity
Options: White; Mixed / multiple ethnic groups; Asian / Asian British; Black / African / Caribbean / Black British; Other ethnic group.

How many people live in your household?
Adults: Numerical response Children: Numerical response

Do you currently have a broadband internet connection at your home?
Options: Yes; no.

What is your current employment status?
Options: Unemployed; Part time (one job); Part time (several jobs); Full time; Self-employed; Furloughed; Long term sick or disabled; Retired; Unwaged; Student.

If employed, how feasible is it for you to work from home?
Options: Not at all feasible; Possible but not ideal; Perfectly feasible

In the past month, have you provided care for someone else? This includes caring for adults and children that you live with, but not paid care work.
Options: Yes – someone I live with; Yes – someone I don't live with; No.

What is your religion?
Options: Christian; Buddhist; Hindu; Jewish; Muslim; Sikh; No religion; Other religion

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