User Insight Phase 2

Final Report

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Prepared by: Accent, Chiswick Gate, 598-608 Chiswick High Road, London, W4

Contact: Rachel Risely
E-mail: Rachel.risely@accent-mr.com
Telephone: 020 8742 2211

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EXECUTIVE SUMMARY

This report analyses the causes and effects of travel behaviour of the different socio-economic groups in the North of England, providing insights on the possible effects of transport investments planned in the Strategic Transport Plan (STP) on the travel behaviour of different segments of the population.

A review of the literature on the causes and consequences of travel behaviour suggested that the determinants of transport behaviour are complex, with a range of possible links between the choices made by individuals regarding travel, the constraints they face to those choices, and individual outcomes. The information gathered in this review was synthesized in a conceptual framework identifying hypothesized links between a series of variables.

The main stage of the study included analysis of primary quantitative data, based on surveys to 3,017 households and to 151 businesses and focusing on current travel behaviour; satisfaction with current trips; constraints to travel; likely effect of STP improvements; possible long-term changes; and wider impacts of travel behaviour and constraints to travel behaviour. This was complemented with discussion groups with individuals representing different population segment, and with businesses, to explore in detail the causes and consequences of travel behaviour.

The analysis of survey data found that sizeable proportion of households reported being constrained in their travel behaviour, including number of trips, number of places visited, and distance travelled. However, there are important differences between the travel behaviour of different segments. Variables measuring travel behaviour (number of trips made outside the local area, number of places visited, and maximum distance travelled) and constraints to travel behaviour were also found to be associated with five potential impacts: employment, social engagement, social contacts, health, and wellbeing.

Analysis of secondary data on levels of accessibility to three types of destinations (employment centres, health-related facilities, and town centres) then confirmed that some segments of the population face constraints to travel to access destinations such as employment centres, health facilities, and town centres. These constraints derive both from geographic isolation and from the difference in the accessibility provided by public transport and by car.

The results of the primary and secondary data analysis were reviewed at the end of the report in the light of the framework built after the literature review, concluding that the study provided evidence on several of the hypothesized links. The links with stronger evidence are as follows.

- Levels of access to private transport and levels of access to and quality of public transport could influence not only the places where people go but also their choice of residence location and decision to own a car.

- The choice of trip destinations may also influence choice of residence location.
- Individuals in the North face several constraints to their travel behaviour, including geographic, economic, time-related, and social/cultural constraints.
- Constraints to travel behaviour are associated with wider negative impacts such as unemployment and reduced social capital, health, and wellbeing.

1 INTRODUCTION

1.1 Background

Transport for the North (TfN) has recently published its draft Strategic Transport Plan (STP) for the North of England, which identifies how transport connectivity can contribute to the ambitions set out in the Northern Powerhouse Independent Economic Review, by promoting economic growth, improvement of productivity, and harnessing the competitive advantages of the North. The Strategic Transport Plan incorporates a series of transport investment programmes, including Northern Powerhouse Rail, the Strategic Development Corridors, and Integrated and Smart Travel.

TfN is concurrently building an evidence base to understand how travel demand is likely to respond to the improvements set out in the Northern Powerhouse Independent Economic Review and to the associated changes in population and employment. The Future Demand in the North of England study introduced a new transport demand model for the North and tested the impact of different scenarios for policy and plans and for technological and socio-cultural changes in the future. The User Insight Phase 1 study then looked at travel patterns of different socio-economic groups across the North (SDG 2018a).

The present study was commissioned by TfN to analyse the causes and effects of travel behaviour of the different socio-economic groups in the North, in order to have a fuller understanding of the relationships between transport connectivity, opportunities, and economic growth, and to strengthen the case for the planned transport investments. This study will add to the evidence that TfN has already gathered on the effects of the planned investments on overall travel demand, by providing insights on the possible effects of the investments on the travel behaviour of the different groups.

The study covers three separate, but interlinked, aspects:

- The drivers that influence the travel behaviour of different groups, i.e. the decisions individuals make of where, how frequently, how far, and by which mode to travel, based on the opportunities they have.

- The constraints faced by individuals in their travel behaviour, considering age, life stage, gender, household composition, disabilities, qualifications, employment status, income, ethnicity, and geographic context.

- The possible wider impacts of travel behaviour on employment, income, social capital, health, wellbeing, social inclusion, and social mobility, and the aggregate impacts on economic activity.

1.2 Structure of Report

The remainder of this report is structured as follows. Chapter 2 is a literature review on the causes and consequences of travel behaviour, focusing on how they differ by social group, and how they might be brought together within an analytical framework.

Chapter 3 and 4 describe respectively the methods and results of an analysis of primary data. This includes two types of data:

- Quantitative data, based on the results of surveys to 3,017 households and 151 businesses, and focusing on current travel behaviour; satisfaction with current trips; constraints to travel; likely effect of STP improvements; possible long-term changes; and the wider impacts of travel behaviour and its constraints.

- Discussion groups with individuals representing each segment and with businesses, to explore in detail the causes and consequences of travel behaviour

Chapter 5 analyses secondary quantitative data at the level of census output areas, focusing on public transport accessibility to three types of destinations (employment centres, health-related facilities, and town centres) and on how levels of accessibility differ with the characteristics of the areas and of the population, drawing conclusions regarding problems of low accessibility in areas with populations vulnerable to transport-related social exclusion.

Chapter 6 brings together the results of Chapters 4 and 5 and discusses their implications in terms of the analytical framework developed in the literature review in Chapter 2. In particular, we assess whether there is enough evidence supporting the hypotheses derived from the literature in the case of the North region, after reviewing the results on the existence, nature, and intensity of the links between the different variables of interest.

Chapter 7 concludes the study.

2 LITERATURE REVIEW

2.1 Introduction

This chapter is a literature review on the causes and consequences of travel behaviour, focusing on how they differ by social group, and how they might be brought together within an analytical framework.

The remainder of the chapter is organised as follows:

- Section 2.2 is a review of academic and grey literature on the causes and effects of travel behaviour. Each subsection focuses on a set of hypotheses related to travel behaviour, synthesized in separate conceptual frameworks, which are brought together into a unified framework at the end of the section.
- Section 2.3 is a review of guidance on the forecasting and appraisal of the wider economic and social benefits of transport schemes, and methods proposed in the literature to cover the gaps in existing guidance.
- Section 2.4 is a synthesis of the relevant information in TfN publications regarding the type of planned transport investments, and how they might influence travel behaviour.
- Section 2.5 concludes the chapter with a synthesis of the main points found in the literature and the implications for the other stages of this research.

2.2 Causes and effects of travel behaviour

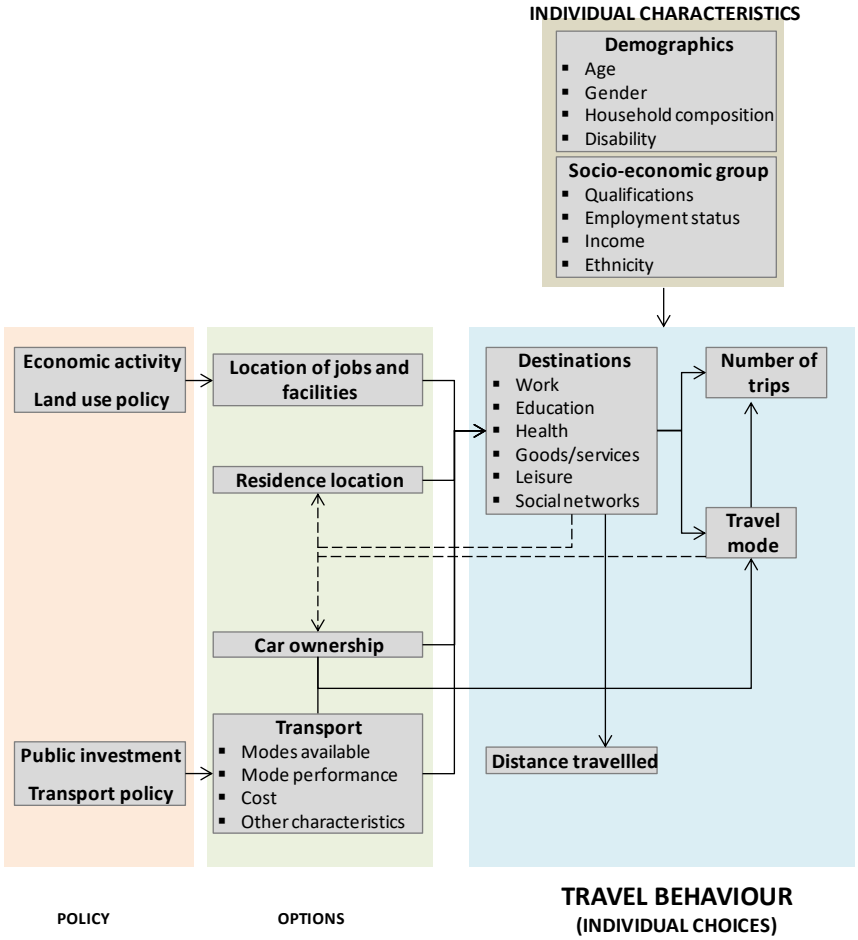
This section looks at the evidence on the causes and consequences of travel behaviour, emphasizing differences between social groups. Subsection 2.2.1 discusses the social determinants of travel behaviour, focusing on how changes in travel behaviour vary by group; Subsection 2.2.2 then looks at the constraints faced by individuals to their travel choices and Subsection 2.2.3 looks at the impacts of travel behaviour on individuals and society. The evidence on each of these subsections is used to build a conceptual framework of hypothesized links between travel behaviour and policy and social dimensions. The different parts of the framework are brought together in Subsection 2.2.4.

2.2.1. Travel behaviour and its social determinants

We suggest the framework in Figure 1 as a starting to point to organise the evidence on the causes and consequences of travel behaviour. This framework is a synthesis of the evidence reviewed in this section. Sections 2.2.2 and 2.2.3 will be organised into other

frameworks. Section 2.2.4 will bring all the frameworks into a unified framework that will be taken as a starting base for the rest of this report.

Figure 1: Framework of analysis (Part 1)



Travel behaviour can be defined as the set of choices made by individuals regarding travel destinations, travel modes, distance travelled, and number of trips made over a period. These choices depend on the options available in terms of the location of residence, jobs, and facilities, and on the availability and quality of transport. The choices depend on the individuals' demographic characteristics (for example, age, gender, household composition, and disabilities) and socio-economic characteristics (for example, qualifications, employment status, income, and ethnicity), as these characteristics influence their preferences. The set of options available to individuals can be influenced by public investment and policies. In the long term, the individuals' choices over travel behaviour can also affect their choices over residence location and car ownership.

From a different perspective, changes in travel behaviour can be brought about either by improvements in the transport system or increasing accessibility of places (by increasing the number of destinations individuals can access in their local area). In the absence of these improvements, individuals can only change their travel behaviour by relocating to another area.

The rest of this subsection describes the available evidence about each type of choice (destinations, travel mode, distance travelled, and number of trips, residence location, and car ownership), emphasizing how they depend on demographics and socio-economic characteristics of the individuals.

Choice of destinations

The choices people make over the places where they go depend on how attractive those places are (for example, in the case of shopping, the range of products available and their price and quality) and on how easy it is to access them. The improvement of travel conditions can decrease the time required to access some places or make the journey more convenient or attractive. This increases the probability that people go to those places and not to other places where they can do similar activities.

The influence of travel conditions on destination choice has been confirmed in empirical studies around the world. For example, in a large-scale study in Sweden, Kristoffersson *et al.* (2018) showed that the probability that someone would visit a shopping destination, and not its alternatives, decreased with travel characteristics such as travel cost, travel time. If the person was travelling by public transport, the probability also decreased with the number of transfers, waiting time, and access and egress time. In a study using GPS data to explain car drivers' non-work destination choices in the USA, Huang and Levinson (2015) also found that the probability that a destination was chosen decreased with travel time and aspects of the trip such as number of turns and speed discontinuity. A study in the Netherlands also found that the choice of shopping destinations depended on the availability and quality of car parking (Waerden *et al.* 1998).

Choice of travel modes

In practice, the choice over the destinations where people go is made at the same time as the choice of the travel mode to go there. This depends on the availability of each mode (i.e. whether people own a car or public transport exists in their local area) and on the characteristics of that mode (e.g. travel time, duration, and convenience). Improvements in public transport can increase its attractiveness, which may lead some people to shift from private transport. Redman *et al.* (2013) reviewed studies on the attributes of public transport that attract car users and found evidence on the effectiveness of interventions that improved service frequency and reliability, cost, speed, access, comfort, and convenience - with reliability generally being the key attribute. The impact of improvements in service reliability on perceptions about public transport is evident, for example, in initiatives such as Quality Bus Partnerships in the Greater Manchester region (Davison and Knowles 2006) and in the Tyne and Wear region (Hensher *et al.* 2010).

However, the decision to change from using car to public transport is complex. The review of Lanzini and Khan (2017) found that this decision is influenced by attitudes towards public transport, social norms, the habit of using a car, past experience of using public transport, and general resistance to change. The decision may also be related with demographic and socio-economic factors. For example, studies in Sweden found

that women had higher propensity to shift to public transport (Polk 2003) and that young adults were more open to change their transport behaviour and start using a new railway line, compared with other age groups (Nordlund and Westin 2013).

The influence of demographic factors may also change over time. For example, in many developed countries there is a noticeable trend towards less car use in younger generations. A recent report by the Independent Transport Commission (ITC 2016) found that younger people are the group where car use is falling faster in England.

Choice of number of trips

The choice over the number of trips made, i.e. the frequency with which each destination is visited depends on the utility derived from the trip and on the (financial and time) costs of each trip. Improvements in transport decrease these costs, which, applying economic reasoning, should increase the number of trips made. However, this varies with demographics and location. For example, in a study in 3 Canadian cities, Roorda *et al.* (2010) found that the effect of the proximity to public transport on the number of trips made was greater for the elderly and low-income individuals, compared with the rest of the population. The effect of car ownership was also greater for the elderly than for younger individuals. However, the number of trips made by the elderly also depended on location, being generally lower in suburban areas

Distance travelled

The choices over destinations determine the distances travelled per trip and the corresponding time spent travelling. These variables are related with demographic variables. As shown in the review of Mokhtarian and Chen (2004), most studies found that employed people and individuals in the 18-65 age group spend more time travelling than unemployed people and those in younger and older age groups. On average men spend more time travelling than women, but this relationship is mediated by factors such as age, area type, and employment status.

The improvement of transport options may not shorten the distance people travel because, rather than keep going to the same places in less time, they may choose instead to travel longer distances to go to places that became easier to access follow the improvement. In other words, people may have what in the literature is known as a "constant travel time budget". There is evidence that this phenomenon occurs in England, for example. The Independent Transport Commission report mentioned above (ITC 2016) found that English residents were making significantly fewer trips in 2014 than in 1995 but their average trips were longer, which suggests that, overall, people are spending about the same time travelling.

Choice of car ownership

In the long term, the choices over travel destinations and modes can also influence the choices over car ownership. Results from the UK Household Longitudinal Study (UKHLS) (Clark *et al.* 2016) show that changes in car ownership depend firstly on household composition and driving licence availability and then on employment status and income.

The same study also found that poorer access to public transport is related to a higher probability of a non-car owning household acquiring a car and to a lower probability of a one-car owning household relinquishing a car. However, not all studies found such a link between access to public transport and car ownership. For example, a study of the effects of four light-rail schemes opened in England (Lee and Senior 2013) found that the proportion of households living in the surrounding areas owning multiple cars increased, and in some cases, increased more than in control areas. The explanation is that light rail gained market share from buses but not from cars.

Nevertheless, there is an increasing trend towards lower car ownership rates among younger generations. As documented by Delbosc and Currie (2013), in many developed countries there is a decline in the proportion of young people acquiring a driving license, which could be due to the increased costs of owning a car, changes in residential and employment locational patterns, driver licensing regulations, changes in life stages and attitudes, and the role of new communication technologies.

Choice of trip origins (residence location)

Also in the long term, the choices over travel destinations and modes can influence the choices over travel origins, i.e. residence location Empirical studies using stated preference methods have found that people prefer to change residence location in order to reduce travel costs and/or travel time. For example, the study of Kim *et al.* (2005) in Oxfordshire found that the intention to change residence location grew with travel time to work and with the travel cost to work and to shops. In some cases, people may trade-off lower travel costs with longer travel times and with housing costs. For example, a study in the Netherlands found that participants preferred to accept longer travel times and pay higher housing costs in order to avoid high travel costs due to road charging (Tillema *et al.* 2010). People may also trade-off one type of accessibility for another, for example, moving to a place more distant from the workplace in order to be nearer to open space, shops, or recreational areas (Chen *et al.* 2008).

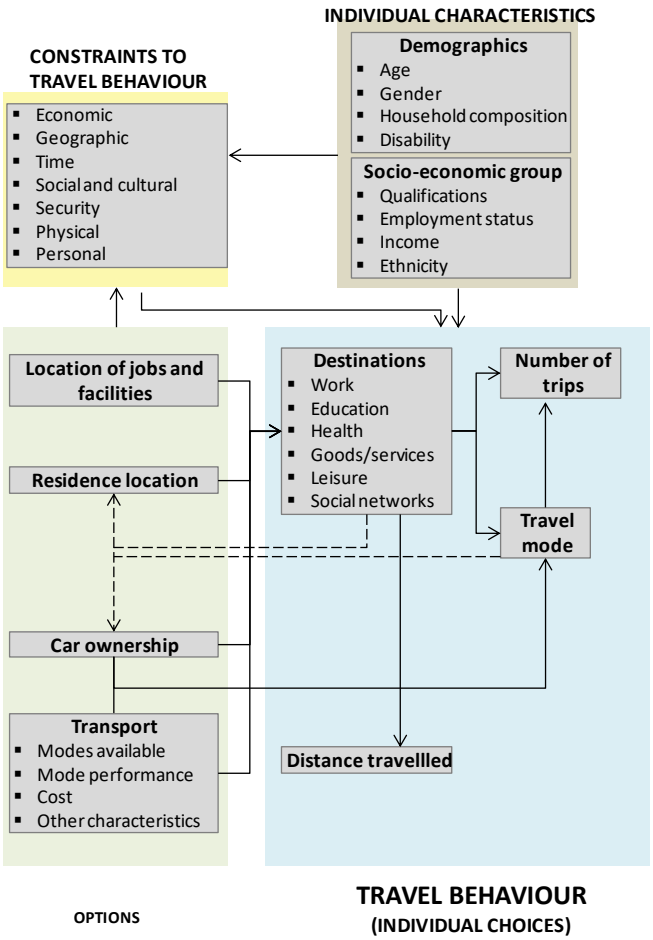
The decision to relocate is however, related to decisions on travel mode and depends, on life stage, household composition, and life course events related to work and education, as shown by Beige and Axhausen (2012) in a longitudinal analysis of people's residential and mobility choices over a period of 20 years in Switzerland.

As described later, in Subsection 2.4.3, the User Insight Phase 1 research (SDG 2018a) also found that the population in the North of England can be segmented into groups with different characteristics in terms of demographic characteristics, residence location, and travel behaviour, which may be the result of a sorting process where households with certain characteristics choose the areas with their preferred combination of accessibility to different types of destination, and other locational characteristics (for example, type of housing, or environmental quality).

2.2.2. Constraints to travel behaviour

Consideration of the constraints faced by individuals in their travel behaviour adds a new dimension to the framework introduced in Subsection 2.2.1. As shown in Figure 2, and discussed in the review that follows, constraints are caused by economic, geographic, time, social and cultural, security, physical, or personal factors. Some of these constraints are related to limits to the set of options individuals can choose from. Other constraints are related to the individuals' demographic and socio-economic characteristics.

Figure 2: Framework of analysis (Part 2)



Geographic constraints

Travel involves movement from one place to another. As such, individuals' travel behaviour is constrained by two geographic factors: the distance between the origins and the destinations where individuals would like to go, and the means of transport available at the origin to go to that destination. As shown below, there is evidence that these factors affect levels of accessibility to destinations such as employment locations, health care facilities, food shops, and green areas.

Geographic constraints may derive from the divide between the patterns of residence location of different social groups and the patterns of land use in a city or region. There

is extensive evidence of a problem known in the literature as the "spatial mismatch" between job opportunities and the residence location of low income and ethnic minorities. This applies mostly to highly dispersed and socially and ethnically segregated cities, especially in the USA, as shown in the review of Gobillon *et al.* (2007). There is no evidence supporting the spatial mismatch hypothesis in the UK. In fact, as shown in the studies of Owen and Green (2005) and Jahanshahi *et al.* (2015), workers with high qualifications tend to commute longer distances than those with no or low qualifications.

There is also some research on accessibility to health care, usually finding substantial differences between urban and rural areas. For example, the study of Haynes *et al.* (2003) in the East of England found that people in rural areas have a much narrower choice set of general medical practices to choose and are more likely to simply choose the nearest practice, compared with people in urban areas. The study also found that people were 29% less likely to register with a practice for every additional minute of travel time.

There is also some literature on "food deserts", i.e. areas with lack of shops selling healthy and affordable food, with empirical evidence of the existence of these areas in British cities (Cummins and Macintyre 2002a, Clarke *et al.* 2002, Guy *et al.* 2004).

Some studies have also investigated the equality of the geographic distribution of green areas across a region. The results are mixed. For example, in a study in Birmingham, Jones *et al.* (2009) found that the most deprived groups tended to live more distant from green areas than less deprived groups, but there were no significant inequalities between ethnic groups. In contrast, Comber *et al.* (2008) found that in Leicester, ethnic minorities lived more distant from parks than other groups.

These geographic constraints posed by distance are mainly a disadvantage when they are compounded by the lack of transport. A large-scale study using UK National Travel Survey data covering the period 2002-2010 found that workers in manual occupations and with low income commute shorter distances spend more time commuting than white-collar clerical workers (Jahanshahi *et al.* 2015). The studies of Wang (2003) and Ong and Miller (2005) in American cities also found that while the different social groups had similar levels of proximity to jobs, on average, they had different levels of job accessibility, due to reliance of low-income groups and racial minorities on public transport, which did not allow them to reach some jobs.

Lack of access to private transport or to frequent and reliable public transport also affects accessibility to health facilities, with some areas having low accessibility due to long travel times and low frequency or unavailability of services (Lovett *et al.* 2002, Martin *et al.* 2008).

These geographic constraints to travel are particularly impactful in rural areas, which tend to have worse public transport accessibility than urban areas. Individuals living in rural areas and lacking access to a car are therefore in a particularly vulnerable position (McDonagh 2006). But within urban areas, access to public transport is also unequal,

and some neighbourhoods have relatively poor public transport accessibility even though the population has low car ownership. Mapping analyses done by Pennycook *et al.* (2001) in Bradford and by Wu and Hine (2003) in Belfast showed that some areas with low car ownership have no access to a nearby bus service. Although these studies did not explain the reasons for this multiple disadvantage, this could be related with economic factors (no-car low-income households living in more peripheral areas due to lower house prices) compounded by spatial segregation (along ethnic lines in Bradford and religious lines in Belfast). However, the results should be interpreted with caution as the studies are now more than 15 years old and levels of car ownership and bus accessibility may have changed.

Economic constraints

Economic factors come into play mainly because some households cannot afford to own a private car. There is evidence that the price of a driver's license restricts the travel behaviour of low-income groups and ethnic minorities (Priya and Uteng 2009).

Some households may also be 'forced' to own a car in order to access the places they need to go despite struggling to afford the costs of using it. This may happen if these households live in an area with poor public transport. Mattioli *et al.* (2018) estimated that these households account for 9% of all households in the UK. In a study in Glasgow, Curl *et al.* (2018) found that even during a severe economic crisis, many households retained a car despite ongoing or worsening financial difficulties, as travelling by car was often the only means available. However, these economic constraints to car use influence travel behaviour. For example, in a study in French cities, Chevallier *et al.* (2018) found that individuals with low-income and dependent on car travel reduced the number of trips and distance covered by car in order to reduce fuel costs.

The cost of public transport can also be a major barrier to mobility to low-income households, as shown in the study of Church *et al.* (2000) in London and in other studies in the UK (Lucas *et al.* 2001, Wixey *et al.* 2003, Hine and Mitchell 2003, Lucas 2004, Rajé 2004, 2017). In these studies, the cost of buses and trains was often mentioned by the participants in surveys, interviews and focus groups as a reason to not making all the trips and go to all the places they want, including both shopping and leisure trips. At an aggregate level, these constraints result in a pattern where low-income households generally make fewer trips and spend less on travel than those with high income, as evident in the data of the National Travel Survey reviewed by Titheridge *et al.* (2014). Lucas *et al.* (2016) also found an association between low income and low trip frequency and less distance travelled, when controlling for other variables.

On the other hand, the availability of free transport increases the mobility of some groups by removing economic constraints to travel. The review of Mackett (2014) concluded that the policy of concessionary bus travel for older people in the UK has led to a growth in bus trips made by this age group, and a higher level of access to shops and services for people who do not have access to a car. A series of qualitative studies in London also linked free bus travel with positive impacts on wellbeing for both the youngest and oldest age groups. Goodman *et al.* (2013) found that the policy had a

positive impact on the independent mobility of young people and Green *et al.* (2014) found that free bus travel improved the wellbeing of the elderly because of the possibility of social interaction. The study of Jones *et al.* (2013) found that the policy also had implications in terms of both younger and older people's perceptions of "entitlement" to public transport and sense of belonging to the city.

Time constraints

Travel is an activity that occurs in time, as trips start at a specific moment in time and, because they involve covering distance in space, also imply spending a certain amount of time. Individuals may be constrained in the times of the day or days of the week they can travel, both because they might need to be doing other activities at certain times or days, or because transport may not be available at those times or days. This is particularly relevant in the case of public transport, as trips depend on the services provided at each moment in time. But it also applies to private transport, as some road links may be closed to private vehicles at some times of the day. Individuals may also be constrained in the total amount of time they spend travelling, because time is a finite resource and individuals need to balance the time spent travelling with time spent doing other activities.

There is evidence from a variety of countries that time constraints are particularly impactful in the case of women, which is related to gender inequalities in responsibilities in childcare and household tasks (Schwanen *et al.* 2008, Uteng 2009) and reliance on public transport (Kwan and Kotsev 2014). The relevance of time constraints also depends on the geographic context. For example, the study of Lucas *et al.* (2001) in several areas in the UK showed that time constraints are of special concern in areas distant from major trip destinations and where public transport is infrequent, including rural areas and some neighbourhoods at the periphery of cities.

Social and cultural constraints

Individuals may feel restricted in their travel behaviour not because of objective factors such as geography, cost, or time, but because of their perceptions about using the transport system.

These perceptions may be related to social factors. For example, individuals may feel compelled to buy and use private vehicle due to social stigma against using public transport or to pressure to use private transport as a social symbol (Nordlund and Garvill 2003, Steg 2005, Bamberg *et al.* 2007).

The constraints to travel behaviour may also have a cultural basis. For example, in some societies or communities there is a prejudice against some groups using some means of transport (for example, adults, or women of all ages using bicycles, or women travelling alone in public transport). Cultural factors also come to play when they restrict the ability of individuals to use transport, for example because they cannot understand how it works due to language barriers (DfT 2003, Rajé 2004, 2017).

Personal security constraints

Fear of crime is another major barrier to travel behaviour, affecting the choice of travel mode and destination. This is especially relevant in the case of public transport users, both while travelling and waiting at rail stations and bus and coach stations and stops.

There is extensive evidence that fear of crime is a particular issue for women (Yavuz and Welch 2010) and that women often change travel patterns due to fear of crime in public transport (Loukaitou-Sideris 2014).

There is also some evidence that perceptions of personal security depend on factors such as ethnicity and income. The studies of Lucas *et al.* (2001) and DfT (2003) provide insights on the security-based constraints to travel among ethnic minorities, due to fear of local gangs and racial abuse. In surveys and interviews conducted in 1996 and 2002, individuals from ethnic minorities were also more likely to report feeling unsafe when using public transport comparing with other groups (Crime Concern 2004). A study in London also revealed that concerns over crime were more evident for individuals with low household incomes, compared with the rest of the population (TfL 2012).

Physical constraints

Some individuals are also restricted in their choices over travel mode due to physical barriers in accessing transport, such as steps, steep slopes, surfaces in poor condition, obstructions, or lack of provision for the visually impaired. While these barriers are primarily barriers to walking, because they may appear on public transport terminals, or on the streets leading to train stations, they also limit the ability of some people to use public transport. Physical constraints to travel are particularly impactful on travel behaviour of the elderly and people with disabilities (Titheridge *et al.* 2009).

Personal constraints

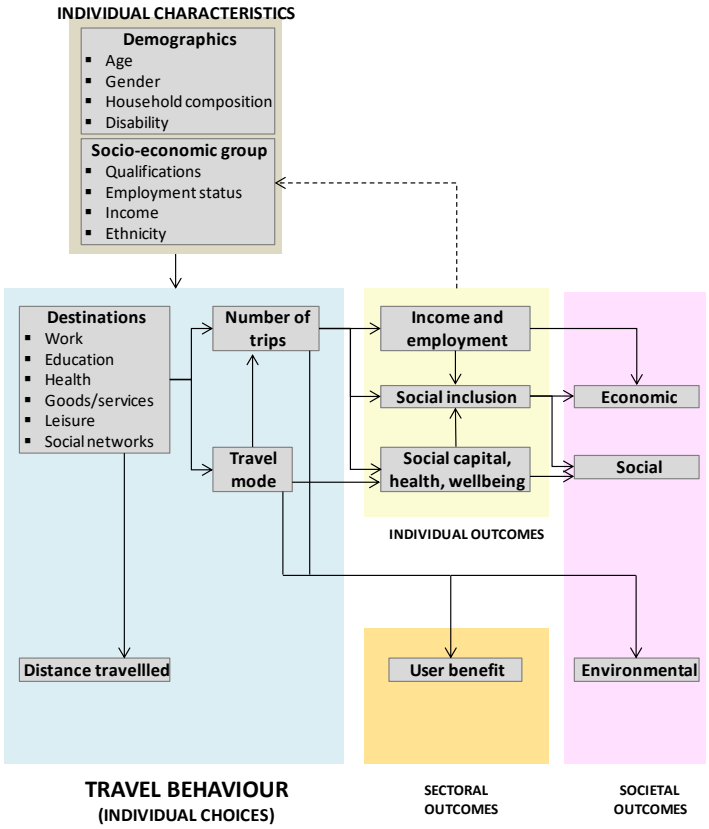
Finally, travel behaviour may be constrained by personal factors, which may be related to life stage, household composition, or employment status. For example, some individuals may need to make at least a minimum number of trips, because they work far from home, or have to drop children at school. Others may need to constrain the number of trips, because they are carers. Travel behaviour is also constrained because of the need to align the decisions of different members in a household regarding the allocation of household tasks (for example, who does the shopping or drop children at school) and resources (for example, who uses the car) (Ho and Mulley 2015).

Personal constraints interact with all the other constraints described above. For example, in a qualitative study in Australia, Hamilton and Adamson (2013) found that many young adult carers found it difficult to manage caring, studying, and working part-time in part because of the logistics of transport and study course timetables, especially when economic constraints prevent them to obtain a driving license.

2.2.3. Wider impacts of travel behaviour

Subsections 2.2.1 and 2.2.2 focused on causes of travel behaviour. This subsection looks at the impacts of that travel behaviour. We use the framework in Figure 3 to organise the review of the evidence found in the literature on those impacts. Travel has an immediate impact for individuals: reaching a destination to perform some activity. These are usually called "user benefits" in transport economics. However, travel also has "wider impacts" on the lives of individuals and on society in general. This literature review focuses on these wider impacts.

Figure 3: Framework of analysis (Part 3)



Individual impacts

Changes in travel behaviour have wider impacts on individuals' lives at various levels, such as employment, income, social capital, health, wellbeing, and more generally on social inclusion and social mobility. Below we review the evidence in each of these areas.

Employment

There is extensive evidence that access to transport influences employment status. Several studies, mostly in the USA, have found a link between poor accessibility and higher unemployment rates among some groups, even after accounting for occupational differences (Cervero *et al.* 1999, Stoll *et al.* 2000, Tyndall 2017). Using

aggregated data at the census output area, Johnson *et al.* (2017) also found that a significant negative relationship between public transport travel time and employment. This relationship is bigger in more urban areas. One explanation for the links between accessibility and employment is that poor transport access narrows the area where people search for jobs (Patacchini and Zenou 2005, Manning and Petrongolo 2017).

This problem is particularly relevant in the case of individuals who do not own a car and rely on public transport. For example, Mackie *et al.* (2012) and KPMG (2017) show that some individuals would only participate in the labour market if bus services were available, due to the lack of transport. In a study in the USA, Kawabata (2003) also found that access to good public transport not only increases the probability of being employed, but also the probability of working full-time, rather than part-time.

Fear of crime in public transport or when walking or cycling to public transport also affects employment prospects at it reduces the scope for working evening and night shifts. This was, for example, a recurrent theme in interviews and focus groups conducted by Wixey *et al.* (2003) in East London and also mentioned by participants of in-depth studies focusing on transport problems in deprived communities conducted by Lucas *et al.* (2001) and Hine and Mitchell (2003).

In the long term, poor transport also affects employment prospects because it restricts the opportunities for education. In a report reviewing different sources of national-level data in the UK, Bourn (2013) found that lack of private vehicle was a barrier for young people to take up education and training opportunities, especially among low-income groups. Kenyon (2011) also found, using focus groups with students at a university in South East England, that inadequate transport is perceived to be a major barrier to access and achievement in higher education.

Income

Poor access to transport also impacts on personal income. Drawing on a range of evidence from the UK, Titheridge *et al.* (2014) described the pathways through which poor transport is associated with poverty for groups such as women, older people, unemployed people, ethnic minorities, students, and individuals living in rural areas or in pockets of urban deprived areas. These pathways are linked to several of the aspects previously mentioned in this chapter, for example the costs of owning and using a private car and using public transport, the higher cost paid for goods and services locally (due to lack of transport to access cheaper goods and services in more distant places) and the impacts of poor access to transport on unemployment, wages, and education.

Social capital

Travel behaviour is also related with the individuals' social capital (which can be defined as "the value of social networks, bonding similar people and bridging between diverse people, with norms of reciprocity" (Dekker and Uslaner 2001)). There is evidence on the negative impact of transport on social capital, coming from several countries. For example, in Scotland, Hine and Mitchell (2003) found that individuals who rely on public transport tend to visit friends and family less frequently than they want because of the

reduced availability of public transport services. In Zurich, Frei *et al.* (2009) also found that lack of access to a car is associated with smaller and less strong social networks. Also in Switzerland, Viry *et al.* (2009) found that this effect is particularly impactful for groups such as women with children, immigrants, people with disabilities, and individuals with low qualifications. At an aggregate level, Utsunomiya (2016) found an association between the provision of local bus services (as measured by the distance of the routes of all available bus services) and indicators of social capital in Japan.

Currie and Stanley (2008) hypothesized that public transport might be associated with social capital not only because it provides mobility and the possibility to travelling to visit people, but also because it provides opportunity for social interaction. This was confirmed in the study previously cited of Green *et al.* (2014) in London, which found that free bus travel has a positive wellbeing impact on older users because of the possibility of social interaction.

Despite this growing evidence, the pathways linking access to transport and social capital are still not well understood. As noted by Schwanen *et al.* (2015), it is difficult to isolate cause-effect relationships, as transport disadvantage reduces social capital, which in turn may reinforce transport disadvantage.

Health

Restrictions on the ability to travel to some destinations or to use some travel modes may also be associated with negative health impacts. This is also a field with growing research, but some of the hypotheses have not been confirmed with robust and consistent evidence.

One hypothesis is that poor accessibility to health facilities, due to poor transport, can have a negative impact on health outcomes. For example, in Northern England, Jones *et al.* (2008) found that longer travel times to general practitioners were associated with late stage diagnosis and higher risk of death from some diseases.

Access to green areas may also be related to the total physical activity done by an individual. However, this hypothesis has been tested mostly in terms of the association between health and lack of ability to walk to green areas (Coombes *et al.* 2010, Mytton *et al.* 2012), with no studies to our knowledge assessing the how levels of private or public transport accessibility to green areas impact on health.

Poor access to healthy food due to lack of transport may also result in poorer health. This hypothesis is based on evidence, from health and nutrition surveys, showing that food consumption patterns, and in particular the consumption of foods integral to a balanced diet, differ by place of residence (Wrigley 2002), which may be related to lack of transport to access food shops (Acheson 1998). Despite this evidence, the studies of Cummins and Macintyre (2002b) in Glasgow and Pearson *et al.* (2005) in South Yorkshire did not find evidence of associations between living in a “food desert” and poor diet. A more recent study focusing on older adults but covering 20 different towns in the UK also found no significant associations between fruit and vegetable intake and

characteristics of the local areas such as density of shops selling fruits and vegetables, density of shops selling fast food, food retail diversity, walkability, and transport accessibility (Hawkesworth *et al.* 2017).

Trips to visit family and friends are also important for maintaining social networks, which contributes to good health (Silva *et al.* 2005). The need to stay connected with communities and social networks is particularly important for the health of older people (Musselwhite *et al.* 2015). As mentioned above, restrictions to travel often reduce the number of trips that people can make to visit family and friends. However, there is little evidence on the pathways linking restrictions to travel, trips to family and friends, and health, as shown in the reviews of Mindell and Karlsen (2012) and Boniface *et al.* (2015).

The choice over travel mode also has health implications, as trips by public transport usually require more walking (to access stations/stop and for interchange), which is a form of physical exercise, a crucial component of physical and mental health. Research using data from the National Travel Survey showed that people with a bus pass were more likely to walk than others (Coroni-Cronberg *et al.* 2012). Results from the English Longitudinal Study of Ageing also found that older people eligible for a free bus pass were less likely to become obese (Webb *et al.* 2012). However, this may not apply to other age groups. For example, Edwards *et al.* (2013) reviewed free bus travel for young people in London and found no impact on total amount of walking.

Wellbeing

Travel behaviour is also linked with subjective wellbeing (which can be defined as 'a person's cognitive and affective evaluations of his or her life' (Diener *et al.* 2002, p.63)). The ability to go to places contributes to wellbeing as it allows individuals to perform activities and maintain employment, relationships, and ultimately, freedom (Delbosc 2012). Restrictions to the number of trips that individuals would like to make affect their overall satisfaction with daily travel because they limit the type and frequency of their out-of-home activities, as shown in many empirical studies (Bergstad *et al.* 2011, 2012, Friman *et al.* 2017, 2018). In the long term, restrictions to travel may also prevent individuals from realising their "true potential" (De Vos *et al.* 2013).

There is a growing number of empirical studies estimating the association between restrictions to travel and subjective wellbeing. For example, the studies of Currie and Delbosc (2010) in Australia found that transport disadvantage (measured by indicators of access to public transport, lack of constraints to travel, disabilities, and reliance on others for transport) was associated with lower subjective wellbeing via its effects on what the authors called "time poverty". In another study (Delbosc and Currie 2011), the same authors found that the association between transport disadvantage and lower wellbeing is particularly strong when individuals are already at disadvantage in terms of other factors such as income or employment.

Restrictions to the travel modes people can use are also important. People may use travel time in some modes to relax or socialize, deriving 'utility' from the trips. However, travel in congested roads or overcrowded public transport contributes to stress.

Improvements in travel conditions can then have benefits that are not directly related to the number of trips or travel time, but to the 'amenity value' of those trips. The choice over travel mode also has implications in terms of subjective wellbeing, as some individuals may feel better using some modes than others. For example, empirical studies have consistently found that individuals have higher travel satisfaction and wellbeing when they have the possibility of walking or cycling to work, compared with individuals who are restricted to using motorised modes of transport (Friman *et al.* 2013, Olsson *et al.* 2013, Martin *et al.* 2014).

Social inclusion

All the factors described above (employment, income, social capital, health, and wellbeing) are important determinants of social inclusion. According to Burchardt (2000), “an individual is socially excluded if he or she does not participate to a reasonable degree over time in certain activities of his or her society, and (a) this is for reasons beyond his or her control, and (b) he or she would like to participate". Having low income, being unemployed, having low social capital, being in poor health condition, and having low wellbeing can increase social exclusion.

There is an extensive literature on the relationships between transport and social exclusion, especially in the UK. This topic started to gather interest from governments and researchers in the late 1990s. A landmark report by the Social Exclusion Unit (SEU 2003) has found that lack of access to good transport contributes to social exclusion of vulnerable groups such as young adults, the elderly, people with disabilities, single parents, low-income groups, and ethnic minorities, due to problems in accessing key destinations such as jobs, schools, health facilities, and shopping areas, which reduce the opportunities to participate in economic and social activities.

This hypothesis has been confirmed in several other studies in the UK (Hine and Mitchell 2003, Lucas 2004, Rajé 2004, 2017, Lucas *et al.* 2009) and in other countries, such as Australia (Currie *et al.* 2010) and South Africa (Lucas 2011). The key factors in the chain of cause-effect relationships linking poor transport with social exclusion are the lack of access to a private vehicle or living in areas far from public transport links or with slow or unreliable services.

The role of transport in reproducing social exclusion is particularly relevant in rural areas. In Ireland, McDonagh (2006) showed that insufficiencies in transport underline the efficiency of economic and social policies aimed at improving the quality of life of populations in urban areas.

Social mobility

In the long-term, through its impacts on employment, income, social inclusion, and health, better transport affects the opportunities that individuals have during their life course, possibly leading to social mobility, transformation of neighbourhoods, and a reduction in social inequality (Ohnmacht *et al.* 2009). The provision of better transport can also contribute to reduce gender imbalances (Uteng and Cresswell 2008).

Societal outcomes

The societal outcomes of travel behaviour of an individual are those that affect not only that individual (directly) but also society in general (indirectly). These outcomes can be economic, social, or environmental.

Economic outcomes

Large transport investments have a positive economic impact that is wider than the one measured by user benefit alone. This wider impact is derived from indirect effects on employment, productivity, investment, and local economic activity. However, it should be noted that wider economic impacts in one area may imply costs in another area, as some of the increased economic activity may be displaced from that area.

There is some evidence on the economic impact of transport on employment. For example, Mackie *et al.* (2012) showed that the existence of public transport can increase total output because some workers would not participate in the labour market otherwise. Mackett (2015) also argued that improving access to transport to older people would enable them to make a more significant economic contribution to society, especially considering that the participation of older people in the labour market is likely to increase in the future.

Improvements in the ability for people to make trips to access goods and services also have a positive impact on local retail in the areas around the destinations where people travel to, an impact usually reflected in land use uplifts.

Through its impacts on reducing unemployment and social exclusion, the provision of transport can also contribute to increasing tax revenue and reducing welfare payments.

Social outcomes

Ensuring that individuals have a good access to transport may also have wider social impacts, related to the cohesion of local communities, the strength of local social networks, and the number, diversity, and vitality of non-economic activities. For example, KPMG (2017) showed that access to public transport increases opportunities to make trips for volunteering. The study of Naegele and Schnabel (2010) in several European countries also found that public transport is a crucial aspect of increasing volunteering activities among the elderly, with the added benefit of increasing wellbeing and reducing social exclusion among this group.

Environmental outcomes

Changes in travel behaviour also have environmental impacts, such as noise, and air pollution, as these depend on the total number of trips people make, how long these trips are, and what mode of transport is used. There is ample evidence that trips by private motorised vehicles are the most environmentally damaging, in terms of impact per trip per person. There are also robust estimates of the economic value of the different types of transport-related environmental impact (Korzhenevych *et al.* 2014).

The reduction of trips that were previously made by motorised modes also has a societal benefit as it helps to reduce environmental impacts.

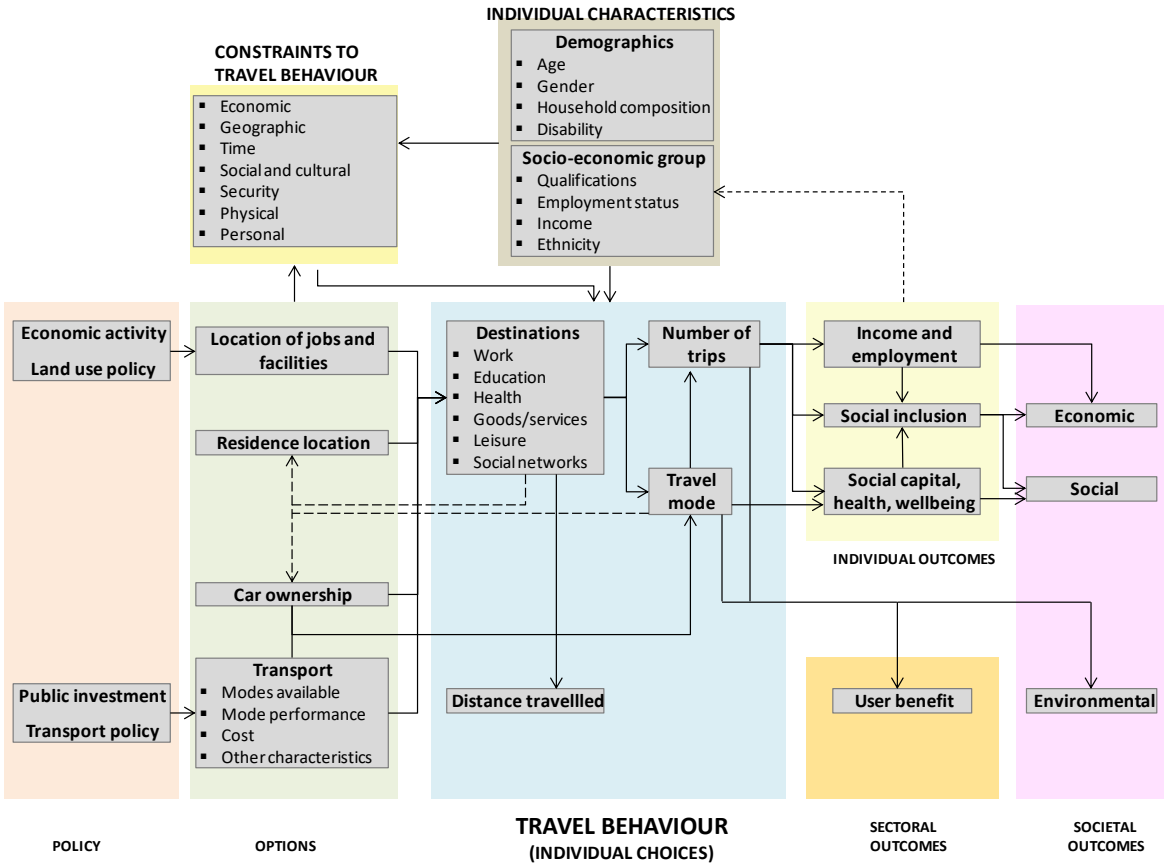
These environmental impacts are a crucial element in judging the desirability of transport investment and TfN already has an extensive evidence base on these impacts, for example, in the Strategic Transport Plan's Integrated Sustainability Appraisal Report (Atkins 2018). Environmental impacts are beyond the scope of this report, and so they will not be the subject of further comments in the rest of this report.

2.2.4. A conceptual framework for the study of causes and consequences of travel behaviour

Figure 4 brings together the different parts of the conceptual framework presented in the last three subsections. This framework will be used as a starting point for the analysis in this report, which will assess the existence, nature, and intensity of the links between the different variables of interest in the specific case of the North region and in the context of the Strategic Transport Plan. Chapter 6 will present a revised framework identifying the links on which there is robust evidence and the links that are unclear - and specify how these 'unclear' links may vary under different scenarios.

The framework is also used to structure the remaining sections of this chapter. Section 2.3 will look at methods for appraisal of the economic and social outcomes represented in the right side of the framework. Section 2.4 will then review the information in the TfN publications regarding future transport investments, discussing the gaps of the existing evidence base in terms of the assessment of the links hypothesized in the framework.

Figure 4: Framework of analysis



2.3 Measuring the wider impacts of changes in travel behaviour

This section reviews the current guidance for measuring the wider impacts of changes in travel behaviour, in the context of transport appraisal. The guidance of the Department for Transport (DfT) is used as a starting point in Subsection 2.3.1, where we identify the parts of the Department's manual for transport appraisal (WebTAG) relevant to the measurement of the economic and social impacts of changes in travel behaviour and then identify their limitations. In Subsection 2.3.2, we describe some alternatives to WebTAG found in the guidance for transport appraisal in other countries, in the transport plans of regions and metropolitan areas, and in sectors other than transport. In Subsection 2.3.3 we give an overview of methods that have been proposed in the academic and grey literature.

2.3.1. WebTAG

The WebTAG guidance (https://www.gov.uk/guidance/transport-analysis-guidance-webtag) recommends assessing transport schemes that change travel behaviour in terms of the impact on "user benefit" (i.e. the benefit for users of the transport system). This is described in TAG unit A1-3. The user benefit derives from two associated changes:

- The reduction in the generalised cost of trips (which includes the financial cost, time spent, and other costs).

- The associated change in the number of trips.

The increase in the number of trips resulting from a reduction in generalised cost from a transport scheme can be calculated as the change in consumer surplus, usually captured by the 'rule-of-a-half' (to approximate the net benefit of new trips as half of the net benefit of existing trips). This benefit is then compared with other monetised benefits and costs of the scheme in cost-benefit analysis.

This method has three main limitations:

- It does not measure the total value of the new trips that are generated, which depends on the value of the activity done at the destination.

- It implicitly assumes that the extra trips represent a benefit.

- It does not account for the wider economic and social impacts of changes in travel behaviour, described in Subsection 2.2.3.

The two first limitations are unresolved issues in transport economics and require further theoretical and methodological developments. However, WebTAG provides guidance on accounting for the wider economic and social impacts, as shown below.

Economic impacts

The guidance on economic impact (TAG Unit A2) provides methods to appraise the wider economic impacts of transport schemes, defined as the effects of increased connectivity and the possible effects of relocation of households and business – something that is not well-captured in the appraisal of user benefits because of the existence of market imperfections. WebTAG guidance on the appraisal of these impacts applies mostly to large-scale projects and it presupposes extensive modelling to isolate the links between transport and the economic benefits. This complexity is a major limitation to the application of the guidance in practice.

WebTAG considers three types of economic impacts:

- Induced investment (TAG Unit A2.2) – assessed by valuing land value uplifts associated with the transport scheme (in the case of land use developments that are dependent on the scheme) or simply by adding 10% to user benefits.

- Employment effects (TAG Unit A2.3). The assessment of new jobs is done by showing that lack of accessibility is a barrier to individuals entering employment, then estimating the change in the generalised cost of travel resulting from the scheme, the resulting change in jobs and GDP, and finally the tax wedge associated with the

increased GDP. The assessment of shifts to more productive jobs is done by showing that improvements in accessibility lead to a relocation of economic activity, then estimating the change in the generalised cost of travel resulting from the scheme, the resulting change relocation of jobs and change in productivity, and finally the tax wedge associated with the increased GDP.

- Productivity gains through agglomeration economies (TAG Unit A2.4). This is assessing by combining, for each sector, the anticipated change in "effective density" (i.e. the accessibility in each area to jobs in all other areas, which is calculated from generalised travel costs) with pre-defined elasticities of productivity with respect to effective density and the average GDP per worker.

Social and distributional impacts

Social exclusion is not explicitly addressed in WebTAG. However, the guidance on social impacts (TAG Unit 4.1) and distributional impacts (TAG Unit 4.2) includes methods to assess security, accessibility, and affordability. As shown previously, in Subsection 2.2.2, these aspects are linked to economic, geographic, and security constrains to travel behaviour.

Security is covered in TAG Unit 4.1. A 3-point scale is recommended for assessing seven aspects related to security, combined with an estimate of the number of users affected. However, there is no guidance on how to assess the effects of personal security concerns on the demand for the different travel modes and on the restrictions that those concerns put on the ability of some individuals to travel to the desired destinations.

The assessment of accessibility is covered in TAG Unit 4.2 and is based on contour maps showing travel time for specific types of destinations at specific time periods, or the number of destinations that can be reached within a specific travel time, before and after implementing a given transport scheme. These are then used to build indicators of accessibility to specific types of destinations, for specific groups, focusing on income groups, children, young adults, older people, ethnic minorities, people with disabilities, households without access to a private car, and households with dependent children. WebTAG also recommends conducting separate accessibility audits looking at frequency of services and several aspects related to the physical accessibility of the infrastructure. Each aspect is scored from -3 to +3.

The assessment of affordability is covered in TAG Unit 4.2 and is based on the anticipated change in the per-trip cost of travel by different modes, and the number of users affected, for different income groups.

TAG Unit 4.2 also gives guidance on the assessment of the distribution of impacts across different groups. This is relevant because transport schemes causing substantial changes in travel behaviour also have an equity dimension, as they may contribute to a reduction of poverty, social exclusion, and social inequality, as seen in changes in user benefits, accessibility, or affordability. The distribution of each of these impacts for each group is classified in a 7-point scale mentioned above, which considers whether the impacts are

"beneficial" or "adverse" and whether the proportion of the group in the population impacted is higher or lower than the proportion of the group in the total population. The main limitations of this method are that it treats the impact as a binary variable (beneficial or adverse) and it does not cover all relevant dimensions of social inequality. For example, it does not consider gender inequality in the constraints faced by individuals on travel behaviour and the associated outcomes of that inequality.

The guidance on social and distributional impacts is also incomplete as it does not cover many of the aspects of social exclusion mentioned in this report (including time, social, and cultural, constraints to travel behaviour) and wider impacts on structural unemployment, income, health, wellbeing, social capital, and social mobility.

However, WebTAG (TAG Unit A 1.3 Appendix B) gives some guidance on the social value of bus travel, comprising the accessibility for users who would have not been able to easy access some opportunities (including jobs) and perform some activities had the bus services not been available. The guidance documents indicate that these valuations should be reported only to provide more detail on the appraisal, as in theory the value is already captured as user benefit. The valuations measure the benefit (gross of transport costs) of bus trips that would not otherwise have taken place without the scheme being appraised, using values from a stated preference survey (Mott McDonald 2013).

2.3.2. Other appraisal guidance

In general, the WebTAG guidance is wider in scope and more detailed than similar national-level guidance documents for transport appraisal in other countries. However, the guidance in some countries (and regions) suggest methods that provide a clearer assessment of the economic and social outcomes of transport schemes that lead to substantial changes in travel behaviour.

The guidance in New South Wales (Australia) (TfNSW 2016) is one of the best examples of methods to assess those outcomes. This guidance recommends a "transport social exclusion index" with 6 components, each one scored based on several indicators. The components are:

- Mobility need, i.e. number of essential trips outside the home a person must make
- Land use accessibility, i.e. travel distance to common destinations
- Physical and communication ability
- Automobile access
- Mobility options, i.e. number of non-automobile mobility options available to an individual for local travel
- Financial wealth, i.e. ability to pay for transport services.

Guidance documents in some countries also suggest more detail in the assessment of accessibility, comparing with WebTAG. For example, the guidance in France (CGSP 2013, Chapter 13) recommends the use of equity indicators based on the increases of

accessibility in different areas within the region served by new or improved transport infrastructures.

The local transport plans at the regional and metropolitan level also include information on how to assess the benefits of transport schemes. However, they tend to rely on narratives of the potential for obtaining these benefits, especially in the case of social impacts. For example, Boisjoly and El-Geneidy (2017) reviewed the transport plans of 32 metropolitan areas around the world and found that few of them include indicators of accessibility, and even fewer look at destinations other than jobs.

The few transport appraisal guidance documents that mention gender equality in transport include narratives on how this topic is important and how to address it, but do not recommend specific indicators to assess how transport schemes can potentially reduce gender inequality.

The appraisal of transport schemes could also benefit from using valuations and methods developed in sectors others than transport. These include, for example, the following sectors and methods:

- Housing and Urban Planning – Land value uplifts
- Employment and social security – Estimates of the individual and social costs of being unemployed, especially cased of structural unemployment
- Personal Security – Average costs of crime incidents
- Environment – Benefits of using green space
- Health – Sickness absence costs

2.3.3. Methods proposed in the literature

There is a vast academic literature with methods to map and analyse levels of accessibility of different groups and how these levels respond to changes in the transport system (Witten *et al.* 2003, Tsou *et al.* 2005, Macintyre *et al.* 2008, Grengs 2015, El-Geneidy *et al.* 2016). These methods usually provide much more detail than the methods proposed in official documents for transport appraisal.

There are also several proposals for indicators of "transport poverty". For example, Sustrans (2012) suggested an area-based composite indicator including household income, distance to the nearest bus stop or train station, and travel time to access key services. Stokes and Lucas (2011) suggested three different dimensions: car availability, access to public transport and access to key services and facilities.

The assessment of transport schemes that generate new trips can also be measured in terms of the impact of those trips on the local economic activity, which can be measured in terms of increased expenditure on local retail businesses. An alternative, in the case of schemes that generate new public transport trips is to account for the impact on the output of individuals that could not participate in the labour market before the scheme due to poor transport (Mackie *et al.* 2012 and KPMG 2017).

Statistical analysis can also be used to derive relationships between aspects of travel behaviour and the hypothesized outcomes on individuals' lives. For example, Utsunomiya (2016) modelled the relationship between social capital and bus-km per capita. This could be combined with valuations of social capital from other studies (for example, Westlund and Adam (2010) reviewed 65 studies providing these estimates) to derive the total economic benefit of bus travel. A more direct approach is to model the relationship of a certain outcome as a function of income and number of trips made (or other characteristic of travel behaviour). This allows for the estimation of the value of a trip as the marginal rate of substitution between income and number of trips. This method was used by Stanley *et al.* (2011, 2012a, 2012b) to estimate the value of an additional trip, using models with social exclusion or social capital as dependent variable and income and number of trips as explanatory variables.

2.4 Transport investment and travel behaviour in the North

This section reviews the information in three key TfN publications regarding the type of planned transport investment, focusing on how this investment might influence travel behaviour and the gaps that they leave regarding the causes and consequences of travel behaviour.

2.4.1. Strategic Transport Plan

TfN's Draft Strategic Transport Plan for the North (TfN 2017) sets out the priorities for developing the strategic transport network that provides the connectivity needed to increase job opportunities and productivity, with the goal of supporting transformational economic growth. This requires a sustained investment programme across the North, including building and upgrading transport infrastructure, and enhancing public transport services. The focus is on pan-Northern connectivity and the time horizon is 2050.

The plan includes an ambitious programme of investments in rail, including the Northern Powerhouse Rail (providing improved rail links between the major urban areas in the North) and a set of investments in lines, stations, services and franchises. This is complemented with the development of integrated and smart travel public transport. The plan will also strengthen the major road network.

One of the major objectives of the plan (p.11) is to improve access to opportunities, ensuring that economic growth is "as inclusive as possible, avoiding transport poverty". There is a commitment to ensure that access for all, "regardless of their age, income level, and mobility". Besides inclusive growth, the plan will also aim at "positive health and wellbeing, and provide affordable access". As shown in the previous sections of this chapter, achieving this objective requires removing the barriers that limit the individuals' travel behaviour, especially those that are intrinsically linked with demographic and socio-economic characteristics. This is the object of analysis of the current report.

2.4.2. Future transport demand in the North of England

The Northern Transport Demand Model (SDG 2018b), developed to support the Strategic Transport Plan, estimates how changes in transport, population, and employment will affect travel patterns across the North. The model forecasts transport demand on the road and rail networks in 2050 under different scenarios. The model analyses the impact of future scenarios in which interventions (including the transport improvements outlined in the Northern Transport Strategy) have achieved the economic transformation of the North, which will have an extra 1.2 million people and 850,000 jobs.

The model considers two types of uncertainty: 1) patterns of land use (compact or dispersed) and 2) how technological and social-cultural change may affect travel behaviour (in particular the decision to undertake activities face-to-face or digitally). It then builds four types of scenarios, combining hypothesis for those two types of uncertainty:

- Scenario 1: Compact & Digital
- Scenario 2: Compact & Travel Friendly
- Scenario 3: Dispersed & Digital
- Scenario 4: Dispersed & Travel Friendly

The total demand for rail travel is expected to increase 327% up to 2050 in Scenario 2 (Compact and Travel Friendly), 192% in Scenario 1, 136% in Scenario 4, and 60% in Scenario 3. The total demand for road travel is forecast to increase much less than rail travel: around 50% in Scenarios 2 and 4 and around 25% in scenarios 1 and 3. The impact of transformational economic growth is likely to increase travel demand within City Regions under all scenarios, but particularly for 'Travel Friendly' scenarios (2 and 4) in relation to road travel and 'Compact' scenarios (1&2) in relation to rail travel.

The model assumed that the number of trips made each purpose made in and area depends on the following factors:

- Commuting trips: the size of the population, the workforce and the number of jobs available
- Business trips: the number, size and type of businesses providing goods and services to each other;
- Other: the size of the population, the proportion in education or seeking services or leisure activities and the availability of services and activities.

The model thus assumes that the restrictions to travel described in this literature review were removed, so the results need to be compared with more detailed analysis on the travel behaviour of different groups, as provided in User Insight Phase 1, described below, and with the analysis of restrictions to that behaviour, in the current report.

2.4.3. User Insight Phase 1

The User Insight Phase 1 (SDG 2018a) provides insight into the travel behaviour and motivations of individuals and the decisions that people make about where they live and work and how and where they travel.

This research defined the user segments shown in Table 1, based on how they currently travel. The groups were created using census data at the output area level and National Travel Survey data.

The research left two questions open (page iii):

- How will the travel behaviour of people within each segment change over time, both in respect to changes in transport supply and the provision of transport services, and in response to exogenous changes?

- How will the size of each segment change over time, again with respect to exogenous and transport stimuli?

The next chapters of this report will address those questions, looking into detail at the two aspects reviewed in the current report: the restrictions individuals face in their travel behaviour, and the potential wider impacts of changes in that behaviour on the individuals' lives.

Table 1: User Segments

Segment	%	Key demographics	Key property/geography characteristics	Key travel characteristics
Inner City Cosmopolitans	3%	Well educated, single. 50% students. Young.	Dense inner cities, private rented flats.	Significantly above average rail. Low car usage and ownership - almost 50% no car.
Multiculturals	11%	High percentage families with children. Younger with more children in households.	Larger towns and cities. Around half rented.	Travel less, shorter journeys. Much higher bus. Almost 50% no car.
Urbanites	15%	Employed full-time in middle occupational roles. Families with children & couples with no children.	Smaller towns and outer fringes of larger cities. Semis and terraces, majority owner occupied.	Travel more, travel more by rail, less bus. Own car and greater propensity to commute by rail
Constrained City Dwellers	9%	High percentage singles, divorced or widowed. High percentage with no qualifications, unemployed and long-term sick.	Densely populated, large towns and cities. High percentage social rented & flats.	Fewest trips, shortest distance, much more bus, much lower rail. More than 50% no car. High walking/bus commute
Hard Pressed Living 1	13%	Families with children. High percentage with no qualifications. Working in manufacturing.	Smaller towns and cities outside metro areas. Terraces houses and semis - around half rented.	Travel less, shorter journeys, considerably less by rail but much higher bus. Greater car ownership.
Hard Pressed Living 2	15%	Families with children. Lower occupations in public admin & education.	Inner suburbs and small towns within metropolitan areas. Approximately half	Travel less and shorter distances. Slightly higher rail and much higher bus.

		Relatively high percentage no qualifications.	owner-occupied, living in terraces or semis.	~30% no car. Commute more likely by bus & rail
Metro Suburbs	13%	Older, employed in high occupations. More likely to be employed full-time and aged 45-59.	Outer suburban areas of metropolitan areas. Majority owner occupied. Semis/detached.	Travel more & further by car and rail. Much lower bus. Car ownership higher. More likely to have 1-2 cars in household and travel to work by car.
Small Town Suburbs	13%	Older and without children.	Outside metropolitan areas. Detached/semis majority owner occupied.	Travel more, travel further, less public transport. Greater car ownership & travel further by car. Significantly less bus.
Rural Residents	8%	Older, married, better educated. Working in primary industries.	Rural, less dense, detached houses	High car ownership and car commuting

2.5 Conclusions

This chapter has reviewed the existing evidence on the causes and consequences of travel behaviour, focusing on how they differ by social group. The determinants of transport behaviour are complex, and there is evidence on a range of links between the choices made by individuals regarding travel and the geographic, economic, and social context. In turn, the individual choices then affect economic, social, and environmental variables, which in many cases also have a feedback effect on travel behaviour.

The review has set out hypotheses on the pathways linking travel behaviour with the factors that constrain that behaviour and with the wider economic and social impacts that result from it. As shown in the review, there is robust and consistent evidence, obtained in the UK and in other countries, that restrictions to travel can contribute to social exclusion, and that there are wider economic benefits that transport could unlock. However, some hypotheses have not been confirmed with robust and consistent evidence. This is particularly the case of the associations between travel behaviour and health.

The framework developed will be taken forward to the next chapters of this report, to assess whether there is enough evidence supporting the hypotheses derived from the literature in the specific case of the Northern region, i.e. to test the existence, nature, and intensity of the links between the different variables of interest. The objective is to gauge the possible impact of TfN's planned transport investments on travel behaviour and on the ability of individuals to take advantage of the increased opportunities provided by that investment.

In Chapters 3 and 4, the framework is assessed against the results of primary data analysis, which look into attitudinal responses of individuals in different socio-economic groups regarding current travel behaviour (considering the transport options available), how they are likely to respond to the proposed transport investments, and the implications in terms of accessing the economic and other opportunities available at different places across the North.

In Chapter 5, the framework is assessed against secondary data on levels of public accessibility of different areas in the North and different socio-economic groups.

Chapter 6 then presents a revised framework identifying the links on which there is robust evidence and the links that are unclear, an specifying how these 'unclear' links may vary under different scenarios.

3 METHODOLOGY

3.1 Introduction

This chapter presents the methods used in the primary data analysis stage of the research. Section 3.2 and Section 3.3 describe the methods used in quantitative survey of households and businesses. Both sections have a similar structure, first presenting sampling and recruitment methods, then the sample composition, and finally the questionnaire structure. Section 3.4 describes the methods used in the qualitative survey.

3.2 Quantitative analysis: households

3.2.1. Sampling and recruitment

The quantitative research comprised of a large-scale online survey of Northern UK residents. A sample of 3,000 residents was selected, to allow for statistically robust results for the 9 segments developed in the User Insight Phase 1 (SDG 2018a).

Residents were sampled via an online panel provider who sent out the contact email to potential participants containing a web link allowing participants access to the web-based questionnaire hosted by Accent. This method allowed Accent to remain in control of the survey from the point of the email being sent out, ensuring that quality control standards were met and adhered to throughout the survey process and subsequent analysis and reporting.

A pilot of 50 interviews split across segments was undertaken and used to test:

- the recruitment process
- the clarity and flow of the questionnaire
- the appropriateness of the language used
- the accuracy of all routings
- ease of use of the show material
- the interview duration
- the survey hit rate.

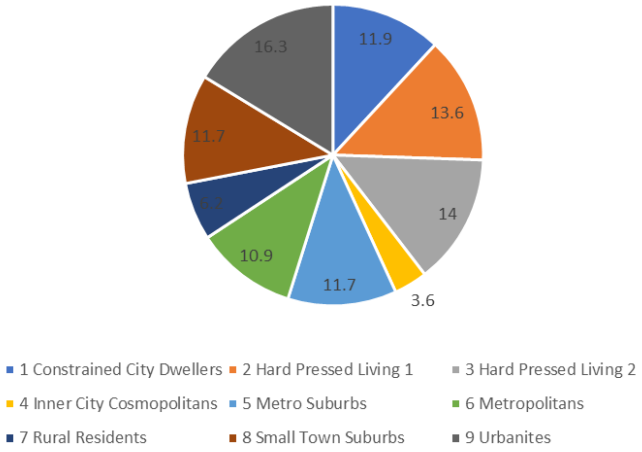
3.2.2. Sample composition

Table 2 shows the proportion of each User Insight Phase 1 segment in the population, the target number of interviews per segment, the number of interviews achieved, and the proportion of each segment in the sample (also shown in Figure 5). The data was weighted back to the segment definitions as provided by TfN, to allow for where numbers fell short of targets or segments were under- or overrepresented.

Table 2: Segments: population and sample

Segment	Proportion of population	Target number	Number achieved	Proportion of participants
Rural Residents	8%	240	188	6%
Small Town Suburbs	13%	390	352	12%
Hard Pressed Living 1	13%	390	409	14%
Urbanites	15%	450	490	16%
Constrained City Dwellers	9%	270	360	12%
Multiculturals	11%	330	330	11%
Inner City Cosmopolitans	3%	90	109	4%
Hard Pressed Living 2	15%	450	423	14%
Metro Suburbs	13%	390	353	12%
	100%	**3,000**	**3,014**	**100%**

Figure 5: Composition of sample by segment



There is a slight overweighting of females (62% in the sample compared with 51% in the population) but a good spread of age groups (Table 3). The geographic distribution of participants is reasonable (Figure 6) and the proportion of the different counties is aligned with the proportion in the population (Table 4).

Table 3: Composition of sample by sex and age group, and comparison with population

Segment	% in sample	% in population
Male	38%	49%
Female	62%	51%
18-24	8%	12%
25-44	37%	33%
45-64	38%	33%
65+	17%	21%

Figure 6: Density of participants in household survey

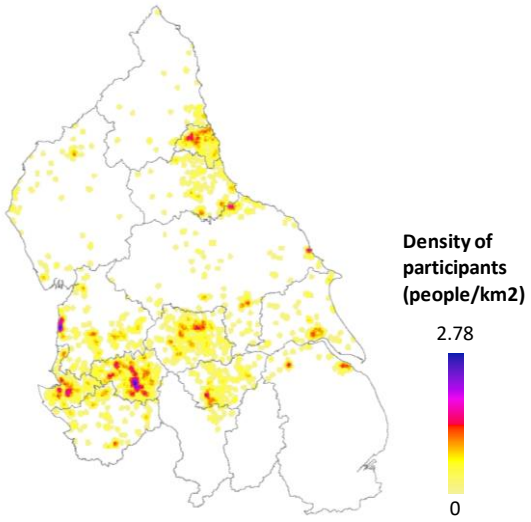


Table 4: Composition of sample by county, and comparison with population

County	% in sample	% in population
Cheshire	6%	7%
Cumbria	3%	3v
Derbyshire	1%	2%
Durham	6%	6%
East Riding of Yorkshire	4%	4%
Greater Manchester	19%	17%
Lancashire	11%	10%
Lincolnshire	3%	2%
Merseyside	9%	9%
North Yorkshire	8%	7%
Northumberland	2%	2%
South Yorkshire	7%	9%
Tyne & Wear	8%	7%
West Yorkshire	13%	15%
	100%	**100%**

Figure 10 shows the employment status of the survey participants. 57% of participants are employed, 20% are retired, and 23% have another employment status.

Figure 7: Current employment status

Employment status	% in sample
Employed full-time	37%
Employed part-time	13%
Self-employed	7%
Retired	20%
Student	3%
Unemployed - seeking work	4%
Unemployed - other	1%
Looking after the home/children full-time	7%
Unable to work (sickness/disability)	7%
Other	1%
	100%

3.2.3. Questionnaire structure

The questionnaire started with a screening question. Participants were first asked their postcode. A postcode lookup automatically checked whether they lived in the target region. Those who lived in the target region were invited to proceed with the rest of the questionnaire. The postcode information was also used to determine which of the nine segments identified in the User Insight Phase 1 each participant is in.

The rest of the questionnaire included the following parts:

- Current travel behaviour and satisfaction with current trips
- Constraints on travel behaviour
- Likely effect of the Strategic Transport Plan
- Possible long-term changes
- Participant characteristics

The following describes each part in turn. A copy of the questionnaire is also included in Appendix B.

Current travel behaviour and satisfaction with current trips

To explore current travel patterns, participants were asked to mark the location in an interactive map of the places where they go in a typical month outside their local area (defined as the area within 15 miles of their home). For each of these places, they were then asked:

- Overall number of return trips in a typical month for each of five different trip purposes (commuting to work, employer's business, education/study, shopping, and other purposes)

- Main means of transport used for those trips (car-driver, car-passenger, bus, coach, train, tram, or other).

- How satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) they were with the journeys to that place - and the reason why, if they answered 1 or 2.

By geocoding the participants' home location (given by their postcodes) and the location of the furthest place visited, we also estimated the distance from home to the furthest place.

Examples of the type of local trips (<15 miles) not considered in the survey are: Bradford to Leeds (11 miles), Bolton to Manchester (13 miles), and Sunderland to Newcastle (14 miles)

It should be emphasized that by focusing on journeys outside the local area, i.e. more than 15 miles away, bus/coach journeys cover only long distance (not local) journeys, and tram journeys are less relevant.

Constraints on travel behaviour

The analysis of the constraints faced by individuals in their travel behaviour is a key objective of the study as a whole, and the questions in this section were addressed to this objective. Unlike the previous questions, the questions on constraints on travel behaviour were not limited to travel outside the local area, as the purpose was to explore the overall constraints to travel behaviour.

This covered the following areas:

- Access to a car (owning a car, or having access to one as driver or passenger)
- Number of cars/vans available in the household
- Level of agreement, on a scale from 1 (disagree strongly) to 5 (agree strongly), to a series of statements related with perceived constraints to travel
  - Frequency of travel ("I travel beyond my local area less often than I would ideally like to")
  - Variety of travel destinations ("I travel to fewer places (e.g. cities or towns outside my local area) than I would ideally like to")
  - Distance of travel destinations ("I travel to places that are nearer than the ones I would ideally like to go to")
  - Travel by car ("I travel by car to places I would ideally like to go to by public transport")
  - Travel by public transport ("I travel by public transport to places I would ideally like to go to by car")
- Reasons for agreeing on perceived constraints to the five aspects mentioned above (if they answered 4 or 5). A wide range of possible reasons were given and participants were encouraged to tick all that apply, or include other reasons if necessary. They were also asked to identify the three most important reasons.

Likely effect of the Strategic Transport Plan

Participants were presented with three different scenarios corresponding to the key areas of investment covered by the strategic transport plan (Major Road Network, Northern Powerhouse Rail, and Integrated and Smart Travel) and asked how their travel behaviour would be affected. The focus was again restricted to destinations outside the participants' local authority area.

After the description of each scenario, participants were asked:

- If they expected the number of trips they typically make outside their local area to change after the improvements, for five different purposes (commuting to work, employer's businesses, education/study, shopping, and other), and two means of

transport (car and public transport). Participants could choose "fewer trips", "same number of trips", and "more trips"

- If they would travel to new places outside their local area (in case they reported "more trips" in the previous question).

- The location of any new places they expected to travel to

Possible long-term changes

Participants were asked about possible medium/long-term decisions (i.e. decisions they might make more than 1 year from now) regarding where they work or look for work; where they live; and whether they own a car, under the following scenarios:

- If they could reach more places by public transport from their area
- If they had faster public transport in their area
- If they had more reliable public transport in their area
- If they had more comfortable public transport in their area
- If they felt safer using public transport
- [In the case of the decision of where to work/live] If they had access to a car
- [In the case of the decision of where to work] If a better job opportunity appeared in a place that it is too far from where they live now

Participant characteristics

The final part of the questionnaire included a wide range of demographic and other questions about participants' characteristics, including:

- Gender
- Age group
- Ethnic group
- How long participants have been living in their local area
- How long participants have been living in the UK
- Housing tenure
- Household composition (number of adults and children)
- Type of housing (number of bedrooms)
- Employment status
- For unemployed people, when did they last work
- Qualifications
- Income
- Benefits received
- Provision of unpaid care
- Health status
- Disabilities
- How often participants meet family
- How often participants meet friends
- Membership in organisations, clubs, or societies

- A series of statements about feelings and thoughts about life and personal circumstances over the last 2 weeks. This allowed us to construct an indicator of subjective wellbeing: the Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) (Stewart-Brown *et al.* 2009, Ng Fat *et al.* 2017).

The list covers questions that allow us to gauge several dimensions of social inclusion, including not only income and employment but also health, social networks, and subjective wellbeing - three aspects identified as important in the Strategic Transport Plan's *Integrated Sustainability Appraisal* report.

3.3 Quantitative analysis: businesses

3.3.1. Sampling and recruitment

The methodology used for the business element of the quantitative research was an online survey among 150 businesses in the North. The sample for this survey was recruited using an online panel, via a third-party panel provider. The survey targeted residents of the North who have given their job title level as Owner, Partner or Senior Management (CEO/VP/Managing Director). While there were no specific target quotas, a maximum quota for micro businesses was applied to ensure a spread of size of business was included in the final sample.

3.3.2. Sample composition

The sample has a good balance of companies of different sizes. Most companies have only 1 or 2 sites and are at the current location for more than 5 years (Figure 8). Participants in the business sample are from a diversity of sectors. The most frequent are retail, education, and professional, scientific and technical (Figure 9).

Figure 8: Composition of business sample by number of employees, number of sites and length at location

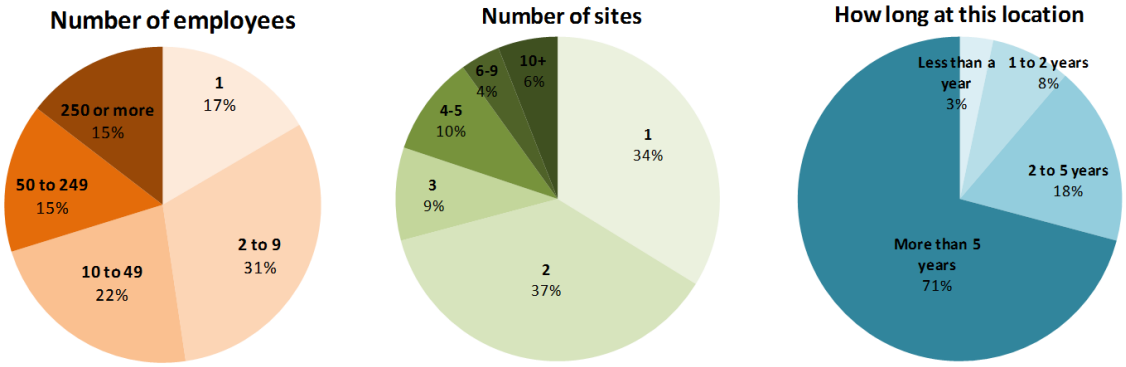
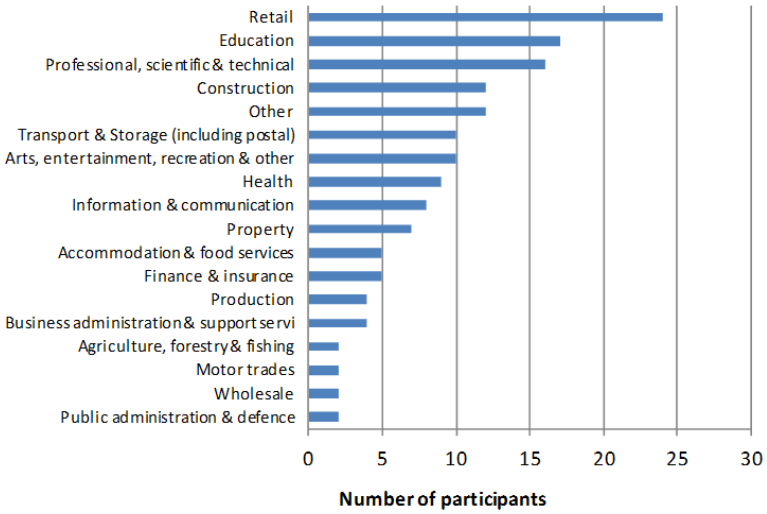


Figure 9: Composition of business sample by main sector of activity



3.3.3. Questionnaire structure

The questionnaire started with a screening question. Participants were first asked the postcode of the main site of the organisation. A postcode lookup automatically checked whether if this was in the target region. The rest of the questionnaire included the following parts:

- Main characteristics of the organisation
- Travel and transport in the organisation
- Satisfaction with current travel and transport and constraints to travel behaviour
- Likely effect of the Strategic Transport Plan
- Possible long-term changes

The following describes each part in turn. A copy of the questionnaire is also included in Appendix C.

Main characteristics of the organisation

This included:

- Sector of activity
- Number of employees
- Number of sites
- How long the organisation has been based at the current location).

Travel and transport in the organisation

This included:

- Proportion of employees living outside the local area (defined as an area within 15 miles of the organisation's main site)
- Proportion of employees who travel to work by public transport

- If the company has any kind of travel plan for employees
- Number of vehicles owned or leased by the company
- Frequency of receiving deliveries from suppliers and location of suppliers
- Frequency of delivering products using company vehicles and location of customers
- Frequency of delivering products using couriers and location of customers
- Frequency of senior managers travelling on business and mode of transport used, for different distances
- Frequency of other staff travelling on business and mode of transport used, for different distances

Satisfaction with current trips and constraints to travel behaviour

Participants were asked how satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) they were with business travel, deliveries made from suppliers to the organisation, delivers from the organisation using company vehicles, and deliveries from the organisation using external couriers - and the reason why, if they answered 1 or 2.

The next question asked the level of agreement, on a scale from 1 (disagree strongly) to 5 (agree strongly), to a series of statements related with perceived constraints to travel

- Frequency of travel ("I and/or others in my organisation travel beyond our local area less often than we would ideally like to")
- Variety of travel destinations ("I and/or others in my organisation travel to fewer places (e.g. cities or towns outside the local area) than we would ideally like to")
- Distance of travel destinations ("I and/or others in my organisation we often travel to places that are nearer than the ones we would ideally like to go to")
- Travel by car ("I and/or others in my organisation travel by car to places we would ideally like to go to by public transport")
- Travel by public transport ("I and/or others in my organisation travel by public transport to places we would ideally like to go to by car")

- Reasons for agreeing on perceived constraints to the five aspects mentioned above (if they answered 4 or 5). A wide range of possible reasons were given and participants were encouraged to tick all that apply, or include other reasons if necessary. They were also asked to identify the three most important reasons.

Likely effect of the Strategic Transport Plan

Participants were presented with three different scenarios corresponding to the key areas of investment covered by the strategic transport plan (Major Road Network, Northern Powerhouse Rail, and Integrated and Smart Travel) and asked how their travel behaviour would be affected. The focus was again restricted to destinations outside the participants' local authority area.

After the description of each scenario, participants were asked:

- If they expected the number of trips they typically make outside their local area, by purpose and travel mode, to change after the improvements, for three different

purposes (senior managers travelling on business, other staff travelling on business, and provision of services), and two means of transport (car and public transport). Participants could choose "fewer trips", "same number of trips", and "more trips"

- If they would travel to new places outside their local area (in case they reported "more trips" in the previous question).

- The location of any new places they expected to travel to

Possible long-term changes

Participants were asked about possible medium/long-term decisions (i.e. decisions they might make more than 1 year from now) regarding where the business is based or reducing the number of vehicles owned or leased by the company, under the following scenarios:

- If they could reach more places by public transport
- If they had faster public transport in their area
- If they had more reliable public transport in their area
- If they had more comfortable public transport in their area
- [In the case of the decision of where the company is based] If they could reach more places by car/van from the new location
- [In the case of the decision of where the company is based] If they had a faster road network in the new location
- [In the case of the decision of where the company is based] If they had a better road network in the new location

3.4 Qualitative analysis

The qualitative research was designed to produce more in-depth insights on the motivations of travel behaviour and its impacts on social inclusion and social mobility, to understand the reasons behind the answers that people gave in the quantitative survey, and more generally, how the choices made regarding travel (and the constraints to those choices) might affect people's lives: something that could not be captured easily in the limited choice scenarios provided in the quantitative survey.

The key objectives of the qualitative work were:

- Households:
  - Understand motivations for travel behaviour across consumer segments
  - Explore how these attitudes and behaviours may change with improved connectivity and new travel opportunities

- Businesses:
  - Understand how the proposals for improved connectivity will impact on immediate business plans and in the longer term

- Explore impact for employees

To answer these objectives different approaches were taken for the resident and business audiences, recognising that each audience faces a range of time pressures and has different external commitments.

Households

Nine standard length discussion groups lasting 90 minutes were conducted: one group with each segment. The sample for the qualitative research included respondents in the nine socio-economic groups identified in User Insight Phase 1. Participants were recruited using Accent's specialist recruitment partner, Riteangle.

A recruitment questionnaire was drafted to include all questions necessary to meet the group structure agreed with the client. Alongside the relevant postcode sectors, the recruitment questionnaire included questions that allowed for participants to be assigned to one of the 9 segments identified in the User Insight Phase 1. The questions covered age, income, household composition, employment status, sector of activity, type of housing, car ownership and geographic context (sub-region within the North, and whether area of residence is urban, suburban, or rural).

In addition, questions were included to ensure that:

- no one was recruited who has taken part in a focus group in the past 6 months
- no one was recruited who has taken part in more than 3 focus groups in the past 2 years
- no one was recruited who has taken part in a group discussion on the same subject matter in the past 2 years
- at least one third of the group had never taken part in a group discussion before.

Ten participants from each segment were recruited, to ensure that 8 attended the discussion group, giving 72 resident qualitative participants in total.

Before the discussion groups all 72 participants were provided with a homework task to complete, comprising travel diaries and 'my world' collage exercises. After the groups participants completed a post-task asking them to record what impact the improvements discussed in the sessions would have on their everyday travel patterns and their longer-term choices and options.

In addition to returning these post group tasks, a quarter of the participants (18 in total, 2 from each segments) were invited to participate in a follow up depth interview (telephone or Skype). This was used to further probe on responses from the post group tasks and to explore what (if anything) information, discussions and thoughts have changed their views since the focus groups.

These 18 participants are also used as case studies throughout the reporting process to highlight and provide real life examples of the potential impacts of the changes.

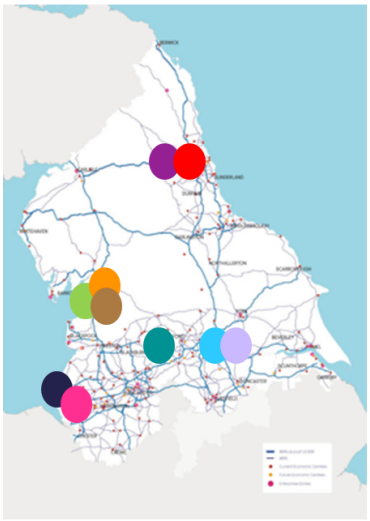
Businesses

To respond to the time constraints often experienced by business participants we are suggesting two Business Breakfast Meetings. This format recognises that business participants prefer to start early and are often busy through to the evenings which makes traditional focus group attendance trick for them.

The workshops lasted for 2 hours and were attended by up to 10 participants who were recruited to represent the mix of businesses operating in the area, including a mix of size (employees), area of operation (SIC) and number of sites. As with the residential research participants were recruited using Accent's specialist recruitment partner, Riteangle.

Overall, the qualitative research covered 5 locations in the North of England, as shown below.

Figure 10: Locations for qualitative research by segment



Segment	Location
Rural Residents	Lancaster
Small Town Suburbs	Lancaster
Hard Pressed Living 1	Lancaster
Urbanites	Leeds
Constrained City Dwellers	Liverpool
Multiculturals	Bradford
Inner City Cosmopolitans	Newcastle
Hard Pressed Living 2	Liverpool
Metro Suburbs	Leeds
Business	Newcastle, Bradford

Copies of the qualitative materials are included in Appendix D

4 MAIN FINDINGS

4.1 Introduction

This chapter presents the results of the quantitative and qualitative research described in the previous chapter. Section 4.2 shows the results regarding the travel behaviour of the overall sample of participants in the two types of research involving households. Subsection 4.2.1 focuses on the quantitative survey and show the current travel behaviour, satisfaction with current trips with trips, travel constraints, likely effect of the Strategic Transport Plan on number of trips, and possible long-term changes. Subsection 4.2.2 then presents the overarching themes identified in the qualitative interviews, as well as on overview of the themes identified in the interviews conducted with participants representing the different segments identified in the User Insight Phase 1 research (SDG 2018a).

Sections 4.3 to 4.11 then present the same type of results as Section 4.2 but disaggregated by the 9 segments. Each of these sections describes the main characteristics of the segment and then follow the same structure as Section 4.2, describing current travel behaviour, satisfaction with current trips, travel constraints, likely effect of the Strategic Transport Plan on number of trips, and possible long-term changes.

Section 4.12 presents the results of the business survey, following a structure similar to the previous sections on the household survey.

Section 4.13 presents the results of the questions in the household quantitative survey that dealt with the wider impacts of travel behaviour and of constraints to that behaviour on employment, social engagement, social contacts, health, and wellbeing. The analysis is presented for the whole sample, i.e. not disaggregated by segment.

Section 4.14 synthesizes the results of the chapter.

4.2 Household travel behaviour: overall results

4.2.1. Quantitative

Current travel behaviour

Survey participants reported making an average of 7.3 trips per month outside their local area. 23% of these trips were for commuting, 13% for business, 4% for education, 26% for shopping, and 34% for other purposes (Figure 11). With regards to mode of transport (Figure 12), 73% of the trips were made by private transport (59% as driver and 14% as passenger), 25% were made by public transport (10% by bus/coach and 15% by train/tram) and 2% were made by other modes of transport). It should be noted that

the survey focused on journeys outside the local area, i.e. more than 15 miles away, so bus/coach journeys cover only long distance, not local, journeys and tram journeys are less relevant.

Figure 11: Average number of return trips per month outside the local area, by trip purpose

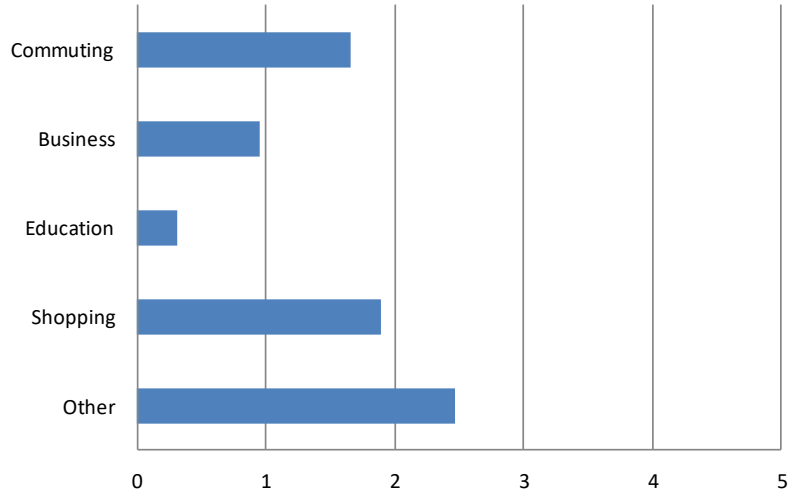
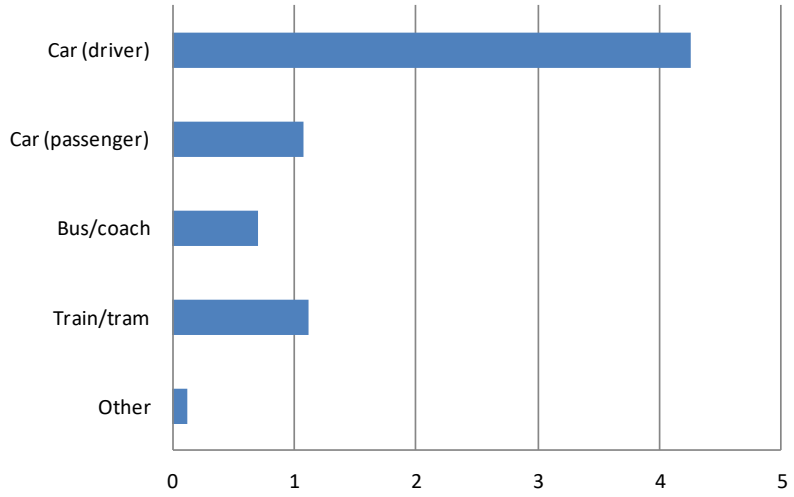


Figure 12: Average number of return trips per month outside the local area, by travel mode

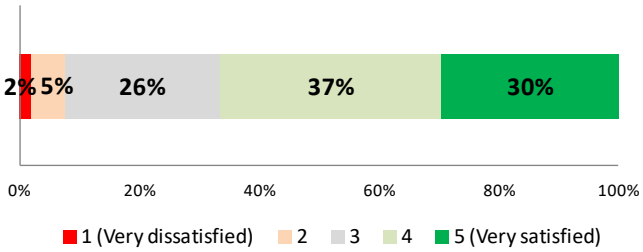


Participants also visit an average of 2.5 places outside their local area, the most distance being located 55.2 km away. The ratio between the number of places visited and the number of trips made in a month is 2.96, i.e. participants visited an average of 2.96 places in every trip they made outside their local area.

Satisfaction with current trips

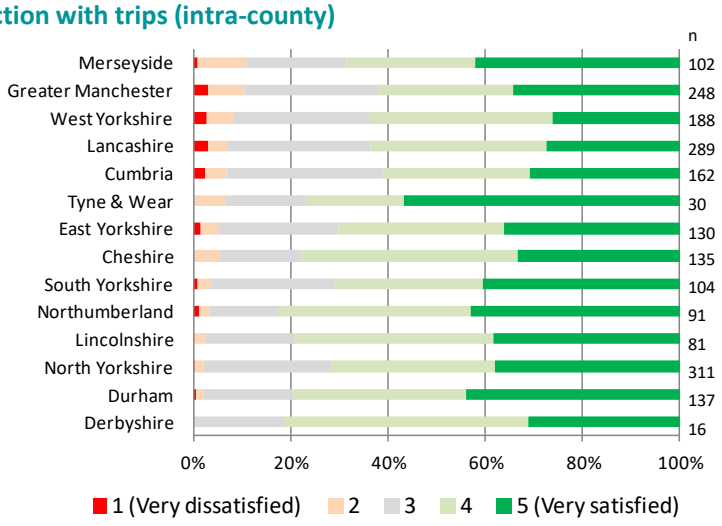
More than two thirds of participant reported being satisfied (37%) or very satisfied (30%) with the trips they currently make. Only 5% reported being dissatisfied and 2% reported being very dissatisfied.

Figure 13: Satisfaction with trips



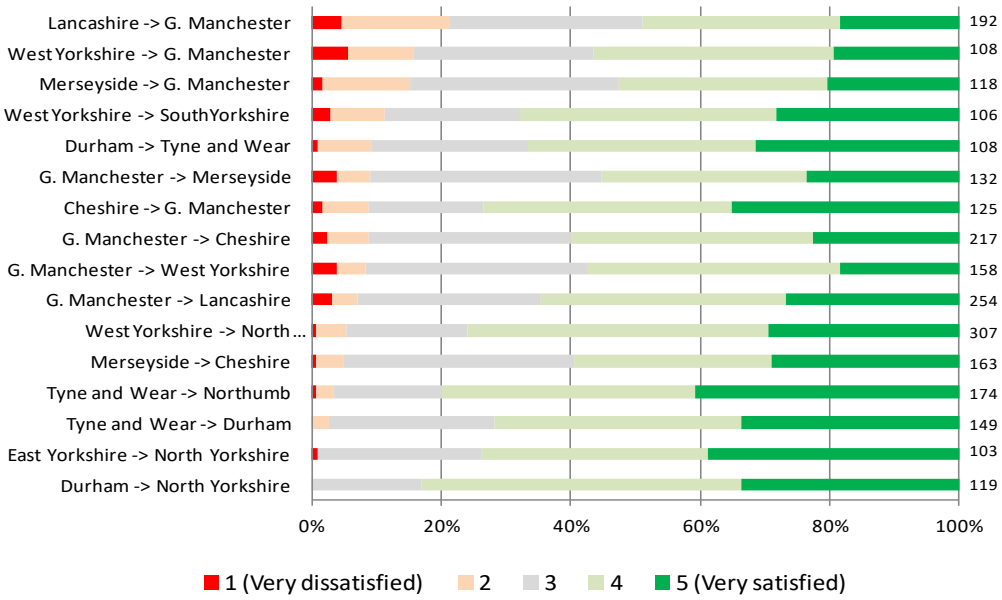
Looking at intra-county current trips, the highest levels of dissatisfaction were reported for trips in the most urbanised counties (Merseyside, Greater Manchester, and West Yorkshire) (Figure 14). Looking at inter-county current trips, the highest levels of dissatisfaction were reported for trips ending in Greater Manchester (Figure 15).

Figure 14: Satisfaction with trips (intra-county)



Note: Rows are sorted according to descending order of dissatisfaction

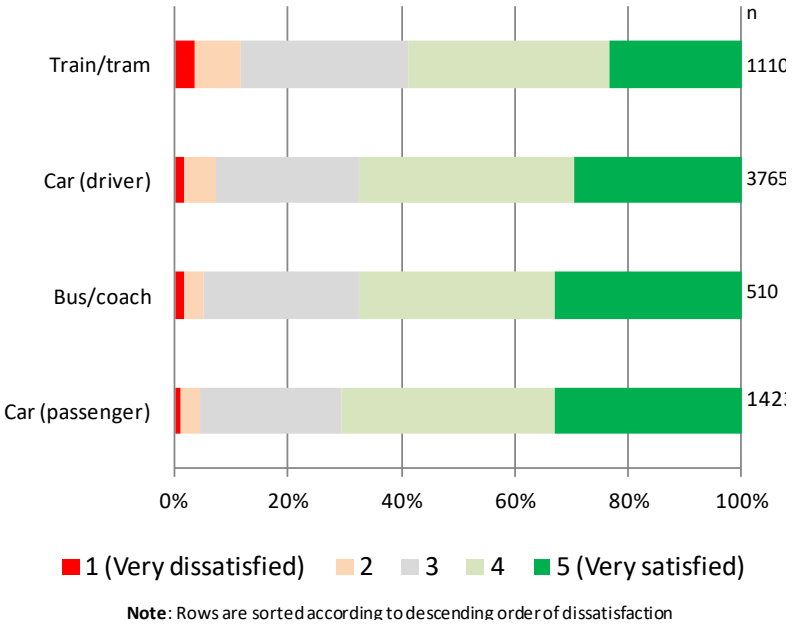
Figure 15: Satisfaction with trips (inter-county)



Notes: Chart shows only pairs with more than 100 trips in the sample)
Rows are sorted according to descending order o dissatisfaction

With regards to travel mode, the highest rates of dissatisfaction were reported for trips by train or tram (8% of participants being dissatisfied and 3% being very dissatisfied, followed by trips as car driver, bus/coach, and car passenger (Figure 16).

Figure 16: Satisfaction with trips (by mode)



Note: Rows are sorted according to descending order of dissatisfaction

Figure 17 and Figure 18 show the frequency of reasons for dissatisfaction that are related to car travel and rail travel, respectively. The main car-related reasons for dissatisfaction were traffic congestion (reported in relation to 194 trips, i.e. 38% of the trips identified by participants in the survey), while the main rail-related reasons for dissatisfaction where delays/disruption/cancellations (identified in relation to 67 trips, i.e. 13% of the trips).

Figure 17: Main reasons for being dissatisfied with trips: reasons related to car travel

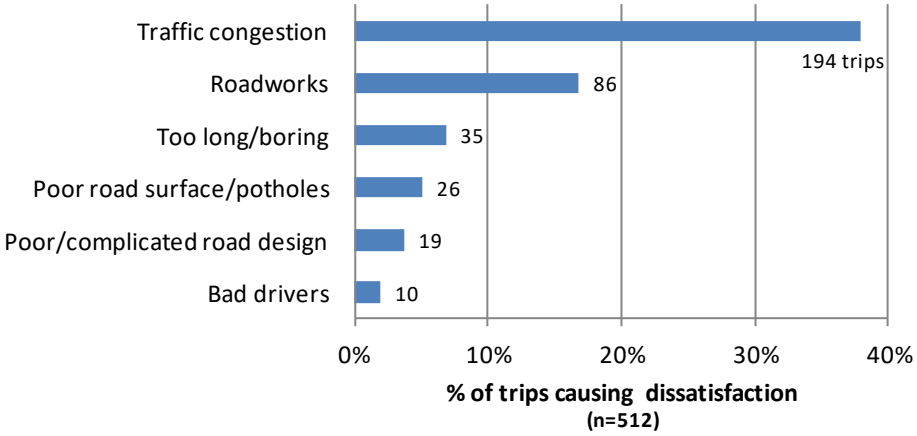
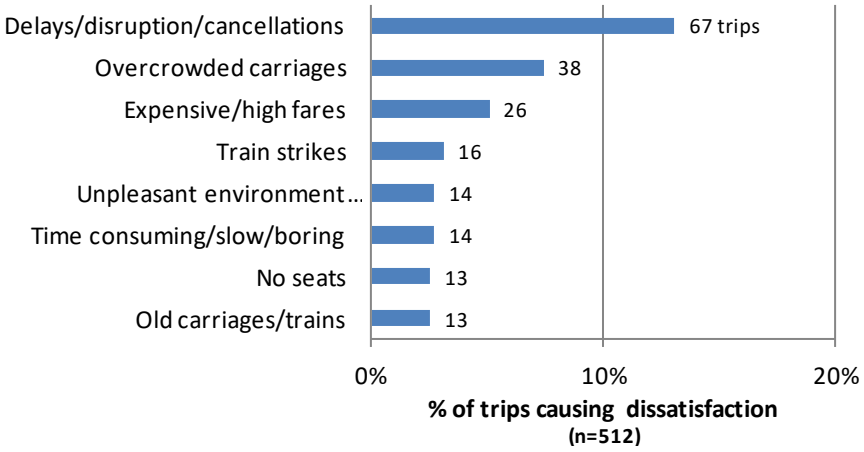


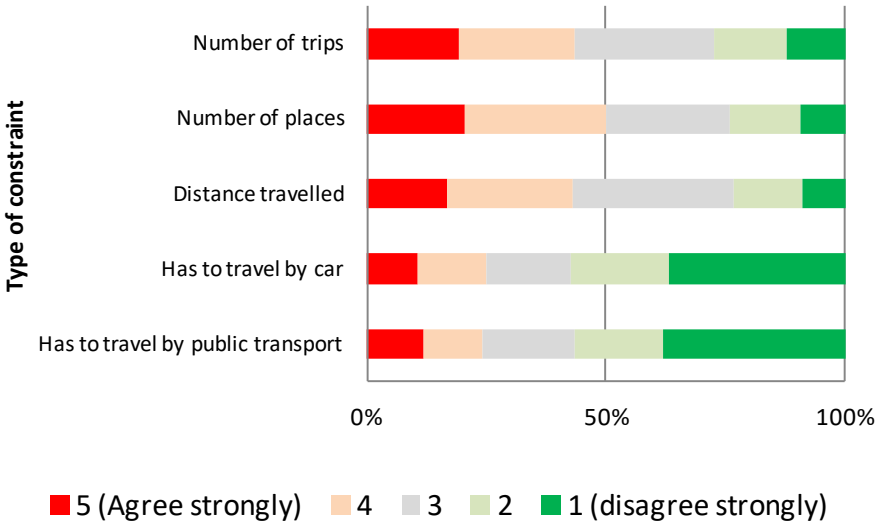
Figure 18: Main reasons for being dissatisfied with trips: reasons related to rail travel



Travel constraints

Figure 19 shows the participants' level of agreement with the five statements about constraints to travel behaviour. 44% agreed or agree strongly with being constrained in the number of trips that they make outside their local area. 50% agreed or agreed strongly with being constrained in the number of places outside they visit outside their local area. 43% agreed or agreed strongly with being constrained in the distance travelled (i.e. they travel to places that are nearer that the ones they would ideally would like to go to. The proportions were smaller for constraints related to transport mode: 25% agreed or agree strongly that they travel by car to places they would ideally like to go by public transport and 24% agree or agree strongly that they travel by public transport to places they would ideally like to go by car.

Figure 19: Level of agreement with statements about constraints to travel behaviour



The three tables below show the top 10 reasons for constraints to the number of trips, number of places, and distance travelled. Most of the top 10 reasons for the constraints were related to public transport. The most frequently mentioned reason for constraints to number of trips was that public transport is unreliable (cited by 12% of participants) and expensive (cited by 10%) (Table 5). The main reasons for constraints to number of places visited was that public transport is unreliable (12%), difficult to find the time to

travel (11%) and costs of public transport (11%) (Table 6). The main reasons for constraints to distance travelled was that the places participants want to go are too far and that public transport is unreliable (8%) (Table 7).

Table 5: Top 10 reasons for constraints to number of trips

Reason	Participants	%	Type of reason
Public transport is unreliable	360	12%	Public transport
I find it difficult to cover the costs of using public transport	301	10%	Public transport
Public transport is too slow	264	9%	Public transport
Difficult to find the time to travel	263	9%	Personal
I can't drive	257	9%	Car
The places I want to go to are too far	256	8%	Distance
Buses/trains/trams do not run frequently enough	223	7%	Public transport
Buses/trains/trams are too crowded	206	7%	Public transport
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops	201	6%	Public transport
I find it difficult to cover the costs of owning and using a car	194	6%	Car

Table 6: Top 10 reasons for constraints to number of places visited

Reason	Participants	%	Type of reason
Public transport is unreliable	348	12%	Public transport
Difficult to find the time to travel	340	11%	Personal
I find it difficult to cover the costs of using public transport	327	11%	Public transport
The places I want to go to are too far	281	9%	Distance
I can't drive	263	9%	Car
Public transport is too slow	247	8%	Public transport
Buses/trains/trams do not run frequently enough	221	7%	Public transport
Buses/trains/trams are too crowded	208	7%	Public transport
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops	176	6%	Public transport
I find driving stressful	171	6%	Car

Table 7: Top 10 reasons for constraints to distance travelled

Reason	Participants	%	Type of reason
The places I want to go are too far	262	9%	Distance
Public transport is unreliable	249	8%	Public transport
I find it difficult to cover the costs of using public transport	223	7%	Public transport
Public transport is too slow	209	7%	Public transport
It's difficult to find the time to travel	198	7%	Personal
I cannot drive	198	7%	Car
Buses/trains/trams do not run frequently enough	158	5%	Public transport
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops	155	5%	Public transport
I find driving stressful	147	5%	Car
Buses/trains/trams are too crowded	129	4%	Public transport

The main reasons for constraints to travel by public transport were unreliable, slow, and infrequent public transport (Table 8). The main reasons for constraints to travel by car were the inability to drive and lack of access to a car (Table 9).

Table 8: Top 10 reasons for constraints to travel by public transport

Reason	Participants	%
Public transport is unreliable	249	8%
Public transport is too slow	221	7%
Buses/trains/trams do not run frequently enough	199	7%
The stations/bus stops are too far from where I want to go	138	5%
I find it difficult to cover the costs of using public transport	137	5%
Buses/trains/trams are not available in the evening/night	133	4%
Buses/trains/trams are too crowded	120	4%
There are no connections between buses/trains/trams	102	3%
The stations/bus stops are too far from my home	101	3%
There are many delays when I travel by bus (due to congestion)	95	3%

Table 9: Reasons for constraints to travel by car

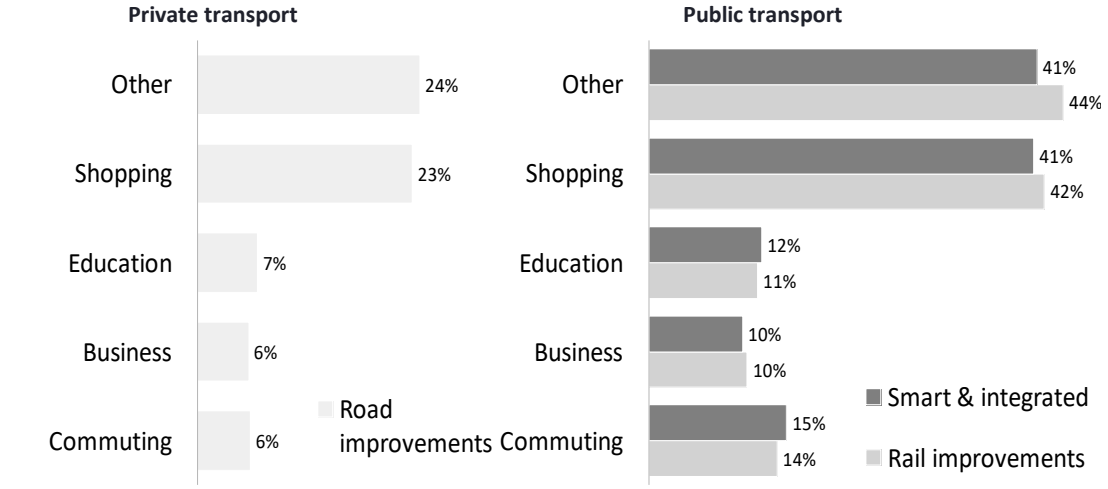
Reason	Participants	%
I cannot drive	232	8%
I do not own or have access to a car	178	6%
There are many delays when I travel by car (because of congestion)	154	5%
I find it difficult to cover the costs of owning and using a car	153	5%
I find driving stressful	119	4%
Other	67	2%
I find it physically difficult to get onto/off the car	30	1%

Likely effect of the Strategic Transport Plan

Figure 20 shows the proportion of participants who stated that they would increase the number of trips beyond their local area following the improvements in the Strategic Transport Plan related to road, rail, and smart & integrated travel. The figure disaggregates the results by trip purpose and travel mode.

Regardless of mode of transport or type of improvement, the proportion was always much higher for trips for shopping or other purposes, compared with education, business, and commuting. The proportion was also higher for public transport trips compared with private transport. For commuting, business and education trips, the differences between the three types of improvements were minimal. For shopping and other trips by private transport, the proportion was higher for road improvements, following by rail improvements and smart and integrated travel improvements. For shopping and other trips by public transport, the proportion was higher for rail improvements, following closely by smart and integrated travel improvements, and then by road improvements.

Figure 20: Likely effect of the Strategic Transport Plan



Possible long-term changes

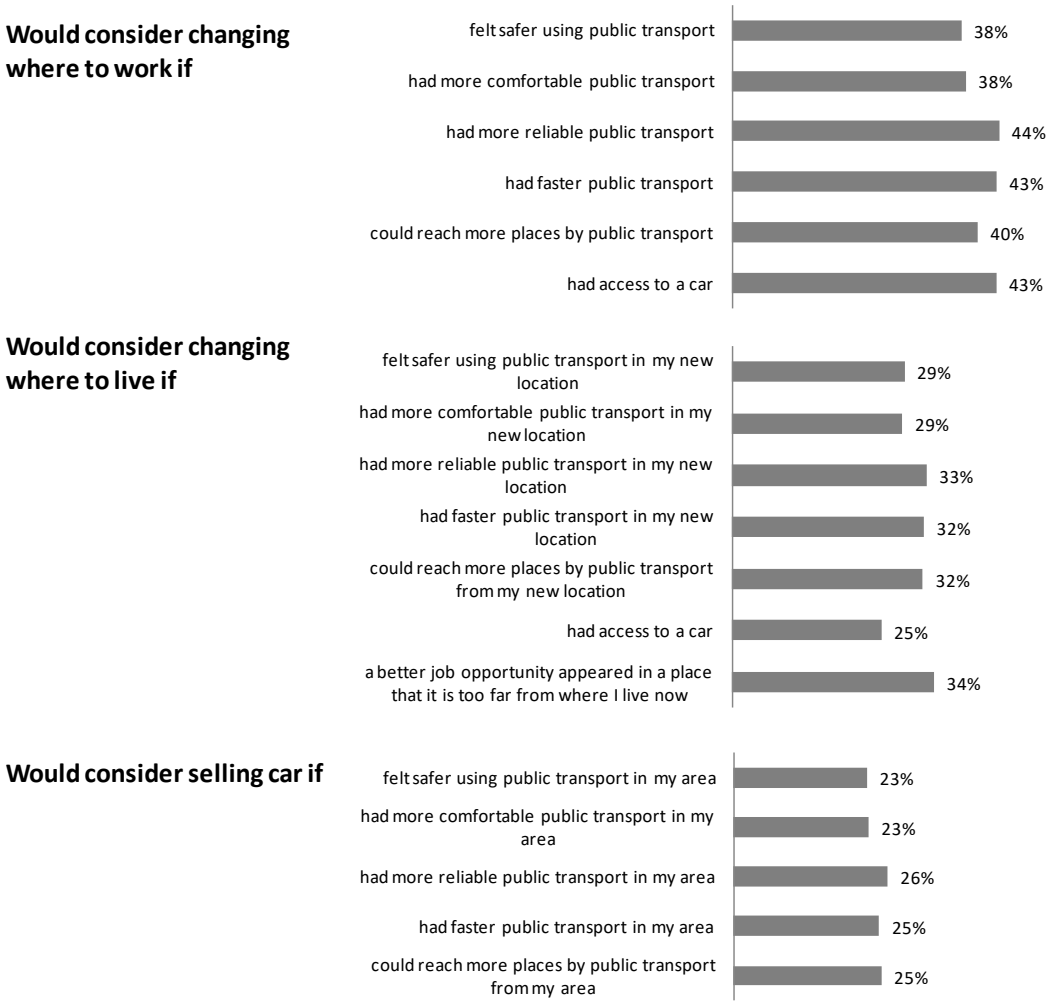
Figure 21 shows the results of the questions on long-term changes that might be associated with travel behaviour: changing workplace or residence location or selling car. As shown below, the propensity for these changes was generally higher in the case of workplace location, followed by residence location, and selling car.

43% of participants who did not currently have access to a car would consider changing where to work, or search for work, if they have access to a car. Between 38% and 44% would consider changing where to work following public transport improvements. The improvement associated with the highest proportion of intentions of changing workplace was more reliable public transport (44%).

34% of participants would consider changing where to live if a better job opportunity appeared in a place that is too far from where they live now. 25% would change if they had access to a car. Between 29% and 33% would consider changing where to live following public transport improvements. The improvement associated with the highest proportion of intentions of changing where to live was more reliable public transport (33%).

Between 23% and 26% of participants who currently own a car would consider selling it following public transport improvements. The improvement associated with the highest proportion of intentions of changing workplace is more reliable public transport (26%).

Figure 21: Possible long-term changes



4.2.2. Qualitative

Overarching themes

Regardless of segment or group location, 10 recurring themes emerged, as follows:

- Pride and affiliation to local Northern home and strong City and/or County identities mean that people do not always want to move/work/travel further afield.
- Transport network in and across the North is felt to need improving. There is a sense of historic underinvestment and some strong feeling that limited attention is being paid to improve transport links in the North versus London and the South East.
- Network links from North to South are felt to be better than within and around the North.
- Cross country travel is felt to be especially prohibitive: East/North-East to West/North-West.

- There is some qualitative evidence that life opportunities are limited by poor transport infrastructure e.g. the type of job opportunities; choice of higher education; business contracts; social activities; visiting friends and family. For example, the idea of working in a nearby city with more relevant opportunities is often dismissed, due to the perceived unreliability or poor speed of transport links.

- The current cost of rail and bus limits further usage and travel across the North and is also felt to limit educational opportunities.

- Lack of confidence in the reliability and predictability of journey times (road and rail) means travel in and around the North has a negative impact on personal time. Either more personal time has to be dedicated to travel to allow for any potential transport issues or professional reputation can be affected by lateness due to transport methods and/or routes used.

- Integrated and smart travel has universal appeal and is felt to be long overdue in areas of the North of England. It needs to be simple, transparent and well promoted to work and is expected to offer fair, capped (tap in/out) fares, just like the Oyster system in London, of which many Northern residents have some awareness.

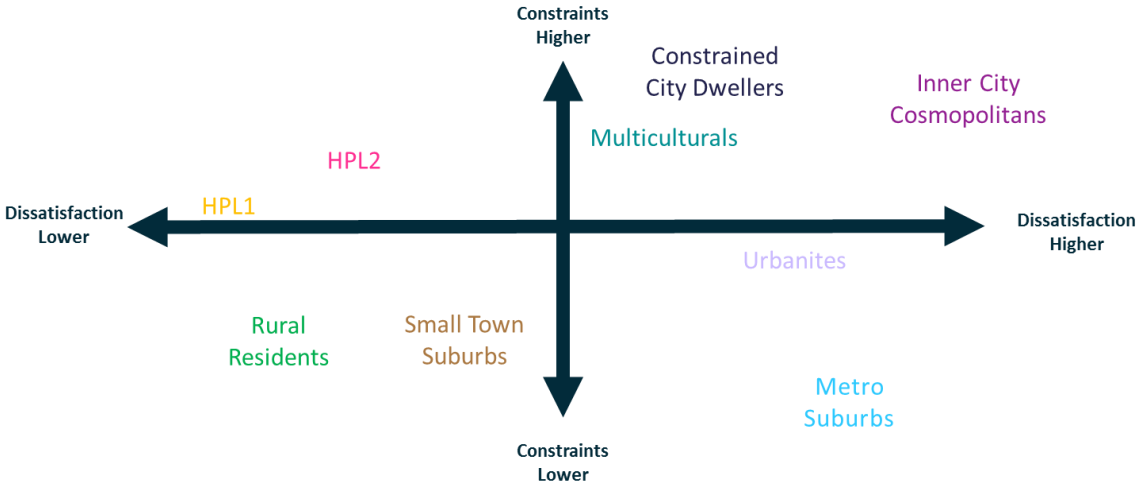
- There are high levels of scepticism about future suggested interventions, such as adding carriageways to the A1; improvements to the M62 and faster trains, often linked to a sense that these have been discussed for many years without plans coming to fruition.

- Suggested improvements are often met with a short-term view: based around fear of the impact of major projects on local congestion and journey times, as opposed to any long-term gain.

Segment overview

The figure below shows a summary of which segments tend to be affected by higher and lower constraints and the relative satisfaction levels across segments. Constrained City Dwellers, Inner City Cosmopolitans and Multiculturals tend to have the highest constraints and higher dissatisfaction, whereas Rural Residents and Small Town Suburbs appear to experience lower constraints and lower levels of dissatisfaction.

Figure 22: Summary of constraints and satisfaction with current trips by segment



- **Multiculturals,** who have some constraints and express some dissatisfaction with trips by bus/coach and by car as drivers, are eager for change, can be financially challenged and constrained by the cost and reliability of Public Transport. Transport interventions which are most likely to have a positive impact on this segment are those which help to ease financial pressures & provide living choices, such as: reducing or capping rail fares and providing faster transport services e.g. Bradford to Manchester for work opportunities.

"I've become grounded – I want to be more out there but because I live in the town centre and fares are high I'm stuck"
Multiculturals

- **Inner City Cosmopolitans** are more constrained than average and demonstrate the lowest satisfaction with trips by train and tram and by car as a driver. They express restlessness and impatience, as well as significant frustrations with the reliability and journey times of trips by rail and road that hinder their movement. Transport interventions which are most likely to have a positive impact on this segment are those which help to provide job and/or education opportunities and improve the travelling experience, such as: provision of SMART travel that makes everything easier; improving the experience on rail e.g. less crowding, modern services and improving the speed of travel to other Northern Cities.

"I want the chance to travel in the North, throughout the UK and outside the country"
Inner City Cosmopolitans

- **Urbanites** are busy jugglers with high time pressure. They have less constraints than average and the fourth highest dissatisfaction with their trips, driven by frustrations with their road experience and delays and perceptions of rail reliability, connectivity, etc., which they see as limiting their job and social opportunities. Transport interventions which are most likely to have a positive impact on this segment are those which could support better job opportunities, such as improving inner city transport to aid congestion and reducing rail journey times. They expect SMART travel as a minimum requirement for improvements.

""Life is so busy and I'm juggling everything – I need better predictability of journey times." Urbanites

- **Constrained City Dwellers'** high constraints are driven by limited opportunities to change their job and/or living accommodation. They are often financially challenged and forced to stay local due to cost of public transport and the reliability of roads. Transport interventions which are most likely to have a positive impact on this segment are those which ease their financial pressures and provide wider job opportunities, such as: addressing fare structures that are perceived as unfair; providing free travel for Under 16s and enabling fast 30 minute journeys to neighbouring Cities

"It's all about money isn't it – you can't do anything without money and trains and buses are expensive"
Constrained City Dwellers

- **Hard Pressed Living 1**, are not using public transport much, so have the lowest dissatisfaction with trips overall. They are happy using the car but have the highest dissatisfaction as a car passenger. They have a 'live for today' attitude and can be content with where they are. Transport interventions which are most likely to have a positive impact on this segment are: Improving and maintaining local roads; quick/easy technology to help reduce their travel barriers and family tickets with lower fares on public transport to ease their financial pressures.

"I'm happy. That's most of my life you know within 15 miles I don't leave the district."
Hard Pressed Living 1

- **Hard Pressed Living 2**, while experiencing constraints, have lower dissatisfaction with their trips by bus/coach. They are more fluid and open to opportunities in other Cities, but transport links prohibit their travel, particularly traffic congestion and slowness of trains. Transport interventions which are most likely to have a positive impact on this segment are those which ease their financial pressures & provide job opportunities, such as free travel for those in education, more buses and less crowding and smarter travel e.g. Oyster to make things easier and enhance price confidence and perceptions of fairness.

"A lot of things I'd change – more money, a better job. Loads"
Hard Pressed Living 2

- **Metro Suburbs** have the lowest level of constraints, but the second highest dissatisfaction with trip by car as a driver or passenger, driven by frustrations with congestion in and out of the City, which limits the number of journeys they make. Otherwise they tend to be highly content, due to having much of what they need easily within reach. Transport interventions most likely to have a positive impact on this segment are those which might encourage them to use public transport more and thereby improve their educational choices, for example. This could include:

more time efficient local links; faster trains to other Northern Cities; integrated SMART ticketing; improved predictability of motorways.

"I got my head around finances early on in life with a pension etc so no financial worries. I don't have an expensive lifestyle. I like walking and cycling."
Metro Suburbs

- **Small Town Suburbs** experience few constraints and low overall dissatisfaction with trips**.** They are happy with where they live and find transport links to be adequate. They may have already seen positive changes to journey times and/or traffic congestion. Few transport interventions are likely to impact on this segment, other than investment in the maintenance of local road networks.

"I go where I like when I like – usually pretty local but nothing stops me."
Small Town Suburbs

- **Rural Residents** are less constrained and have low overall dissatisfaction with their trips, although they have the highest dissatisfaction with public transport. They can be content with their own lives, but any issues they have with remoteness and social isolation are amplified by poor public transport, such as poor bus connections and timings, alongside limited links from their home to other Cities. Transport interventions which are most likely to have a positive impact on this segment are those which provide them with more social opportunities: including developing local, direct bus links to/from central areas, bus links around the North and addressing high car parking costs at stations, which they have to drive to due to lack/timing of buses.

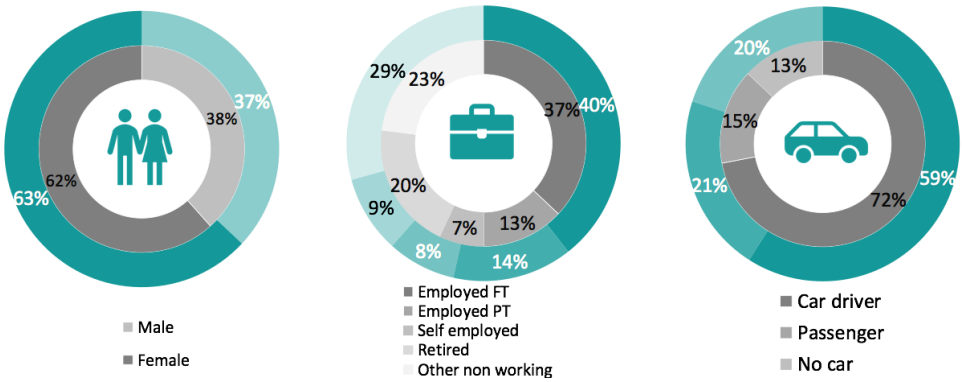
"It's beautiful in the countryside, but we need to be better connected or we are totally isolated."
Rural Residents

4.3 Travel behaviour: Multiculturals

4.3.1. Quantitative

The Multiculturals segment has less than half of the proportion of retired people (9%), compared with the overall sample (20%), and a lower proportion of people with access to car as driver (59%, compared with 72%) (Figure 23). These results are consistent with those from the User Insight Phase 1. As previously shown in Table 1, Multiculturals tend to be younger and have lower car usage and ownership, compared with other user segments.

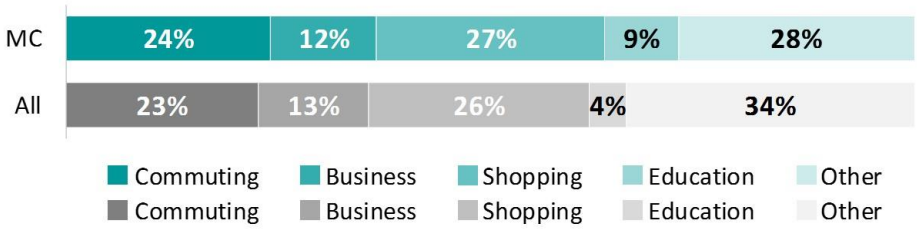
Figure 23: Characteristics of Multiculturals



On average, Multiculturals make more trips outside their local area (8.9) and a higher proportion of trips by public transport (38%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 24). However, they travel to the same number of places outside their local area and to places located at the same maximum distance, compared with the overall sample. Multiculturals also make more trips for education (9%) and fewer trips for other purposes (28%), compared with the overall sample (4% and 34%, respectively) (Figure 25).

Figure 24: Current travel behaviour: Multiculturals

Figure 25: Trip purpose: Multiculturals (MC)



With regards to satisfaction with current trips, Multiculturals showed almost the same level of satisfaction as the overall sample (Figure 26). However, they reported more constraints (Figure 27). 51% agreed that they travel beyond their local area less often than they would ideally like to and 58% agreed that they travel to fewer places.

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, and delays, disruption and cancellations. The main reasons for the reported constraints to travel were the unreliability of public transport, difficulty to cover the costs of using public transport, and places where one wants to go being too far.

Figure 26: Satisfaction with current travel: Multiculturals (MC)

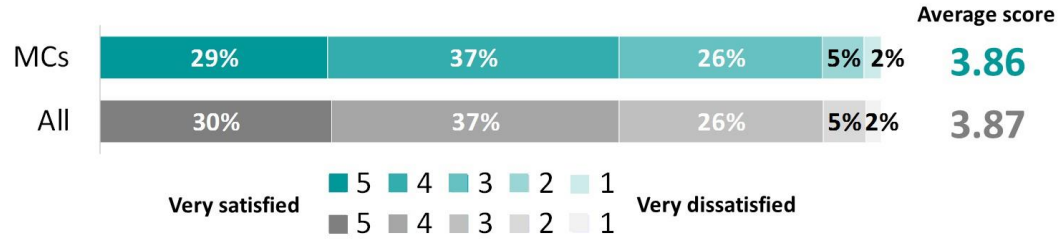
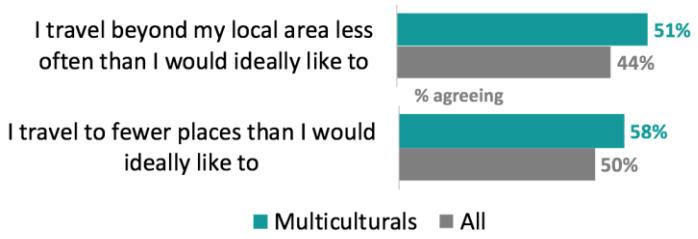
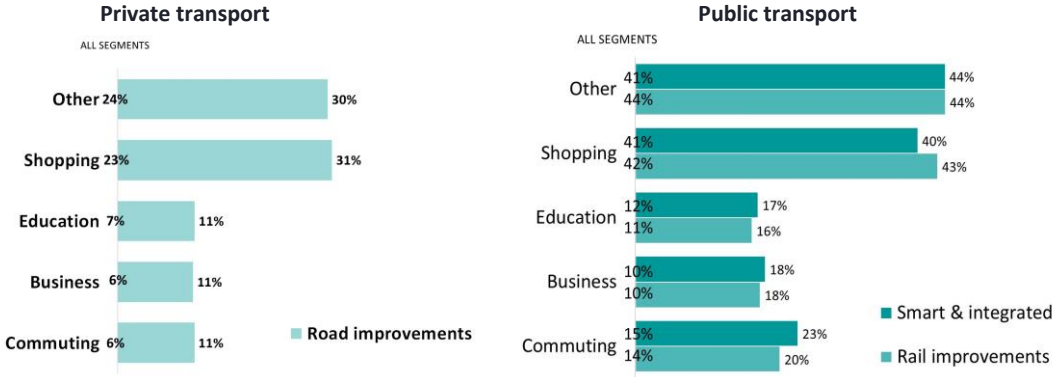


Figure 27: Travel constraints: Multiculturals



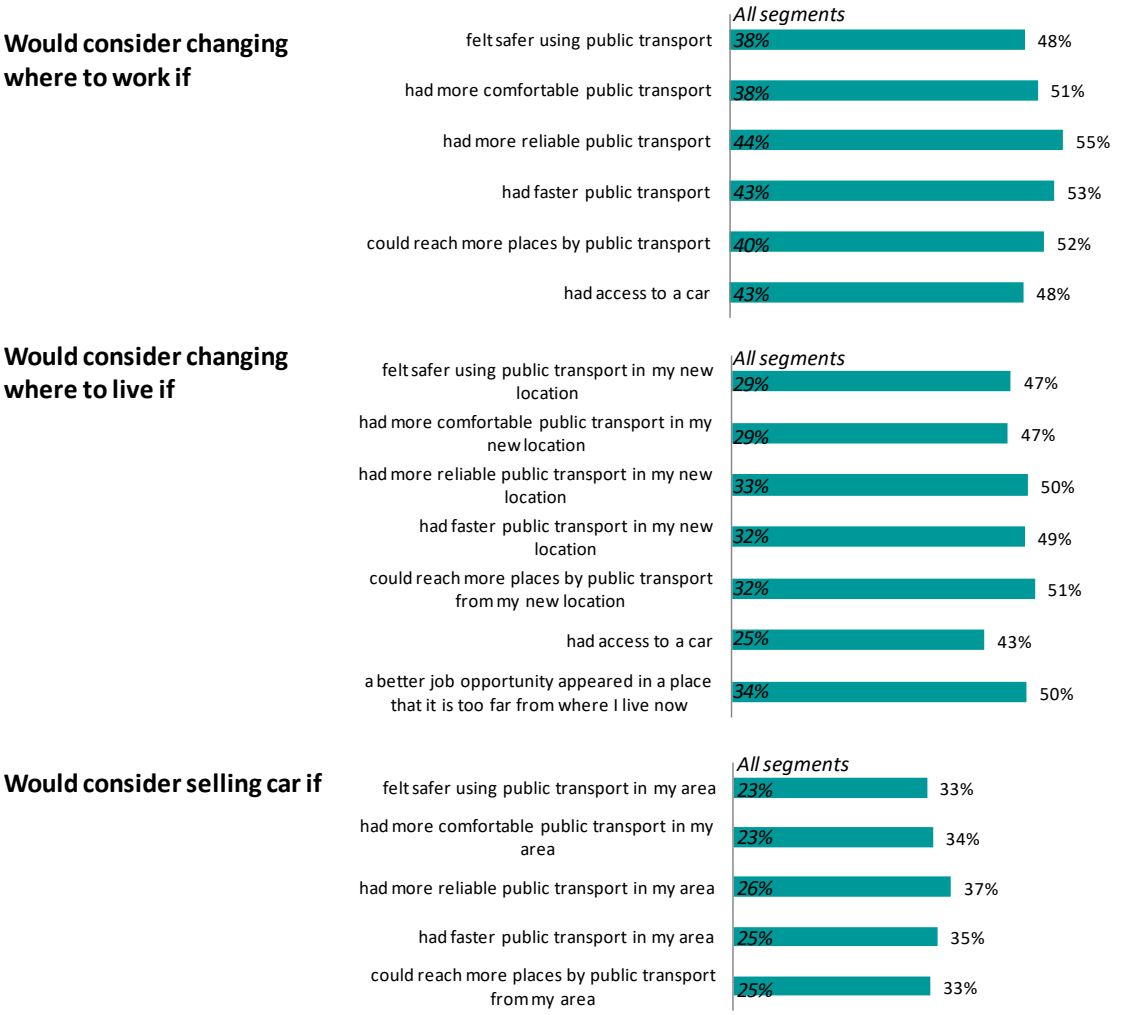
Multiculturals also stated they would make more additional private and public transport trips following the improvements of the Strategic Transport Plan, compared with the overall sample (Figure 28).

Figure 28: Likely effect of the Strategic Transport Plan: Multiculturals



Regardless of the scenario, the propensity of Multiculturals for changing where to work, where to live, or selling car, was always higher than the average of participants of all segments (Figure 29). The most marked differences were the propensity for changing where to live, which were between 16-19% higher for Multiculturals, compared with the overall sample.

Figure 29: Possible long-term changes: Multiculturals



4.3.2. Qualitative

Life situation

Multiculturals present as much more disaffected with their current life situations than other segments. They are family focused and this roots them to their current location while their children are young, as they are settled in schools and there is a reluctance to move them, despite some potential for moving into suburbs. They can feel trapped in their current lives. They are often living in rented and Local Authority accommodation and working in low-semi low paid jobs (examples are carer, DJ, clerical) OR studying on a longer-term basis.

Their priorities focus on health and wellness: specifically mental health (some experience of anxiety, depression etc.). Financial pressures are also rife: the pressure to earn more to facilitate a nice life for them and their children is strong, (which has implications regarding the cost of public transport). They are hopeful that they can make big changes to their life at some stage: e.g. move away, set up new business, get a new council house, or find a partner.

They are engaged with technology, but only once proven, so are not early adopters. The cost of technology prohibits the amount spent, so lower specification models are often selected. Examples of technology used are: fitbit, laptop, PS4, i-Pad, Xbox, Switch.

"My career has always been put on hold because of the children."
Multiculturals

Attitudes towards transport and travel

There is an interest in travelling more outside their immediate area, but the cost and reliability of public transport are significant constraints for Multiculturals; causing a reluctance to travel. For some, their lack of driving or confidence in driving prohibits travel by car.

There is a mixed response to bus services: buses are used, but often felt to be small, crowded and congested. Bus connections are not felt to be good enough and multiple interchanges are off-putting. There are also some negative experiences of service from bus drivers.

This group have considerable issues with Northern and TransPennine Express rail services. Trains are felt to be expensive to travel to other cities in the region, such as Manchester and York and peak-time fares are prohibitive. Other criticisms include: ticket restrictions on boundaries (e.g. West Yorkshire ticket that does not cover York); a lack of ticket transparency (e.g. split ticketing is cheaper); as well as delays, stops between stations and staff issues.

Road travel is not felt to be as problematic, though some have minimal driving experience. Those who do drive are very attached to using their car and non-drivers are keen to pass their test. Drivers in this segment tend to make few criticisms, other than peak time traffic being congested in the region. The M62 Motorway is criticised here (Bradford) as in some other groups.

"If I get offered a job in Huddersfield then I would be too nervous to drive and then I'd need to rely on the train and I'm not sure I can do that"
Multiculturals

Potential impact of travel interventions

- Qualitative research reveals a sense that Multiculturals want to travel more than they do, with poor/expensive rail service causing the greatest constraints. So interventions that would make a difference are focused on rail improvements vs. road and address the perceived high cost of train travel.
- They also spontaneously ask for a train station at Bradford airport e.g. Bradford parkway, which would mean they did not have to pay such high car parking or taxi fees and may give them the opportunity to travel more.
- The concept of a high speed rail link between Bradford and Manchester is very appealing, as Manchester offers excitement and opportunity with many work and leisure opportunities.

- There is limited interest in Chain Bar improvements. It is felt that these would be good but chances are there will be extreme issues with roadworks.

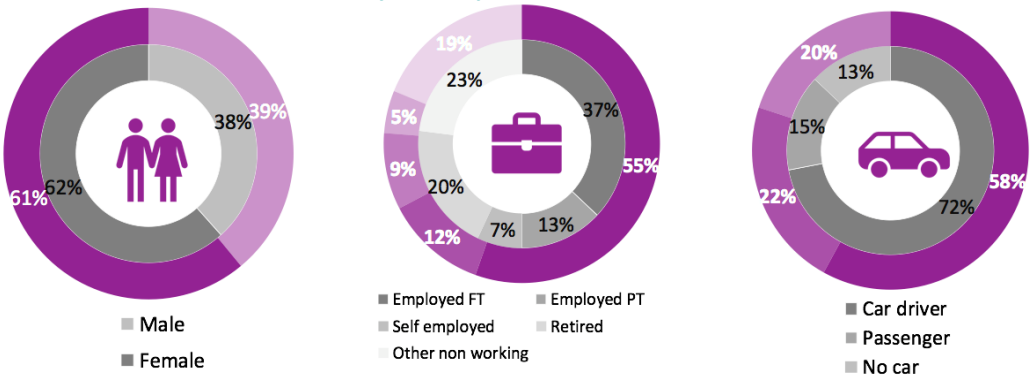
"I've become grounded – I want to be more socially out there but because I live in the town centre and don't drive I'm stuck"
Multiculturals

4.4 Travel behaviour: Inner City Cosmopolitans

4.4.1. Quantitative

The Inner City Cosmopolitans segment has a much higher proportion of individuals employed fulltime (55%) than the overall sample (37%) and a lower proportion of retired people (5% vs. 20%). It also has a lower proportion of people with access to a car as driver (58%, compared with 72% for the overall sample (Figure 30). These results are consistent with those from the User Insight Phase 1. As previously shown in Table 1, Inner City Cosmopolitans tend to be younger and have low car usage and ownership, compared with other user segments.

Figure 30: Characteristics of Inner City Cosmopolitans



On average, Inner City Cosmopolitans make more trips outside their local area (8) and a much higher proportion of trips by public transport (54%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 31). They also travel longer distances (84km vs. 55km). However, they travel to the same number of places outside their local area. Inner City Cosmopolitans also make more trips for commuting (34%), compared with the overall sample (23%) (Figure 32).

Figure 31: Current travel behaviour: Inner City Cosmopolitans

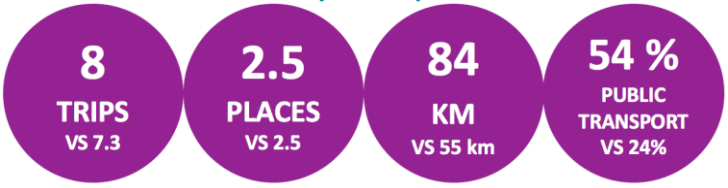


Figure 32: Trip purpose: Inner City Cosmopolitans (ICC)

Inner City Cosmopolitans were being slightly less satisfied with their current trips (Figure 33) and reported more constraints to travel (Figure 34).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion and overcrowded carriages, delays, disruption and cancellations. The main reasons for the reported constraints to travel were the unreliability of public transport, difficulty to cover the costs of using public transport, and not owning or having access to a car.

Figure 33: Satisfaction with current travel: Inner City Cosmopolitans (ICC)

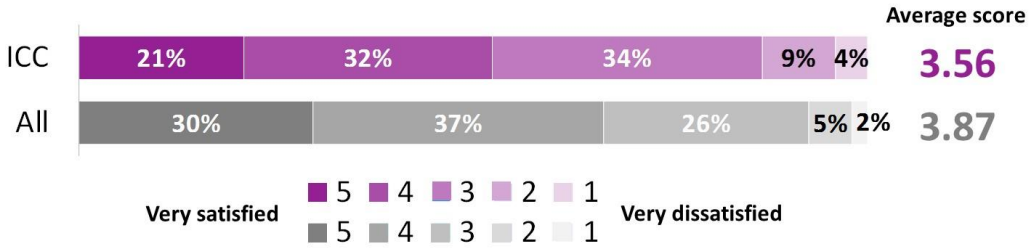
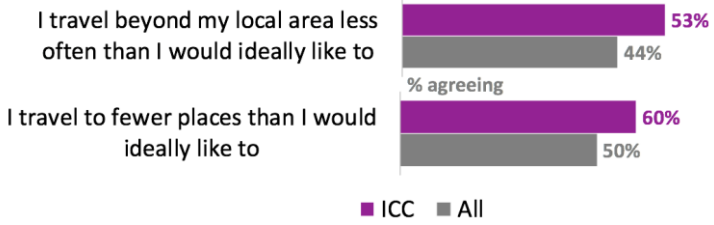
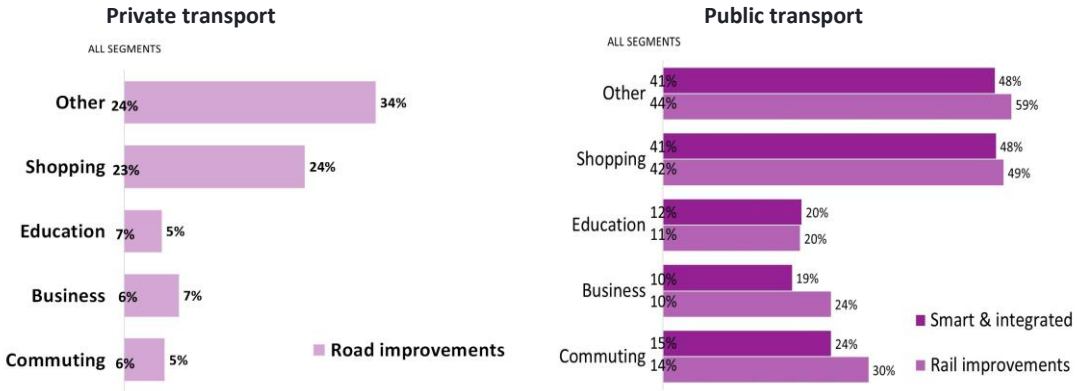


Figure 34: Travel constraints: Inner City Cosmopolitans (ICC)



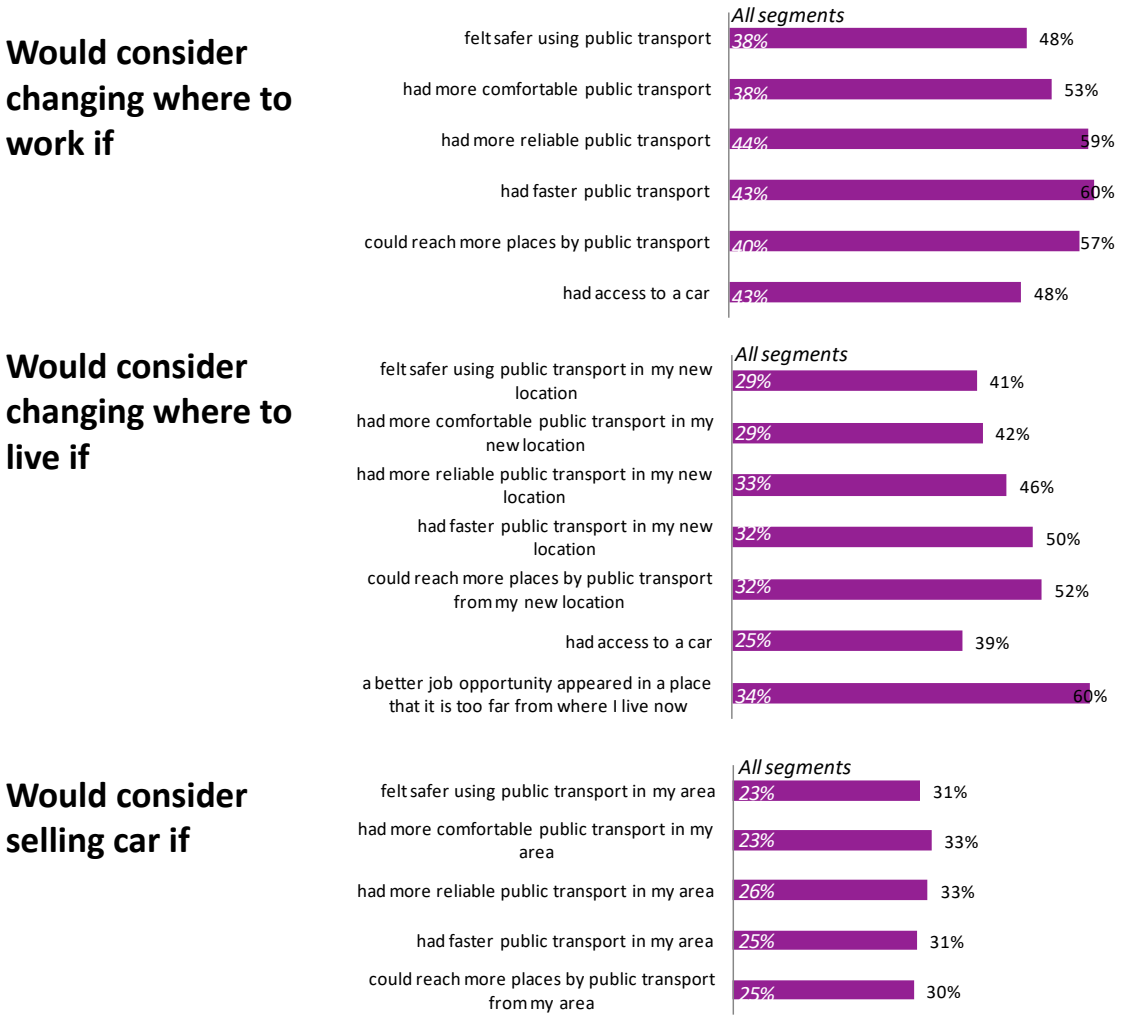
Inner City Cosmopolitans also stated they would make more additional private and public transport trips following the improvements of the Strategic Transport Plan, compared with the overall sample (Figure 35).

Figure 35: Likely effect of the Strategic Transport Plan: Inner City Cosmopolitans



Regardless of the scenario, the propensity of Inner City Cosmopolitans for changing where to work, where to live, or selling car, was always higher than the average of participants of all segments (Figure 36). The most marked difference was the propensity for changing where to live if a better job opportunity appeared in a place that is too far from the current residence location (60% for Inner City Cosmopolitans vs. 34% for the overall sample).

Figure 36: Possible long-term changes: Inner City Cosmopolitans



4.4.2. Qualitative

Life situation

Inner City Cosmopolitans are a mix of students and workers who share many common attitudinal characteristics. Students may be on their first or second or Masters degrees in subjects such as medicine, law, research, nursery education, sports & exercise. Those working are young professionals, in their first or second jobs in careers, such as Project Management, health, finance.

Their priorities are 'me-centric' and financially focused: saving up, clearing student debt, socialising. They are time-squeezed, as they balance studies with work: reinforcing that they have limited time to travel as much as they would like. They can be very optimistic and dedicated to their work/study and commit to extra hours in their first years of work. They are eager to earn more money and to 'move up': for example, out of parents' houses, onto their next home. They are restless and impatient and do not tolerate delays, hence some frustrations with public transport

They are engaged with technology, but not early adopters. They use smart phones, laptops, tablets. They are users of social media primarily for business vs. personal posting.

"Right now it's really busy but I'm coming to the end of the degree so that's good"
Inner City Cosmopolitans

Attitudes towards transport and travel

ICCs are youthful, fun and ambitious segment. The qualitative participants look beyond a future in Newcastle, providing transport links are good. This is because they are studying and see their current location as temporary and/or they are open about the idea of working elsewhere. They are keen to travel more widely – North, UK and overseas and faster journey times would make a difference to them

Those without a car see car ownership as giving them freedom and want to own one at some point. However inner-city traffic congestion is a key issue, making travel time prohibitive on the roads that they are relying on for work/leisure. In the Newcastle area, it is felt that there are often crashes on the A19 and that the A1 is usually heavily congested going north; all of which explains their high levels of dissatisfaction with car trips.

There is some dissatisfaction among this segment with public transport travel inside and outside Newcastle. Metro is their main transport link and is seen as convenient, but old-fashioned, creaky, slow and busy. The service is also felt to be questionable, due to lack of visible staff and fare prices are felt to be rising despite the issues encountered.

Bus is seen as a reasonable local mode, with benefits being the accessibility and number of stops. It is felt to be convenient and good value compared to the cost of parking, for example, but bus travel is also seen as time consuming for this busy segment.

Inner City Cosmopolitans are mainly using trains over coaches for longer distance trips, but find them prohibitively expensive unless planned weeks in advance. They cite regular problems with seat reservations and there are concerns about reliability on TransPennine Express and slow trains from the East to West coast.

"It's not just getting into Newcastle it's all around and you have to add so much more time into your journeys"
Inner City Cosmopolitans

Potential impact of travel interventions

- Qualitative research reveals that Inner City Cosmopolitans can feel isolated in Newcastle and a little forgotten. They want to travel more than they do: mainly to socialise (to see friends in other cities for example), but also to open up job opportunities
- Interventions that could make a difference focus on addressing issues with rail travel. They expect these improvements across InterCity services and local Metro
  - InterCity across the North - speed, ticketing and connections
  - Address increasing costs on the Metro and improve reliability, comfort, cleanliness, security
- The idea of increasing speed to Leeds is good, but not a deal breaker, as it is only saving 15 minutes
- Improvements to road at A1/A19 could be interesting but is claimed unlikely to change their behaviour
- They would like an Oyster style system that offers integrated travel on different modes with a daily cap – feel that this would reduce barriers to travel and make spontaneous travel easier.

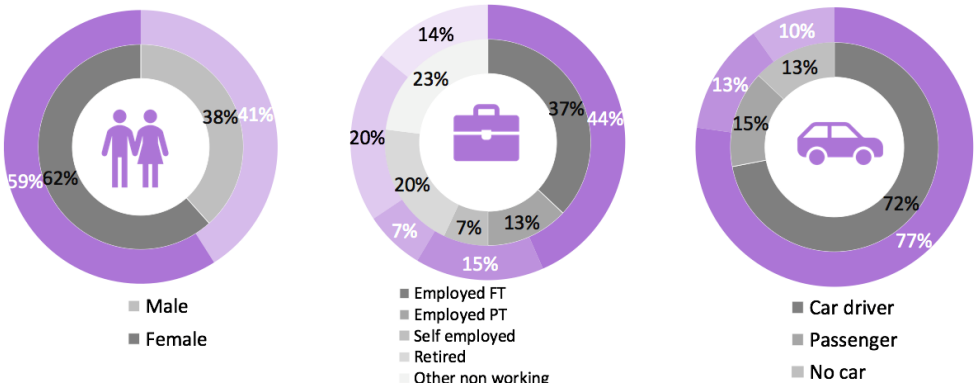
"If they made it easier to get across to Manchester by train then I could go to a hospital there and work – as long as it was easy to get home"
Inner City Cosmopolitans

4.5 Travel behaviour: Urbanites

4.5.1. Quantitative

Urbanites have more full-time workers (44%) than average and a slightly higher proportion of participants with access to car as driver (77%) (Figure 37). These results are consistent with those from the User Insight Phase 1, as previously shown in Table 1.

Figure 37: Characteristics of Urbanites

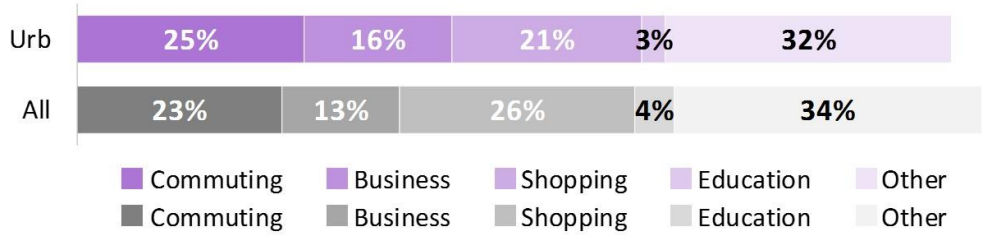


Urbanites make slightly more trips outside their local area than average (7.7 vs. 7.3) and travel longer distances (62 vs. 55km) (Figure 38). However, they travel to the same number of places outside their local area. Urbanites also make a slightly higher

proportion of trips for commuting and business and a slightly lower proportion of trips for shopping, compared with the overall sample (Figure 39).

Figure 38: Current travel behaviour: Urbanites

Figure 39: Trip purpose: Urbanites (Urb)



Urbanites showed only slightly smaller level of satisfaction and more constraints to travel than the overall sample (Figure 40 and Figure 41).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, and delays, disruption and cancellations. The main reasons for the reported constraints to travel were the difficulty to cover the costs of using public transport, and unreliability of public transport.

Figure 40: Satisfaction with current travel: Urbanites (Urb)

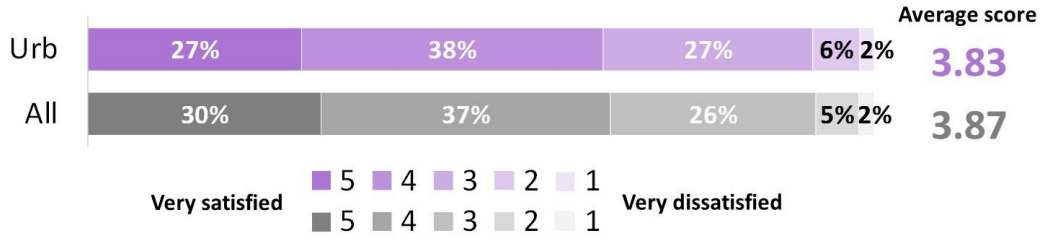
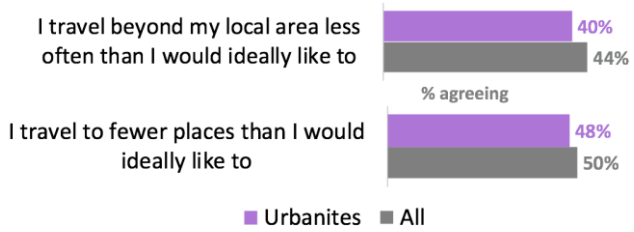
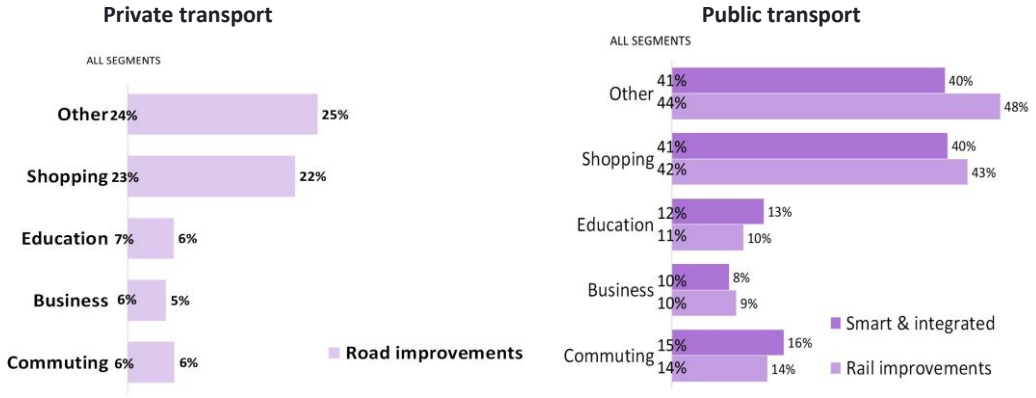


Figure 41: Travel constraints: Urbanites



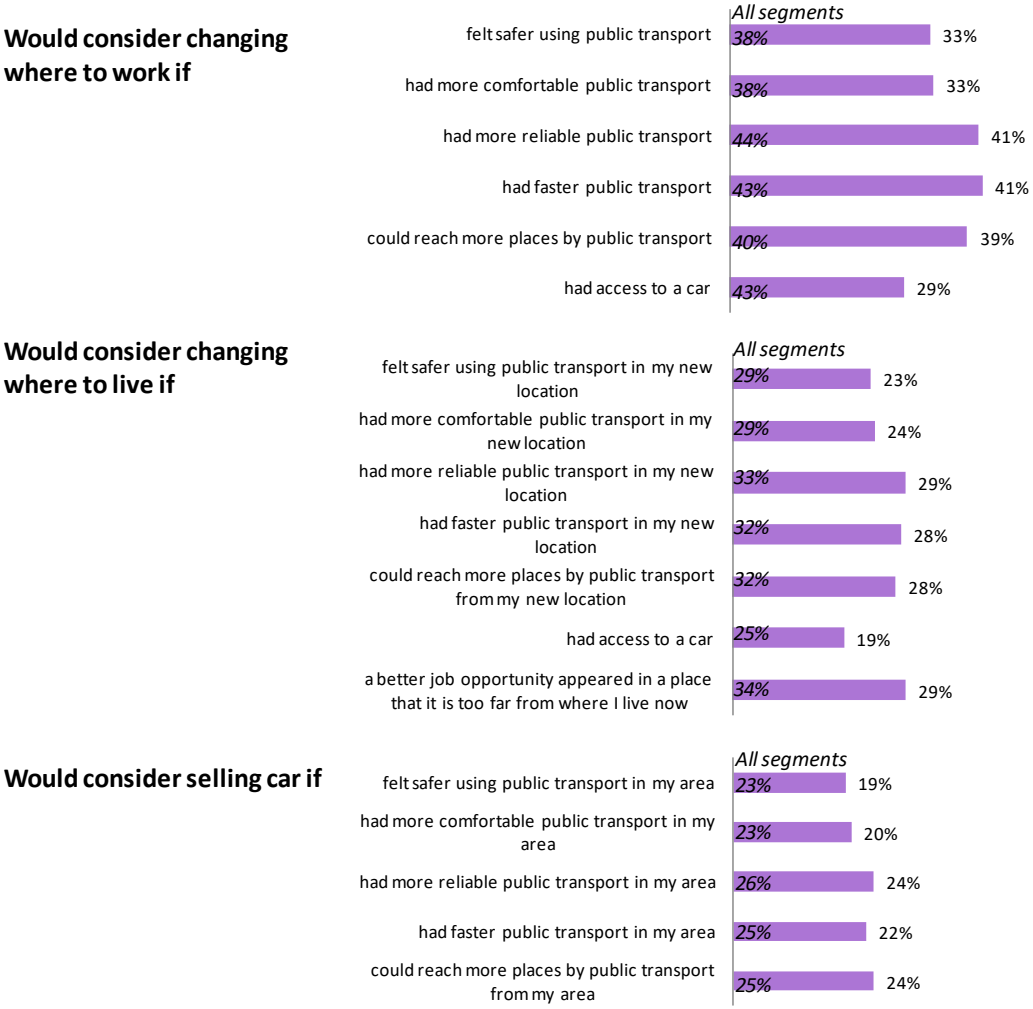
The propensity of Urbanites to make additional private and public transport trips following the improvements of the Strategic Transport Plan was slightly smaller than the overall sample (Figure 42).

Figure 42: Likely effect of the Strategic Transport Plan: Urbanites



The propensity of Urbanites for changing where to work, where to live, or selling car, following potential improvements, was always slightly (1-6%) lower than the average of participants of all segments (Figure 43).

Figure 43: Possible long-term changes: Urbanites



4.5.2. Qualitative

Life situation

Urbanites are busy jugglers: demanding career; strong social life; looking to give their children the best life. They are 30-something single/newly married/divorced, often with young children under 10 and they are balancing young families with work. They are living in privately owned properties, but some are in negative equity and/or in smaller houses than they would like. All are working in professional roles e.g. musician, police person, accountant, midwife, project manager, Business Manager.

Life is good but now they are at a more responsible life stage they are beginning to deal with challenging issues. Their high-level priorities are very personal and split between health and wellness and finances. Health and wellness is about getting well and staying well for themselves and their families. Finance is about clever budgeting to avoid elevating stress levels when, for example, their children want to do lots of different activities. The qualitative participants feel settled in Leeds but there is a sense that they would move for something different or better.

Urbanites are a high-tech group who rely on technology 24/7, such as Apple Watch, laptops, tablets, Smartphones, Alexa, Apple pay. Social media is important for them to stay in the loop

"I've got a lot going on at the moment so life is a bit stressful"
Urbanites

Attitudes towards transport and travel

Urbanites might choose to move locally, but not out of Leeds zone, as they enjoy where they live. They would consider work in other Cities if the transport was good enough. Some work commitments mean greater travel outside the 15 mile zone and they would choose to travel more to Manchester, for example, if better predictability of journey times.

Buses are considered cheaper than parking in the City Centre, but there are mentions of key issues with the service: unreliability; bus drivers who do not always stop; countdown signage not working and limited bus lanes.

There is minimal train usage in this segment which has fairly negative perceptions of rail services. Perceived expense, poor frequency and insufficient connections all prohibit further train travel.

Their perceptions of public transport (cost and experience) stop them from having the confidence to travel more without their cars. They tend to be hugely reliant on driving and claim they will continue to be car users, despite frustrations with congestion and the cost of parking in the city centre.

They have a sense that they are spending lots of wasted time on the road. There are criticisms of 'pinch points' in the centre e.g. A64, Moortown roundabout and the M62 is a particular problem: especially the lack of journey predictability.

"I've got family in Manchester but the idea of getting on the motorway stops me every time"
Urbanites

Potential impact of travel interventions

- Urbanites are not necessarily feeling constrained, but there are clear indications that their journeys are limited by negative road experience and negative rail perceptions.
- Interventions that could make a difference focus on transport investment priorities within the 15 mile boundary e.g. improving congestion in and around Leeds city centre; investing in some kind of Metro system; more carriages on the trains going into Leeds; better bus lanes; better bus service (especially the 1 and 72 routes).
- Perceptions of rail travel across the North is poor and is causing people not to use: they want improvements to reliability, frequency, connectivity
- Developing the M62 is key, but there is some disbelief about proposed changes to M62 (extra lane, journey predictability). Successful improvements would mean it was possible to have a choice between airports, go to concerts/exhibitions in Manchester and offer greater social opportunities
- The road to Leeds/Bradford airport is sometimes congested, so improving journey times to the airport would encourage travel from that airport.
- Improving customer experience on the train e.g. seat availability would be useful, but crucially reducing the time from Leeds to Manchester would enable greater work opportunities
- This segment is shocked that smart, integrated travel is 'new' and feels this should be an urgent priority for TFN.

"If that was the case and the time to Manchester was reduced by train then I'd look at a contract there when my time is up"
Urbanites

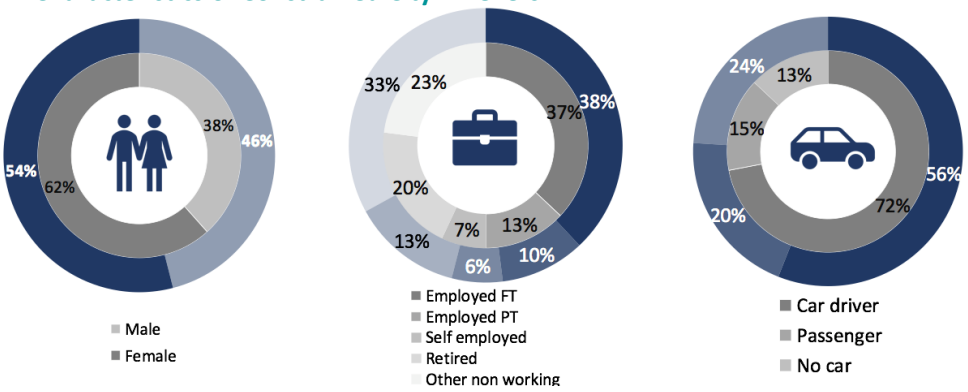
4.6 Travel behaviour: Constrained City Dwellers

4.6.1. Quantitative

The sample of Constrained City Dwellers has a higher predominance of men (46%), compared with the overall sample (38%), as well as a higher proportion of individuals not working and not retired (which includes students and individuals who are

unemployed or looking after the home/children full-time) (33% vs. 23% in the overall sample). The proportion of participants with access to car as driver is also much lower than in the overall sample (56%, compared with 72%) (Figure 44). These results are consistent with those from the User Insight Phase 1, as previously shown in Table 1, which indicated that Constrained City Dwellers have a higher than average percentage of individuals with no qualifications, unemployed and long-term sick, and a high probability (>50%) of not having a car.

Figure 44: Characteristics of Constrained City Dwellers



Constrained City Dwellers make fewer trips outside their local area (6.8) and a higher proportion of trips by public transport (34%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 45). They also travel to fewer places outside their local area (2.1) and to nearer places (42km), compared with the overall sample (who go to 2.5 places and travel 55km, on average). Constrained City Dwellers also make a higher proportion of trips for shopping (29%) and a smaller proportion of trips for commuting (19%), compared with the overall sample (26% and 23%, respectively) (Figure 46).

Figure 45: Current travel behaviour: Constrained City Dwellers

Figure 46: Trip purpose: Constrained City Dwellers (CCD)

Constrained City Dwellers had higher levels of satisfaction than the overall sample (Figure 47), despite the fact that they reported more constraints to travel (Figure 48).

54% agreed that they travel beyond their local area less often than they would ideally like to and 60% agreed that they travel to fewer places.

The main reasons for dissatisfaction (not shown in the tables below) were delays, disruption, and cancellations; traffic congestion, and roadworks. The main reasons for the reported constraints to travel were the inability to drive, unreliability of public transport, difficulty in meeting the costs of using public transport, and slow public transport.

Figure 47: Satisfaction with current travel: Constrained City Dwellers (CCD)

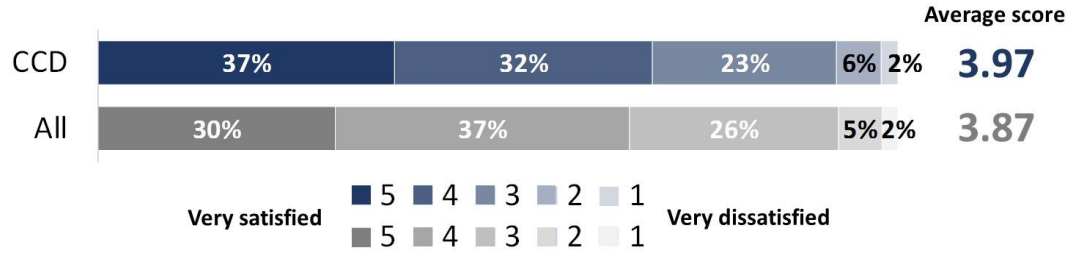
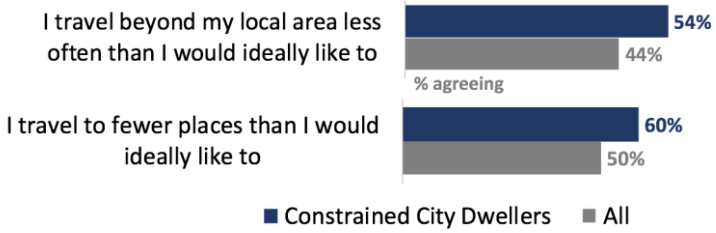
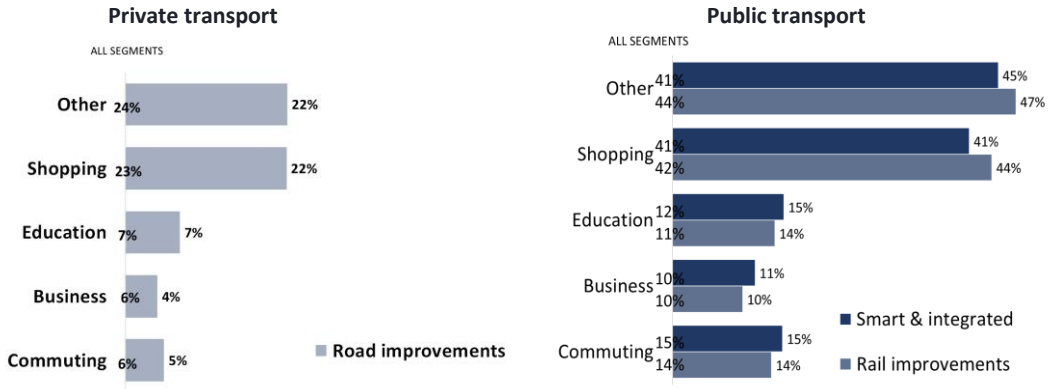


Figure 48: Travel constraints: Constrained City Dwellers (CCD)



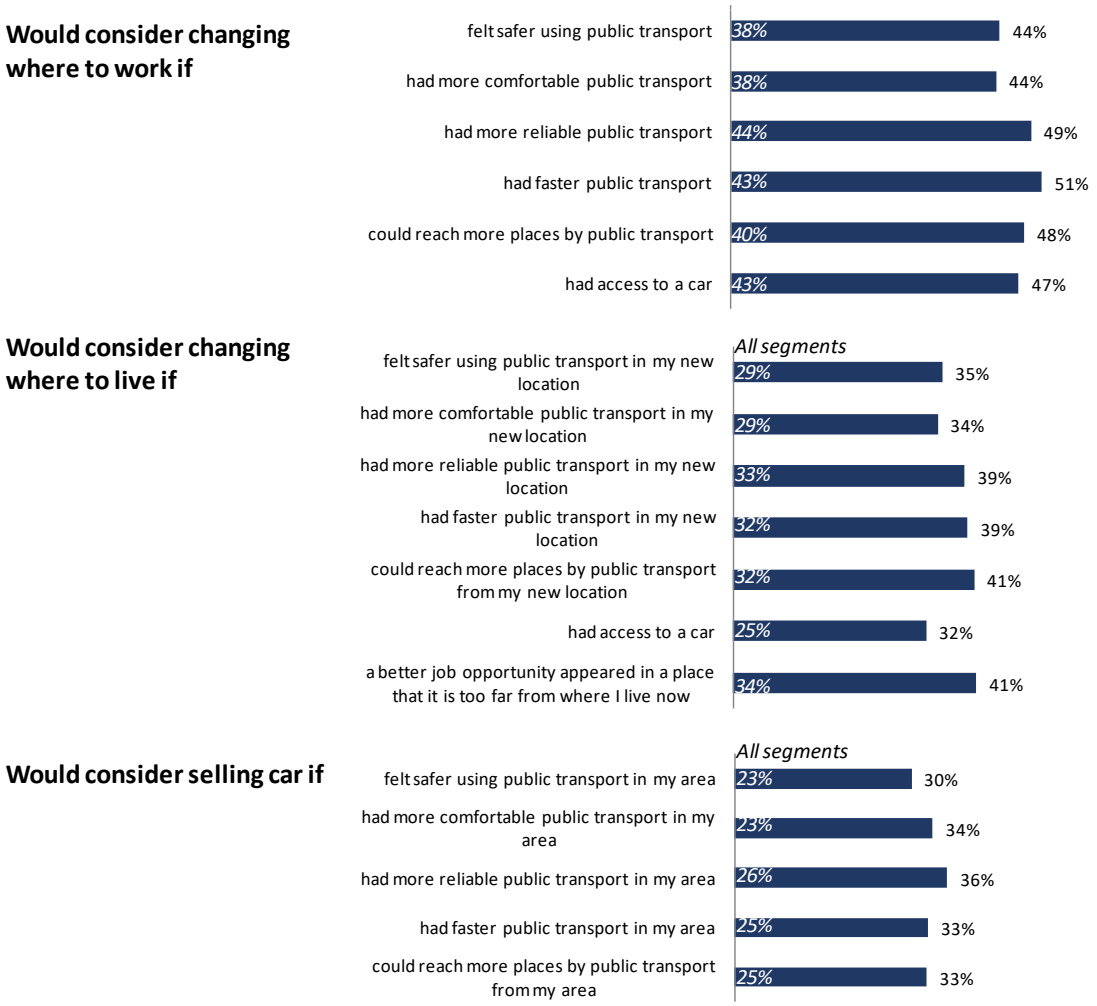
Constrained City Dwellers had a slightly higher propensity to state they would make additional private and public transport trips following the improvements of the Strategic Transport Plan, compared with the overall sample (Figure 49).

Figure 49: Likely effect of the Strategic Transport Plan: Constrained City Dwellers



The propensity of Constrained City Dwellers for changing where to work, where to live, or selling car, following potential improvements, was always 5-11% higher than the average of participants of all segments (Figure 50).

Figure 50: Possible long-term changes: Constrained City Dwellers



4.6.2. Qualitative

Life situation

Constrained City Dwellers have various personal challenges leading to underlying financial constraints. They are sometimes out of work or describe themselves as in 'dead end' jobs. Typical professions are waitressing and admin/clerical. They are parents (often single parents) with growing families. They are a mix of drivers and non-drivers, but are mostly using the train to get around.

Balancing financial commitments is the greatest pressure, as there is always something they feel they need to pay for and they do not tend to have spare money to save up for anything. They are more conscious of health and wellness now as they begin to encounter some physical challenges and also some mental health challenges, fuelled by the everyday pressures of wanting better lives.

Constrained City Dwellers are not overly concerned about time, as they are young and feel they have lives ahead of them and they do not tend to be in jobs that are time pressured.

This segment has high engagement with technology: smartphones, laptops, fire sticks, air pods, which they use for activities such as banking, gaming, transport apps, social media, photographs, and music. They are often fairly early adopters: sometimes within six months of technology becoming available.

"It's all about money isn't it – you can't do anything without money"
Constrained City Dwellers

Attitudes towards transport and travel

The cost of public transport is felt to be a real hindrance and this group claim they would use public transport more it there were meaningful changes. Constrained City Dwellers want the freedom to travel more around town and further afield, with some aspiring to travel more abroad. The non-drivers in this segment are keen to learn to drive.

While they love Liverpool, these Constrained City Dwellers are hopeful that they will move outside of the City Centre one day and into the suburbs. For some, the key aim is to move out of rented accommodation in the future.

Those with cars tend to be hugely reliant on them and say they will continue to be car users, despite frustrations with congestion and the cost of parking in the city centre. Their perceptions of public transport (cost and experience) stop them from having the confidence to travel more without their cars.

There is high bus usage in this group, but fares are felt to be expensive at £2.30 plus per journey, which is considered to be higher than using buses in London. Bus provision is felt to be good. Buses are direct with routes all over the City during the daytime and provide a fairly high-tech experience. There are some issues with reliability: experience of buses being delayed and/or cancelled. Some in this group are using the contactless card (Walrus) but experiencing initial teething problems with this.

There is low satisfaction here with the trains operated by Mersey Rail. They are felt to be unreliable: delayed, for example, due to lack of train crew. Rail provision from Liverpool to Manchester Victoria is felt to be slow, with only the occasional 30-minute service and others taking an hour. Trains are felt to be expensive, though the Lancashire Day Rail pass is seen as slightly better value.

"And they said 'right to be able to get the bus and the train you need to have the walrus card so that's an extra pound' and you're like for Christ's sake."
Constrained City Dwellers

Potential impact of travel interventions

- There is a real sense in this segment that life opportunities are limited by transport related issues:
  - The cost of public transport (buses) in and around the city
  - The cost of public transport (trains) in and outside of the city

  - Fare structures that they see as unfair and designed to get people to pay more: a perceived noticeable difference with the cost of public transport in London vs. Liverpool, including a lower daily cap and free travel for under 16s.
  - The cost of parking in the city

- The idea of a fast rail service to the airport is welcomed. However, for this segment, public transport needs to be more reliable overall to overcome current negative perceptions.
- Utilising existing technology offering integrated and SMART ticketing would reduce barriers to travel here, such as the inconvenience of using cash, or the temptation to spend leftover cash once it has been taken out.

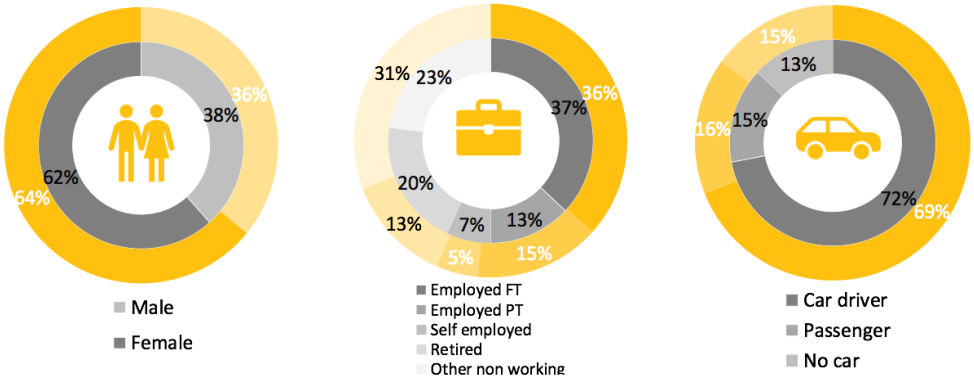
"I think that the Virgin service as stands is quick enough, I think that what they need to be looking at is the Liverpool to Manchester. There's one train that takes half an hour and the rest of them take like over an hour"
Constrained City Dwellers

4.7 Travel behaviour: Hard Pressed Living 1

4.7.1. Quantitative

The Hard Pressed Living 1 segment has a composition broadly similar to the overall sample, with only a smaller proportion of retired people (13%) and a higher proportion of people not working and not retired (31%), compared with the overall population (20% and 23% respectively). The proportion of participants with access to a car as driver is slightly smaller (69%) than the overall sample (72%) (Figure 51). The User Insight Phase 1 found that individuals in this segment has higher than average car ownership, although they travels less, and for shorter distances, compared with other segments.

Figure 51: Characteristics of Hard Pressed Living 1



On average, the Hard Pressed Living 1 segment makes more trips outside the local area (8.3) and a lower proportion of trips by public transport (20%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 52). This segment also travel to places that are nearer (48km), compared with the overall sample (55km). Trip purposes are broadly similar to the overall sample (Figure 53).

Figure 52: Current travel behaviour: Hard Pressed Living 1

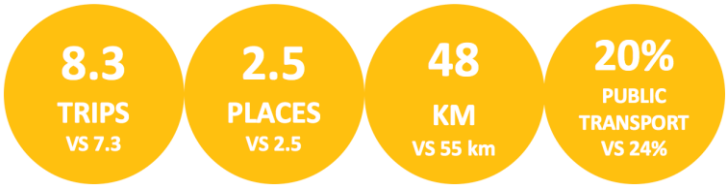
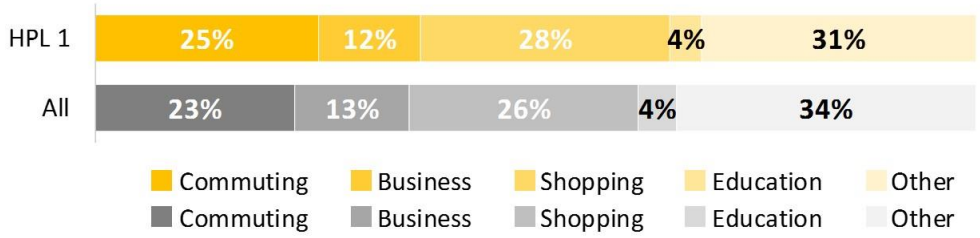


Figure 53: Trip purpose: Hard Pressed Living 1 (HPL1)



The level of satisfaction with current trips in this segment was higher than in the overall sample (Figure 54). However, the propensity to report constraints to travel was similar (Figure 55).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, and delays, disruption, and cancellations. The main reasons for the reported constraints to travel were the unreliability of public transport, difficulty in meeting the costs of using public transport, and the places where one wants to go being too far.

Figure 54: Satisfaction with current travel: Hard Pressed Living 1 (HPL1)

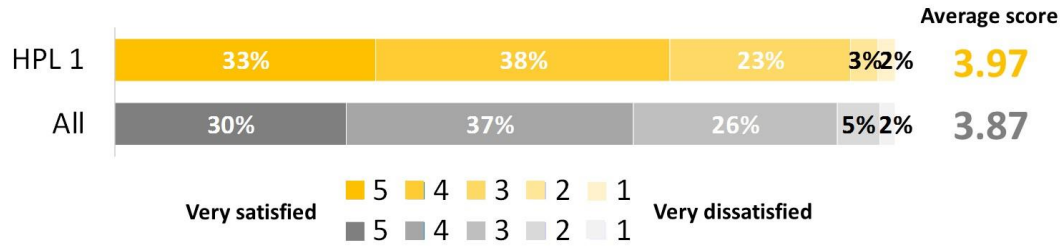
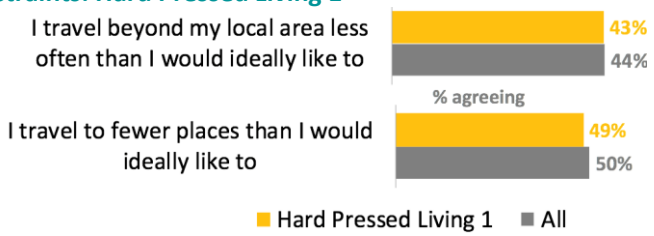
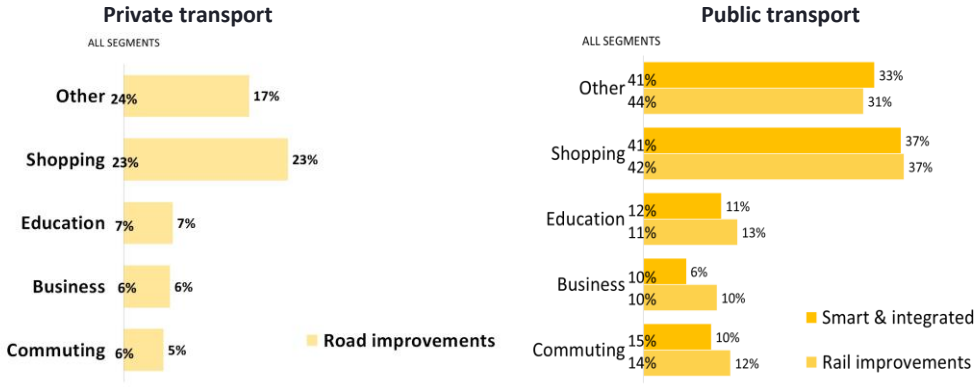


Figure 55: Travel constraints: Hard Pressed Living 1



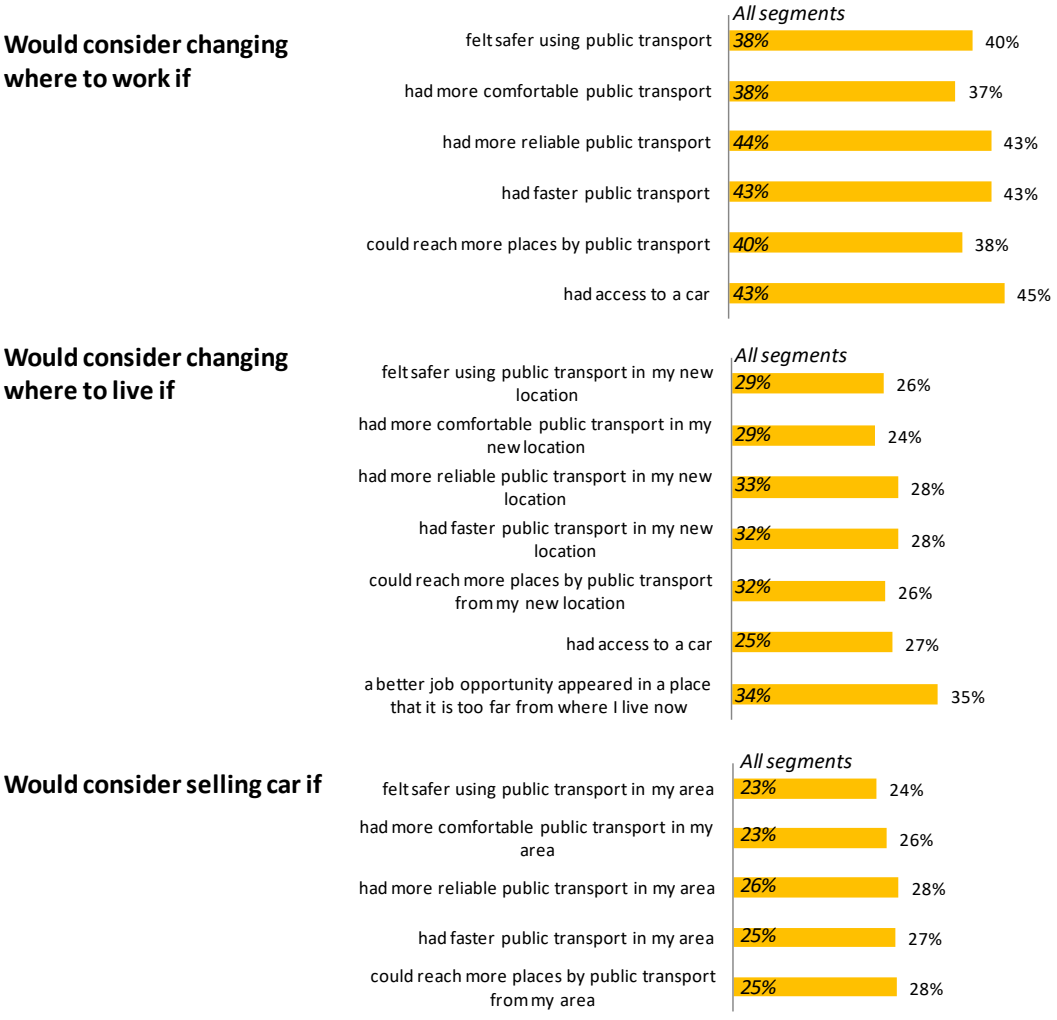
The propensity to make additional trips following the improvements of the Strategic Transport Plan was lower in the case of trips for shopping and other purposes (especially in the case of trips by public transport), but similar for other purposes (Figure 56).

Figure 56: Likely effect of the Strategic Transport Plan: Hard Pressed Living 1



The propensity of participants in the Hard Pressed Living 1 segment for changing where to work, where to live, or selling car, following potential improvements was generally similar to the overall sample, i.e. never more than 3% higher or lower (Figure 57).

Figure 57: Possible long-term changes: Hard Pressed Living 1



4.7.2. Qualitative

Life situation

The Hard Pressed Living 1 segment consists of those who are young: often working and looking after small children/babies. They tend to work in jobs vs. careers, for example council worker, builder, dog walker, nurse, chef. They all like walking or cycling as their preferred mode of transport and they are often too impatient for public transport.

Hard Pressed Living 1 are happy to trade 'more money/more stuff' for more time: prioritising wellness and time with the family over chasing money. Their financial outlook is based on a sense that 'everything is ok as long as the bills are paid'. They are reluctant to be on the work treadmill and miss out on raising their families. Health and wellness has become more important as they realise that they are not so young anymore (used to care about drinking and smoking).

This segment has fairly low engagement with technology, but uses it for speed and convenience e.g. payment and checking information. They have some concerns about technology and social media use among children and young people.

"You can go for walk like by yourself or go for a walk with the pram and just enjoy the day: you don't need to be going shopping and spending."
Hard Pressed Living 1

Attitudes towards transport and travel

Hard Pressed Living 1 use the car for convenience, comfort and low cost when travelling with a family. Their perceptions of public transport are very negative and usually based on hearsay and historic experience, which causes them to avoid it as much as possible.

They consider the car to be much more convenient mode for their life stage: while they are travelling with prams for shopping, etc. They claim that the Lancaster Bypass has been very helpful at easing traffic flow in/out of the city and while there is still some traffic in rush hour, their driving experience is felt to be acceptable.

There is minimal bus usage among this group, due to negative perceptions, driven by past experiences of late running buses; ill-mannered drivers; timetable not working for their needs. The cost of bus usage is also felt to be unfairly expensive: e.g. £4 for a day rider, £2.50 for school bus.

Some negative perceptions around crowding, delays and cost reduce the likelihood of using trains among this group. However, it is felt to be fairly easy to get the train from Lancaster to Preston which is a big hub to other parts of the country.

Hard Pressed Living 1 like to feel connected but are not particularly concerned about extending their life outside of their local zone. Their longer-term ambitions are unpredictable as they tend to be living in the moment. They talk about moving to a

bigger house rather than a different location and their intention is to continue to use the car more than public transport.

"I pay for my car so it's there: like I can't imagine walking past my car in the drive and going to get the bus because I just think I already pay for the petrol."
Hard Pressed Living 1

Potential impact of travel interventions

- Those in the Hard Pressed Living 1 segment do make journeys outside their local zone but their life stage means that travelling with families is challenging (due to the organisation and expense).
- Interventions that would make a difference would involve reducing cost of train and bus to make family travel viable e.g. family deals, free travel for children - this would enable consideration to other places in the North.
- Any transport initiative needs to be supported by convenient and quick technology so the response to the smart and integrated travel was positive, with claimed potential to break down barriers to using.
- Reducing cost of parking at key train stations might encourage usage and further travel across the North.
- There was not strong interest in or potential impact of reinstatement of the Colne Route: They do not know many people living there and are unsure why they would travel there.
- There is an appetite for improving local roads and keeping them well maintained, as opposed to any big changes, as the bypass has improved things considerably for their driving experience and is perceived as having made better use of their time.

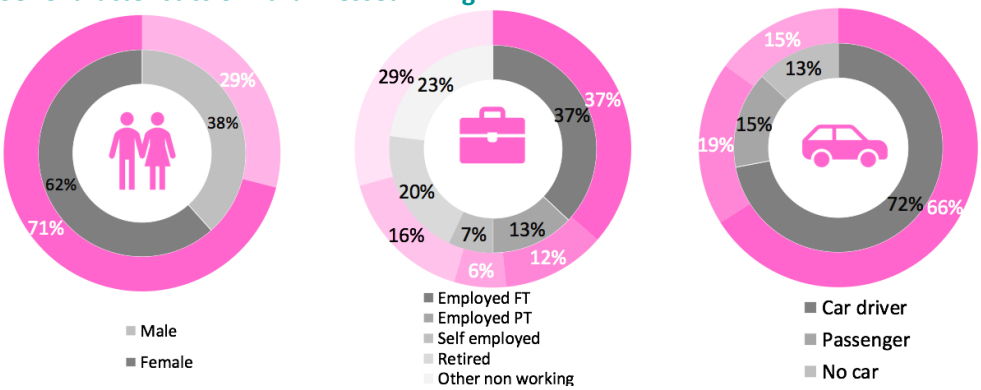
"As soon as you pay for a family of four: or if there's more than one person you're cheaper to drive."
Hard Pressed Living 1

4.8 Travel behaviour: Hard Pressed Living 2

4.8.1. Quantitative

The Hard Pressed Living 2 segment has a higher proportion of women (71%), a lower proportion of retired people (16%) and a higher proportion of people who are not working or retired (29%), compared with the overall sample. The proportion of participants with access to car as driver is also lower (66%, compared with 72%) (Figure 58), which is consistent with the results from the User Insight Phase 1.

Figure 58: Characteristics of Hard Pressed Living 2



The Hard Pressed Living 2 segment makes a much smaller number of trips outside the local area (4.9), visits fewer places (2) and travels shorter distances (46km), compared with the overall sample (7.3 trips, 2.5 places, and 55km) (Figure 59). This segment also makes more trips for shopping (32%) and fewer trips for commuting (20%) and business (8%) (Figure 60).

Figure 59: Current travel behaviour: Hard Pressed Living 2

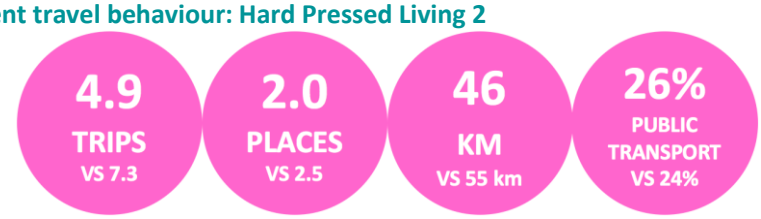
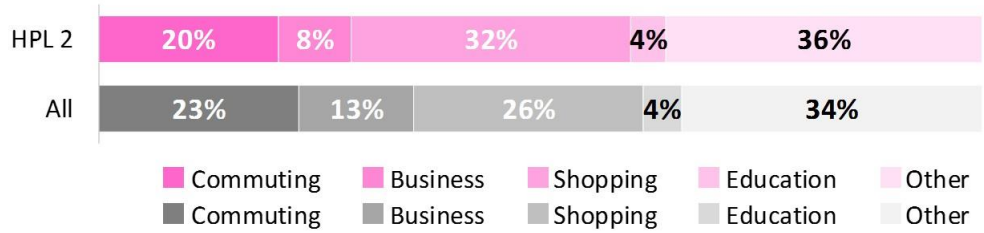


Figure 60: Trip purpose: Hard Pressed Living 2 (HPL2)



The level of satisfaction with current trips was higher than average (Figure 61). However, this segment reported more constraints to travel (Figure 62). 49% agreed that they travel beyond their local area less often than they would ideally like to and 55% agreed that they travel to fewer places.

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, and delays, disruption, and cancellations. The main reasons for the reported constraints to travel were the unreliability of public transport and difficulty in meeting the costs of using public transport.

Figure 61: Satisfaction with current travel: Hard Pressed Living 2 (HPL2)

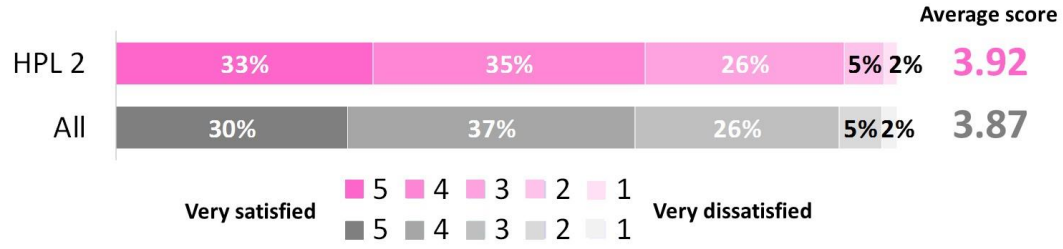
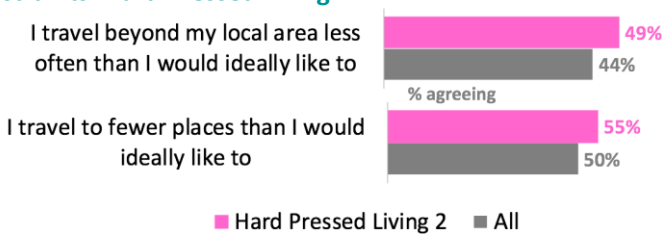
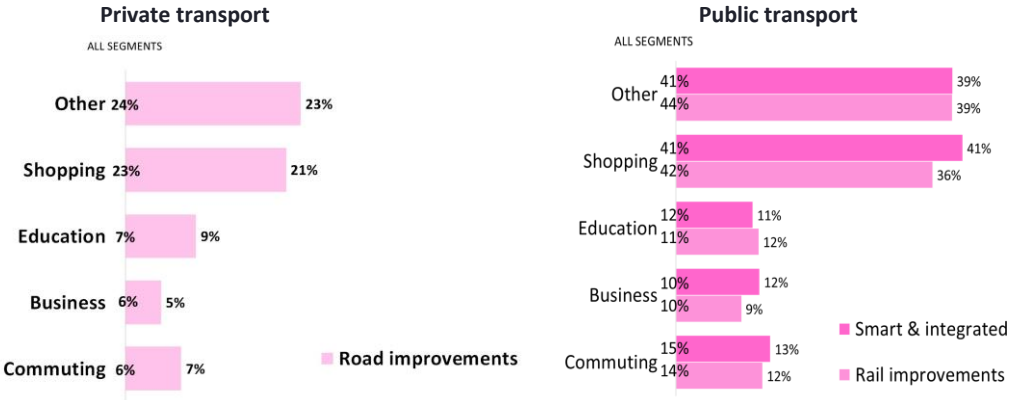


Figure 62: Travel constraints: Hard Pressed Living 2



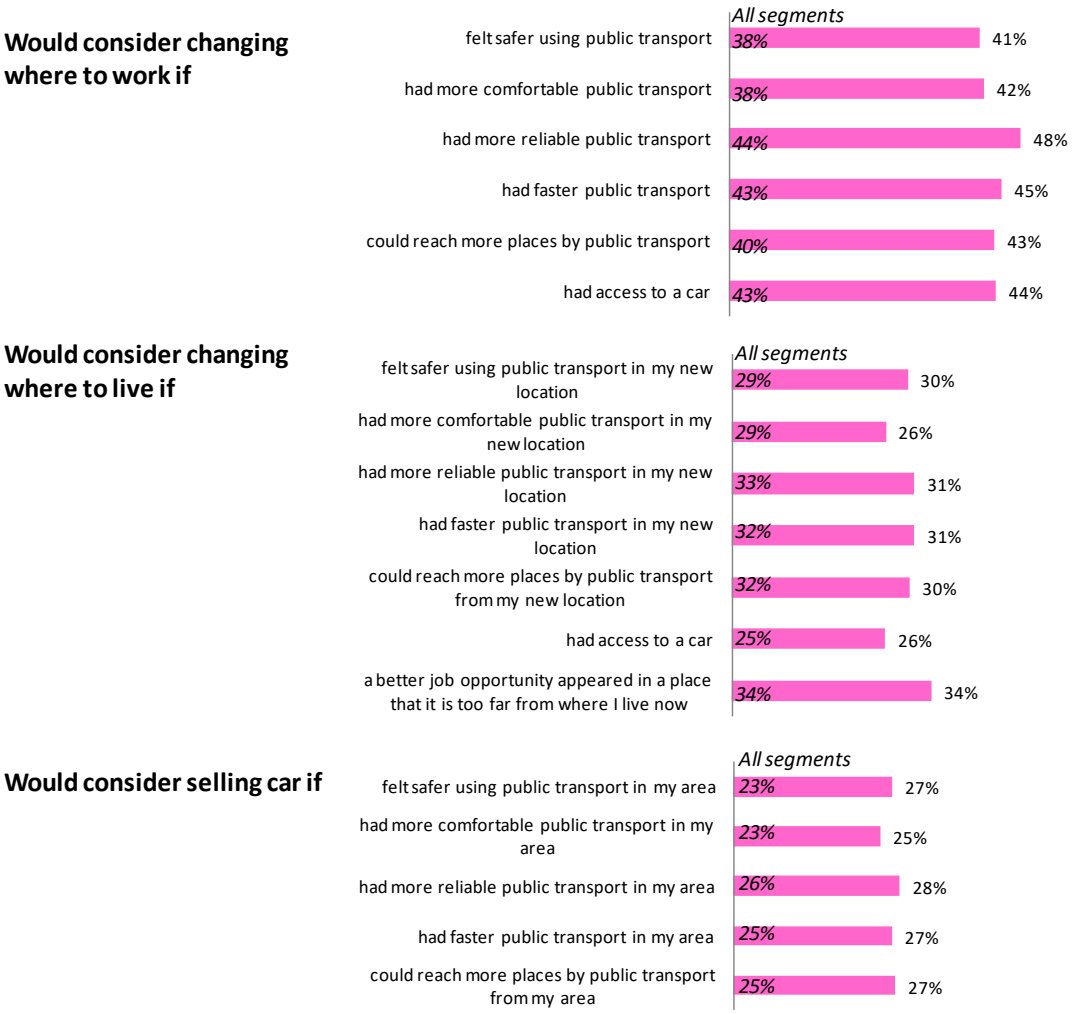
The Hard Pressed Living 2 segment also stated they would make fewer additional private and public transport trips following the improvements of the Strategic Transport Plan, compared with the overall sample (Figure 63).

Figure 63: Likely effect of the Strategic Transport Plan: Hard Pressed Living 2



The propensity of participants in the Hard Pressed Living 2 segment for changing where to work, where to live, or selling car, following potential improvements was in general similar to the overall sample, i.e. never more than 4% higher or lower (Figure 64).

Figure 64: Possible long-term changes: Hard Pressed Living 2



4.8.2. Qualitative

Life situation

The Hard Pressed Living 2 segment is young and contains a mixture of families and those with no children. There is a mix of types of profession: e.g. Graphic Designer, Project Manager, Bricklayer, Hairdresser, Auditor, Chef, Make-up artist. This segment shares similar financial constraints to Hard Pressed Living 1 but they are keener to get different jobs and tend to rely on public transport: often using the train or bus for work and leisure purposes.

For this group health and wellness is about feeling the need to get fit, exercise, quit smoking and eat healthier. Some focus on mental health problems to try and reduce stress and create some headspace within their busy lives. Finances feature as very important here and the sense is that there is not much to go around: which provides motivation to get better jobs and earn more. Their lifestyle descriptions often focus on simple activities, such as feeding the ducks, going for a walk in the park, having a bath, reading a book etc.

This segment engages highly with technology for gaming, social networks, payment mechanism, shopping, banking, YouTube etc. However, they do not tend to be quick to get new technology or gimmicks.

"I'm happy but I want to work on more things in life, like get a better job fitting round my son and stuff like that, I've got stuff to work on."
Hard Pressed Living 2

Attitudes towards transport and travel

Hard Pressed Living 2 have high bus usage and are very positive about bus services, due to the perceived reliability, frequency and route coverage, as well as a good experience on board (e.g. Wi-Fi on buses, charging points) and they embrace ticketless travel, in the form of Walrus.
However, they see bus travel as expensive at £2.50 for 2 stops.

Journeys outside of the 15 mile zone are prohibited by slow, expensive trains. This segment use trains, but still criticise the service as being expensive for local and long distance journeys. Some have family railcards and they compare rail travel to London Underground where journeys are capped and under 18s are free.

There is limited car usage among Hard Pressed Living 2. They see traffic in and around the city centre as very bad and car parking as expensive, at £8 for 2 hours, £21 a day. While driving outside of the local area (more than 15 miles) can be busy with poor traffic (thus limiting their willingness to take more trips), they still feel that this is better than taking expensive, slow trains.

"Getting to Manchester, I need to leave here 5.45 in the morning to get there for 9. That shouldn't happen for a 40 minute journey."
Hard Pressed Living 2

Potential impact of travel interventions

- Although the Hard Pressed Living 2 segment is attached to their current location, they seem more fluid and open to job opportunities outside of the City if transport links were better.
- Hard Pressed Living 2 recognise that job opportunities in Manchester are greater so they welcome improved transport links in between.
- Although the bus routes are good in the City Centre, there is a need to address cost: specifically free travel for those in education.
- Even though they are happy with current provision, longer term they request more buses, to relieve congestion at peak times.
- General improvements to the train fares and faster trains to Leeds/York would make these journeys more appealing by train if it were quicker/cheaper than driving.

- Integrated ticketing was spontaneously requested; a similar system to Oyster in London with capped journey fees is needed to create better movement and give price confidence.

- There is an appetite for improving traffic congestion through to Manchester.

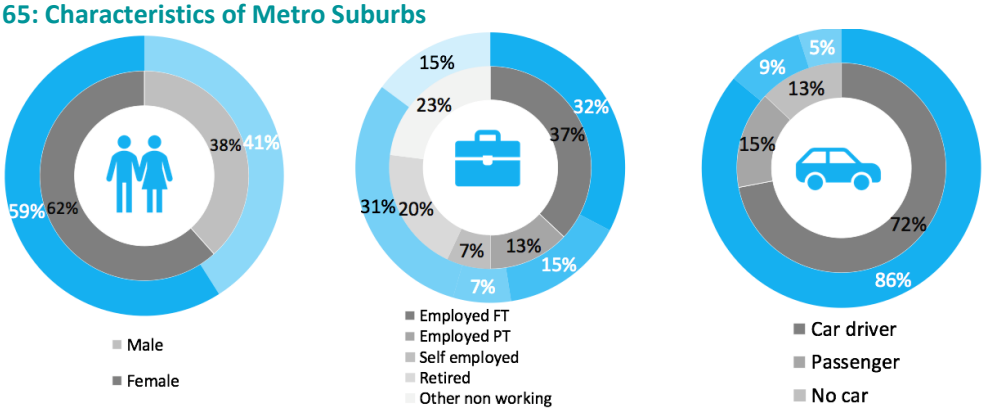
"You could apply for like more jobs. There's a lot more jobs going in Manchester probably than Liverpool so more money and more opportunity as well."
Hard Pressed Living 2

4.9 Travel behaviour: Metro Suburbs

4.9.1. Quantitative

The Metro Suburbs segment has a higher proportion of retired people (31%), compared with the overall sample (20%), and a lower proportion of individuals employed full-time (32% vs. 37%) and not working or retired (15% vs. 23%). The proportion of participants with access to car as driver is much higher than average (86%, compared with 72%) (Figure 65). These results are consistent with those from the User Insight Phase 1.

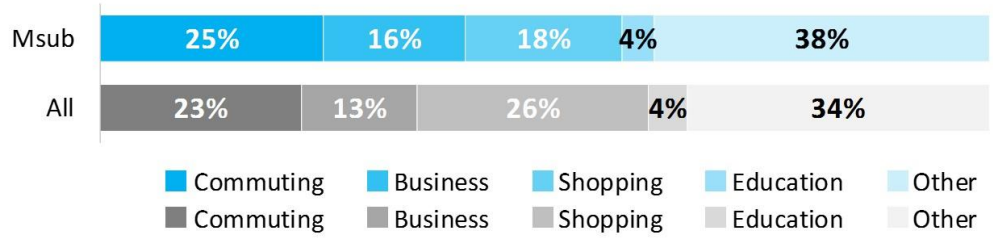
Figure 65: Characteristics of Metro Suburbs



On average, participants in the Metro Suburbs segment make fewer trips outside their local area (6.5) and a lower proportion of trips by public transport (17%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 66). However, they travel to almost the same number of places outside their local area and to places located at almost the same distance, compared with the overall sample. The Metro Suburbs segment also make more trips for other purposes (38%), compared with the overall sample (34%), and fewer trips for shopping (18% vs. 26%) (Figure 67).

Figure 66: Current travel behaviour: Metro Suburbs

Figure 67: Trip purpose: Metro Suburbs (Msub)



The level of satisfaction with current trips was lower than average (Figure 68). However, participants in this segment reported fewer constraints (Figure 69).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion and roadworks. The main reasons for the reported constraints to travel were the unreliability of public transport.

Figure 68: Satisfaction with current travel: Metro Suburbs (Msub)

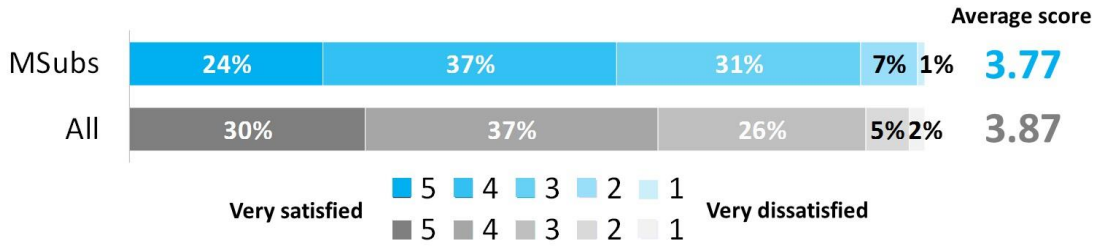
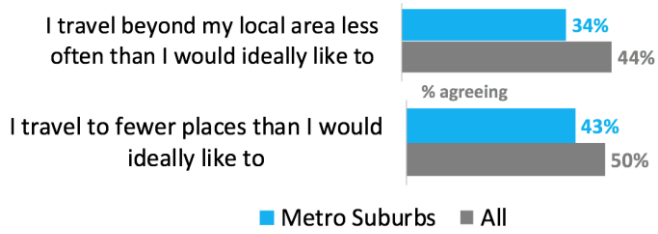
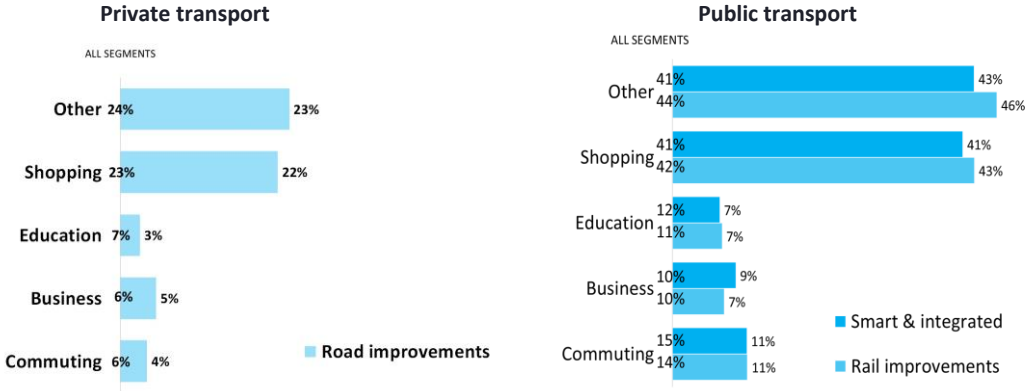


Figure 69: Travel constraints: Metro Suburbs



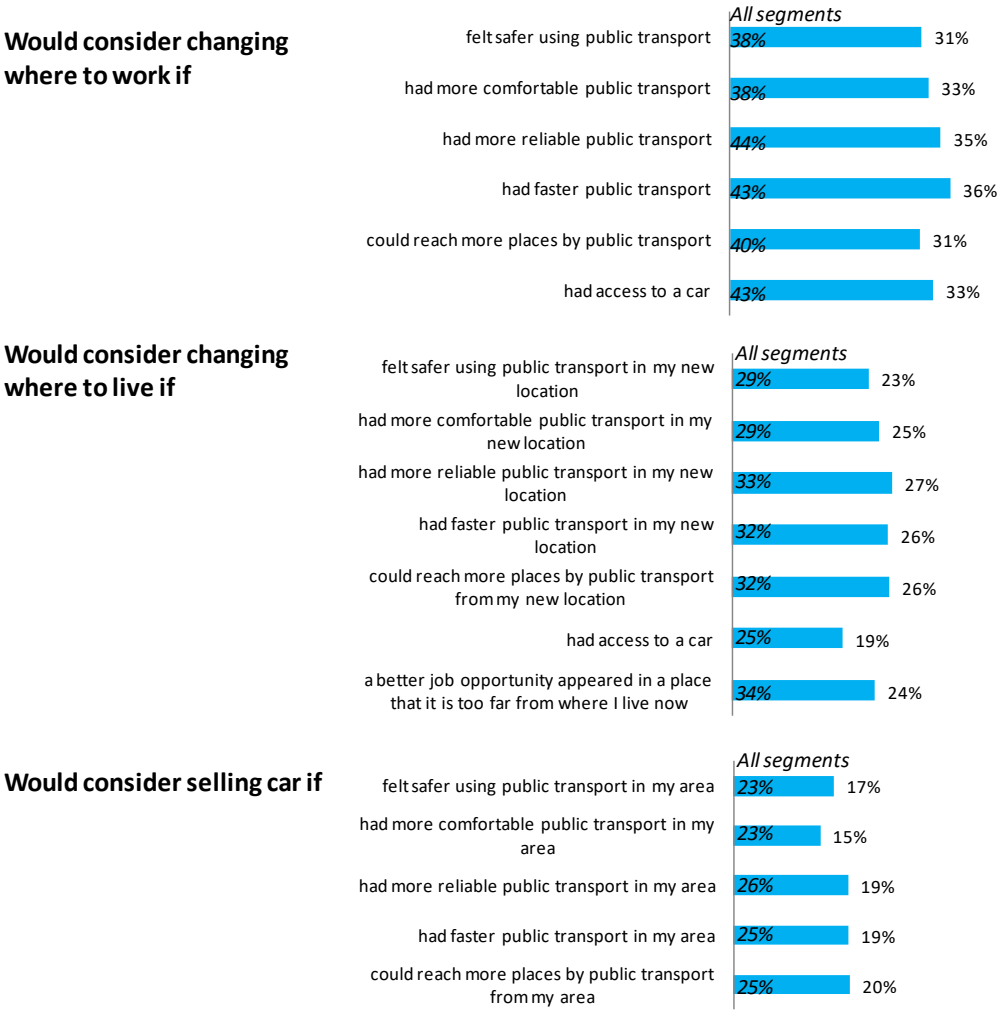
The propensity for making additional private or public transport trips was higher only in the case of trips for other purposes (Figure 70).

Figure 70: Likely effect of the Strategic Transport Plan: Metro Suburbs



The propensity for changing where to work, where to live, or selling car, following potential improvements was always 5-10% lower than the average of the overall sample (Figure 71).

Figure 71: Possible long-term changes: Metro Suburbs



4.9.2. Qualitative

Life situation

The Metro Suburb segment is made up of members of the classic 'sandwich generation', who may have young, teenage or university age children and ageing parents. Some also have specific challenges with their children, such as additional needs. They are living in privately owned properties and working in professional roles e.g. property, IT, pharmacist.

Despite real time pressures, Metro Suburbs are content with life and display a strong social conscience. Their high level priorities are about society: they care about politics, the environment and societal cohesion. Their personal priorities focus on health and wellness: for example, some are dealing with grief, coping with disability, have a partner

in poor health and/or focused mainly on their children's needs. Time is a real pressure for this segment, given their juggle with children, parents, work, etc. Financial pressures are much less of a concern

They tend to be very settled in their current home and area and not looking to move. They see that Leeds has lots to offer and feel it is a rising star City. They tend to be hugely reliant on cars despite some environmental guilt.

Metro suburbs are interested in technology and financially stable so are relatively early to adopt laptops, Smart TV, Alexa, Apple watch, for example. They are less involved with social media, due to concerns about their children becoming too much so and more generally about 'people becoming introspective'.

"I think some days I think – just stop the wheel please I need a break."
Metro Suburbs

Attitudes towards transport and travel

Metro Suburbs make occasional trips outside the Leeds sphere for specific events but feel everything is on their doorstep and car travel dominates. This car-reliant segment experiences significant frustration with road travel impacting on their personal value of time. They blame population growth and roadworks for much of the congestion they experience: specifically issues with driving into City Centre and around the suburbs e.g. Harrogate Road. They have some concerns about park and ride plans and what the impact might be of these. Outside of Leeds, the M62 to Manchester is seen as highly congested and a real barrier to journeys further afield.

The Metro Suburb segment is making minimal use of buses and there is a perception that there are fewer buses running than previously. When used, the specific bus journeys taken are felt to be very convenient and almost ''door to door', but bus travel is perceived as surprisingly more expensive than train travel.

There is little train usage among this group and the time taken to drive into Leeds Centre prohibits further train usage. Past experiences of occasional train travel are mainly good, in that it has been found as reliable, clean and easy to use. The cost of train travel itself is felt to be fairly reasonable in comparison to the cost of parking in Leeds.

They have a positive perception of Leeds suburbs and feel they have everything they need. They talk about their roots being local and a pride in Yorkshire that, linked to being settled in their life stage, means that they are unlikely to move home.

"I can't get a bus or train to Tadcaster so I have to drive and I'm late every single day. Every day I'm late."
Metro Suburbs

Potential impact of travel interventions

- Metro Suburbs are content with their current travel patterns and not looking to move.
- However, their dissatisfaction with roads and public transport means that they are limiting the number of longer journeys that they make.
- Spontaneous interventions that could make a difference are split between improvements within the 15 mile zone to help congestion into the City and across the North to make travel to the West easier.
- Specifically ensuring predictable journey times on the M62 is a priority, but they are not convinced about the capacity here for the introduction of an extra lane and how much this would help.
- Improving road journey times from Leeds to Bradford is not a key concern for this segment.
- They are looking for a more efficient, affordable Public Transport service, but for them this means links into Leeds as well as out: for example, more buses and/or trains into the suburbs.
- Integrated SMART ticketing system is expected by this group.
- Faster trains to east, west and north (Hull, Manchester and Darlington) would mean greater opportunities for work and university choices for their children.

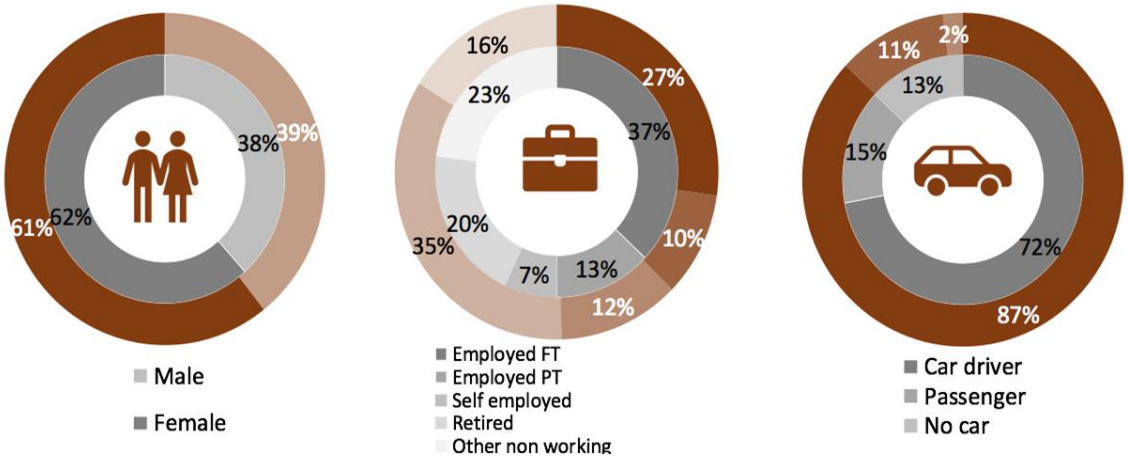
"Better car parking in Leeds so that you can leave the car and go on longer journeys out of Leeds."
Metro Suburbs

4.10 Travel behaviour: Small Town Suburbs

4.10.1. Quantitative

The Small Town Suburbs segment has a much higher proportion of retired people (35%), compared with the overall sample (20%) and a lower proportion of people working full-time (27%, compared with 37%). The proportion of participants with access to car as driver is much higher than average (87%, compared with 72%) (Figure 72). These results are consistent with those from the User Insight Phase 1.

Figure 72: Characteristics of Small Town Suburbs



Participants in the Small Town Suburbs segment make fewer trips outside their local area (6.8) and a lower proportion of trips by public transport (15%), compared with the overall sample (7.3 trips, 24% of which by public transport) (Figure 73). However, they travel further (61km) and to more places (2.8). Participants in this segment also make more trips for other purposes (41%), compared with the overall sample (34%) (Figure 74).

Figure 73: Current travel behaviour: Small Town Suburbs

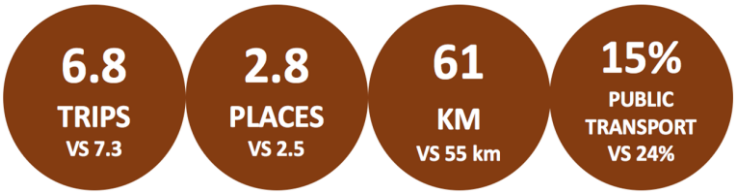
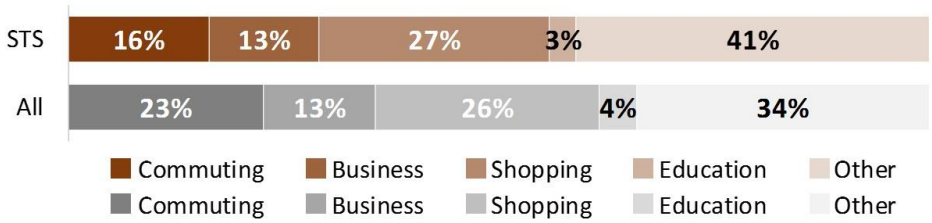


Figure 74: Trip purpose: Small Town Suburbs (STS)



The level of satisfaction with current trips in this segment was almost similar as in the overall sample (Figure 75). However, this segment reported fewer constraints with travel (Figure 76).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, and poor surface/potholes. The main reasons for the reported constraints to travel were the difficulty to find the time to travel.

Figure 75: Satisfaction with current travel: Small Town Suburbs (STS)

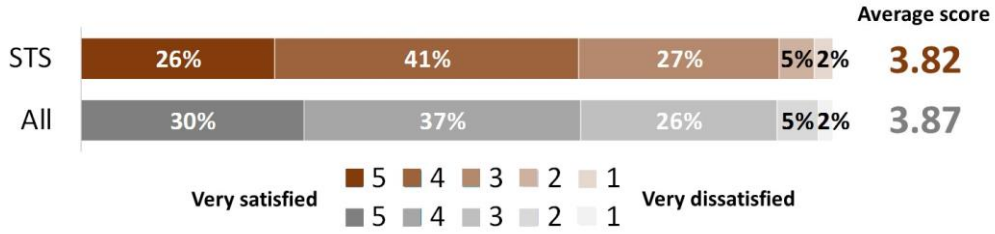
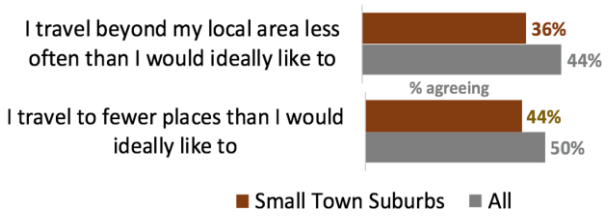
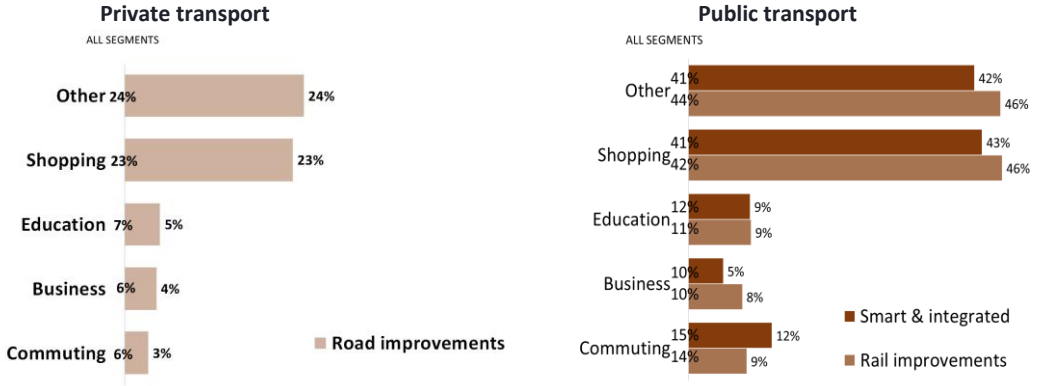


Figure 76: Travel constraints: Small Town Suburbs



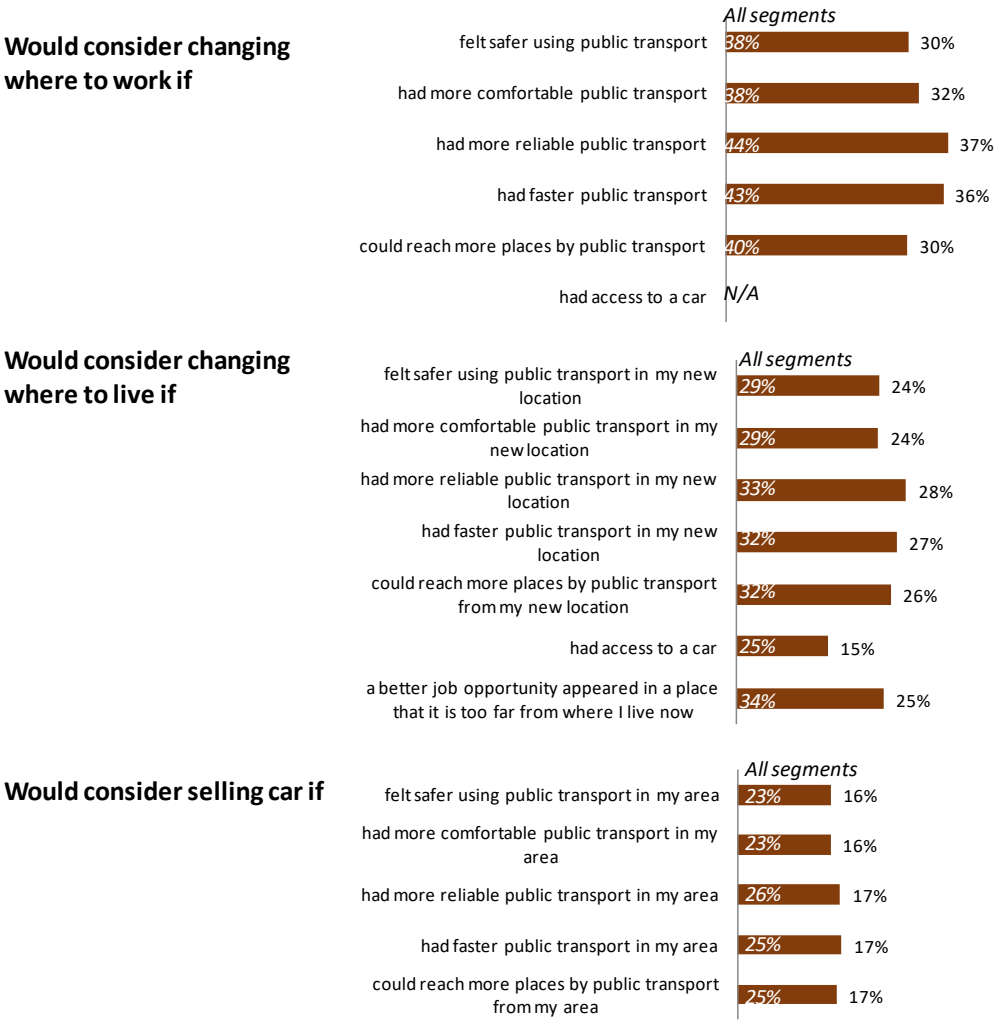
The propensity for making additional trips following the improvements of the Strategic Transport Plan was lower than average for commuting, business, education, and shopping trips, and slightly higher for trips with other purposes (Figure 77).

Figure 77: Likely effect of the Strategic Transport Plan: Small Town Suburbs



The propensity of participants in the Small Town Suburbs segment for changing where to work, where to live, or selling car, following potential improvements was always 5-10% lower than the average of the overall sample (Figure 78).

Figure 78: Possible long-term changes: Small Town Suburbs



4.10.2. Qualitative

Life situation

The Small Town Suburbs segment are older workers or retired, with older children at home or having left home. Example occupations are: working in a medical surgery, clerical, office assistant. If they are retired or at home much of the time they are often doing voluntary work (e.g. running local rugby club, hosting exchange students) as well as running the home.

Their priorities focus around health and wellness, which they recognise has come with age: for example, the need to focus on their physical care, exercise, keep fit, look after their cholesterol, blood pressure etc. They often take a 'life's too short' attitude to finances, where they consider that as long as they have enough to live they are not looking to accumulate wealth. This group describe themselves has having nice lives, but their life stage means they have often begun to experience trauma, such as grief and health issues.

Small Town Suburbs sometimes talk about never having enough time, but they have limited real pressure and often fill their lives with activities they want, rather than have

to do. This means that they sometimes have more transport choices. For example, they may be happy to take longer routes when driving so that they can enjoy the scenery. Car travel is the main mode of transport for this segment as they enjoy comfort and the driving experience, but some also make use of local buses.

Members of this segment can be quite fearful of technology, even when they are fairly able to use it and they may, for example, be using laptops handed on to them by family, be resistant to multichannel television and unwilling to use smartphones. They often have limited interest in social media.

"We have a smart TV and it's smarter than I am!"
Small Town Suburbs

Attitudes towards transport and travel

Small Town Suburbs make trips mainly within the locality (up to 15 miles) using a range of modes, but any longer distance is always by car as they perceive the cost of public transport as prohibitive. They can be very positive about local journeys by car, especially as they remember the roads before improvements, such as the local bypass, though they have some minor problems with getting used to newer road layouts and bus lanes etc. Even road travel outside of the 15 miles is often felt to be very straightforward and enabling, due to the scenery and sense of it being a pleasure to drive on the roads (which they are often doing outside of peak times).

They feel that local bus travel is generally good but high cost: especially during peak hours in the morning (citing £4 for a journey) and for children's bus passes. Some claim that their limited use of buses is linked to a lack of knowledge and information about routes and timetables. There tends to be minimal train usage among this segment and a perception that train fares are very high.

They have no desire to move away from their current suburbs, as have everything they need and feel they live in a lovely location. They expect no material changes to their travel in the future, but they are likely to have more time to travel for recreation within their zone and they expect they will continue to rely on the car unless major changes are made to public transport which tempts them away from the car, or they are unable to drive as much.

"My daughter's bus pass annoys me. If you pay for a daily day rider it's £5.50 for an adult, and it's £2.25 for a child. But if you get a monthly one it's only £9 cheaper for the month for my child than an adult one!"
Small Town Suburbs

Potential impact of travel interventions

- There is no real sense that Small town Suburbs feel constrained by lack of travel choices: they travel when they need to, where they need to.

- Previous changes to roads locally have made a big difference to the time of travel and their experience, which has had a positive impact on their journeys.
- They would prefer money to be spent locally on potholes and road maintenance, rather than on wider interventions that improve connections.
- Galgate is recognised as a bottleneck and can increase journey times, so there is some interest that this is a proposed improvement, but they claim this is unlikely to make a substantial difference to their personal travel patterns or plans as they avoid this and join the M6 further north.
- There has been hearsay about an extra junction on the motorway near the University and this sounds good to some who have to use that route, but they choose to avoid problem areas when possible.
- None of the rail changes suggested are felt to make a difference to them. Skelmersdale is so far away that they might as well drive (and it can be felt to be a pleasant drive).
- They would prefer a reopening of local public transport connections, such as connecting Bare village to Lancaster and Lancaster to the coast for recreational use.

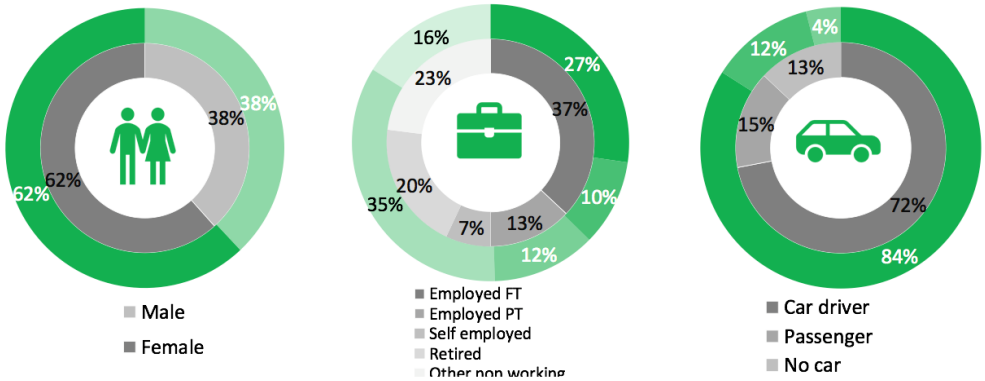
"Because we have got good. We're so near to the M6, we've got the great gateway now which has made a massive difference to our area"
Small Town Suburbs

4.11 Travel behaviour: Rural Residents

4.11.1. Quantitative

The Rural Residents segment has a much higher proportion of retired people (35%), compared with the overall sample (20%) and a lower proportion of people working full-time (27%, compared with 37%). The proportion of participants with access to car as driver is much higher than average (84%, compared with 72%) (Figure 79). These results are consistent with those from the User Insight Phase 1.

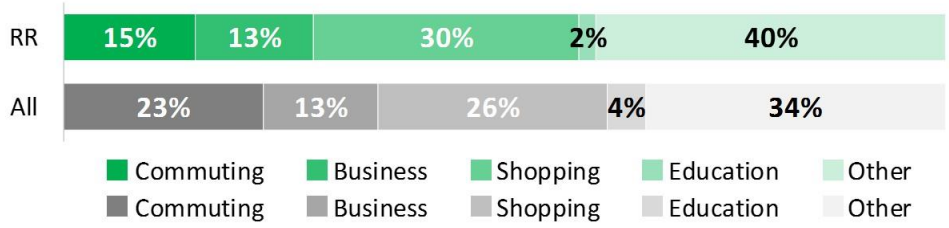
Figure 79: Characteristics of Rural Residents



Compared with the other segments, Rural Residents make more trips outside their local area (8.9 vs. 7.3), visit more places (3.6 vs. 2.5), travel much longer distances (75km vs. 55km) and have a much lower propensity to use public transport (11% vs. 24%) (Figure 80). Rural Residents also make more trips for shopping (30%) and for other purposes (40%), compared with the overall sample (26% and 34%, respectively) (Figure 81).

Figure 80: Current travel behaviour: Rural Residents

Figure 81: Trip purpose: Rural Residents (RR)



The level of satisfaction with current trips of Rural Residents was higher than average (Figure 82). This segment also reported fewer constraints to travel (Figure 83).

The main reasons for dissatisfaction (not shown in the tables below) were traffic congestion, roadworks, poor road surfaces/potholes, and overcrowded carriages. The main reasons for the reported constraints to travel were the unreliability of public transport, infrequency of public transport, and public transport not being available in the evening/night.

Figure 82: Satisfaction with current travel: Rural Residents (RR)

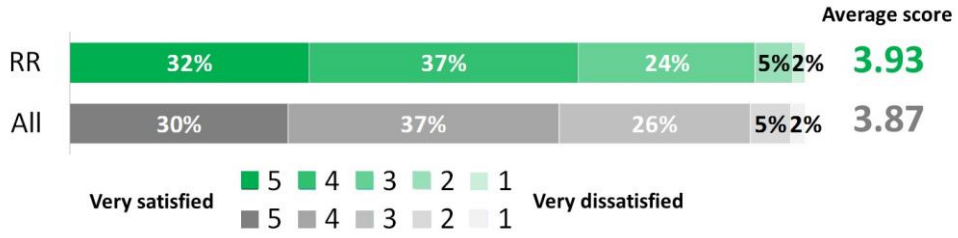
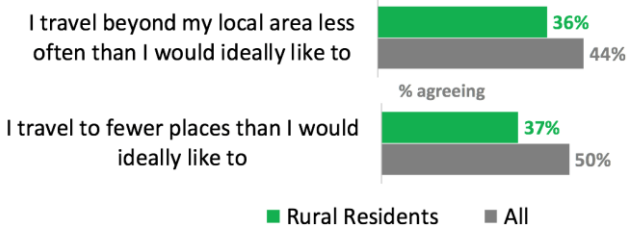
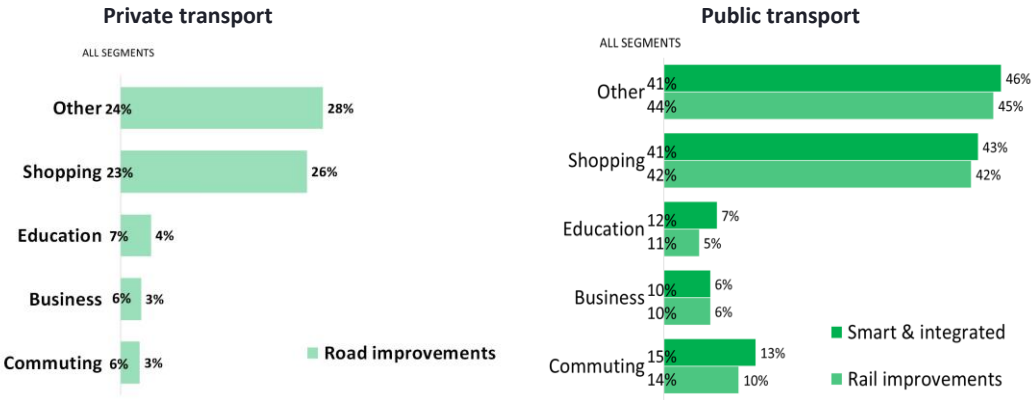


Figure 83: Travel constraints: Rural Residents



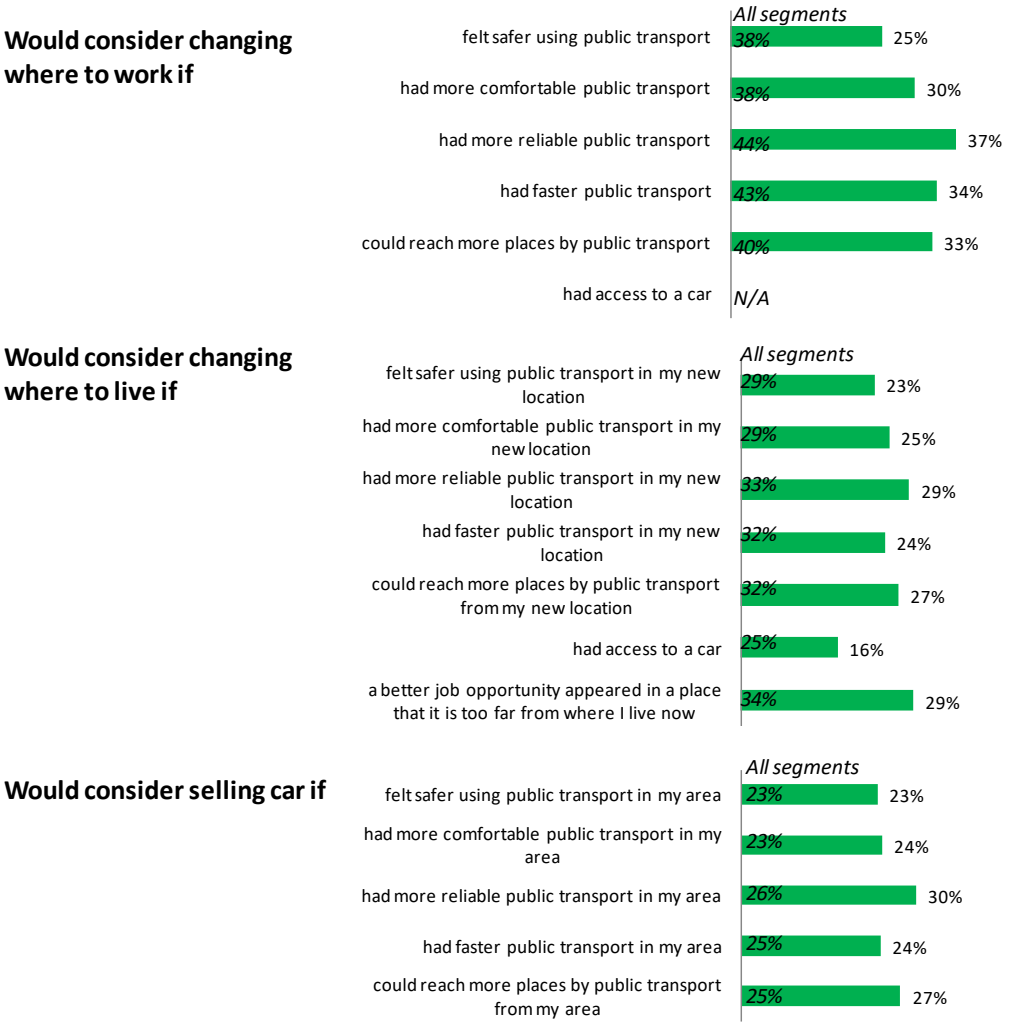
In general, Rural Residents stated they would make fewer additional private and public transport trips following the improvements of the Strategic Transport Plan, compared with the overall sample (Figure 84).

Figure 84: Likely effect of the Strategic Transport Plan: Rural Residents



The propensity of Rural Residents for changing where to work or where to live, following potential improvements, was 4-13% lower than the average of the overall sample (Figure 85). The most marked difference was the propensity to change where to work if they felt safer using public transport (25% for Rural Residents vs. 28% overall), which may be explained by the fact that Rural Residents tend to be older than average, and so more likely to be retired . The propensity for selling car was similar to the overall average for most types of potential improvements. However, more reliable public transport was associated with a propensity to sell car in the case of Rural Residents that was 4% higher than the average for the overall sample.

Figure 85: Possible long-term changes: Rural Residents



4.11.2. Qualitative

Life situation

Rural Residents are aged 40 plus and in a settled stage of life. They are either 'empty nesters' with older children who live away, or with children at home. Some are retired or they may be working in community-based jobs: e.g. teacher, mental health support worker. They are living in privately owned properties with gardens and space. They enjoy life and live in beautiful villages and surroundings, but can experience some sense of remoteness, which is amplified by poor public transport provision.

Their priorities focus around age related health and wellness, such as arthritis, generally lower mobility, and increasing anxiety/uncertainty about the future. Financially they are not affluent and generally describe themselves as 'keeping afloat'. For retired people in this segment, the focus is on their pension provision and whether there is enough money in the pot to 'see you out'.

They have high awareness of time: either the pressure of it running out (retired) or the lack of hours in the day to get things done (families). This segment is hugely reliant on

cars. They can be very frustrated with local transport links and the lack of bus provision to local villages leaving them with a feeling of isolation and limited opportunities to socialise.

This segment contains a mix of technically incompetent and very switched on users. However, they are less likely to be the first to adopt technology and village life sometimes means poorer broadband connections, so fewer opportunities to do so.

"If she'd like to change anything it would be to retire and for society to get Brexit over with."
Rural Residents

Attitudes towards transport and travel

Road travel dominates with this segment and satisfaction is generally good. Local journeys are acceptable, when they involve empty country roads or via the new bypass that has improved traffic flow. Getting in and out of Lancaster is more problematic. Some use Park and Ride and they adjust the time of their travel to avoid traffic or go via a different route.

Longer journeys by car are usually fine (for example the M6 from Lancaster to Preston is great) and the claim to use different routes across the Pennines at different times of day and in different weather conditions.

Bus frequency is an issue for Rural Residents. Services to villages are perceived as having been reduced or dropped over the past year and the lack of evening and/or late night buses affects social and leisure journey opportunities. The perception is also that bus travel seems more expensive than driving.

Train usage is minimal among Rural Residents, though the few past experiences have been positive, with trains on time and a relaxing journey. However, train fares are felt to be expensive and access/cost of parking at key stations to be prohibitive.

Some are ferrying children around (up to 100 miles a week) and this may change as children get older. In the future they expect to travel more to go and visit the children wherever they are.
Longer term, they expect more UK-wide travel adventures as the freedom of retirement/empty nesting kicks in, but their perception is that they have to rely on their car and will continue to do so.

"From the Park and Ride, not from Overton, it would take me 2 hours to get in to Lancaster" (NB this is an 8 mile journey)."
Rural Residents

Potential impact of travel interventions

- Rural residents would welcome wider travel opportunities, although there is no desire to move/work elsewhere. Issues for them centre around addressing poor

public transport options and interventions that would make a difference focus on improving local links, e.g. buses to rural areas.

- Poor local links to train stations mean addressing car parking at the station is a necessity (quoted as £12 a day).
- Developing local, direct bus links to/from the city centre and to/from the rail station would encourage greater travel in and around the North.
- Better frequency of buses would allow more socialising in the city for Rural Residents and improving buses would also be felt to create more independence for young people, as they would not have to rely on the 'parental taxi'.
- Suggested rail interventions are felt to have minimal impact and although the idea of smart and integrated travel is welcomed the first priority is to address the lack of transport options.
- There are some spontaneous suggested local road improvements e.g. link bridge from Morecambe to south Lancaster to accommodate new housing estate
- The response here to upgrading the A582 was that it would be good to be able to overtake the lorries heading for the docks, but there are some concerns that this will create 'a race track'.
- M6 J33 Link Roads could improve traffic flows and make it better for University traffic, but this group claim this would not have much impact on their journeys.

"From the Park and Ride, not from Overton, it would take me 2 hours to get in to Lancaster" (NB this is an 8 mile journey)."
Rural Residents

4.12 Business travel behaviour

4.12.1. Quantitative

Travel and transport in the organisation

In the majority of the organisations in the sample, less than a quarter of employees lives outside the local area (top part of Figure 86) or travel to work by public transport (bottom part of Figure 86). 24% of the companies in the sample have a travel plan for employees (not shown in the figures).

Figure 86: Proportions of the organisation's employees who live outside the local area and who travel to work by public transport

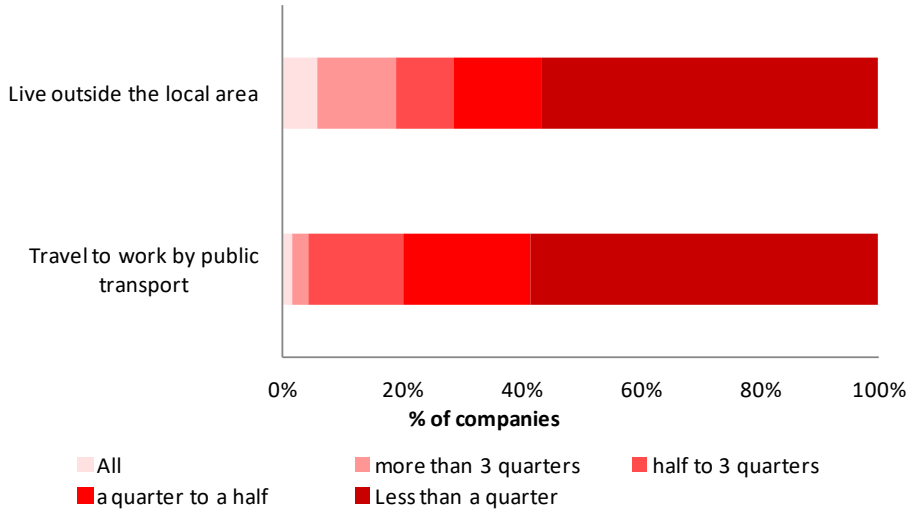


Figure 87 and Figure 88 show the frequency and mode of transport of business trips made by senior managers and other staff, for different distances. In the majority of the companies (60%), senior managers travel on business in the local area (up to 15 miles) at least once a week. This proportion decreases to 42% for distances between 15 and 50 miles and to 30% for distances above 50 miles in the North and outside the North. The frequency of business trips made by other staff is similar to the frequency of trips made by senior managers.

The proportion of business trips made by public transport (bus, coach, train, tram, of other) is low in the case of senior managers and distances below 15 miles (11%) and between 15 and 50 miles (14%). This proportion grows to 18% and 36% for distances above 50 miles in the North and outside the North, respectively. Regardless of distance, the proportion of public transport in business trips made by other staff is higher than in the case of senior managers.

Figure 87: Frequency of business trips, by distance and type of staff

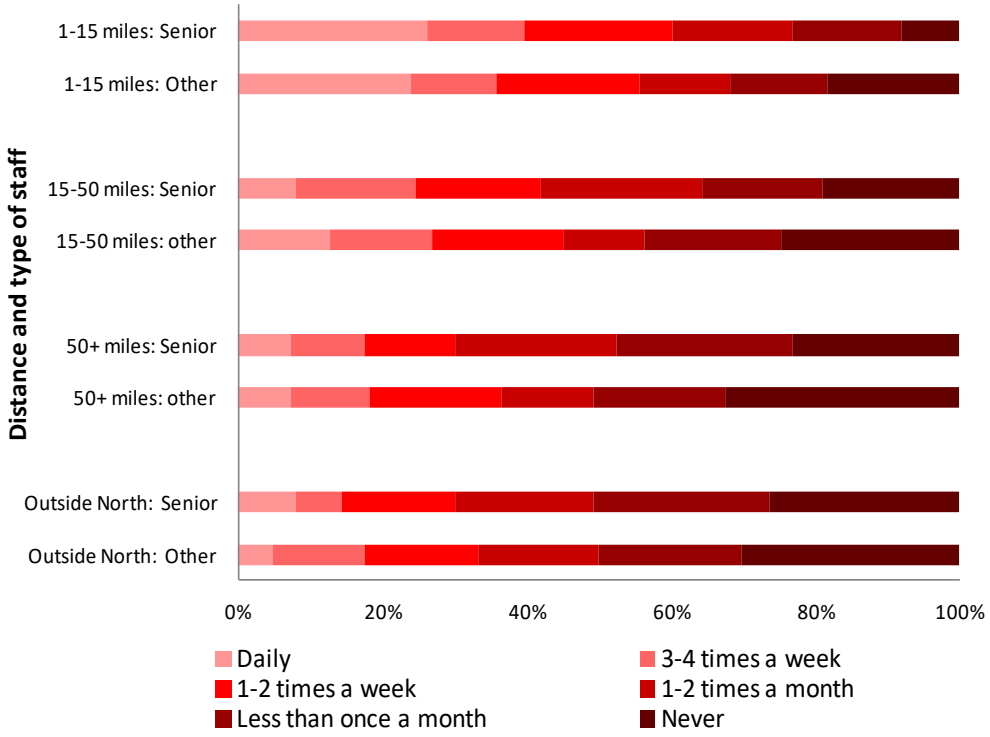


Figure 88: Means of transport of business trips, by distance and type of staff

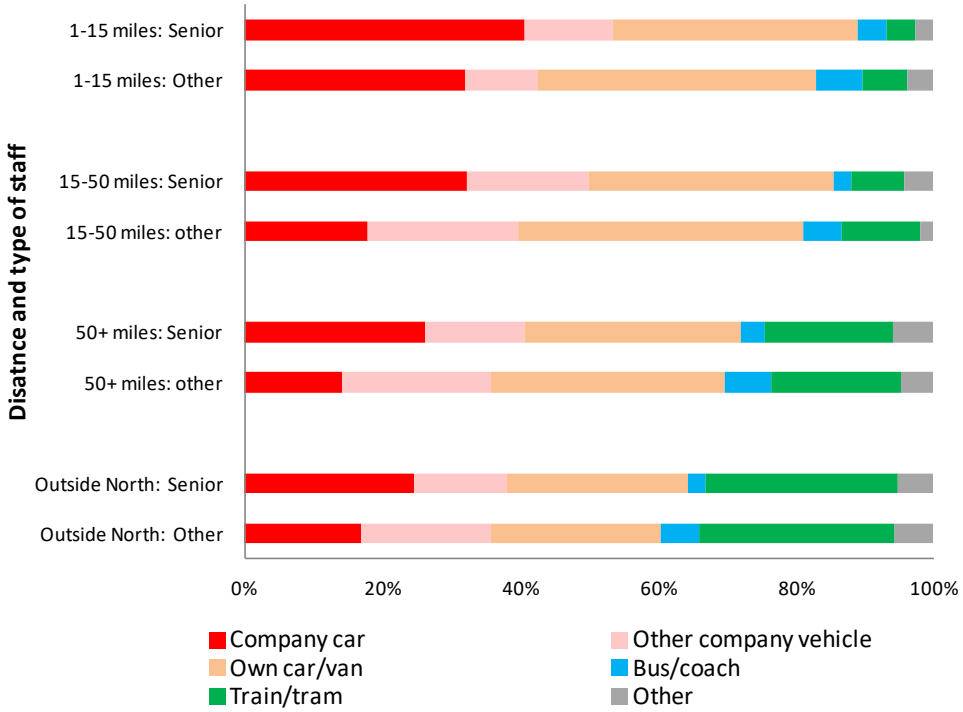


Figure 89 shows the geographic scope of deliveries from the company (via own transport or via courier) and of supplies delivered to the company. Around two thirds of the companies in the sample did not deliver products or other items via own transport or via couriers. Within the group that delivers products or other items, the local area is

more important for deliveries via own transport. Almost the same proportion of companies receives supplies from within the local area, outside the local area but in the North, and other parts of the country.

Figure 89: Deliveries to and from the company: location

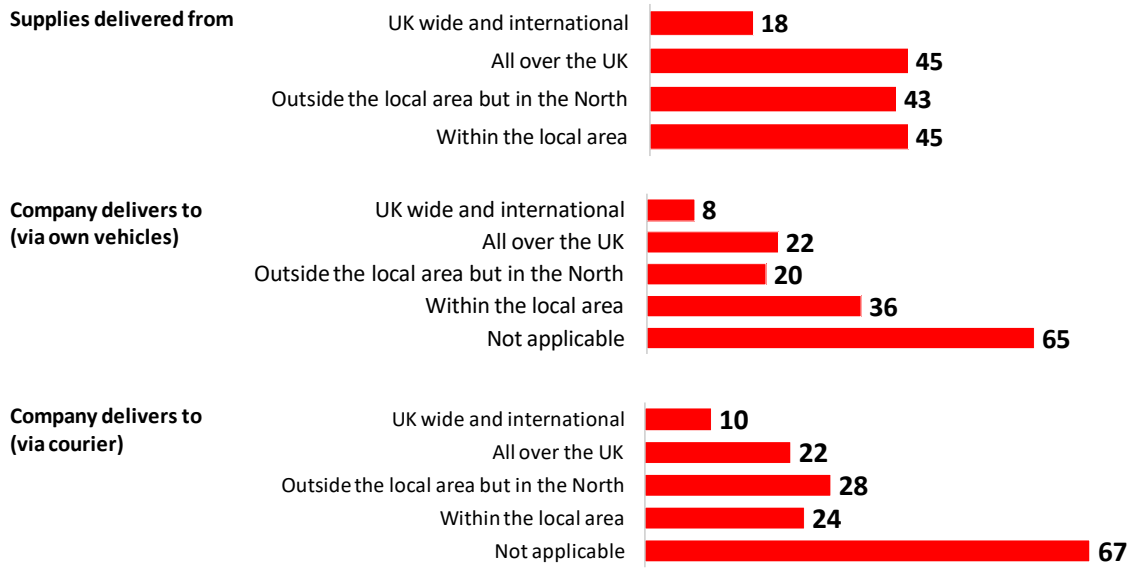
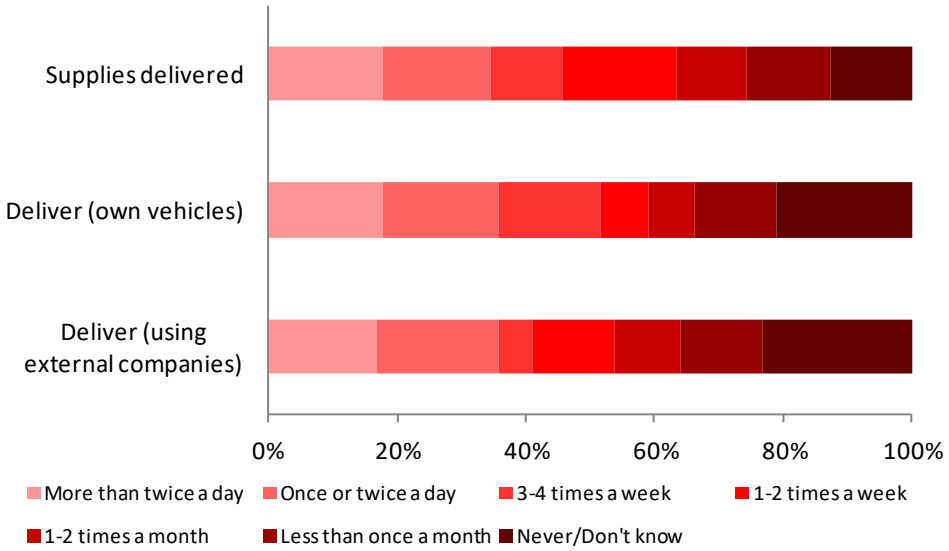


Figure 90 shows the frequency of deliveries from the company (via own transport or via courier) and of supplies delivered to the company. Around 35% of companies receive deliveries from suppliers, deliver to customers using own vehicles, and deliver to customers using external companies at least once a day. Around 20% receive deliveries from suppliers, deliver to customers using own vehicles, and deliver to customers using external companies more than twice a day.

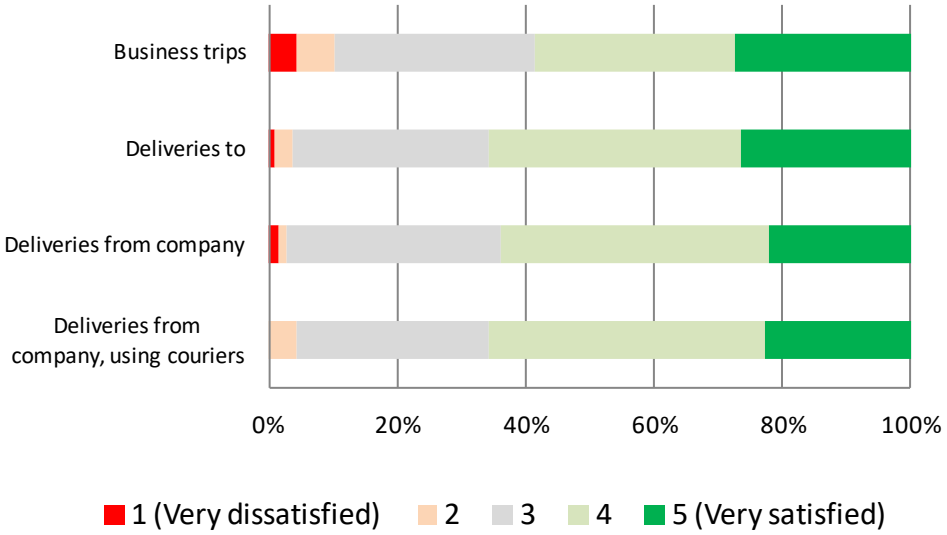
Figure 90: Deliveries to and from the company: frequency



Satisfaction with current travel and transport

Businesses show almost the same level of satisfaction for deliveries from the company (using own vehicle or couriers), deliveries to the company, and business trips (Figure 91).

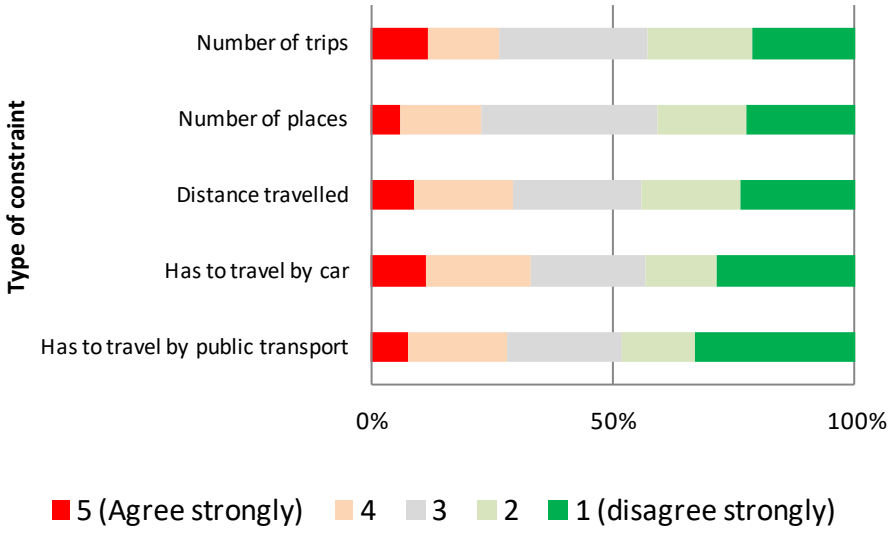
Figure 91: Satisfaction with current transport and travel: Businesses



Travel constraints

Figure 92 shows the business participants' level of agreement with the five statements about constraints to travel behaviour. 27% agreed or agreed strongly being constrained in the number of trips they make outside their local area. 23% agreed or agreed strongly being constrained in the number of places outside they visit outside their local area. 29% agreed or agreed strongly being constrained in the distance travelled (i.e. they travel to places that are nearer that the ones they would ideally would like to go to. 33% agreed or agreed strongly that they travel by car to places they would ideally like to go by public transport and 28% agreed or agreed strongly that they travel by public transport to places they would ideally like to go by car. All these proportions were higher than in the case of households (compare with Figure 19).

Figure 92: Level of agreement with statements about constraints to travel behaviour (businesses)



The three tables below show the top 10 reasons for constraints to number of trips, number of places, and distance travelled. The most frequent reasons for being constrained with number of trips was that not all staff have access to a car, the costs of owning/using vehicles, and public transport is too slow, unreliable, and expensive (Table 10). The most frequent reasons for being constrained with the number of places visited were time and lack of connections between different modes of transport (Table 11). The most frequent reason for being constrained with distance travelled was that public transport is unreliable (Table 12).

Table 10: Top 10 reasons for constraints to number of trips (businesses)

Reason	Participants	%	Type of reason
Not all relevant staff have access to a car	11	7%	Car
We find it difficult to cover the costs of owning and using company vehicles	11	7%	Company vehicles
Public transport is too slow	11	7%	Public transport
Public transport is unreliable	11	7%	Public transport
We find it difficult to cover the costs of using public transport	10	7%	Public transport
Buses/trains/trams do not run frequently enough	9	6%	Public transport
There are no connections between buses/trains/trams	9	6%	Public transport
Difficult to find the time to travel	8	5%	Time
Buses/trains/trams are too crowded	8	5%	Public transport
The stations/bus stops are too far from where we want to go	7	5%	Public transport

Table 11: Top 10 reasons for constraints to number of places visited (businesses)

Reason	Participants	%	Type of reason
Travelling further afield takes up too much of the working day	10	7%	Time
Difficult to find the time to travel	9	6%	Time
There are no connections between buses/trains/trams	9	6%	Public transport
Public transport is unreliable	8	5%	Public transport
We find it difficult to cover the costs of owning and using company vehicles	7	5%	Company vehicles
Not all relevant staff can drive	6	4%	Car
Not all relevant staff have access to a car	6	4%	Car
There are many delays when we travel by car (because of congestion)	6	4%	Car
Buses/trains/trams do not run frequently enough	6	4%	Public transport
Buses/trains/trams are too crowded	6	4%	Public transport

Table 12: Top 10 reasons for constraints to distance travelled (businesses)

Reason	Participants	%	Type of reason
Public transport is unreliable	10	7%	Public transport
Difficult to find the time to travel	7	5%	Time
Not all relevant staff have access to a car	7	5%	Car
There are many delays when we travel by bus (due to congestion)	7	5%	Public transport
Travelling further afield takes up too much of the working day	7	5%	Time
There are many delays when we travel by car (because of congestion)	6	4%	Car
We find it difficult to cover the costs of owning and using company vehicles	6	4%	Company vehicles
We find it difficult to cover the costs of using public transport	5	3%	Public transport
Public transport is too slow	5	3%	Public transport
The stations/bus stops are too far from where we want to go	5	3%	Public transport

The most frequent reasons for being constrained in using public transport were distance to stations/bus stops; slow, unreliable, infrequent public transport; and delays due to congestion (Table 13). The most frequent reasons for being constrained in using car were delays due to congestion and the fact that some staff cannot drive or do not have access to a car (Table 14).

Table 13: Top 10 reasons for constraints to travel by public transport (businesses)

Reason	Participants	%
The stations/bus stops are too far from our business	17	11%
Public transport is too slow	14	9%
Public transport is unreliable	14	9%
Buses/trains/trams do not run frequently enough	14	9%
There are many delays when we travel by bus (due to congestion)	13	9%
There are no connections between buses/trains/trams	12	8%
Buses/trains/trams are not available in the evening/night	10	7%
Buses/trains/trams are not comfortable	10	7%
We find it difficult to cover the costs of using public transport	9	6%
The stations/bus stops are too far from where we want to go	9	6%

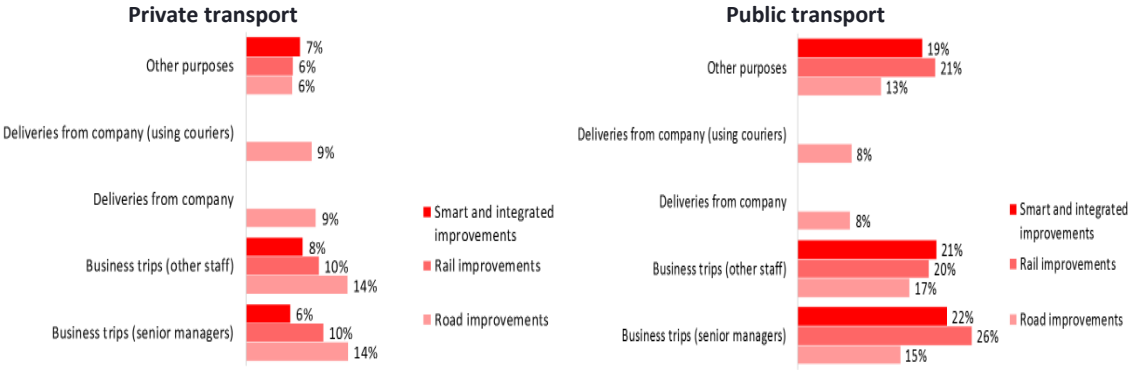
Table 14: Reasons for constraints to travel by car

Reason	Participants	%
There are many delays when we travel by car (because of congestion)	18	12%
Some staff cannot drive	12	8%
Some staff do not own or have access to a car	9	6%
Public transport is a more reliable way of getting to meetings on time	8	5%
We find it difficult to cover the costs of owning and using a company vehicle	8	5%
Using public transport takes more time out of the working day than using the car	7	5%
There are many delays when we travel by car (because of congestion)	18	12%

Likely effect of the Strategic Transport Plan

A relatively high proportion of organisations stated they would do additional business trips or trips by other purposes by public transport following the planned improvements in public transport and Smart & Integrated Travel (Figure 93).

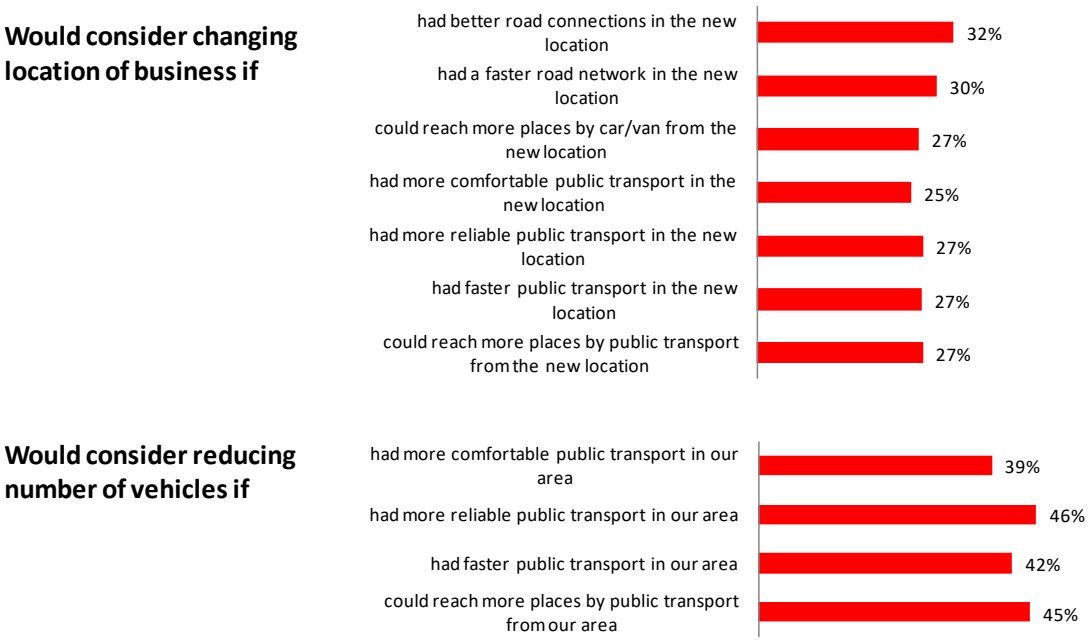
Figure 93: Likely effect of the Strategic Transport Plan: Businesses



Possible long-term changes

A sizeable proportion of participants also stated that they would consider reducing the number of vehicles following transport improvements (Figure 94). The improvements associated with higher propensity for the reduction of the number of vehicles were more reliable public transport and reaching more places by public transport. Smaller, but still sizeable proportions stated they would consider moving the location of their business following transport improvements, especially in the case of better road connections and a faster road network.

Figure 94: Possible long-term changes: businesses



4.12.2. Qualitative

Business context

Examples of businesses encountered in the smaller category (2 – 50 employees) are: Sports services; printing; medical supplier; ball-bearing manufacturer; security company; property company; solicitors; exhibition company.

Examples of participating businesses in the larger category (50 plus employees) are: engineering company; medical sector; manufacturer/distributor; food manufacturer; energy company; telecoms/IT data centre.

Spontaneous priorities vary by organisation and include a range of business factors, such as: number and value of sales; supplier problems; staffing and finding skilled workers; legislative reform; company reputation; environmental factors. In addition, there are some very current concerns around the uncertainty and instability relating to Brexit. In this context transport is claimed to be of lower concern.

However, despite a number of claimed challenges, it is important to note that many state healthy order books and even some expansion plans and claim to be feeling good about their organisation despite the unstable backdrop. Hopes for the future centre around greater stability to allow for more forward planning, e.g. resourcing, securing materials etc.

"Our biggest clients are the banks for their Graduate programmes but they are not recruiting because of BREXIT and so we have lost a chunk of work"
Larger Business

Attitudes towards transport and travel

Although transport is not mentioned as an area of key concern, significant issues arise with road and rail. Infrastructure in the North is generally felt to be below par and it is felt to be sometimes easier to do business with London/Southern based companies for this reason.

Experience of business travel/transport by road is poor, due to congestion and unpredictable journey times. The M62 East-West is causing significant problems at J17-J27 and other problem areas of road include: bottlenecks at Simister Island; M606/M62 Chain Bar junction; M60 Co-Op Pyramid; the Silverlink tunnel; the A1 going North past Newcastle; travel within Newcastle and difficulty for employees getting to business parks on outskirts of Newcastle.

Perceptions of rail travel are also poor, especially services run by Northern and TransPennine Express. There are felt to be infrequent connections between major cities, e.g. Newcastle to Manchester and train journeys are felt to be slow East to West: especially compared to journeys from the North to South of the UK. Issues affecting perceptions of unreliability include strikes, cancellations, timetable changes and increasing delays on the Newcastle Metro system.

When explored in detail, there is some qualitative evidence of transport issues having had some impact on businesses in the North, as follows:

- Negative impact on business growth: for example, a Property Developer who had to turn down a contract in Stockport.
- Negative impact on business reputation: for example, staff arriving late to service contracts.
- Negative impact on staff satisfaction and resourcing: for example, a security company who had to open a satellite office in another Northern location to avoid transport inconvenience and unpredictability.
- Negative impact on business profitability: for example, an exhibition company which has to pay for accommodation the night before an Exhibition to ensure timely arrival.

"We have turned down contracts across the Pennines because we lost money the first time. The lads couldn't get there on time."
Smaller Business

Potential impact of travel interventions

- Businesses are Looking for transport improvements to be made to improve local congestion and to ease intercity travel by road and rail:
  - Improvements to the Metro system to help staff commuters and ease congestion
  - Rail services to the North and North West from Newcastle

- Transport intervention would benefit these businesses by:
  - Improving productivity of staff due to faster travel times
  - Enhancing staff well being through more enjoyable journeys
  - Widening resourcing opportunities e.g. more skilled workers from further afield
  - Reducing time of staff travelling between sites
  - Reducing costs through predictable journey times
  - Creating new business opportunities and opening up new regions e.g. up to Scotland/East-West
  - Improving the choice of suppliers
- Business were not particularly impressed by the examples given, even though these may address some of their complaints
- Smart and integrated travel is felt to be useful and would help to bring the North more in line with London.

"The transport situation is desperate especially the congestion around Newcastle"

4.13 Wider impacts of travel behaviour

4.13.1. Methods

This section looks at the results of the questions in the household quantitative survey that dealt with the wider impacts of travel behaviour and of constraints to that behaviour. We looked at five possible impacts, drawing from the insights gained in the literature review in Chapter 2. Table 15 shows the five impacts considered, the indicator of that impact that can be extracted from the quantitative survey, the hypothesis on the link between travel and the impact, and the population of concern that can be identified using the indicator.

Table 15: Wider impacts of travel behaviour and constraints to travel behaviour

Impact	Indicator	Hypothesis	Population of concern
Employment	Reporting being unemployed	Travel allows people to take up jobs outside their local area	Unemployed
Social engagement	Membership in organisations, clubs, or societies	Travel allows people to participate in activities outside their local area	No membership in any organisation, club, or society
Social contacts	Frequency of meeting family Frequency of meeting friends	Travel allows people to meet family and friends outside their local area	Only meeting family and friends once a year
Health	Self-reported health status ("very good, "good, "average", "bad", or "very bad")	The possibility of travelling outside their local area allows them to access goods, services, activities, and people, contributing to their health	"Bad" or "very bad" health status
Wellbeing	SWEMWBS wellbeing index (Stewart-Brown et al. 2009, Ng Fat *et al.* 2017), based on questions about participants' experiences over the previous two weeks	The possibility of travelling outside their local area gives people freedom and allows them to do the things described above	Bottom 10% of wellbeing score distribution

The indicators were calculated from the answers to the questionnaire. Wellbeing was assessed with the Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) (Stewart-Brown et al. 2009, Ng Fat et al. 2017). This is the sum of the scores given by participants to seven statements about their experiences over the previous two weeks, on a five-point scale. The seven statements were 'feeling optimistic about the future', 'feeling useful', 'feeling relaxed', 'dealing with problems well', 'thinking clearly', 'feeling close to other people', and 'been able to make up my own mind about things'. The scale had five levels: 'none of the time' (scored 1), 'rarely', 'some of the time', 'often', 'all of the time' (scored 5).

In sub-sections 4.13.2 to 4.13.6 we analyse how these five indicators relate to travel behaviour (number of trips and places participants visited and maximum distance travelled) and to reported constraints to travel. In sub-section 4.13.7 we then estimate models of the probability of being in the population of concern, using travel behaviour and constraints to travel behaviour as explanatory variables.

It should be noted that the results in this section report associations between variables, and assigning causality is not straightforward. The hypothesis is that travel behaviour or constraints to travel behaviour cause the wider impacts, but the associations may also partly capture reverse causality. For example, travel constraints may affect health, but poor health also causes constraints to travel.

4.13.2. Employment

As shown in the figures below, on average, participants who are unemployed make fewer trips, visit fewer places, and travel fewer distances outside local area, compared with those who are not unemployed (Figure 95, Figure 96, and Figure 97).

Figure 95: Average number of trips per month outside local area vs. employment status

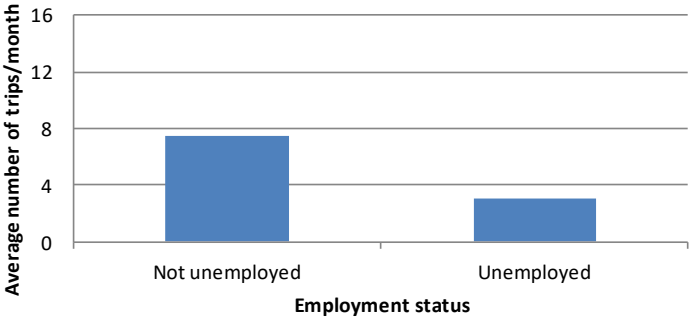


Figure 96: Average number of places visited outside local area vs. employment status

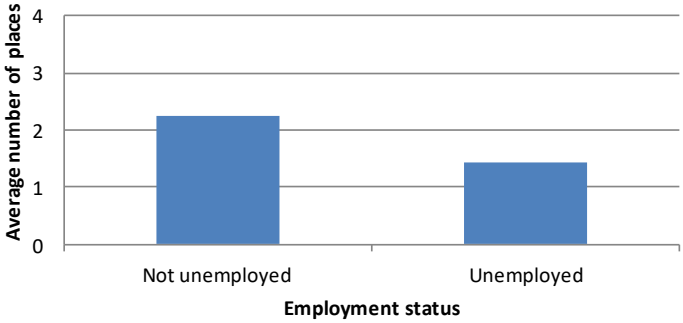
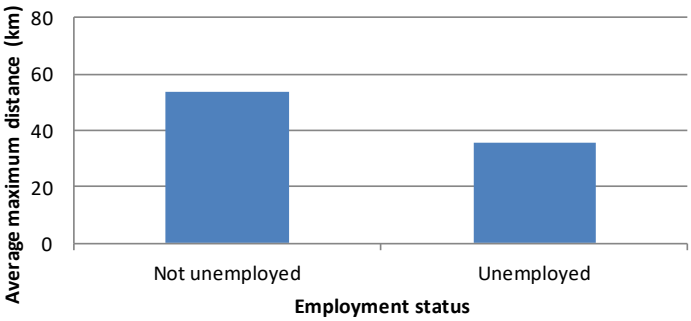


Figure 97: Average maximum distance of places visited outside local area vs. employment status



Participants who agreed or agreed strongly with feeling more constrained in the number of different places they visit tend to have a higher probability of being unemployed than others (Figure 99). The same applies, to a lesser extent, to number of trips and distance travelled (Figure 98 and Figure 100 respectively).

Figure 98: Unemployment rate, by level of agreement with statement "*I travel beyond my local area less often than I would ideally like to*"

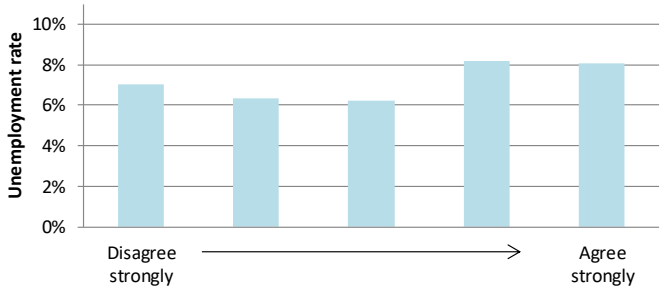


Figure 99: Unemployment rate, by level of agreement with statement "*I travel to fewer places outside my local area than I would ideally like to*"

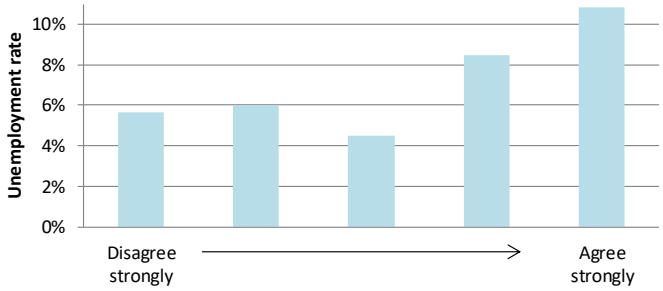
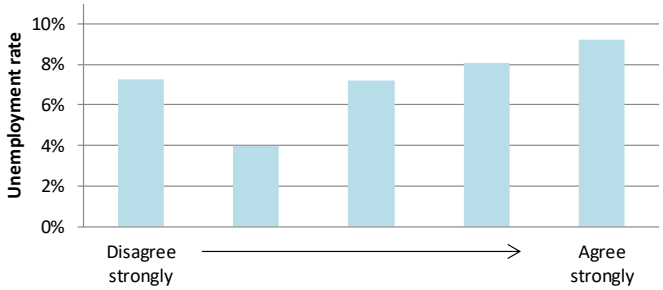


Figure 100: Unemployment rate, by level of agreement with statement "*I travel to places that are nearer than the ones I would ideally like to*"



4.13.3. Social engagement

The higher the number of memberships in associations, the higher the number of trips made and places visited (Figure 101, Figure 102). The relationship with the maximum distance travelled is not linear. However, participants with no membership in any association travel shorter distances than others (Figure 103).

Figure 101: Average number of trips per month outside local area vs. number of memberships in associations

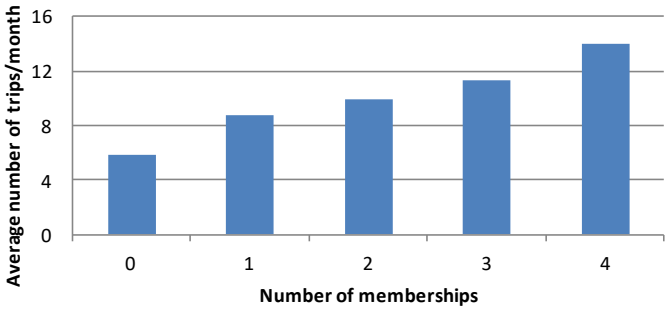


Figure 102: Average number of places visited outside local area vs. number of memberships in associations

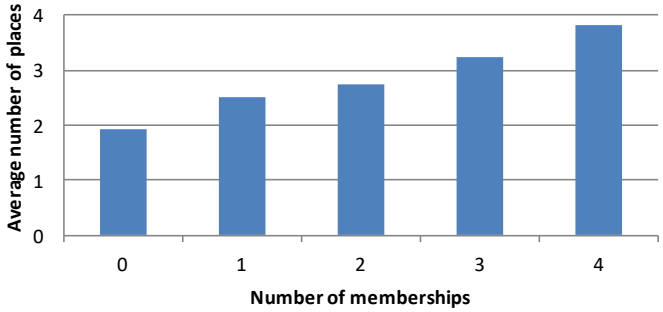
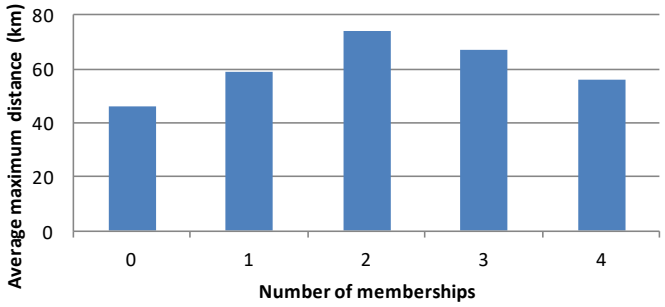


Figure 103: Average maximum distance of places visited outside local area vs. number of memberships in associations



There are only small differences in the number of memberships in associations for participants with different constraints to travel (Figure 104, Figure 105, Figure 106).

Figure 104: Proportion of participants with no membership in any association, by level of agreement with statement "*I travel beyond my local area less often than I would ideally like to*"

Figure 105: Proportion of participants with no membership in any association, by level of agreement with statement "*I travel to fewer places outside my local area than I would ideally like to*"

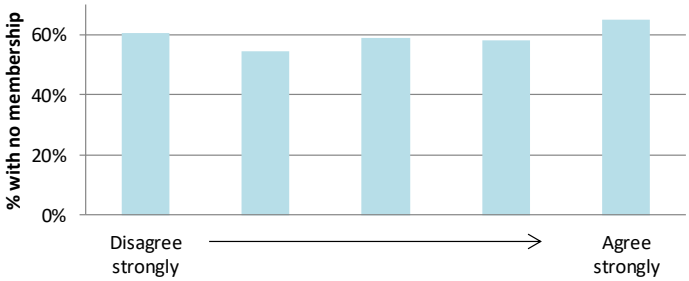
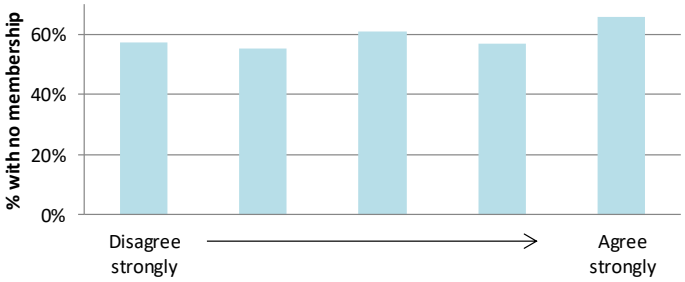


Figure 106: Proportion of participants with no membership in any association, by level of agreement with statement "*I travel to places that are nearer than the ones I would ideally like to*"



4.13.4. Social contacts

There is a linear relationship between frequency of meeting family and number of places visited (Figure 108). The relationship is still generally positive, but not linear, in the case of number of trips per month (Figure 107). There is no general relationship with distance travelled (Figure 109).

With regards to the frequency of meeting friends and family, the relationships with number of trips made, places visited, and distance travelled is generally positive, but not linear (Figure 110, Figure 111, Figure 112).

Figure 107: Average number of trips per month outside local area vs. frequency of meeting family

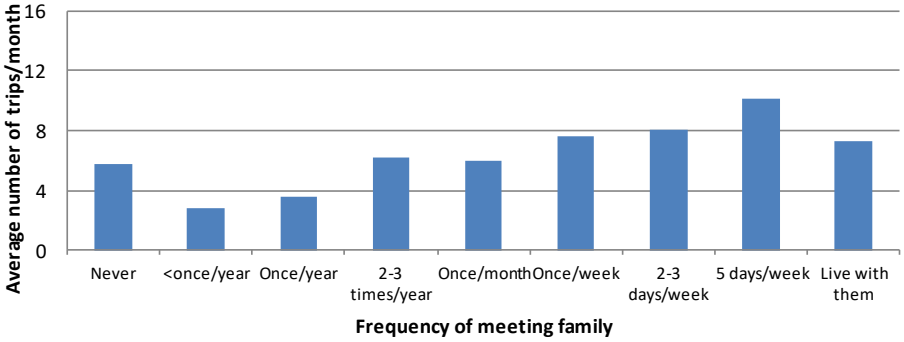


Figure 108: Average number of places visited outside local area vs. frequency of meeting family

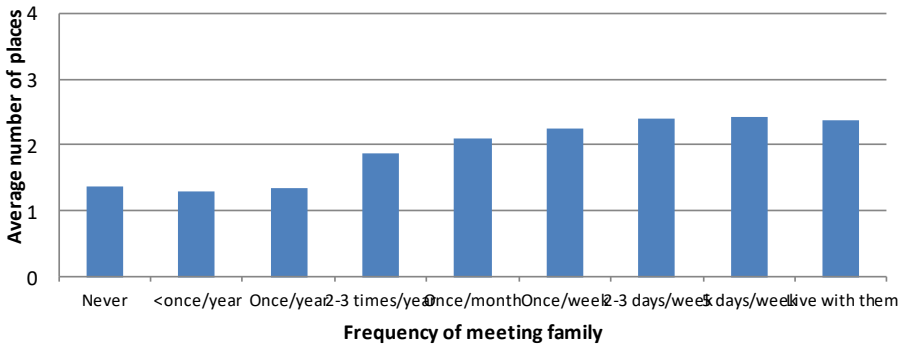


Figure 109: Average maximum distance of places visited outside local area vs. frequency of meeting family

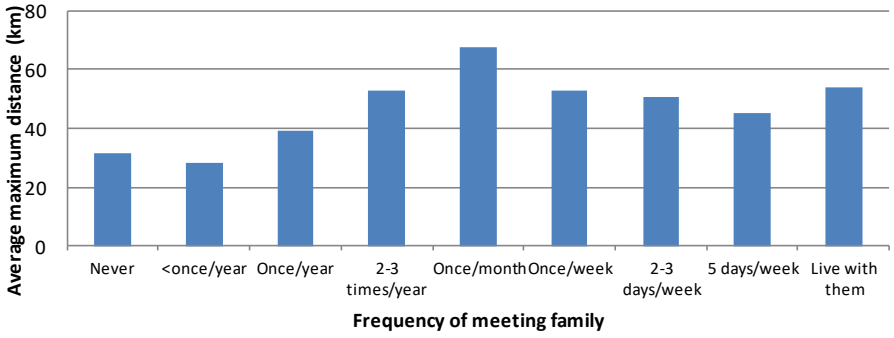


Figure 110: Average number of trips per month outside local area vs. frequency of meeting friends

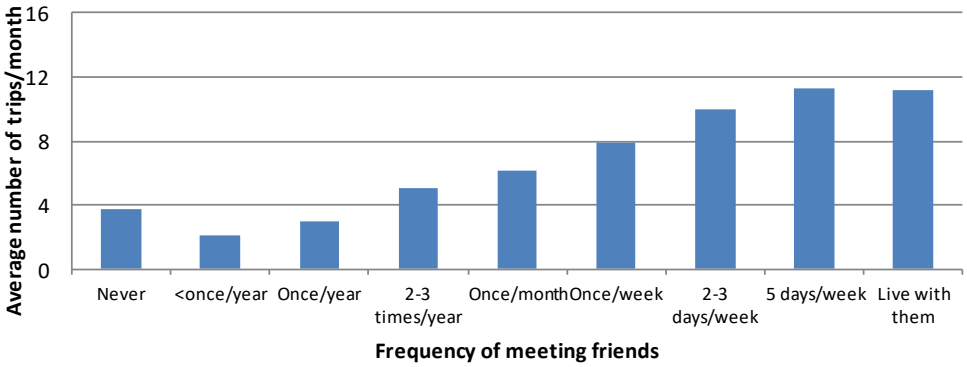


Figure 111: Average number of places visited outside local area vs. frequency of meeting friends

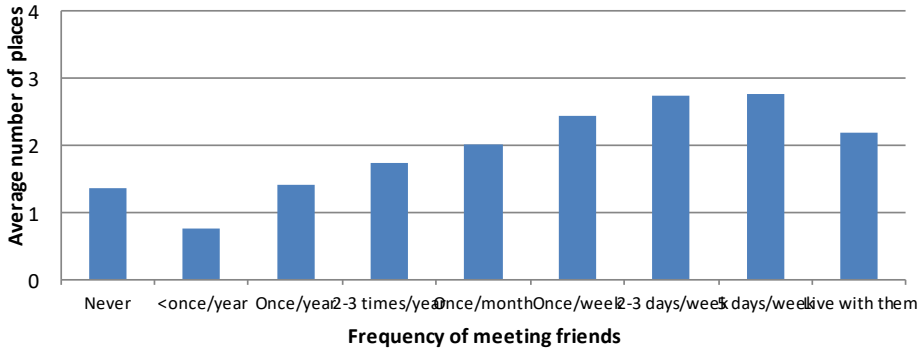
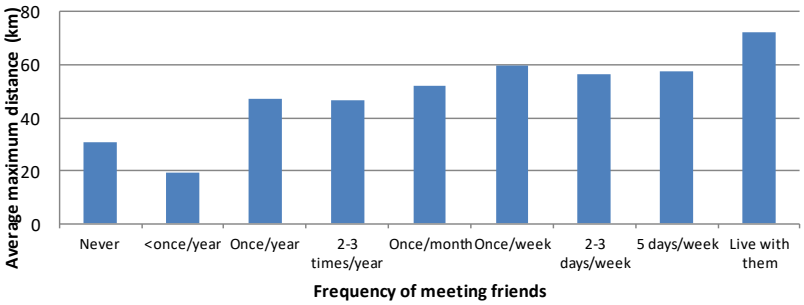


Figure 112: Average maximum distance of places visited outside local area vs. frequency of meeting friends



Participants who agreed or agreed strongly that they are constrained in their travel behaviour have a higher propensity for meeting family and friends only once a year (Figure 113, Figure 114, Figure 115).

Figure 113: Proportion of participants who only meet friends/family once a year or less often, by level of agreement with statement "*I travel beyond my local area less often than I would ideally like to*"

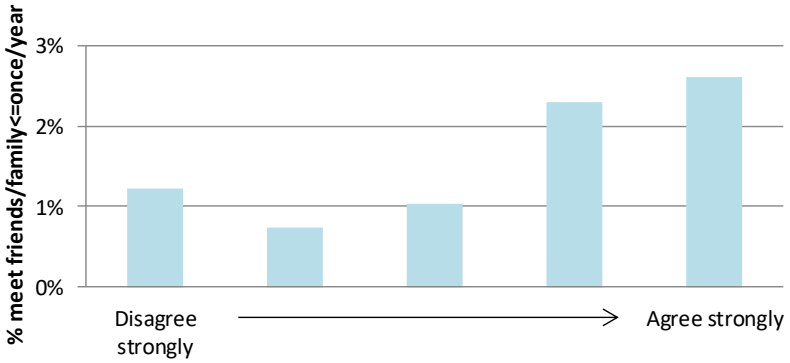


Figure 114: Proportion of participants who only meet friends/family once a year or less often, by level of agreement with statement "*I travel to fewer places outside my local area than I would ideally like to*"

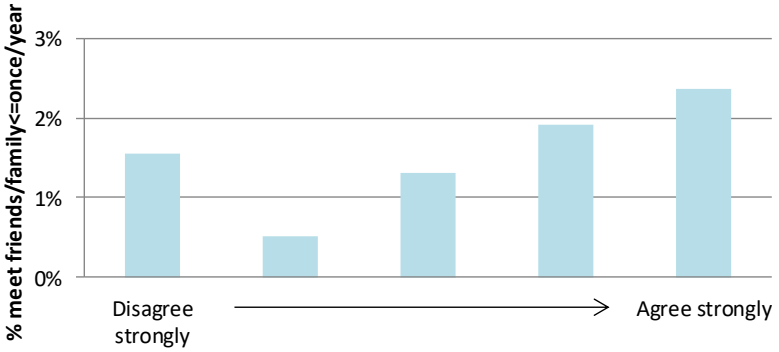
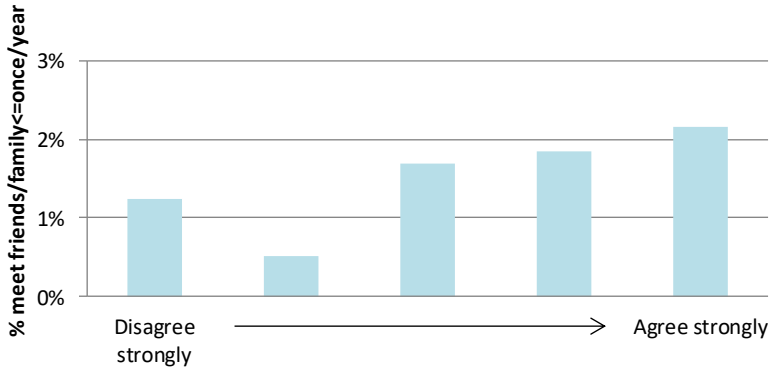


Figure 115: Proportion of participants who only meet friends/family once a year or less often, by level of agreement with statement "*I travel to places that are nearer than the ones I would ideally like to*"



4.13.5. Health

The relationships between health status and travel behaviour are linear. The lower the health status, the lower the number of trips made, number of places visited, and distance travelled (Figure 116, Figure 117, Figure 118).

Figure 116: Average number of trips per month outside local area vs. health status

Figure 117: Average number of places visited outside local area vs. health status

Figure 118: Average maximum distance of places visited outside local area vs. health status

Participants who agreed strongly with being constrained to their travel behaviour have a much higher propensity for stating they have lower health status than others (Figure 119, Figure 120, Figure 121).

Figure 119: Proportion of participants with bad or very bad health status, by level of agreement with statement "*I travel beyond my local area less often than I would ideally like to*"

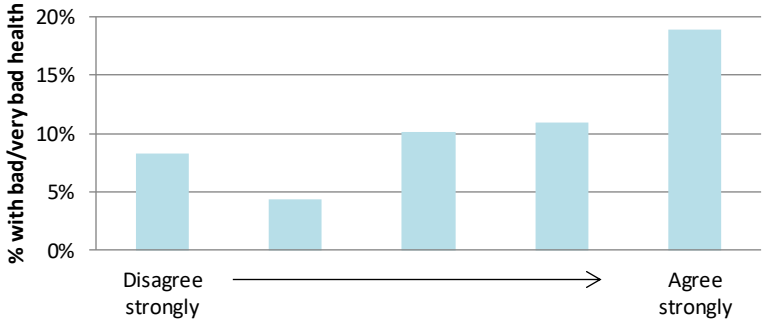


Figure 120: Proportion of participants with bad or very bad health status, by level of agreement with statement "*I travel to fewer places outside my local area than I would ideally like to*"

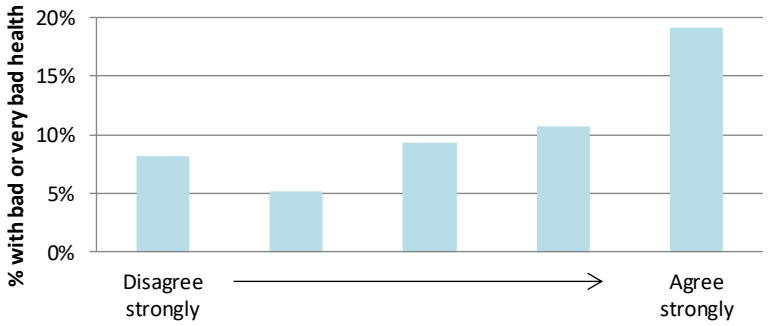
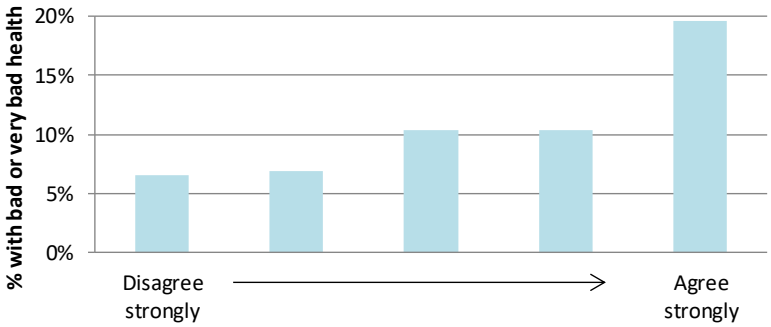


Figure 121: Proportion of participants with bad or very bad health status, by level of agreement with statement "*I travel to places that are nearer than the ones I would ideally like to*"



4.13.6. Wellbeing

There is a generally increasing relationship between the wellbeing index and the number of trips made, number of places visited, and distance travelled (Figure 122, Figure 123, Figure 124).

Figure 122: Average number of trips per month outside local area vs. wellbeing index

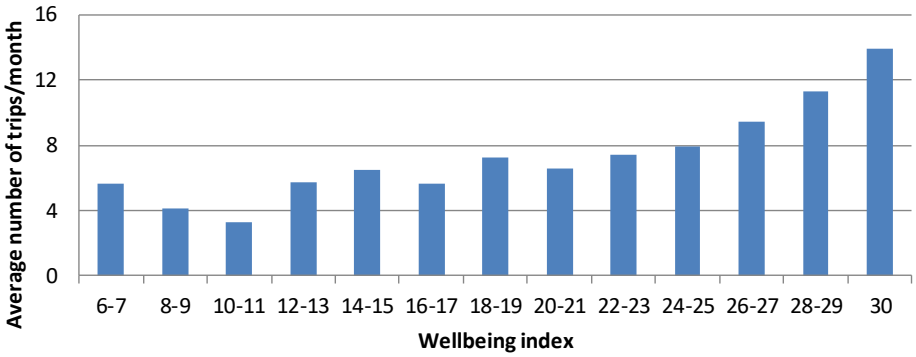


Figure 123: Average number of places visited outside local area vs. wellbeing index

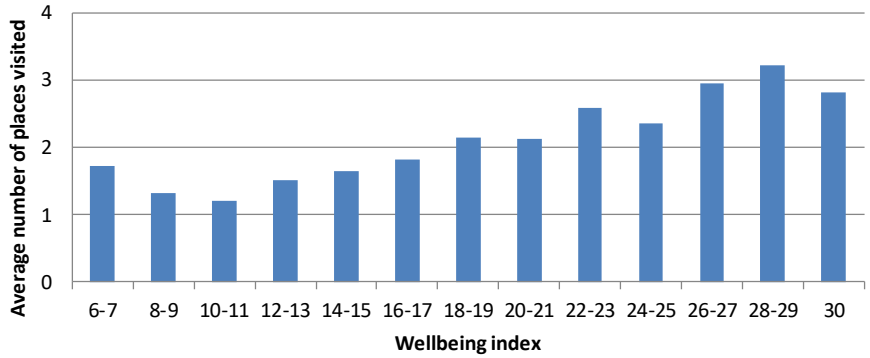
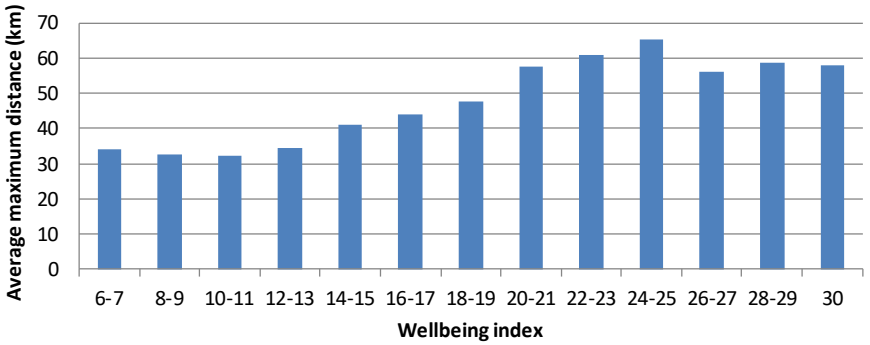


Figure 124: Average maximum distance of places visited outside local area vs. wellbeing index



The relationship between wellbeing score and reported constraints to travel is linear. The stronger the constraints to travel, the lower the wellbeing score (Figure 125, Figure 126, Figure 127).

Figure 125: Average wellbeing score, by level of agreement with statement "*I travel beyond my local area less often than I would ideally like to*"

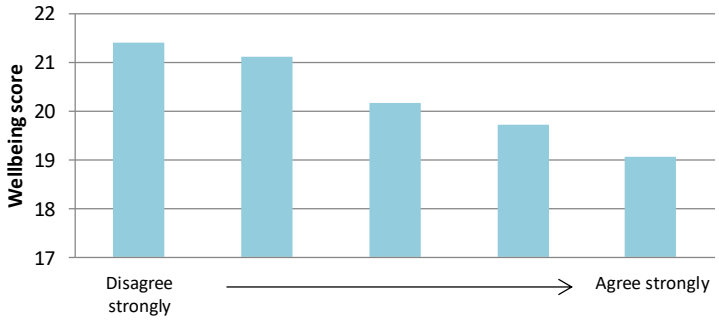


Figure 126: Average wellbeing score, by level of agreement with statement "*I travel to fewer places outside my local area than I would ideally like to*"

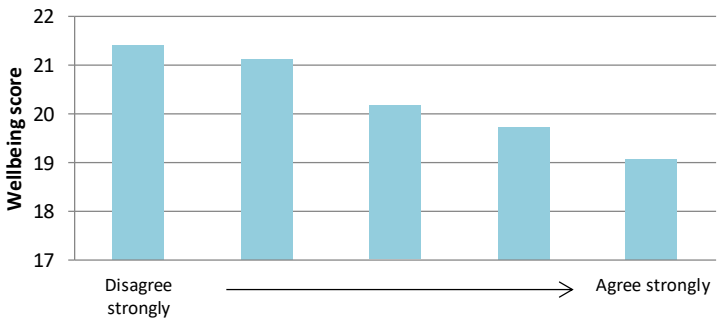
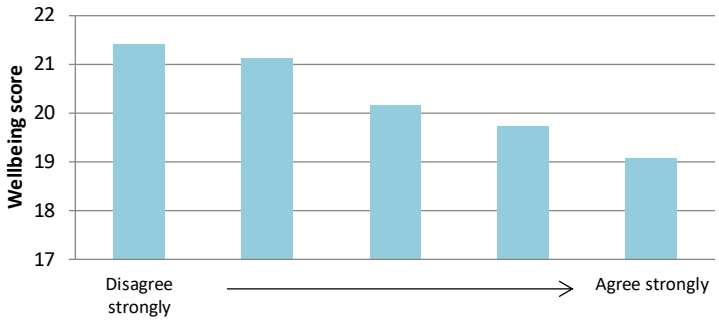


Figure 127: Average wellbeing score, by level of agreement with statement "*I travel to places that are nearer than the ones I would ideally like to*"



4.13.7. Modelling impacts

Methods

In this section, we model the probability of belonging to a group of concern controlling for the effect of all the variables measuring travel behaviour and constraints to travel behaviour, as well as other demographic and socio-economic variable (Figure 128). The models used a logit specification. From the model, we estimated the odds ratio of belonging to a group of concern.

The full models are presented in Appendix A.

Figure 128: Methods

Dependent variables	Explanatory variables	Control variables (where applicable)
Odds of ▪ Being unemployed ▪ Not being a member of any association ▪ Seeing family/friends less than once/year ▪ Having bad/very bad health status ▪ Wellbeing index in the bottom 10%	Travel behaviour outside local area ▪ Number of trips made ▪ Number of places visited ▪ Maximum distance travelled Constraints to travel behaviour ▪ Number of trips ▪ Number of places ▪ Distance travelled ▪ Travelling by car and not by public transport (as desired) ▪ Travelling by public transport and not by car (as desired)	▪ Gender ▪ Age ▪ Income ▪ Benefits received ▪ Qualifications ▪ Employment status ▪ Being a carer ▪ Having a disability ▪ Length of residency in local area ▪ Length of residency in UK ▪ Ethnic group ▪ Household type ▪ Living conditions (People/room) ▪ Housing tenure ▪ County

Results

Table 2 shows the odds ratios estimated from the models. An odds ratio of 1 means that changes in the explanatory variable do not have a significant effect on the probability of belonging to a group of concern. Odds ratio above/below 1 mean that increases in the explanatory variable is associated with a significant increase/decrease in that probability.

Table 16: Odds ratio

	Outcome				
	Being active and unemployed	No membership in any association	Seeing family/ friends less than once a year	Bad/very bad health status	Wellbeing in bottom 20%
Travel behaviour (outside local area)					
Additional trip	N/A	0.989***	1	1	1
Additional place visited	1	1	0.835***	1	0.893***
Additional km travelled	1	0.998***	1	1	1
Constraints to travel behaviour (Agreeing/strongly agreeing feeling constrained)					
Number of trips made	1.43*	1	1	1	1
Number of places visited	1	1	1	1.51***	1.31*
Maximum distance travelled	1	1	1	1	1.51***
Travelling by car, not by public transport	1	1	1	1	1
Travelling by public transport, not by car	1.60**	1	1	1	1

Significance levels: ***1%, **5%,*10%,

The table shows that travel behaviour has a significant association with:

- Social engagement: making more trips and travelling to more distant places decreases the odds of not being a member of any association
- Social contacts: visiting more places decreases the odds of seeing friends and family less than once a year
- Wellbeing: visiting more places decreases the odds of having low wellbeing (in bottom 10%)

In addition, constraints to travel behaviour have a significant association with

- Employment status: among the active population, constraints to the number of trips and to modal choice (having to travel by public transport and not by car, as desired) increases the odds of being unemployed
- Health: constraints to the number of places visited increases the odds of having bad or very bad health
- Wellbeing: constraints to the number of places visited and to the distance travelled increases the odds of having low wellbeing (in bottom 10%)

4.13.8. Wider impacts of travel behaviour: conclusions

The bivariate analysis in sub-sections 4.13.2 to 4.13.6 suggest that the five outcomes analysed (employment, social engagement, social contacts, health, and wellbeing) are related to most of the variables defining travel behaviour, and/or with constraints to travel. In some cases the relationships are linear. This is especially the case of the relationships between health status and variables measuring travel behaviour.

The models of the probability of belonging to a group of concern (being unemployed, having no membership in any organisation, club, or society, only meeting family and friends once a year, having "bad" or "very bad" health status, and being in the bottom 10% of the distribution of the wellbeing score) control for the effect of all the variables

measuring travel behaviour and constraints to travel behaviour, as well as other demographic and socio-economic variable. These models found that some variables measuring travel behaviour and constraints to travel behaviour are significant predictors of the probability of belonging to a group of concern.

4.14 Conclusions

This chapter found that only a small proportion of households and business are dissatisfied with the trips they currently make. However, a sizeable proportion reported being constrained in their travel behaviour, including number of trips, number of places visited, and distance travelled. The main reasons for the constraints were related to public transport, especially cost, speed, reliability, and frequency.

The improvements planned in the Strategic Transport Plan (road, rail, and smart and integrated travel) may lead to a sizeable proportion of individuals making additional trips, especially for shopping or other purposes (not commuting, business, or education). The lack of a similar strong change in the case of commuting, business, or education trips may be explained by the fact that it is more difficult to anticipate possible changes in the number of these trips, as they are partly outside the control of individuals.

The improvements in the Strategic Transport Plan may also lead to a sizable proportion of businesses making additional business trips and trips for other purposes.

In the long term, more than 40% of individuals would consider changing where to work, more than 30% would consider changing where to live, and around 25% would consider selling their car following certain public transport improvements. Around 30% of businesses would consider changing their locations following certain road or public transport improvements and more than 40% would consider reducing the number of vehicles following certain public transport improvements.

The chapter also found important differences between the travel behaviour of different segments of the population, satisfaction with travel, and constraints to that behaviour. There are five segments feeling particularly constrained or dissatisfied with respect to their travel behaviour and/or showing higher propensity for long-term changes (residence/workplace location) if transport was improved:

- Multiculturals and Inner City Cosmopolitans make more trips than average, especially by public transport. However, Inner City Cosmopolitans are also the most dissatisfied with car trips. Both segments are the most prone to increase number of trips following the improvements of the plan.

- Rural Residents also make more trips than average, but mostly by car. They visit more places, and travel further, than average, but are the most dissatisfied with public transport trips.

- Hard Pressed Living 2 and Constrained City Dwellers make fewer trips, visit fewer places and travel shorter distances than average and make a higher proportion of trips by public transport than average.

We also found that variables measuring travel behaviour (number of trips made outside the local area, number of places visited, and maximum distance travelled) and constraints to travel behaviour are associated with five potential wider impacts: employment, social engagement, social contacts, health, and wellbeing.

5 SECONDARY DATA ANALYSIS

5.1 Introduction

This chapter analyses secondary quantitative data at the level of census output areas, focusing on public transport accessibility to three types of destinations: employment centres, health-related facilities (GPs, hospitals and food stores), and town centres, and on how levels of accessibility differ with the characteristics of the areas and of the population, drawing conclusions regarding problems of low accessibility in areas with populations vulnerable to transport-related social exclusion.

The remainder of the chapter is organised as follows:

- Sections 5.2 and 5.3 describe the data and the methods used in the study
- Sections 5.4, 5.5, and 5.6 present the results of the analysis of accessibility to employment, centres health-related facilities, and town centres.
- Section 5.7 summarizes the main lessons learnt from the analysis of the data and the implications for the following stages of the research.

5.2 Data

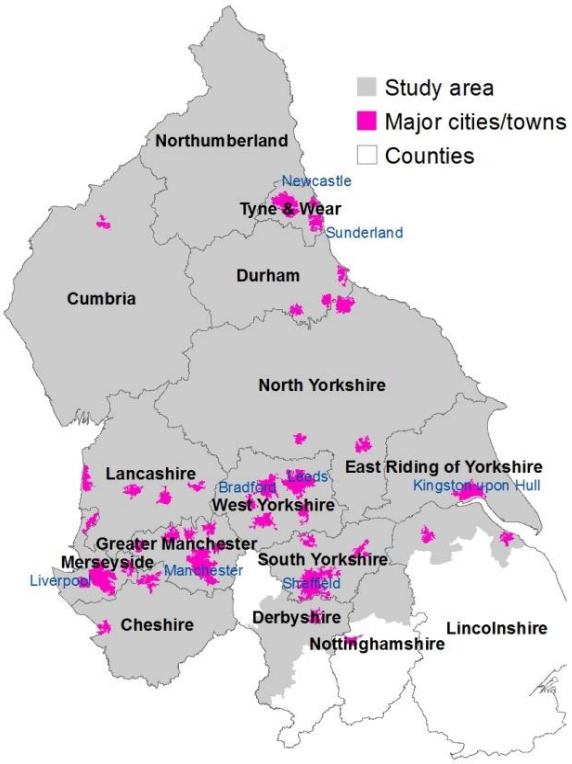
The analysis used four different sets of data: DfT data on accessibility (at the level of the lower super output area), two types of output area classification (rural-urban classification and ONS area classification) and the results of the 2011 census at the level of the output area.

It should be noted that the delimitation of the study area in this study used the same definition of "North" as the one used in the User Insight Phase 1 report (SDG 2018a), which includes some output areas in Derbyshire, Nottinghamshire, and Lincolnshire. Figure 129 shows the counties included in the study area, and the main urban areas.

All analyses in this chapter used data on the boundaries of output areas in the North downloaded from https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011.

The datasets used in this study have some limitations in relation to the ideal for addressing the objectives as outlined above. These limitations are outlined in the end of this section and in the discussion in Section 5.7.

Figure 129: Study area



Sources: Authors, derived from data from ONS (Output Areas Boundaries 2011), ONS (https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011Major Towns and Cities Boundaries December 2015, http://geoportal.statistics.gov.uk/datasets/93a5a6c605da4ea59986a3704c921450_0?geometry=-26.478%2C48.184%2C22.478%2C57.436) and Ministry of Housing, Communities and Local Government (Ceremonial County Boundaries of England, https://data.gov.uk/dataset/0fb911e4-ca3a-4553-9136-c4fb069546f9/ceremonial-county-boundaries-of-england).

5.2.1. Accessibility

The data on accessibility was produced by the Department for Transport (DfT) and was published in 2015 (https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts). The data is available at the level of the lower super output area.

The data includes information about 9 types of destinations: employment centres, primary schools, secondary schools, colleges, GPs, hospitals, food stores, pharmacies, and town centres. For each type of destination, the dataset includes three types of variables: travel times to nearest destination by car, public transport (including walking), and cycling; number of destinations within given minutes using each mode of transport; and proportion of users within given minutes of a destination using each mode of transport.

For the present study, we extracted only data on:

- Employment centres

- Three destinations which we grouped as a set of "health-related facilities": GPs, hospitals, and food stores. Pharmacies were not considered as the dataset did not include information on public transport.
- Town centres - understood in this study as a destination where a range of facilities are present, allowing individuals to perform activities not related to employment or health but important for their wellbeing (e.g. shopping, leisure).

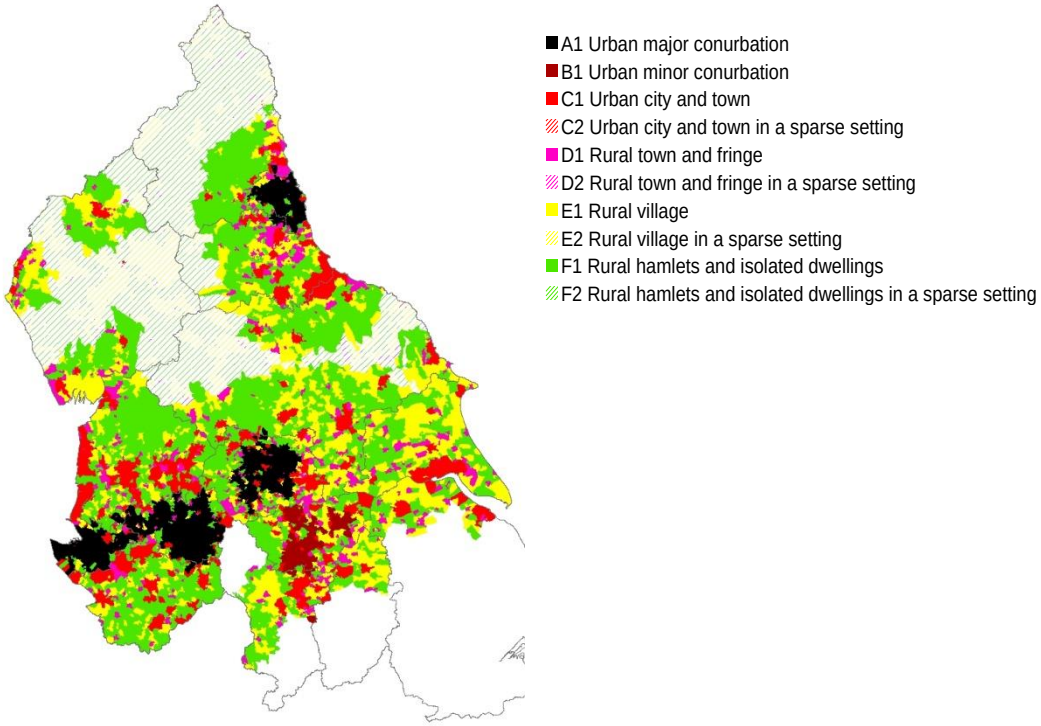
We retained for further analysis only a few of the available variables, including the travel times to nearest destination, by mode, and, for the case of employment centres, also the number of employment centres of each dimension within 60 minutes, using different modes of transport.

5.2.2. Rural-urban classification of output areas

The rural-urban classification of output areas is a dataset released by the Office for National Statistics (ONS) in 2013 (https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655). Output areas were classified as urban if they were in a built-up area with a population over 10,000. Urban areas were then sub-divided into three groups ("major conurbation", "minor conurbation", and "urban city and town") and rural areas sub-divided into three groups ("rural town and fringe", "rural village", and "rural hamlets and isolated dwellings"). All groups except the conurbations were then further split in two, based on whether the wider surrounding area was sparsely populated or not.

Figure 130 shows the rural-urban classification of the output areas in the North. There are three main urban conurbations, one linking Liverpool and Manchester, another formed by Leeds, Bradford, and surrounding cities and towns, and another formed by Newcastle, Sunderland, and surrounding areas. There is also an urban minor conurbation in Sheffield. There is a regular network of urban cities and towns in the southern parts of the North but most of the northern parts are rural villages or hamlets, many of them in a sparse setting.

Figure 130: Urban rural-classification of output areas



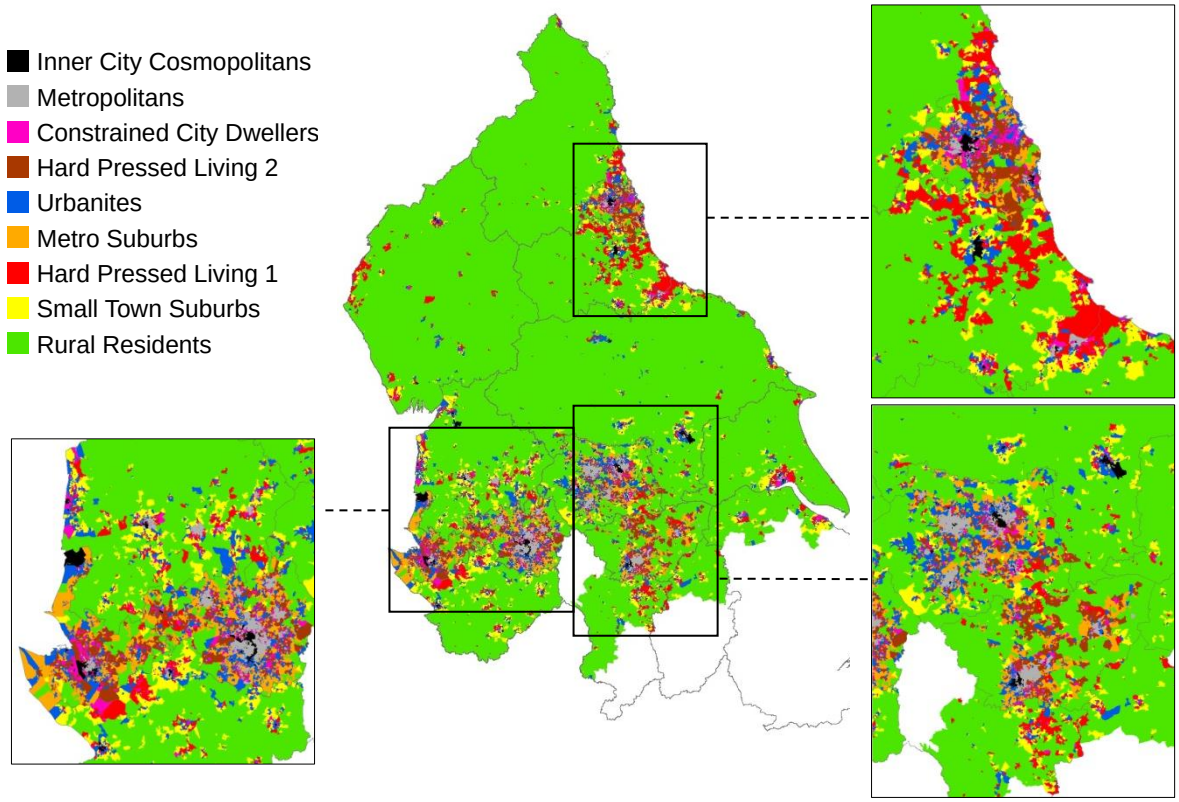
Source: Authors, derived from data from Office for National Statistics (2013) Rural-urban classification of output areas.

5.2.3. Modified ONS classification of output areas

The ONS area classification is a geodemographic classification of output areas based on data from the 2011 census. The ONS classification consists of 8 groups of areas. The dataset used was produced as a part of the results from the User Insight Phase 1 research (SDG 2018a), and was provided to the authors of the present report by TfN. This research slightly modified the original ONS classification, and consists of 9 groups. Table 1 in Chapter 2 shows the percentage of each group in the North's population and the key demographic, property/geography, and travel characteristics associated with each group.

Figure 131 shows the modified ONS classification of the output areas in the North. The majority of the areas were classified as "rural residents". The three major urban areas (Liverpool-Manchester, Leeds-Bradford(-Sheffield), and Newcastle-Sunderland-(Middlesbrough)), shown in the map insets, are very diverse, with all groups represented. Areas classified as Inner City Cosmopolitans and Multiculturals are confined to the centres of those three urban areas. In the Newcastle-Sunderland area there are many areas classified as Hard Pressed Living 1 and 2.

Figure 131: Modified ONS classification of output areas



Source: Authors, derived from data provided by TfN (Modified ONS classification of output areas) and Output Areas Boundaries 2011.

5.2.4. Census 2011

Data was extracted from the "key statistics" and "quick statistics" tables of the 2011 population census, at the level of the output area (https://www.nomisweb.co.uk/census/2011). The census includes many variables on individuals, households, and dwellings. We extracted only the variables that are relevant for the characterization of the areas in terms of vulnerability to transport-related social exclusion, as the overall demographic characteristic of the areas is already incorporated in the modified ONS classification described in Subsection 5.2.3. The selection of relevant variables is based on the previous literature, reviewed in Chapter 2. Table 17 is a list of the variables extracted from the census data.

Table 17: Variables extracted from census and groups of concern

Variable/group of variables	Groups of concern
Age	Age>65, Age>75
Household composition	1-person household 1-person household aged over 65
Ethnic group	Non-white
Length of residence in UK	<2 years in UK
Health	Bad or very bad health Very bad health Long-term health problem or disability Long-term health problem or disability - day-to-day activities limited a lot
Care Provision	Provided unpaid care Provided unpaid care >50 hours a week
Social Grade (Market Research Society method)	Grade DE
Qualifications	No qualifications
Economic activity	Unemployed Long-term unemployment (>12 months) Unemployed and never worked Part-time employee
Occupation (Standard Occupational Classification 2010)	Class 9: Elementary occupations
National Statistics Socio-Economic Classification	Class 7: Routine occupations
Households with dependent children	Long-term health problem and with children Not in employment and with children Lone parent not in employment
Car and van availability	Zero car households

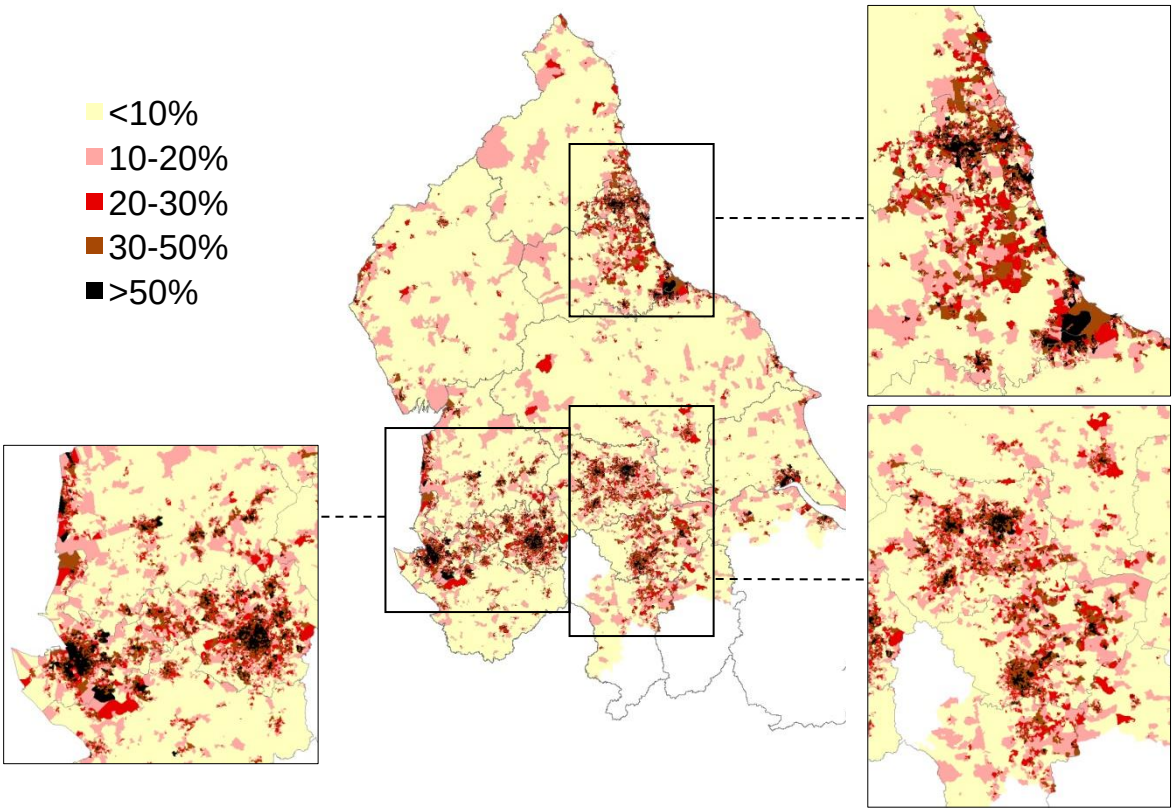
The last variable in the table above (Zero-car households) is particularly important, as we use it as key variable in the analysis of accessibility, as it will be shown in the sections that follow. Figure 132 shows the proportion of zero car households in the output areas in the North and Table 18 shows descriptive statistics of this variable and averages by type of area, using the two classifications presented above. In the calculation of these statistics, each area was weighted by the total number of households.

The map shows that the proportion of zero-car households is highly variable. There are large expanses of rural areas where the proportion is lower than 10%, but also concentrated pockets in urban areas where the proportion is above 50%. The insets showing Liverpool-Manchester, Leeds-Bradford-Sheffield, and Newcastle-Sunderland-Middlesbrough also show variations inside urban areas, with the proportion of zero-car households generally decreasing as we move away from the city centres, but with some exceptions to this pattern, which are probably related to income and other socio-economic variables (the analysis of which is beyond the scope of the present study).

Table 18 confirms the high variability of the proportion of zero car households (which varies from 0% to 93% and the general inverse correlation between the proportion of zero-car households and the degree of urbanization. Only 6% of households in rural

hamlets and 9-10% of those in rural villages have no car. In terms of modified ONS classification, there are three groups with a proportion of zero-car households clearly above the mean of 26%: Constrained City Dwellers (52%), Inner City Cosmopolitans (46%), and Multiculturals (43%).

Figure 132: Proportion of zero-car households



Source: Authors, derived from data from Census 2011 and ONS Output Areas Boundaries 2011.

Table 18: Descriptive statistics of proportion of zero-car households, overall and by rural-urban classification and modified ONS classification

All	
Mean	26%
Std.dev	18%
Minimum	0%
Maximum	93%
By type of area (mean)	
A1 Urban major conurbation	30%
B1 Urban minor conurbation	28%
C1 Urban city and town	25%
C2 Urban city/town (sparse)	28%
D1 Rural town and fringe	18%
D2 Rural town/fringe (sparse)	21%
E1 Rural village	9%
E2 Rural village (sparse)	10%
F1 Rural hamlets	6%
F2 Rural hamlets(sparse)	6%
Inner City Cosmopolitans	46%
Multiculturals	43%
Constrained City Dwellers	52%
Hard Pressed Living 2	35%
Urbanites	20%
Metro Suburbs	11%
Hard Pressed Living 1	32%
Small Town Suburbs	9%
Rural Residents	9%

Source: Authors, derived from data from Census 2011https://www.nomisweb.co.uk/census/2011, Office for National Statistics (2013) Rural-urban classification of output areas, https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655and Modified ONS classification of output areas.

5.2.5. Data not used

Data on the 2015 Index of Multiple Deprivation was also collected and pre-processed. However, this data was not included in the present study for two reasons:

- The data combines several variables into single scores for each broad domain of deprivation. For example the employment domain combines several variables related to employment. In contrast, the census data provides information on individual variables, allowing for a more detailed analysis of the relation between accessibility and population characteristics associated with risk of transport-related social exclusion.

- The data is only available at the level of the lower level output area - while most of the other data used in this study is available at the level of the output area, which is smaller.

5.2.6. Data limitations

The datasets available for this research have some limitations, which should be acknowledged.

Firstly, the data is only available at an aggregate level (census units), not at the individual level. As such, the characteristics of individuals and households are defined as proportions of each area's population, potentially masking important internal variations.

Secondly, the available datasets also do not include some relevant variables to understand the constraints faced by individuals in their travel behaviour, levels of accessibility, and the incidence of transport poverty. This includes variables on economic aspects such as the cost of owning and using a car and the affordability of the public transport system. There is also no available information on the accessibility provided by specific public transport modes (i.e. rail or bus).

5.3 Methods

The analysis of accessibility to three types of destinations (employment centres, health-related facilities, and town centres) follows the same three steps, as detailed below. All calculations were weighted by the population of interest in each output area: economically active population (in the case of access to employment centres) or the whole population (in the case of access to health-related facilities and town centres).

5.3.1. First step: accessibility indicators

In a first stage, we calculate descriptive statistics of indicators of accessibility, map their geographic distribution, and analyse their statistical distribution in the different types of areas (using both the rural-urban classification and the modified ONS classification).

The indicators of accessibility are the travel times to several types of destination, by different modes. In the case of access to employment centres we consider a further indicator: the number of jobs reached within 60 minutes (the travel time threshold typically considered as "acceptable" in studies of the UK Department for Transport).

In all cases, we consider the accessibility by public transport and the difference in accessibility by public transport and by car. While lack of accessibility by public transport can be caused by geographic isolation or poor transport, the difference in accessibility by car or public transport is more closely linked to the poor provision of public transport.

5.3.2. Second step: inaccessible areas

In a second stage, we define inaccessible areas (by public transport) as those where the public transport time to access a destination (or the difference between the public

transport and car time) is more than one standard deviation above the mean for the whole population.

In the case of the indicator not based on time (i.e. the number of jobs reached within 60 minutes), inaccessible areas are those where the number is more than one standard deviation below the mean.

The rationale behind this definition is that accessibility is a relative concept and that society should aim at a balanced distribution of accessibility among different regions and social groups. Inaccessibility is therefore not defined in relation to a given standard of accessibility (e.g. "travel time above x minutes"), which is difficult to define, but in relation to the average conditions in the North. It is assumed that an individual living in an area where travel time to a given place is much longer than the average in the North is at disadvantage, regardless of the actual travel time.

Having defined inaccessible areas based on each indicator, we then map their geographic distribution, and calculate descriptive statistics by rural-urban classification and the modified ONS classification of the areas. We then estimate the proportion of zero-car households in accessible and non-accessible areas, by rural-urban classification and modified ONS classification.

5.3.3. Third step: areas with transport poverty

Transport poverty has been defined in different ways in the previous literature, as shown in Chapter 2 of this report. As the analysis in this chapter uses secondary data aggregated at area level, the scope for defining a precise indicator of transport poverty, of the type used in previous literature, is somewhat limited. Unlike previous studies, the available datasets do not include important variables such as number of trips, income, and transport affordability, but only accessibility indicators and car ownership rates.

We therefore define areas with transport poverty as the inaccessible areas by public transport, as defined in Subsection 5.3.2, where the proportion of zero-car households is above the mean for the whole population. The rationale behind this definition is that the population in areas with relatively poor public transport accessibility and low car ownership face more constraints in accessing key destinations due to the lack of transport, compared with population in areas with good public transport accessibility or in areas with poor public transport accessibility but with high car ownership.

It should be noted that, while at the individual level car ownership could be defined as a "yes/no" variable, at the area level we need to define "high" and "low" car ownership rates. Rather than using an arbitrary threshold value, we considered how the car ownership rate in each area differs from the average rate in the North. An area where car ownership is lower than the average in the North is at disadvantage, regardless of the actual car ownership rate.

Having defined areas with transport poverty, based on each indicator of accessibility, we then calculate descriptive statistics by rural-urban classification and the modified ONS classification of the areas. We then estimate the proportion of the population living in inaccessible areas and in areas with transport poverty that belong to the groups of concern defined in Table 17.

5.4 Employment centres

5.4.1. Accessibility indicators

We define three groups of indicators of accessibility to employment centres:

- Number of jobs reached within 60 minutes by car, by public transport, and by car but not by public transport. The original data only contained information on the number of employment centres with 100 to 499 jobs, 500 to 4,999 jobs, and more than 5,000 jobs. The data was combined using a weighted average, assigning a value of 300, 2750, and 5000 to those three types of employment centre, respectively. This is a simplification, and therefore the results for this indicator must be treated with more caution than the results for the other indicators. In addition, we used a threshold of 60 minutes, but different results could have been obtained using a threshold of 15, 30, or 45 minutes.

- Time to nearest major employment centre (>5,000 jobs), by public transport, and by car but not by public transport.

- Time to nearest minor employment centre (500-4,999 jobs), by public transport, and by car but not by public transport.

Descriptive statistics

Table 19 shows descriptive statistics of the three groups of indicators. It is clear that car provides more accessibility than public transport, both in terms of the number of jobs that can be reached within 60 minutes and in terms of time to the nearest major or minor employment centre. The average time to reach the nearest major employment centre by public transport is almost double the time by car. There is a high variability in the difference of accessibility provided by car and public transport across output areas, as shown by the standard deviations of the difference between the number of jobs reached by car and public transport and the difference between the car and public transport times to reach the nearest major or minor employment centre. The maximum difference in public transport and car time to access major and minor employment centres are very high: 97 and 100 minutes respectively.

Table 19: Descriptive statistics of indicators of accessibility to employment centres

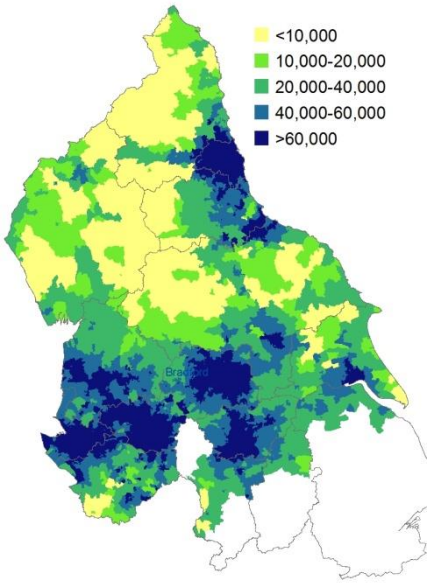
	Mean	Std. Dev.	Min	Max
Number of jobs within 60 minutes				
By car	77,728	9,327	30,200	80,500
By public transport	63,579	19,064	0	80,500
Difference car and public transport	14,148	16,705	-10,300	80,100
Time to nearest major employment centre (minutes)				
By car	17	9	6	86
By public transport	32	18	2	120
Difference public transport and car	15	12	-14	97
Time to nearest minor employment centre (minutes)				
By car	9	2	5	33
By public transport	14	9	2	120
Difference public transport and car	5	7	-4	100

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Geographic distribution

Figure 133 shows the geographic distribution of the number of jobs that can be reached within 60 minutes by public transport. The northern areas are in general less accessible than the southern ones. There is also a clear divide between the rural areas and the highly urbanised areas in the Liverpool-Manchester-Leeds axis and Newcastle-Sunderland area and cities such as Sheffield, Preston, Middlesbrough, York, and Hull. The role of major railway lines is also clear in the spatial patterns of accessibility, with areas along the main North-South lines having more accessibility than the surrounding areas.

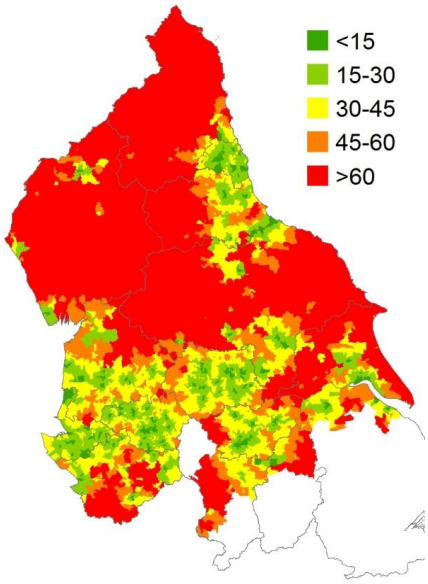
Figure 133: Estimated number of jobs reached within 60 minutes by public transport



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

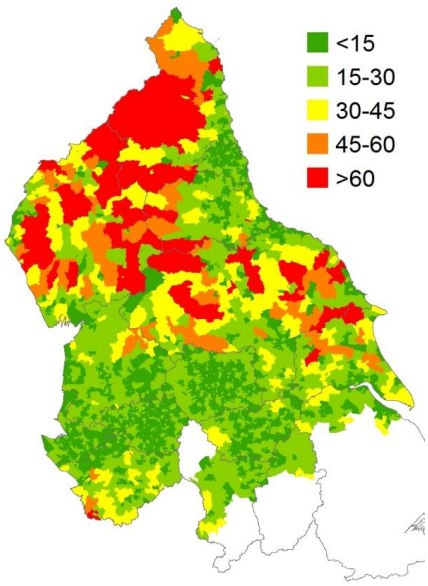
Figure 134 and Figure 135 show the distribution of the public transport time to major and minor employment centres. A vast part of the Northern areas is more than 1 hour away from the nearest major employment centre and some of it is also more than 1 hour away from the nearest minor employment centre. Again, there is an overall divide between urban and rural areas.

Figure 134: Public transport time (minutes) to major employment centres (>5000 jobs)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Figure 135: Public transport time (minutes) to minor employment centres (500-5000 jobs)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Distribution by rural-urban and modified ONS classification

Table 20 shows the average of the three groups of indicators of accessibility to employment centres, by rural-urban classification and modified ONS classification. The figures that follow the table show the cumulative distribution of the indicators of public transport accessibility by rural-urban and modified ONS classification.

In terms of **rural-urban classification**, as shown in Table 20, the average number of jobs reachable within 60 minutes by car is not very different in urban major and minor conurbations (A1 and B1), but decreases considerably as we move to urban cities/towns (C1) and then slightly decreases as we move to rural town and fringes (D1) and rural villages and hamlets (E1 and F1). In all cases, areas in sparse settings (C2, D2, E2, and F2) can reach a much smaller number of jobs that those in non-sparse settings (C1, D1, E1, and F1). The pattern for the average number of jobs within 60 minutes by public transport is slightly different: the number of jobs decreases even more abruptly as we move from urban minor conurbations (B1) to urban cities and towns (C1) and also from these to rural town and fringes (D1). The difference between sparse and non-sparse areas is also more pronounced than in the case of access by car. For example, rural villages or hamlets in sparse settings can only reach only around a third of jobs, compared with those in non-sparse settings. The divide in public transport accessibility levels in conurbations and other areas and in sparse and non-sparse areas is also clear when we look at the cumulative distribution of the number of reachable jobs by public transport in Figure 136.

The times to the nearest major employment centre follow the same patterns as the previous indicator, as shown in Table 20. In particular, there is a big difference in times in urban areas (A1, B1, and C1) and rural areas (D1, E1, and F1), and a very high difference in times in areas in sparse (C2, D2, E2, and F2) and non-sparse settings (C1, D1, E1, and F1), especially in the case of public transport. This is confirmed in the chart with the cumulative distribution in Figure 137.

The car times to the nearest minor employment centre are relatively balanced by type of area, compared with the times to major employment centres, as shown in Table 20. The average times in sparse rural hamlets are only 9 minutes longer than the times in urban major conurbations. In contrast, the public transport times are very unbalanced: times in sparse rural village and hamlets (E2 and F2) are almost 5 times higher than in urban areas (A1 to C2). This is also evident in Figure 138, where E2 and F2 areas can clearly be identified as outliers, with a distribution of public transport time very different from all other areas.

In terms of the modified ONS classification, as shown in Table 20, the average number of reachable jobs by car is relatively balanced for all type of areas, being only slightly lower for rural residents. In contrast, the average number of reachable jobs by public transport is highly variable, ranging from around 34,000 (Rural Residents) to almost 77,000 (Inner City Cosmopolitans and Multiculturals). This variability is also clear in Figure 139. Areas classified as Inner City Cosmopolitans and Multiculturals have high public transport accessibility, areas classified as Small Town Suburbs and Hard Pressed

Living 1 areas have low accessibility, and areas classified as Rural Residents have very low accessibility. Table 20 also shows that Inner City Cosmopolitans can access almost the same number of jobs by car or public transport (the difference is only 2,315 jobs), while other groups can access by public transport only a fraction of the jobs they can access by car.

The average car times to the nearest major employment centre are again relatively balanced across all groups except rural residents, but public transport times vary from 18 minutes (Inner City Cosmopolitans) to more than an hour (Rural Residents). Figure 140 shows again that areas classified as Rural Residents are outliers, with public transport times to major employment centre generally much higher than in all other types of areas. Inner City Cosmopolitans and Multiculturals have the shortest times.

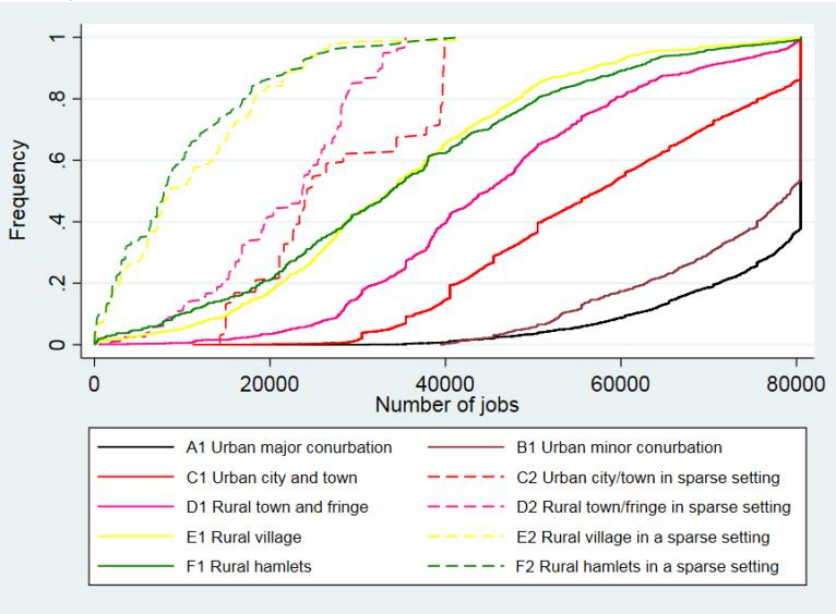
The average car times to the nearest minor employment centre are balanced for all areas, varying from 8 to 11 minutes. In contrast, public transport times are markedly longer for Rural Residents than for all other areas, as shown in Table 20 and Figure 141.

Table 20: Average indicators of accessibility to employment centres, by rural-urban and modified ONS classification

	Jobs within 60 minutes			Time to major employment centre (minutes)			Time to minor employment centre (minutes)		
	Car	PT	Diff. Car-PT	Car	PT	Diff. PT-Car	Car	PT	Diff. PT-Car
All	77,728	63,579	14,148	17	32	15	9	14	5
A1 Urban major conurbation	80,229	75,532	4,697	14	25	11	8	11	3
B1 Urban minor conurbation	80,228	72,570	7,658	15	26	11	8	13	4
C1 Urban city and town	76,722	57,824	18,899	18	32	14	8	12	4
C2 Urban city/town (sparse)	40,392	27,699	12,693	53	74	20	7	9	2
D1 Rural town and fringe	75,444	46,063	29,381	22	44	21	10	17	7
D2 Rural town/fringe (sparse)	51,404	21,796	29,609	44	82	38	10	17	6
E1 Rural village	74,228	34,767	39,460	25	58	33	12	26	14
E2 Rural village (sparse)	45,701	11,202	34,499	46	100	53	15	47	31
F1 Rural hamlets	74,743	34,919	39,824	24	59	34	11	28	17
F2 Rural hamlets(sparse)	46,373	10,111	36,262	47	101	55	17	54	37
Inner City Cosmopolitans	79,130	76,815	2,315	13	18	5	8	10	2
Multiculturals	80,181	76,795	3,386	12	19	7	7	9	2
Constrained City Dwellers	77,780	69,161	8,619	16	27	11	8	10	3
Hard Pressed Living 2	80,196	73,299	6,898	15	27	12	8	12	4
Urbanites	78,185	66,131	12,054	17	30	13	8	11	3
Metro Suburbs	80,193	70,350	9,843	16	29	13	9	14	5
Hard Pressed Living 1	75,081	54,359	20,722	20	37	17	9	13	5
Small Town Suburbs	76,996	54,697	22,300	18	36	17	9	15	6
Rural Residents	70,635	33,929	36,707	27	61	33	11	27	15

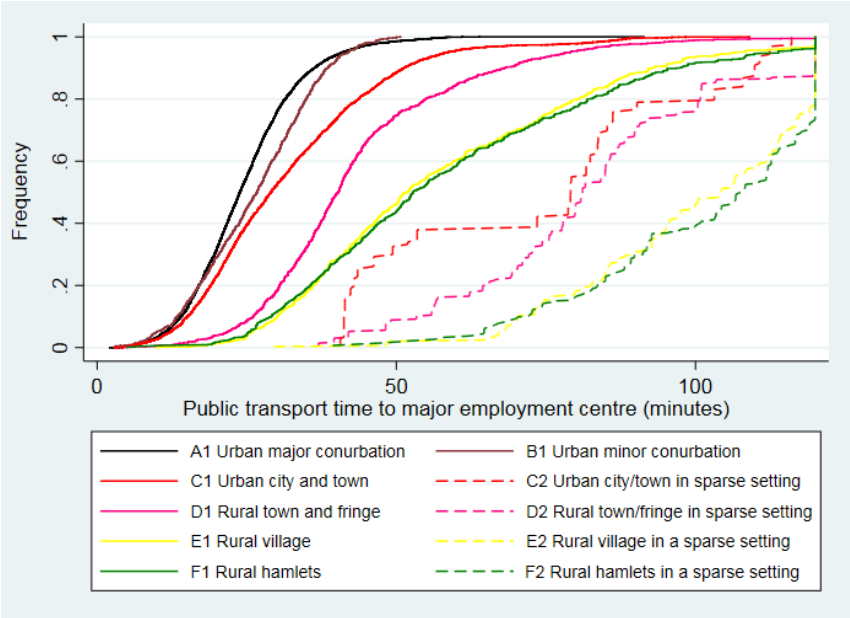
Notes: PT: Public transport, diff.: difference. **Sources**: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts, Rural-urban classification of output areas, and Modified ONS classification of output areas.

Figure 136: Cumulative distribution of estimated number of jobs reached within 60 minutes by public transport, by rural-urban classification



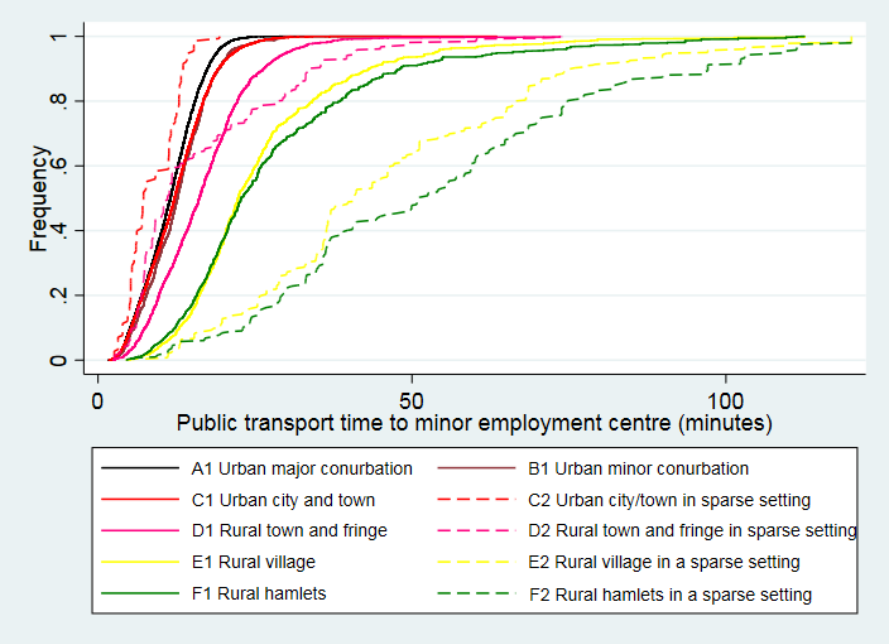
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Rural-urban classification of output areas.

Figure 137: Cumulative distribution of public transport time to major employment centres, by rural-urban classification



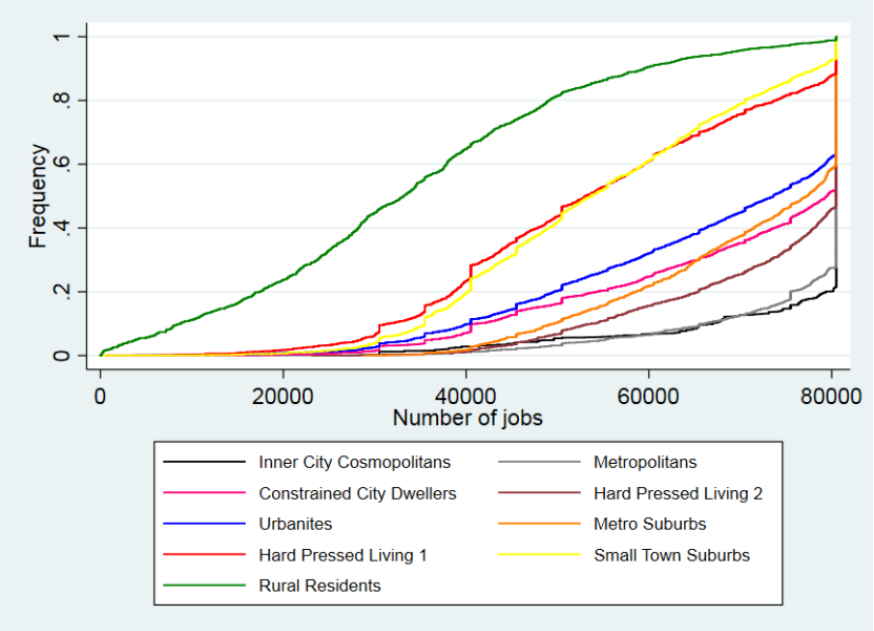
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Modified ONS classification of output areas.

Figure 138: Cumulative distribution of public transport time to minor employment centres, by rural-urban classification



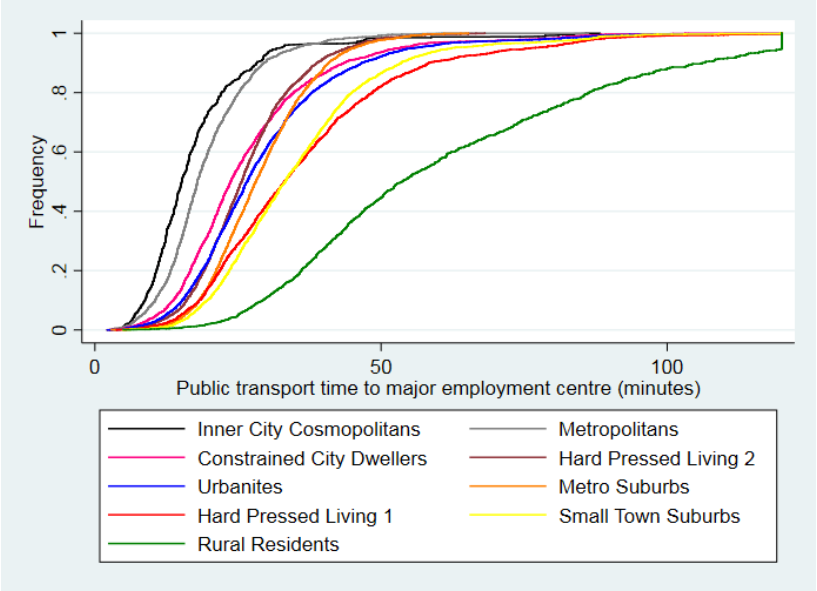
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Rural-urban classification of output areas.

Figure 139: Cumulative distribution of estimated number of jobs reached within 60 minutes by public transport, by modified ONS classification



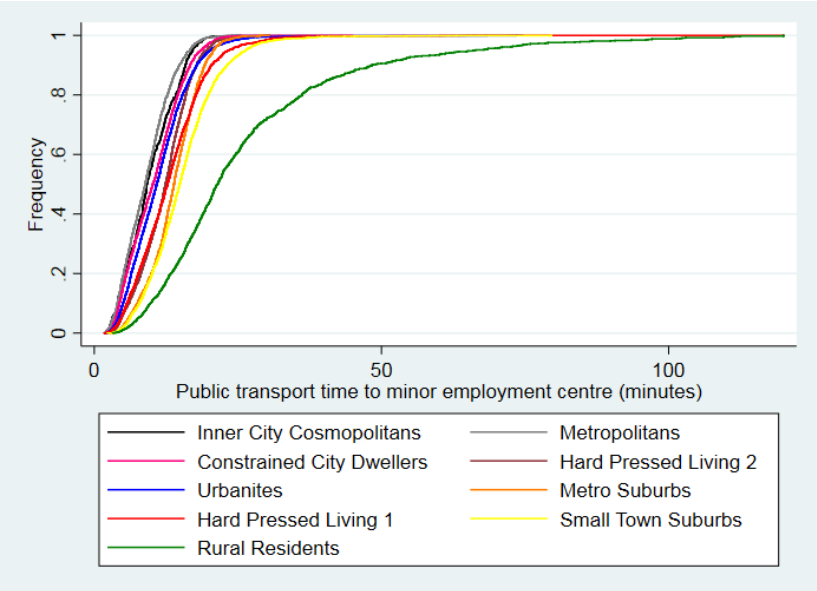
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Modified ONS classification of output areas.

Figure 140: Cumulative distribution of public transport time to major employment centres, by modified ONS classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Rural-urban classification of output areas.

Figure 141: Cumulative distribution of public transport time to minor employment centres, by modified ONS classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) and Modified ONS classification of output areas.

5.4.2. Inaccessible areas

We define inaccessible areas by public transport using three separate criteria:

- The number of jobs reached within 60 minutes by public transport (or reachable by car but not by public transport) is more than one standard deviation below the mean for the whole economically active population in the North.

- The public transport time to access a major employment centre (or the difference between the public transport and car time) is more than one standard deviation above the mean for the whole economically active population.

- The public transport time to access a major employment centre (or the difference between the public transport and car time) is more than one standard deviation above the mean for the whole economically active population and the public transport time to access a minor employment centre (or the difference between the public transport and car time) is also more than one standard deviation above the mean for the whole economically active population. This criterion identifies areas that are inaccessible both to major employment centres and to minor employment centres.

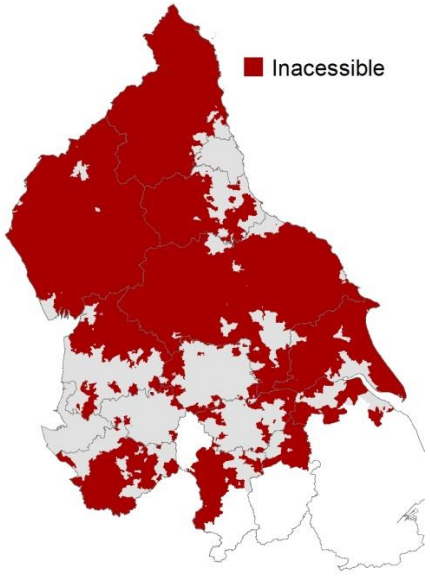
Geographic distribution

The following three figures show the location of the inaccessible areas based on the three criteria defined above. The areas where the number of jobs reached within 60 minutes by public transport is more than one standard deviation below the mean (Figure 142) include most of the rural areas in the North, covering most of the northern regions.

The areas where the public transport time to access a major employment centre is more than one standard deviation above the mean (Figure 143) cover almost all the areas that were identified with the previous criteria.

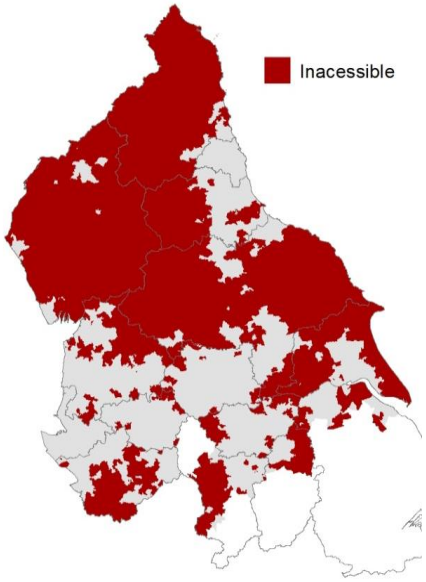
The number of areas where the public transport time to access a major employment centre is more than one standard deviation above the mean and the public transport time to access a minor employment centre is also more than one standard deviation above the mean is smaller than the number of areas identified with the previous criteria, but it still covers large expanses of the northern parts of the North (Figure 144).

Figure 142: Inaccessible areas (based on jobs accessible by public transport)



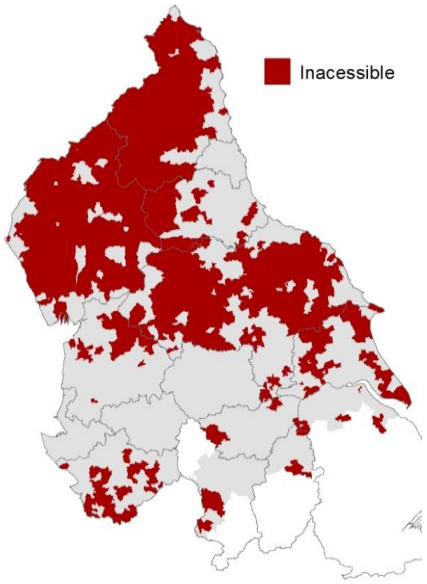
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Figure 143: Inaccessible areas (based on public transport time to nearest major employment centre)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Figure 144: Inaccessible areas (based on public transport time to nearest major and minor employment centre)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Distribution by rural-urban and modified ONS classification

Table 21 shows the proportion that the areas identified above represent in the economically active population of the North and of the different types of areas in the rural-urban and modified ONS classification. It also includes similar statistics for an alternative definition of accessible areas based not on public transport travel but on the difference between public transport and car travel.

Overall, 20% of the North's economically active population live in inaccessible areas defined by the number of jobs reached by public transport. However, this value varies from only 2% in conurbations (areas A1 and B1) to 100% in all the areas in sparse settings. A similar pattern is identified when inaccessible areas are defined by the public transport time to major employment centres. These areas account for 11% of the North's economically active population, but this value varies from 0-1% for conurbations to 91% for sparse rural town/fringes and 98% of sparse rural villages and hamlets. The inaccessible areas defined by the time to major and minor employment centres represent only 3% of the North's economically active population but 79% and 84% of the economically active population in sparse rural villages and hamlets, respectively.

In terms of the ONS classification, the inaccessible areas are overwhelmingly those classified as Rural Residents. There are only two other groups with proportion of inaccessible areas above the overall average (and only for the first two criteria defining inaccessibility): Hard Pressing Living 1 and Small Town Suburbs.

In both classifications, the results obtained for the first two criteria when looking at inaccessible areas defined by the difference between car and public transport travel are

quite different from those described above, which are based on public transport travel only.

Table 21: Proportion of the North's economically active population living in inaccessible areas to employment, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Jobs within 60 minutes		Time to major employment centre		Time to major and minor employment centres	
	PT	Diff. Car-PT	PT	Diff. PT-Car-	PT	Diff. PT-Car
All	20%	1%	11%	17%	3%	4%
A1 Urban major conurbation	2%	0%	1%	5%	0%	0%
B1 Urban minor conurbation	2%	0%	0%	6%	0%	0%
C1 Urban city and town	25%	3%	11%	19%	0%	1%
C2 Urban city/town (sparse)	100%	0%	67%	52%	0%	0%
D1 Rural town and fringe	50%	1%	25%	35%	4%	6%
D2 Rural town/fringe (sparse)	100%	0%	91%	86%	20%	19%
E1 Rural village	74%	0%	53%	65%	26%	32%
E2 Rural village (sparse)	100%	0%	98%	98%	79%	86%
F1 Rural hamlets	70%	0%	56%	66%	34%	40%
F2 Rural hamlets(sparse)	100%	0%	98%	96%	84%	89%
Inner City Cosmopolitans	3%	1%	2%	2%	0%	0%
Multiculturals	2%	0%	1%	2%	0%	0%
Constrained City Dwellers	12%	2%	6%	8%	0%	0%
Hard Pressed Living 2	3%	0%	2%	6%	0%	0%
Urbanites	14%	1%	8%	12%	0%	1%
Metro Suburbs	6%	0%	2%	9%	0%	0%
Hard Pressed Living 1	34%	3%	17%	27%	1%	2%
Small Town Suburbs	31%	2%	13%	25%	1%	3%
Rural Residents	73%	0%	55%	63%	29%	35%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas)https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655, Modified ONS classification of output areas, and Census 2011.

Zero car households in accessible and inaccessible areas

Table 22 compares the proportion of zero-car households in accessible and inaccessible areas, for the different definitions of inaccessibility, and segmenting the results by rural-urban and modified ONS classification. The expectation is that inaccessible areas by public transport have a lower proportion of zero-car households. A situation where the proportion of zero-car households is similar or higher in inaccessible areas could signal a situation where living in inaccessible areas by public transport is associated with a lower propensity to have access to a car, two factors than can contribute to transport-related social exclusion.

The table shows that overall, the proportion of zero-car households is lower in inaccessible areas, when considering inaccessibility in terms of public transport only. When considering inaccessibility in terms of the gap between car and public transport, and for one of the definitions of inaccessibility (based on number of reachable jobs), then the proportion of zero-car households is higher in inaccessible areas. This means that the areas where the difference in the number of jobs reached by car and by public transport is higher are also areas with higher proportion of zero-car households.

The table also shows differences according to rural-urban classification. The difference in the proportion of zero-car households in accessible and inaccessible areas is particularly high in the A1 areas (urban major conurbation).

There are also differences in terms of the modified ONS classification. The difference in the proportion of zero-car households in accessible and inaccessible areas is particularly high in the areas classified as Inner City Cosmopolitans and Multiculturals, when considering jobs reachable, and in the areas classified as Multiculturals, when considering time to the nearest major employment centre.

Table 22: Proportion of zero-car households in accessible and inaccessible areas to employment, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Jobs within 60 minutes				Time to major employment centre				Time to major and minor employment centres			
	PT		Diff. Car-PT		PT		Diff. Car-PT		PT		Diff. Car-PT	
Accessible?	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
All	28%	18%	26%	29%	27%	16%	28%	17%	26%	8%	26%	9%
A1 Urban major conurbation	31%	20%	30%		31%	20%	31%	20%	30%	4%	30%	30%
B1 Urban minor conurbation	29%	21%	28%		28%	28%	29%	19%	28%		28%	
C1 Urban city and town	25%	23%	25%	29%	25%	24%	25%	21%	25%	8%	25%	13%
C2 Urban city/town (sparse)		28%	28%		25%	29%	25%	30%	28%		28%	
D1 Rural town and fringe	18%	18%	18%	23%	18%	18%	18%	18%	18%	13%	18%	13%
D2 Rural town/fringe (sparse)		21%	21%		19%	21%	21%	21%	21%	21%	21%	19%
E1 Rural village	10%	9%	9%	14%	10%	9%	10%	9%	10%	7%	10%	7%
E2 Rural village (sparse)		10%	10%		9%	10%	12%	10%	10%	10%	10%	10%
F1 Rural hamlets	8%	6%	6%	5%	7%	5%	7%	6%	7%	5%	7%	5%
F2 Rural hamlets(sparse)		6%	6%		10%	6%	9%	6%	7%	6%	7%	6%
Inner City Cosmopolitans	46%	41%	46%	9%	46%	51%	46%	40%	46%		46%	
Multiculturals	43%	38%	43%	44%	43%	28%	43%	39%	43%	11%	43%	11%
Constrained City Dwellers	52%	50%	52%	40%	52%	49%	52%	48%	52%	41%	52%	47%
Hard Pressed Living 2	35%	30%	35%	52%	35%	29%	35%	30%	35%		35%	29%
Urbanites	20%	20%	20%	23%	20%	20%	21%	17%	20%	12%	20%	13%
Metro Suburbs	11%	10%	11%	34%	11%	9%	11%	10%	11%		11%	
Hard Pressed Living 1	32%	30%	31%	12%	32%	29%	32%	30%	32%	23%	32%	24%
Small Town Suburbs	9%	9%	9%	9%	9%	9%	10%	8%	9%	6%	9%	7%
Rural Residents	10%	9%	46%	9%	10%	8%	10%	8%	10%	7%	10%	7%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areashttps://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011https://www.nomisweb.co.uk/census/2011.

5.4.3. Transport poverty

Distribution by rural-urban and modified ONS classification

We define areas with transport poverty as the inaccessible areas by public transport (as defined above) where the proportion of zero-car households is above the mean for the whole population.

Table 23 shows the proportion that that the areas identified as having transport poverty represent in the economically active population of the North and of the different types of areas in the rural-urban and modified ONS classification.

The proportion of the economically active population living in areas with transport poverty is 5% when considering inaccessibility based on job reachable by public transport and 2%, when considering public transport time to major employment centres. When considering inaccessibility based on public transport time to major and minor employment centres, then only 0.1% of the economically active population lives in areas with transport poverty.

These proportions vary according to the type of area. For example, 53% of the population in sparse urban city/towns (C2) and 30% of the population in sparse rural town/fringe areas (D2) live in areas with transport poverty, when considering inaccessibility based on job reachable by public transport.

In terms of the modified ONS classification, the type of area with highest incidence of transport poverty, considering reachable jobs and public transport time to major employment centres, is the one classified as Hard Pressed Living 1.

Table 23: Proportion of the North's economically active population living in areas with transport poverty to access employment, by rural-urban and modified ONS classification

TRANSPORT POVERTY BASED ON	Jobs within 60 minutes		Time to major employment centre		Time to major and minor employment centres	
	PT	Diff. Car-PT	PT	Diff. Car-PT	PT	Diff. Car-PT
All	5%	1%	2%	4%	0.1%	0.1%
A1 Urban major conurbation	1%	0%	0%	1%	0%	0%
B1 Urban minor conurbation	1%	0%	0%	2%	0%	0%
C1 Urban city and town	10%	2%	4%	7%	0%	0%
C2 Urban city/town (sparse)	53%	0%	40%	32%	0%	0%
D1 Rural town and fringe	11%	0%	6%	8%	0%	1%
D2 Rural town/fringe (sparse)	30%	0%	28%	25%	6%	4%
E1 Rural village	2%	0%	1%	1%	0%	0%
E2 Rural village (sparse)	3%	0%	3%	3%	3%	3%
F1 Rural hamlets	0%	0%	0%	0%	0%	0%
F2 Rural hamlets(sparse)	0%	0%	0%	0%	0%	0%
Inner City Cosmopolitans	3%	1%	2%	1%	0%	0%
Multiculturals	2%	0%	0%	2%	0%	0%
Constrained City Dwellers	12%	2%	6%	8%	0%	0%
Hard Pressed Living 2	2%	0%	1%	4%	0%	0%
Urbanites	4%	0%	2%	2%	0%	0%
Metro Suburbs	0%	0%	0%	0%	0%	0%
Hard Pressed Living 1	21%	3%	10%	17%	1%	1%
Small Town Suburbs	0%	0%	0%	0%	0%	0%
Rural Residents	1%	0%	0%	0%	0%	0%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areashttps://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011https://www.nomisweb.co.uk/census/2011.

Vulnerable population, inaccessible areas, and transport poverty

We finally compared the characteristics of the economically active population living in the areas identified as inaccessible and having transport poverty with the average characteristics of the overall economically active population of the North. We focused on the characteristics that can be related to social exclusion in the case of lack of accessibility to employment: unemployment (overall, and of people who never worked and are in unemployment for a long time), part-time work, individuals without qualifications, and individuals with occupations classified as elementary in the Standard Occupational Classification 2010 and routine in the National Statistics Socio-Economic Classification.

Table 24 shows the results. The results of the areas with transport poverty based on time to major and minor employment centres are not shown, as those areas represent only 0.1% of the total economically active population, as seen above.

In general, the unemployment rate is slightly lower than average in inaccessible areas but higher than average in areas with transport poverty. The proportion of people who are unemployed and who have never worked, those in long term unemployment, and part-time workers are also slightly higher than average in areas with transport poverty.

The proportion of individuals with low qualifications or elementary or routine occupations is also slightly smaller than average in inaccessible areas, but considerably higher than average in areas with transport poverty.

Table 24: Proportion of vulnerable population in inaccessible areas and areas with transport poverty to access employment

	Unemployment rate			Part-time work	No qualif.	Elementary occupation	Routine occupation
	All	Never worked	Long term				
All	7%	1%	3%	21%	28%	12%	13%
INACESSIBILITY BASED ON:							
Jobs within 60 minutes							
PT	5%	1%	2%	22%	26%	11%	13%
Difference Car-PT	7%	1%	3%	24%	29%	14%	16%
Time to major emp. centre (minutes)							
PT	5%	1%	2%	22%	25%	11%	12%
Difference PT-Car	5%	1%	2%	21%	25%	11%	12%
Time to major/min emp. Centre (minutes)							
PT	3%	0%	1%	20%	21%	10%	9%
Difference PT-Car	3%	0%	1%	20%	21%	10%	9%
TRANSPORT POVERTY BASED ON							
Jobs within 60 minutes							
PT	11%	2%	4%	24%	37%	17%	20%
Difference Car-PT	9%	1%	4%	25%	35%	18%	20%
Time to major emp. centre (minutes)							
PT	11%	2%	4%	24%	36%	17%	19%
Difference PT-Car	11%	2%	5%	23%	38%	17%	20%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and Census 2011https://www.nomisweb.co.uk/census/2011.

5.5 Health-related facilities

5.5.1. Accessibility indicators

We define three groups of indicators of accessibility to health-related facilities: time to nearest GP, nearest hospital, and nearest food store. The indicators have two versions: time by public transport and difference in the time by public transport and by car.

Descriptive statistics

Table 25 shows descriptive statistics of the three groups of indicators. The average times to reach the nearest GP and nearest food store are relatively small and the difference between car and public transport are also small. However, the range and standard deviations of the public transport times are high. The maximum values of public transport time are 116 minutes, in the case of GPs, and 120 minutes, in the case of food stores.

In the case of time to reach the nearest hospital, the average car time (18 minutes) is almost half of the public transport time (35 minutes). The public transport time also has a high variability.

Table 25: Descriptive statistics of indicators of accessibility to health-related facilities

	Mean	Std. Dev.	Min	Max
Time to nearest GP (minutes)				
By car	8	1	6	25
By public transport	11	7	2	116
Difference car and public transport	3	6	-7	91
Time to nearest hospital (minutes)				
By car	18	6	6	78
By public transport	35	17	3	120
Difference public transport and car	17	12	-18	99
Time to nearest food store (minutes)				
By car	7	1	6	34
By public transport	9	7	2	120
Difference public transport and car	2	6	-6	99

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

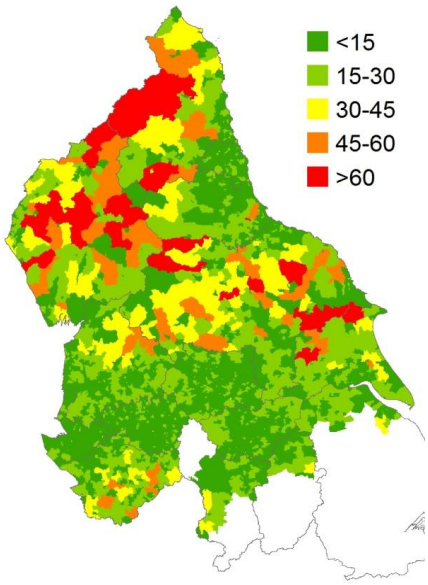
Geographic distribution

The following figures show the geographic distribution of the public transport time to GPs (Figure 145), hospitals (Figure 146), and food stores (Figure 147).

Almost all areas in the southern part of the North are within 30 minutes by public transport of the nearest GP and food store, but some areas in the northern part and in the eastern part are more than 1 hour away (Figure 145 and Figure 147).

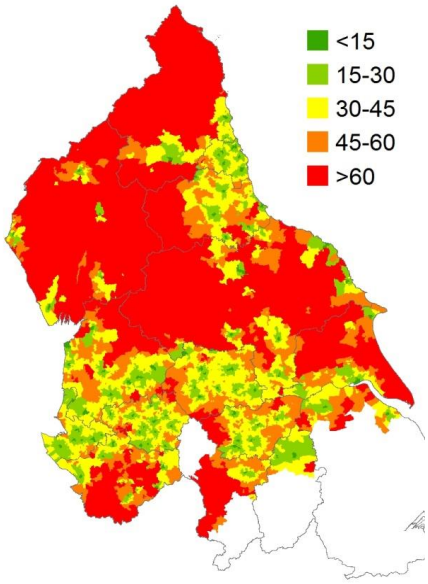
Most of the northern areas and some eastern and southern areas are also more than 1 hour away by public transport from the nearest hospital. Only the most urbanised areas have times lower than 30 minutes (Figure 146).

Figure 145: Public transport time to nearest GP (minutes)



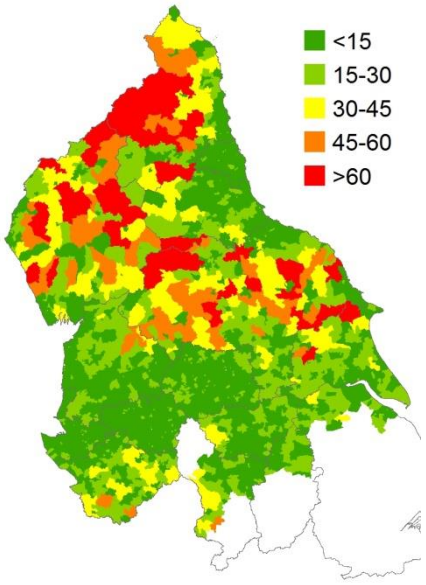
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015)https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Figure 146: Public transport time to nearest hospital (minutes)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015)https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Figure 147: Public transport time to nearest food shop (minutes)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Distribution by rural-urban and modified ONS classification

Table 26 shows the average travel times to the three types of facilities, by rural-urban classification and modified ONS classification. The figures that follow the table show the cumulative distribution of the public transport times by rural-urban and modified ONS classification.

In terms of the **rural-urban classification**, as shown in Table 26, the average car times to the nearest GP and food store are relatively balanced across all groups, with only values clearly above the overall average in the case of sparse rural villages and hamlets. However, the public transport times to those destinations are highly variable, with the values of rural villages and hamlets being around double of the overall average, and the values of sparse rural villages and hamlets being almost 4 times higher than the overall average. This is confirmed in the chart with the cumulative distribution of the time to GPs and food stores in Figure 148 and Figure 150).

The times to the nearest hospital are generally higher and more variable than the times to the other facilities, both in the case of car and public transport. The distribution of the public transport time to hospitals shown in Figure 149 illustrates the differences between the areas, which can be grouped into 5 different groups. The most urbanized areas (A1 to C1) have lowest times, followed by rural towns and fringes (D1), then by rural villages and hamlets (E1 and F1), rural town/fringes in a sparse setting (D2), and finally by rural villages and hamlets in a sparse setting (E2 and F2). Due to the small number of areas, C2 areas have an atypical distribution of public transport time to hospitals, with around two thirds of low times and one third of very high times.

As shown in Table 26, the differences between car and public transport times are substantial, in the case of access to hospitals in all types of areas, and of access to GPs and food stores in the less urbanised areas (E1, E2, F1, F2).

In terms of the **modified ONS classification**, as shown in Table 26, the average car times to the three facilities are balanced across all groups, except for Rural Residents. The public transport times to GPs and food stores are also balanced across all groups other than Rural Residents. This is also evident in the cumulative distribution charts in Figure 151 and Figure 153.

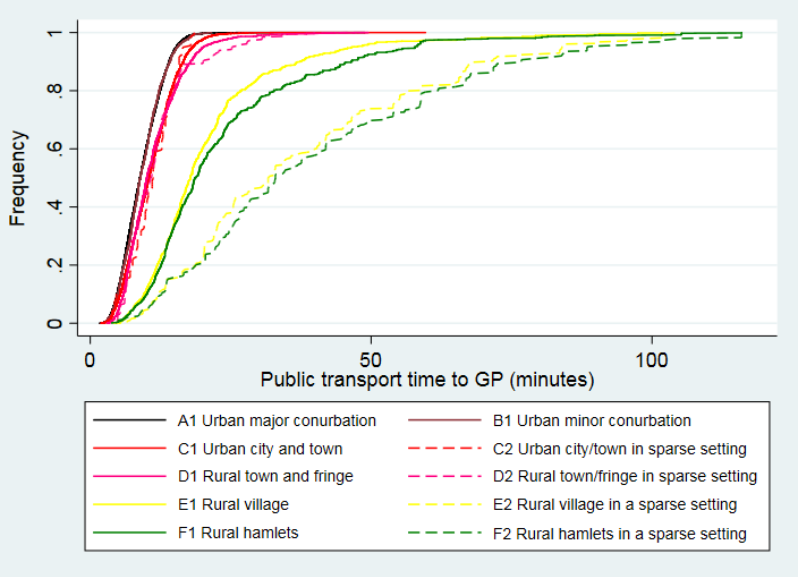
The times to hospitals are more variable, as the times in areas classified as Inner City Cosmopolitans and Multiculturals are considerably smaller than average and the times for Rural Residents are much higher than average. This is also clear in the cumulative distribution chart in Figure 152.

Table 26: Average indicators of accessibility to health-related facilities, by rural-urban and modified ONS classification

	Time to GP (minutes)			Time to hospital (minutes)			Time to food store (minutes)		
	Car	PT	Diff. Car-PT	Car	PT	Diff. PT-Car	Car	PT	Diff. PT-Car
All	8	11	3	18	35	17	7	9	2
A1 Urban major conurbation	8	9	2	17	31	14	7	8	1
B1 Urban minor conurbation	7	9	2	16	30	15	7	8	1
C1 Urban city and town	8	11	3	17	33	16	7	8	1
C2 Urban city/town (sparse)	9	11	2	30	47	18	7	8	1
D1 Rural town and fringe	8	11	3	23	47	24	7	10	2
D2 Rural town/fringe (sparse)	8	12	4	35	77	42	7	10	3
E1 Rural village	10	21	11	24	58	34	10	21	11
E2 Rural village (sparse)	12	38	26	35	89	55	13	40	27
F1 Rural hamlets	10	24	14	23	59	36	10	24	14
F2 Rural hamlets(sparse)	12	41	28	37	93	56	13	43	29
Inner City Cosmopolitans	7	7	0	14	23	9	7	5	-1
Multiculturals	7	7	0	15	26	11	7	7	0
Constrained City Dwellers	7	9	1	16	31	15	7	7	0
Hard Pressed Living 2	8	10	2	17	32	15	7	8	1
Urbanites	8	10	2	18	34	16	7	8	1
Metro Suburbs	8	11	3	18	34	17	7	9	2
Hard Pressed Living 1	8	11	3	19	37	18	7	8	1
Small Town Suburbs	8	13	4	18	38	20	7	10	3
Rural Residents	10	22	12	25	60	35	10	21	12

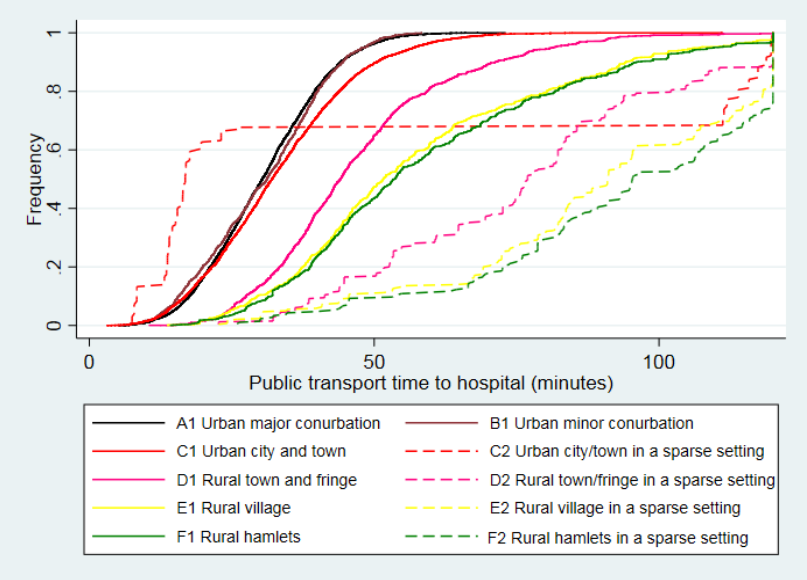
Notes: PT: Public transport, diff.: difference. **Sources**: Authors, derived from data from Department for Transport (Journey time statistics 2015)https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts, Rural-urban classification of output areas, and Modified ONS classification of output areas.

Figure 148: Cumulative distribution of public transport time to nearest GP, by rural-urban classification



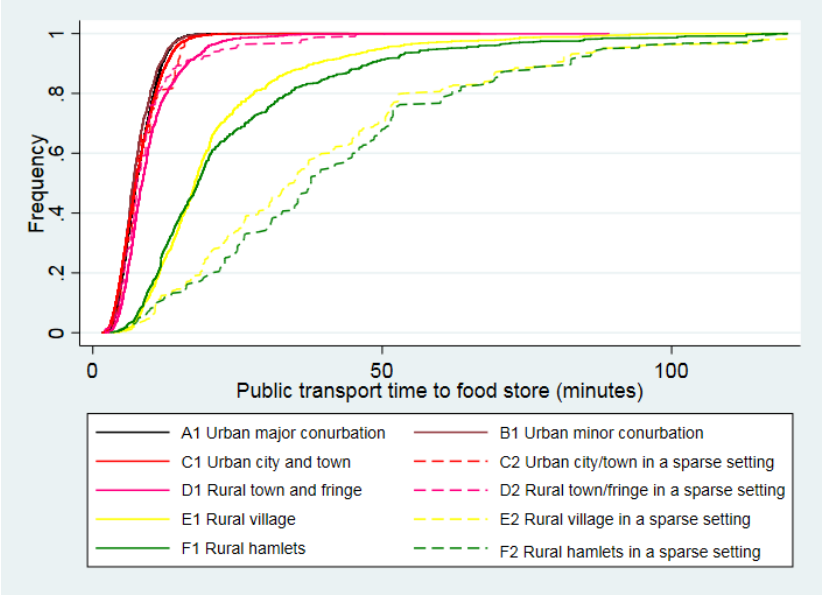
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 149: Cumulative distribution of public transport time to nearest hospital, by rural-urban classification



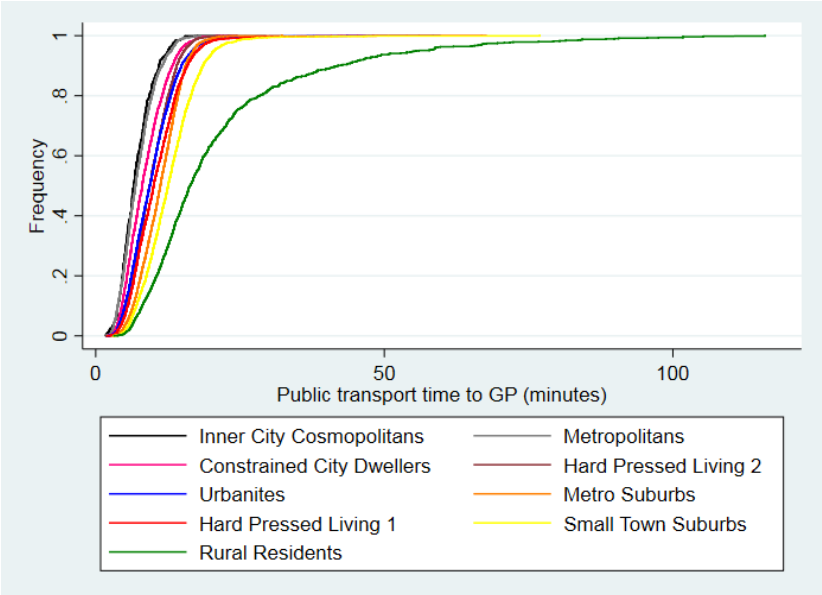
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 150: Cumulative distribution of public transport time to nearest food store, by rural-urban classification



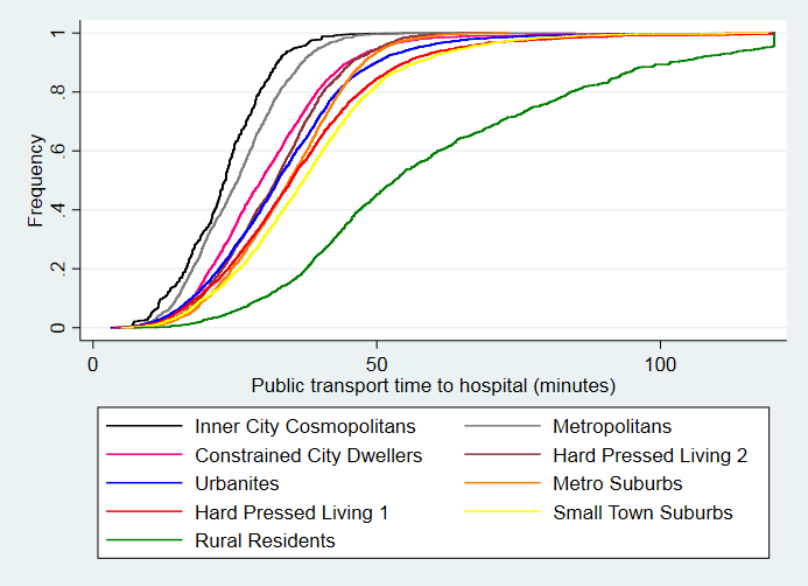
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 151: Cumulative distribution of public transport time to nearest GP, by modified ONS classification



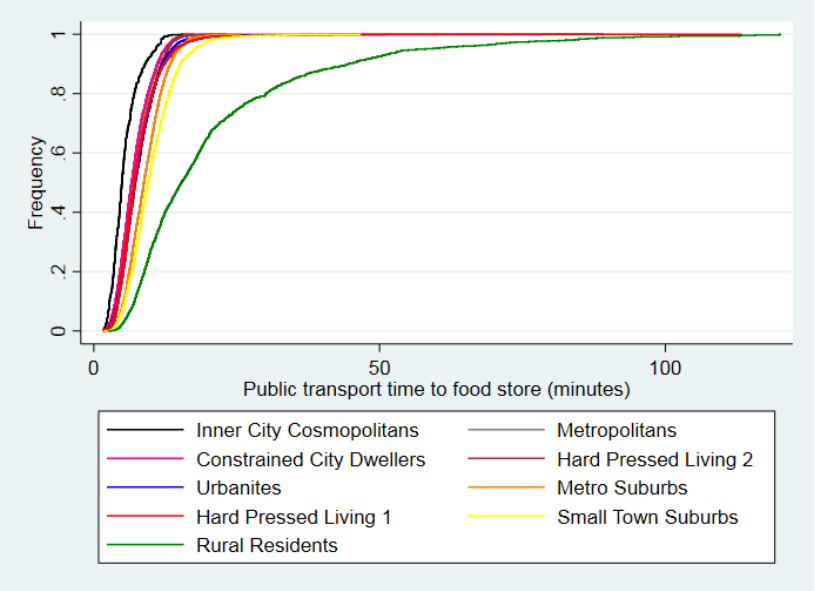
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 152: Cumulative distribution of public transport time to nearest hospital, by modified ONS classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 153: Cumulative distribution of public transport time to nearest food store, by modified ONS classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

5.5.2. Inaccessible areas

Inaccessible areas by public transport are identified as those where the public transport time to access a GP, hospital, or food store (or the difference between the public transport and car time) is more than one standard deviation above the mean for the whole population.

We also consider the situation when the public transport time to access all three types of facilities is in all three cases more than one standard deviation above the mean for the whole population.

Geographic distribution

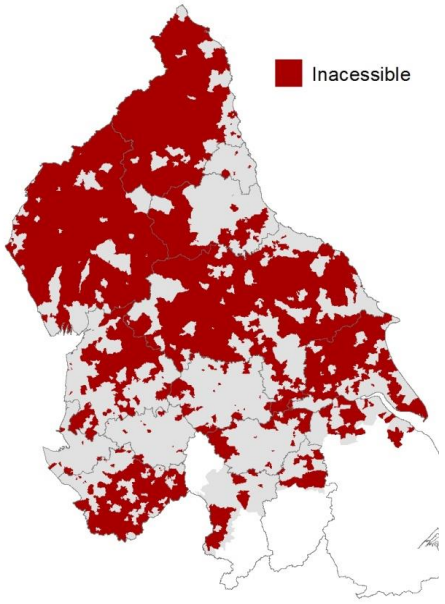
The following four figures show the location of the inaccessible areas for the three types of facilities separately (Figure 154, Figure 155, Figure 156) and then together (Figure 157).

The areas where the public transport time to access a GP or a food store is more than one standard deviation above the mean (Figure 154 and Figure 156) include many areas in the northern region, and some in the eastern and southern region. However, the number of inaccessible areas is considerably smaller than the number of inaccessible areas in terms of employment, as shown in Subsection 5.4.2 (Figure 142, Figure 143, and Figure 144).

The areas where the public transport time to access a hospital is more than one standard deviation above the mean form a more continuous area in the northern region, and includes also some areas in the eastern and southern regions (Figure 155).

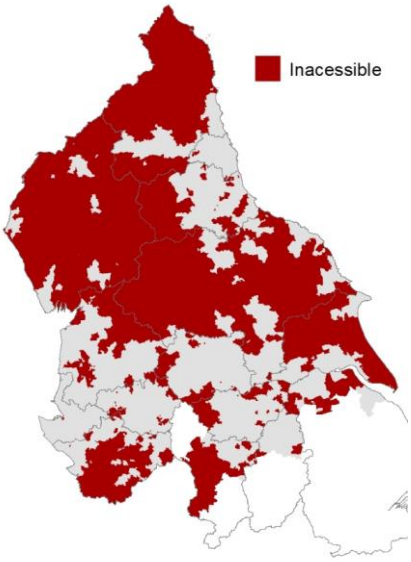
The areas where the public transport time to all three types of facilities is more than one standard deviation above the mean cover about half of the North, and are especially concentrated in the northern region (Figure 157).

Figure 154: Inaccessible areas (based on public transport time to nearest GP)



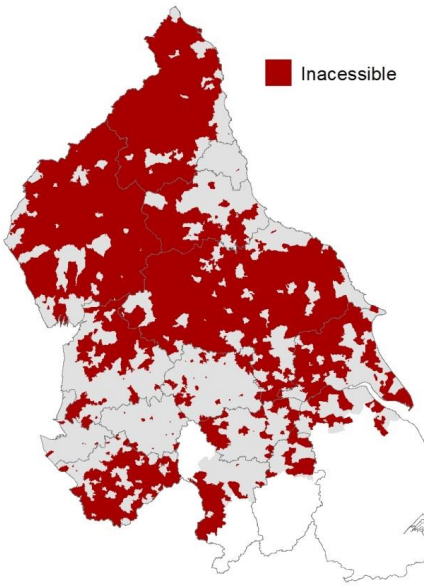
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Figure 155: Inaccessible areas (based on public transport time to nearest hospital)



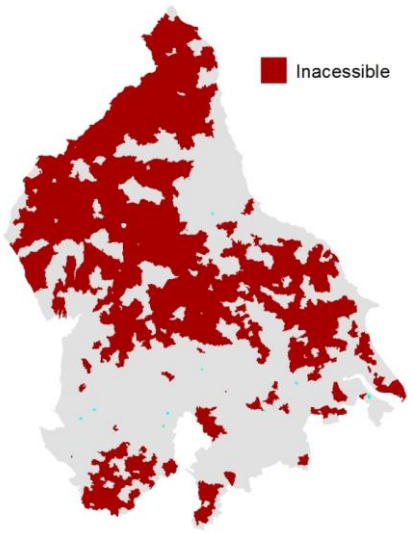
Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Figure 156: Inaccessible areas (based on public transport time to nearest food store)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Figure 157: Inaccessible areas (based on public transport time to three types of health-related facilities)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Distribution by rural-urban and modified ONS classification

Table 27 shows the proportion that the areas identified above represent in the population of the North and of the different types of areas in the rural-urban and modified ONS classification. It also includes similar statistics for an alternative definition of accessible areas based not on public transport travel but on the difference between public transport and car travel.

Overall, 7% of the North's population live in inaccessible areas defined by time to GP and 6% live in inaccessible areas defined by time to food stores. However, this value varies from 1-6% in conurbations and urban cities and towns (areas A1, B1, C1, and C2) to more than 80% in sparse villages, and hamlets (areas E2 and F2). The proportion of inaccessible areas defined by time to hospital is 11%, on average, but varies from 2% in conurbations to around 90% in sparse villages and hamlets. Only 3% of the population lives in areas inaccessible to all three types of destinations. This varies from 0% in the more urbanised areas (areas A1 to C2) to around 70% in sparse villages and hamlets.

In terms of the ONS classification, as in the case of access to employment centres, the inaccessible areas are overwhelmingly those classified as Rural Residents.

Table 27: Proportion of the North's population living in inaccessible areas to health-related facilities, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Time to GP		Time to hospital		Time to food store		Time to all 3	
	PT	Diff. Car-PT	PT	Diff. PT-Car	PT	Diff. PT-Car	PT	Diff. PT-Car
All	7%	6%	11%	10%	6%	5%	3%	3%
A1 Urban major conurbation	1%	1%	2%	2%	1%	0%	0%	0%
B1 Urban minor conurbation	1%	1%	2%	2%	1%	1%	0%	0%
C1 Urban city and town	6%	4%	8%	8%	2%	2%	0%	0%
C2 Urban city/town (sparse)	1%	0%	32%	32%	1%	1%	0%	0%
D1 Rural town and fringe	10%	8%	31%	25%	10%	7%	3%	3%
D2 Rural town/fringe (sparse)	11%	10%	80%	72%	9%	9%	8%	8%
E1 Rural village	49%	42%	49%	48%	57%	48%	28%	27%
E2 Rural village (sparse)	81%	79%	89%	87%	83%	78%	68%	66%
F1 Rural hamlets	55%	49%	53%	51%	56%	51%	37%	37%
F2 Rural hamlets(sparse)	82%	77%	91%	90%	84%	83%	73%	72%
Inner City Cosmopolitans	0%	0%	0%	0%	0%	0%	0%	0%
Multiculturals	0%	0%	0%	0%	0%	0%	0%	0%
Constrained City Dwellers	1%	1%	4%	4%	0%	0%	0%	0%
Hard Pressed Living 2	1%	1%	4%	3%	0%	0%	0%	0%
Urbanites	3%	2%	8%	7%	1%	1%	0%	0%
Metro Suburbs	3%	2%	4%	4%	2%	2%	0%	0%
Hard Pressed Living 1	4%	3%	13%	11%	3%	2%	1%	1%
Small Town Suburbs	13%	9%	14%	15%	7%	5%	1%	1%
Rural Residents	44%	39%	52%	49%	46%	41%	29%	28%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas) https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655, Modified ONS classification of output areas, and Census 2011.

Zero-car households in accessible and inaccessible areas

Table 28 compares the proportion of zero-car households in accessible and inaccessible areas, for the different definitions of inaccessibility, and segmenting the results by rural-urban and modified ONS classification.

As in the case of access to employment, the proportion of zero-car households is generally lower in inaccessible areas than in accessible areas, the difference being particularly high in the A1 areas (urban major conurbation). The difference is also high in the areas classified as Inner City Cosmopolitans and Multiculturals.

Table 28: Proportion of zero-car households in accessible and inaccessible areas to health-related facilities, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Time to GP				Time to hospital				Time to food store				Time to all 3			
	PT		Diff. Car-PT		PT		Diff. Car-PT		PT		Diff. Car-PT		PT		Diff. Car-PT	
Accessible?	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
All	27%	10%	27%	9%	27%	14%	27%	14%	27%	9%	27%	8%	26%	7%	26%	7%
A1 Urban major conurbation	31%	14%	31%	15%	31%	18%	31%	18%	31%	18%	31%	17%	30%	17%	30%	15%
B1 Urban minor conurbation	29%	13%	29%	15%	28%	31%	28%	30%	29%	8%	29%	8%	28%	45%	28%	45%
C1 Urban city and town	25%	13%	25%	12%	25%	19%	25%	18%	25%	10%	25%	9%	25%	8%	25%	7%
C2 Urban city/town (sparse)	28%	12%	28%		27%	29%	27%	29%	28%	12%	28%	12%	28%		28%	
D1 Rural town and fringe	18%	11%	18%	11%	18%	17%	18%	16%	18%	11%	18%	11%	18%	10%	18%	10%
D2 Rural town/fringe (sparse)	21%	17%	21%	17%	22%	21%	22%	20%	21%	18%	21%	18%	21%	17%	21%	17%
E1 Rural village	11%	8%	11%	8%	10%	8%	10%	8%	11%	8%	11%	8%	10%	7%	10%	7%
E2 Rural village (sparse)	12%	10%	12%	10%	12%	10%	12%	10%	12%	10%	11%	10%	12%	10%	12%	10%
F1 Rural hamlets	8%	5%	7%	5%	7%	6%	7%	5%	8%	5%	8%	5%	7%	5%	7%	5%
F2 Rural hamlets(sparse)	8%	6%	8%	6%	6%	6%	6%	6%	8%	6%	8%	6%	7%	6%	7%	6%
Inner City Cosmopolitans	46%	16%	46%	16%	46%	33%	46%	34%	46%	40%	46%		46%		46%	
Multiculturals	43%	17%	43%	19%	43%	22%	43%	28%	43%	31%	43%	32%	43%	13%	43%	11%
Constrained City Dwellers	52%	44%	52%	44%	52%	46%	52%	46%	52%	50%	52%	50%	52%	45%	52%	45%
Hard Pressed Living 2	35%	27%	35%	28%	35%	30%	35%	31%	35%	30%	35%	25%	35%	31%	35%	31%
Urbanites	21%	13%	20%	12%	20%	18%	20%	18%	20%	11%	20%	11%	20%	11%	20%	11%
Metro Suburbs	11%	8%	11%	8%	11%	9%	11%	8%	11%	8%	11%	8%	11%	8%	11%	7%
Hard Pressed Living 1	32%	25%	32%	25%	32%	28%	32%	28%	32%	24%	32%	24%	32%	20%	32%	20%
Small Town Suburbs	10%	8%	10%	7%	10%	8%	10%	8%	10%	6%	10%	6%	9%	6%	9%	5%
Rural Residents	10%	7%	10%	7%	10%	8%	10%	8%	11%	7%	10%	7%	10%	7%	10%	7%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011 https://www.nomisweb.co.uk/census/2011.

5.5.3. Transport poverty

Distribution by rural-urban and modified ONS classification

Areas with transport poverty are again defined as inaccessible areas by public transport (as defined above) where the proportion of zero-car households is above the mean for the whole population.

Table 29 shows the proportion that that the areas identified as having transport poverty represent in the population of the North and of the different types of areas in the rural-urban and modified ONS classification

Only a small proportion of the population lives in areas with transport poverty (0.4% in the case of access to GPs, 0.2% in the case of food stores and 2% in the case of access to hospitals). Almost no population lives in areas with transport poverty defined by lack of access to all three types of destinations.

These proportions in the case of time to hospital vary substantially: 20% of the population in sparse urban city/towns (C2) and 19% of the population in sparse rural town/fringe areas (D2) live in areas with transport poverty.

In terms of the modified ONS classification, the type of area with highest incidence of transport poverty, considering access to hospital, is the one classified as Hard Pressed Living 1.

Table 29: Proportion of areas with transport poverty to access health-related facilities, by rural-urban and modified ONS classification

TRANSPORT POVERTY BASED ON	Time to GP		Time to hospital		Time to food store		Time to all 3	
	PT	Diff. Car-PT	PT	Diff. Car-PT	PT	Diff. Car-PT	PT	Diff. Car-PT
All	0.4%	0.3%	2%	2%	0.2%	0.1%	0.0%	0.0%
A1 Urban major conurbation	0%	0%	1%	1%	0%	0%	0%	0%
B1 Urban minor conurbation	0%	0%	1%	1%	0%	0%	0%	0%
C1 Urban city and town	1%	0%	2%	2%	0%	0%	0%	0%
C2 Urban city/town (sparse)	0%	0%	20%	20%	0%	0%	0%	0%
D1 Rural town and fringe	1%	0%	6%	5%	1%	0%	0%	0%
D2 Rural town/fringe (sparse)	2%	2%	19%	16%	2%	2%	1%	1%
E1 Rural village	0%	0%	1%	0%	1%	0%	0%	0%
E2 Rural village (sparse)	1%	1%	1%	1%	1%	1%	0%	0%
F1 Rural hamlets	0%	0%	0%	0%	0%	0%	0%	0%
F2 Rural hamlets(sparse)	0%	0%	0%	0%	0%	0%	0%	0%
Inner City Cosmopolitans	0%	0%	0%	0%	0%	0%	0%	0%
Multiculturals	0%	0%	0%	0%	0%	0%	0%	0%
Constrained City Dwellers	1%	1%	4%	4%	0%	0%	0%	0%
Hard Pressed Living 2	0%	0%	2%	2%	0%	0%	0%	0%
Urbanites	0%	0%	1%	1%	0%	0%	0%	0%
Metro Suburbs	0%	0%	0%	0%	0%	0%	0%	0%
Hard Pressed Living 1	2%	1%	7%	6%	1%	1%	0%	0%
Small Town Suburbs	0%	0%	0%	0%	0%	0%	0%	0%
Rural Residents	0%	0%	0%	0%	0%	0%	0%	0%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011https://www.nomisweb.co.uk/census/2011.

Vulnerable population, inaccessible areas, and transport poverty

The comparison of the population living in the areas identified as inaccessible and having transport poverty and the average population considered the following characteristics that may be associated with social exclusion in the case of lack of accessibility to health-related facilities: age (>65 and >75), disability (all, and disabilities that severely limit day-to-day activities), general health condition (bad/very bad, very bad), population providing unpaid care (all and those providing more than 50 hours of care a week), and population with a long-term health problem and with dependent children.

Table 30 shows the results. The results of the areas with transport poverty based on time to all three types of destinations is not shown, as those areas represent a very small proportion of the total population, as seen above.

The proportion of population older than 65 is higher in both inaccessible areas and areas with transport poverty than in the whole population of the North. The proportion of

individuals with disability (all and those with severe disability), and bad or very bad health is slightly lower in inaccessible areas but higher in areas with transport poverty, compared with the whole population

Table 30: Proportion of vulnerable population in inaccessible areas and areas with transport poverty to access health-related facilities

	Age		Disability		Health		Carer		LT health problem+ child
	>65	>75	All	Severe	Bad/ very bad	Very Bad	All	>50 h.	
All	9%	6%	20%	10%	7%	5%	11%	3%	5%
INACESSIBILITY BASED ON:									
Time to GP									
PT	19%	7%	17%	8%	5%	1%	12%	2%	4%
Difference Car-PT	19%	7%	17%	7%	4%	1%	12%	2%	4%
Time to hospital									
PT	18%	7%	19%	9%	5%	1%	12%	3%	4%
Difference PT-Car	19%	7%	19%	9%	5%	1%	12%	3%	4%
Time to food store									
PT	19%	7%	17%	7%	4%	1%	12%	2%	4%
Difference PT-Car	19%	7%	17%	7%	4%	1%	12%	2%	4%
TRANSPORT POVERTY BASED ON									
Time to GP									
PT	18%	8%	26%	14%	9%	2%	11%	4%	5%
Difference Car-PT	17%	8%	26%	14%	10%	2%	11%	4%	6%
Time to hospital									
PT	17%	8%	26%	14%	9%	2%	11%	3%	5%
Difference PT-Car	17%	8%	26%	14%	10%	2%	11%	4%	6%
Time to food store									
PT	14%	6%	24%	13%	9%	2%	10%	3%	7%
Difference PT-Car	15%	6%	24%	13%	9%	2%	10%	3%	6%

Notes: LT: Long term, 50h: 50 hours. **Source:** Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and Census 2011 https://www.nomisweb.co.uk/census/2011.

5.6 Town centres

5.6.1. Accessibility indicators

The indicators of accessibility to town centres are the public transport time to the nearest town centre and the difference in time by public transport and car.

Descriptive statistics

Table 31 shows descriptive statistics of the indicators. The average time to reach the nearest town centre is 12 minutes by car and 21 minutes by public transport. However,

public transport times are highly variable, having a standard deviation of 11 minutes and a maximum value of 120 minutes.

Table 31: Descriptive statistics of indicators of accessibility to town centre

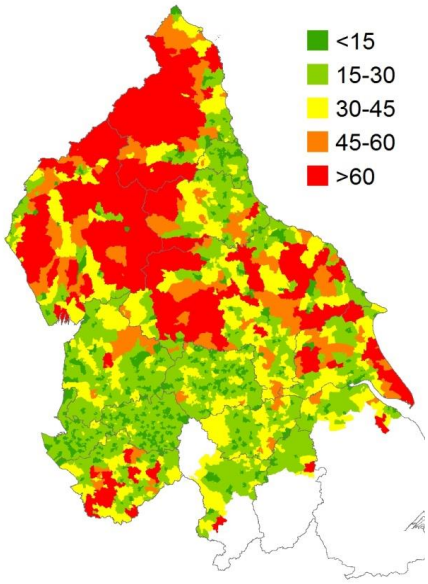
	Mean	Std. Dev.	Min	Max
Time to nearest town centre (minutes)				
By car	12	4	6	47
By public transport	21	11	3	120
Difference car and public transport	9	8	-4	120

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Geographic distribution

Figure 158 shows the geographic distribution of the public transport time to the nearest town centre. About half of the total area of the North is more than 1 hour away from the nearest town centre by public transport. Most the areas more than one hour away are in the northern region, but there are also a few areas in the south-western region.

Figure 158: Public transport time to nearest town centre (minutes)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts and ONS (Output Areas Boundaries 2011).

Distribution by rural-urban and modified ONS classification

Table 32 shows the average travel times to town centres by rural-urban classification and modified ONS classification and the two figures that follow the table show the cumulative distribution of the indicators of public transport time by rural-urban and modified ONS classification.

In terms of the **rural-urban classification**, as shown in Table 32, the average car and public transport times are reasonably balanced across all groups, but with values clearly

above the overall average in the least urbanized areas (E1 to F2). This is also visible in the chart with the cumulative distribution in Figure 159.

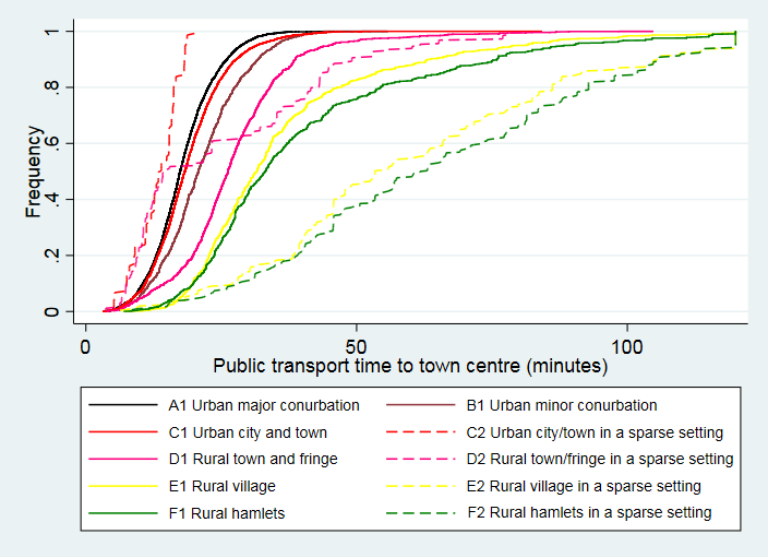
In terms of the **modified ONS classification**, as shown in Table 32, the average car times are balanced across all groups, with the exception of Rural Residents. The public transport times are also balanced across all groups other than Rural Residents, which have times much higher than average, and Inner City Cosmopolitans, which have times lower than average. This is also clear in the cumulative distribution chart in Figure 160.

Table 32: Average indicators of accessibility to town centre, by rural-urban and modified ONS classification

	Time to town centre (minutes)		
	Car	PT	Diff. Car-PT
All	12	21	9
A1 Urban major conurbation	11	18	7
B1 Urban minor conurbation	13	21	9
C1 Urban city and town	12	19	7
C2 Urban city/town (sparse)	9	13	4
D1 Rural town and fringe	16	27	12
D2 Rural town/fringe (sparse)	15	25	10
E1 Rural village	16	37	20
E2 Rural village (sparse)	21	61	40
F1 Rural hamlets	17	40	24
F2 Rural hamlets(sparse)	22	65	43
Inner City Cosmopolitans	10	13	3
Multiculturals	11	17	6
Constrained City Dwellers	11	17	6
Hard Pressed Living 2	12	20	8
Urbanites	11	18	7
Metro Suburbs	12	20	8
Hard Pressed Living 1	12	21	8
Small Town Suburbs	13	23	10
Rural Residents	17	37	21

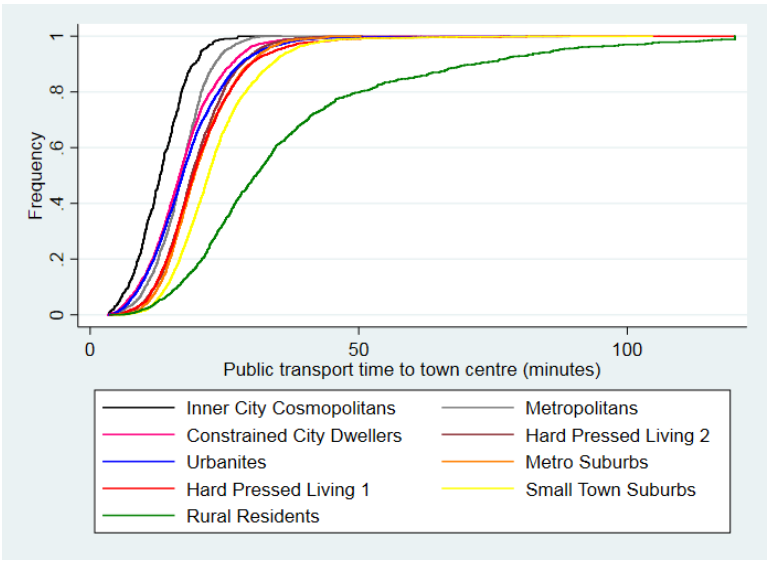
Notes: PT: Public transport, diff.: difference. **Sources**: Authors, derived from data from Department for Transport (Journey time statistics 2015) https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts, Rural-urban classification of output areas, and Modified ONS classification of output areas.

Figure 159: Cumulative distribution of public transport time to nearest town centre, by rural-urban classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

Figure 160: Cumulative distribution of public transport time to nearest town centre, by modified ONS classification



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015).

5.6.2. Inaccessible areas

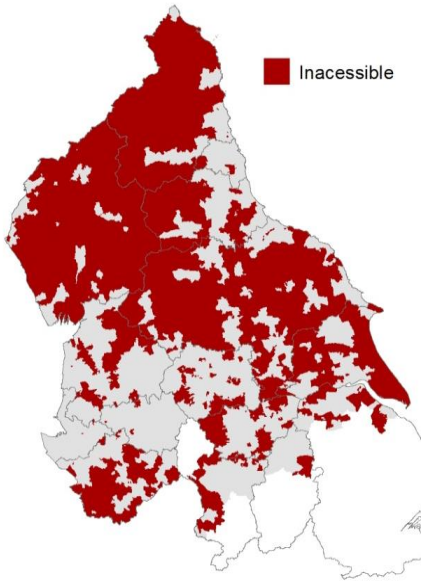
Inaccessible areas by public transport are identified as those where the public transport time to access a town centre (or the difference between the public transport and car time) is more than one standard deviation above the mean for the whole population.

Geographic distribution

Figure 161 show the location of the inaccessible areas. They are broadly similar to the inaccessible areas in the case of GPs and food stores, previously shown in Figure 154 and Figure 156.

Distribution by rural-urban and modified ONS classification

Figure 161: Inaccessible areas (based on public transport time to nearest town centre)



Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and ONS (Output Areas Boundaries 2011 https://borders.ukdataservice.ac.uk/easy_download_data.html?data=England_oa_2011).

Table 33 shows the proportion that the areas identified above represent in the population of the North and of the different types of areas in the rural-urban and modified ONS classification. It also includes similar statistics for an alternative definition of accessible areas based not on public transport travel but on the difference between public transport and car travel.

Overall, 9% of the North's population live in inaccessible areas. However, this value is very unequally distributed, with values much higher than average in all the rural areas (D1 to F2), especially in sparse villages and hamlets (E2 and F2), where it reaches more than 80%.

In terms of the ONS classification, the inaccessible areas are overwhelmingly those classified as Rural Residents, but also some classified as Small Town Suburbs.

Table 33: Proportion of inaccessible areas to town centre, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Time to town centre	
	PT	Diff. Car-PT
All	9%	7%
A1 Urban major conurbation	2%	1%
B1 Urban minor conurbation	10%	5%
C1 Urban city and town	5%	3%
C2 Urban city/town (sparse)	0%	0%
D1 Rural town and fringe	26%	16%
D2 Rural town/fringe (sparse)	36%	20%
E1 Rural village	48%	41%
E2 Rural village (sparse)	83%	79%
F1 Rural hamlets	53%	47%
F2 Rural hamlets (sparse)	87%	82%
Inner City Cosmopolitans	0%	0%
Multiculturals	0%	0%
Constrained City Dwellers	3%	2%
Hard Pressed Living 2	4%	3%
Urbanites	5%	3%
Metro Suburbs	6%	4%
Hard Pressed Living 1	7%	4%
Small Town Suburbs	13%	10%
Rural Residents	47%	40%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas) https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655, Modified ONS classification of output areas, and Census 2011.

Zero-car households in accessible and inaccessible areas

Table 34 compares the proportion of zero-car households in accessible and inaccessible areas, segmenting the results by rural-urban and modified ONS classification. As in the case of access to employment and health-related facilities, the proportion of zero-car households is generally lower in inaccessible areas than in accessible areas, the difference being particularly high in the more urbanized areas (A1 to C1) and in the areas classified as Inner City Cosmopolitans and Multiculturals.

Table 34: Proportion of zero-car households in accessible and inaccessible areas to town centre, by rural-urban and modified ONS classification

INACCESSIBILITY BASED ON:	Time to town centre			
	PT		Diff. Car-PT	
Accessible?	Yes	No	Yes	No
All	27%	13%	27%	12%
A1 Urban major conurbation	31%	21%	31%	22%
B1 Urban minor conurbation	29%	21%	29%	21%
C1 Urban city and town	25%	14%	25%	12%
C2 Urban city/town (sparse)	28%		28%	
D1 Rural town and fringe	19%	15%	18%	14%
D2 Rural town/fringe (sparse)	20%	22%	21%	21%
E1 Rural village	10%	8%	10%	8%
E2 Rural village (sparse)	11%	10%	11%	10%
F1 Rural hamlets	7%	5%	7%	5%
F2 Rural hamlets(sparse)	6%	6%	7%	6%
Inner City Cosmopolitans	46%	26%	46%	26%
Multiculturals	43%	32%	43%	37%
Constrained City Dwellers	52%	50%	52%	52%
Hard Pressed Living 2	35%	32%	35%	34%
Urbanites	21%	15%	21%	13%
Metro Suburbs	11%	10%	11%	9%
Hard Pressed Living 1	32%	27%	32%	27%
Small Town Suburbs	10%	8%	10%	7%
Rural Residents	10%	8%	10%	7%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011 https://www.nomisweb.co.uk/census/2011.

5.6.3. Transport poverty

Distribution by rural-urban and modified ONS classification

Areas with transport poverty are again defined as inaccessible areas by public transport (as defined above) where the proportion of zero-car households is above the mean for the whole population.

Table 35 shows the proportion that that the areas identified as having transport poverty represent in the population of the North and of the different types of areas in the rural-urban and modified ONS classification

Only 1% of the population lives in areas with transport poverty. However, in sparse rural town/fringe areas the proportion is 10%.

Table 35: Proportion of areas with transport poverty to access town centres, by rural-urban and modified ONS classification

TRANSPORT POVERTY BASED ON	Time to town centre	
	PT	Diff. Car-PT
All	1%	1%
A1 Urban major conurbation	1%	1%
B1 Urban minor conurbation	3%	2%
C1 Urban city and town	1%	0%
C2 Urban city/town (sparse)	0%	0%
D1 Rural town and fringe	4%	2%
D2 Rural town/fringe (sparse)	10%	5%
E1 Rural village	1%	0%
E2 Rural village (sparse)	1%	0%
F1 Rural hamlets	0%	0%
F2 Rural hamlets(sparse)	0%	0%
Inner City Cosmopolitans	0%	0%
Multiculturals	0%	0%
Constrained City Dwellers	3%	2%
Hard Pressed Living 2	3%	2%
Urbanites	0%	0%
Metro Suburbs	0%	0%
Hard Pressed Living 1	3%	2%
Small Town Suburbs	0%	0%
Rural Residents	0%	0%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts), Office for National Statistics (2013 Rural-urban classification of output areas https://ons.maps.arcgis.com/home/item.html?id=3ce248e9651f4dc094f84a4c5de18655), Modified ONS classification of output areas, and Census 2011 https://www.nomisweb.co.uk/census/2011.

Vulnerable population, inaccessible areas, and transport poverty

The comparison of the population living in the areas identified as inaccessible and having transport poverty and the average population considered the following characteristics: age (>65 and >75), 1-person households (All and with age>65), individuals less than 2 years living in the UK, disability (all, and disabilities that severely limit day-to-day activities), general health condition (bad/very bad, very bad), population providing unpaid care (all and those providing more than 50 hours of care a week), household reference persons classified as Grade DE, individuals without qualifications, unemployment, population without work and with dependent children, lone parents without working, population with a long-term health problem and with dependent children, and students.

Table 36 shows the results. The proportion of population older than 65 is higher in both inaccessible areas and areas with transport poverty than in the whole population of the North. The proportion of 1-person households (all and those aged>65), individuals with disability (all and those with severe disability), and bad or very bad health, individuals

with no qualifications, or unemployed is lower in inaccessible areas but higher in areas with transport poverty, compared with the whole population

Table 36: Proportion of vulnerable population in inaccessible areas and areas with transport poverty to access town centres

	Age		1-person household		<2yrs in UK	Disability		Health		Carer		Grade DE	No qualif.	Unemp.	No work +		LT health problem + child	Student
	>65	>75	All	>65		Severe	Bad/ very bad	Bad	All	All	>50h				child	lone par.		
All	15%	6%	30%	12%	1%	20%	10%	7%	1%	11%	3%	29%	28%	7%	5%	3%	5%	8%
INACESSIBILITY BASED ON:																		
Time to town centre																		
PT	18%	7%	26%	12%	0%	18%	8%	5%	1%	12%	3%	20%	23%	5%	2%	2%	4%	6%
Difference Car-PT	18%	7%	25%	12%	0%	18%	8%	5%	1%	12%	2%	19%	22%	4%	2%	1%	4%	6%
TRANSPORT POVERTY BASED ON																		
Time to town centre																		
PT	18%	8%	37%	18%	0%	27%	15%	10%	2%	11%	4%	41%	39%	12%	7%	5%	5%	6%
Difference Car-PT	17%	8%	36%	17%	0%	27%	15%	10%	2%	11%	4%	41%	39%	12%	7%	5%	6%	6%

Source: Authors, derived from data from Department for Transport (Journey time statistics 2015 https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts) and Census 2011 https://www.nomisweb.co.uk/census/2011.

5.7 Conclusions

This chapter analysed levels of accessibility to employment centres, health-related facilities, and town centres, in the North, looking at how accessibility differs with the characteristics of the areas and of the population. The study used census output areas as unit of analysis and first focused on the distribution of accessibility indicators, then defined and characterised inaccessible areas (those more than one standard deviation below the mean level of accessibility in the North) and areas with transport poverty (inaccessible areas where the proportion of zero-car households is above the mean).

We found that the accessibility provided by car is generally higher than the accessibility provided by public transport. However, the accessibility provided by public transport is highly variable, and is much higher in urbanized areas and in areas where the population is classified as Inner City Cosmopolitans and Multiculturals in the modified ONS classification created in the User Insight Phase 1 research (SDG 2018a).

There is also a regional divide between the northern and southern regions, with the latter being in general much more accessible. Another divide is between the highly urbanised areas in the Liverpool-Manchester-Leeds axis and Newcastle-Sunderland region and the rest of the North.

The proportion of areas identified as having transport poverty is in general small. However, this proportion is also variable, and is particularly high in areas classified as sparse rural town/fringe, and Hard Pressed Living 1.

Moreover, areas identified as having transport poverty have higher than average proportions of some groups at risk of transport-related social exclusion, such as older people, 1-person households, individuals with poor health, unemployed people, individuals with low qualifications, and with elementary/routine occupations,

The results also help to explain some of the key travel characteristics identified for the population in the different types of areas in the revised ONS classification as shown in Table 1 in Chapter 2 of this report. For example, Inner City Cosmopolitans have low car ownership and use, which is consistent with the fact they live in the most accessible areas, and where the difference in car and public transport accessibility is minimal, as shown in the present study. A similar remark can be made in the case of Multiculturals, which have low car ownership and travels less and over shorter distances, which is consistent with the fact that they live in very accessible areas. In contrast, the high car ownership and levels of car commuting for Rural Residents is associated with low levels of public transport accessibility. Individuals in Hard Pressed Living 1 areas also travel less and make shorter journeys, compared with the average which is consistent with the fact that they tend to live in more isolated areas, with levels of accessibility that are lower than average.

The results of the present study have some caveats, due to the limitations in the datasets used. As mentioned in Subsection 5.2.6., the use of spatially aggregate data may mask internal variations inside each area and does not allows us to fully understand the constraints face by each individual or households to their travel behaviour. In addition, the available datasets lack important variables, such as the accessibility and affordability of different public transport modes in each area.

6 CONCEPTUAL FRAMEWORK

6.1 Introduction

This chapter brings together the results of Chapters 4 and 5 and discusses their implications in terms of the analytical framework developed in the literature review in Chapter 2. In particular, we assess whether there is enough evidence supporting the hypotheses derived from the literature in the case of the North region, after reviewing the results on the existence, nature, and intensity of the links between the different variables of interest. The objective is to gauge the possible impact of TfN's planned transport investments on travel behaviour and on the ability of individuals to take advantage of the increased opportunities provided by that investment.

The structure of this chapter mirrors that of Section 2.2 of the literature review:

- Section 6.2 discusses the determinants of travel behaviour and how they vary by group.
- Section 6.3 looks at the constraints faced by individuals to their travel choices.
- Section 6.4 looks at the impacts of travel behaviour on individuals and society.
- Section 6.5 brings together all the parts of the framework.

As in Chapter 2, the conceptual framework will be presented in different parts, showing only the relevant links in each section.

The framework shows all the links described in the literature review. However, in this chapter, the links are represented with different colours and sizes, as below. It should be noted that a link classified as having “moderate evidence” is not necessarily a link with weak statistical associations between the variables of interest, but simply a link where the methods used to gauge evidence in this study were not robust enough or did not test direct statistical associations.

Table 37: Legend of framework figures

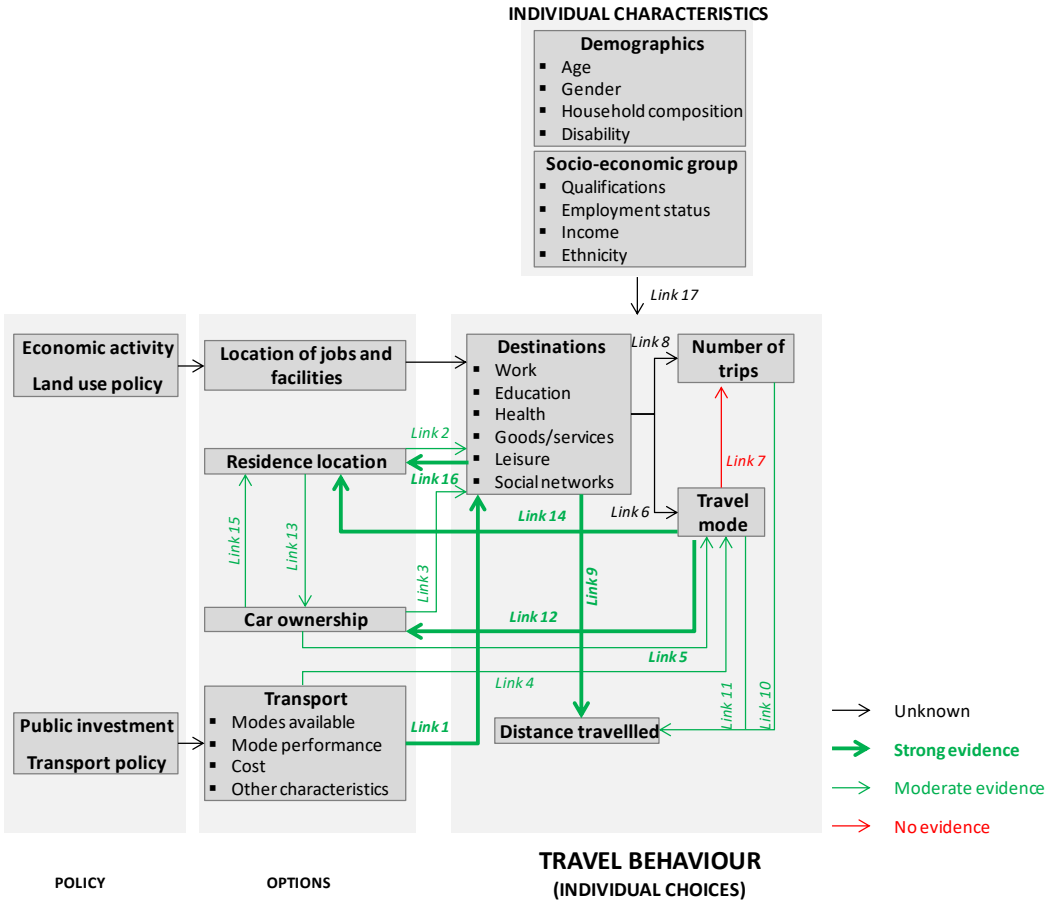
Legend		Description	
———	Black	Unknown	(The study did not provide enough evidence on the link)
———	**Green (thick)**	**Strong evidence**	**(The study showed strong evidence that the link applies in the North)**
———	Green (thin)	Moderate evidence	(The study showed moderate evidence that the link applies in the North)
———	Red	No evidence	(The study showed evidence that the link does not apply in the North)

6.2 Causes and effects of travel behaviour

6.2.1. Travel behaviour and its social determinants

Figure 162 shows the revised first part of the conceptual framework, showing how travel behaviour relates to the available options and to the characteristics of individuals. The links are represented using the legend defined in Section 6.1. The subsections that follow synthesize the evidence (of lack of evidence) that the study provided on each link.

Figure 162: Conceptual framework (Part 1)



6.2.2. Choice of destinations

The study found strong evidence that the choices people make over the places where they go are associated with their levels of access to private transport and with levels of access and perceived quality of public transport (*Link 1* in Figure 162). For example, the quantitative survey found that 43% of survey participants who currently do not have access to a car would consider changing where to work, or look for work, if they had access to a car. Similarly large proportions (38%-44%) would also consider changing where to work or look for work it they could reach more places by public transport or if they had faster, more reliable, more comfortable, or safe public transport.

There is also some evidence that this potential impact of public transport improvements on employment location depends on residence location (*Link 2* in Figure 162) and on current car ownership rates (*Link 3* in Figure 162). In other words, if public transport in the North was improved, people would expand the areas they would consider changing where to work or look for work, but this depends on where they currently live and whether they have access to a car. This is suggested by the fact that survey participants in the user segments with the highest propensity to change their employment location (Multiculturals and Inner City Cosmopolitans) were also the ones with the highest propensity to live in larger cities and rented dwellings, and with the lowest current car ownership rates. The evidence is classified as "moderate" and should be treated with caution, as the study did not test the existence of direct statistical associations at the individual level between propensity to change residence location and characteristics of current residence location and car ownership.

6.2.3. Choice of travel modes

Comparing the results of different stages of the research, we can also find some evidence reaffirming our understanding that the choice of travel modes is associated with levels of accessibility provided by the different modes of transport (*Link 4* in Figure 162). For example, the user segments with highest levels of public transport accessibility (Multiculturals and Inner City Cosmopolitans), as found in the secondary data analysis, make a higher proportion of trips by public transport, as found in the quantitative survey. Conversely, the segments with lowest levels of public transport accessibility (Rural Residents, Small Town Suburbs, and Hard Pressed Living 1) make the fewest trips by public transport.

We also found some evidence, from the quantitative survey, that the choice of travel mode is linked with car ownership (*Link 5* in Figure 162). This is because the segments with highest proportion of trips by public transport (Rural Residents, Small Town Suburbs, and Hard Pressed Living 1) are also the ones with highest car ownership rates; while the segments with the lowest proportion (Multiculturals and Inner City Cosmopolitans) are the ones with the lowest car ownership rates.

Both of the links mentioned above are classified as having "moderate evidence" as the study did not test the existence of direct statistical associations between the variables of interest.

The study did not collect information on the link between choice of travel destinations and number of trips made (*Link 6* in Figure 162).

6.2.4. Choice of number of trips

It is uncertain from this study whether the number of trips is related to travel mode choice (*Link 7* in Figure 162). For example, the quantitative survey found that some segments (e.g. Rural Residents) make a relatively high number of trips but a very small proportion of trips by public transport, while other segments (Multiculturals and Inner City Cosmopolitans) make a high number of trips and a high proportion of trips by public

transport. This may be explained by geographic aspects. As seen in the secondary data review, Rural Residents live in areas with poor public transport accessibility and Multiculturals and Inner City Cosmopolitans live in areas with better public transport accessibility.

The study did not collect information on the link between choice of travel destinations and number of trips made (*Link 8* in Figure 162).

6.2.5. Distance travelled

The quantitative survey found that the maximum distance travelled is strongly correlated with the number of places visited (correlation=0.41) (*Link 9* in Figure 162) and less strongly correlated with the number of trips made (correlation=0.21) (*Link 10* in Figure 162) and with the proportion of trips by public transport (correlation=0.05) (*Link 11* in Figure 162).

6.2.6. Choice of car ownership

The study found strong evidence, from the quantitative survey, that the decision to own a car is associated with travel conditions, and particularly with public transport conditions, as sizeable proportions (around 20-25%) of all participants who currently own a car indicated they would consider selling it they could reach more places by public transport or if they had faster, more reliable, more comfortable, or safer public transport (*Link 12* in Figure 162)

We also found some evidence that the link between public transport conditions and car ownership is mediated by residence location (*Link 13* in Figure 162), as the user segments with the highest propensity to consider selling their car (Multiculturals, Inner City Cosmopolitans, and Constrained City Dwellers), as found in the quantitative survey, tend to have highest propensity to live in larger cities, as found in the User Insight Programme Phase 1. In contrast, the segments with the lowest propensity to consider selling their car (Urbanites, Metro Suburbs, Small Town Suburbs, and Rural Residents) are the ones with the lowest propensity to live in larger cities. Again, this evidence is classified as “moderate” as the study did not test the existence of statistical associations between the variables of interest.

6.2.7. Choice of trip origins (residence location)

The quantitative survey also found strong evidence that levels of access to private transport and levels of access to and quality of public transport could influence the choice of residence location (*Link 14* in Figure 162). For example, around one third of all survey participants who currently do not have access to a car would consider changing where to live if they had access to a car. Slightly lower proportions (25%-33%) of the overall sample would also consider changing where to live if they could reach more places by public transport or if they had faster, more reliable, more comfortable, or safer public transport.

We also found some evidence that this potential impact of private or public transport improvements on residence location depends on car ownership (*Link 15* in Figure 162), as the user segments with the lowest propensity to consider changing their residence location (Urbanites, Metro Suburbs, Small Town Suburbs, and Rural Residents), as found in the quantitative survey, also tend to gave the highest current car ownership rates. In contrast, the user segments with the highest propensity to consider changing their residence location (Multiculturals, Inner City Cosmopolitans, and Constrained City Dwellers) are the ones with the lowest current car ownership rates, as found in the User Insight Programme Phase 1. Again, this evidence is classified as "moderate" as the study did not test the existence of statistical associations between the variables of interest. However, the results of the qualitative stage give further insights on how lack of access to a car limits people's choices regarding where to live, particularly in the Multiculturals and Constrained City Dwellers segments.

The attractiveness of trip destinations is also associated with the choice over residence location (*Link 16* in Figure 162). For example, we found in the quantitative survey that 34% of participants would consider changing their residence location if a better job opportunity appeared in a place that is too far from the place where they live now.

6.2.8. Social determinants of travel behaviour

The quantitative survey and the qualitative study found that travel behaviour differed according to user segment. It is not possible to pinpoint any relationship between travel behaviour and individual characteristics (*Link 17* in Figure 162), as the segments synthesize information on many variables (as obtained in the User Insight Programme Phase 1).

6.3 Constraints to travel behaviour

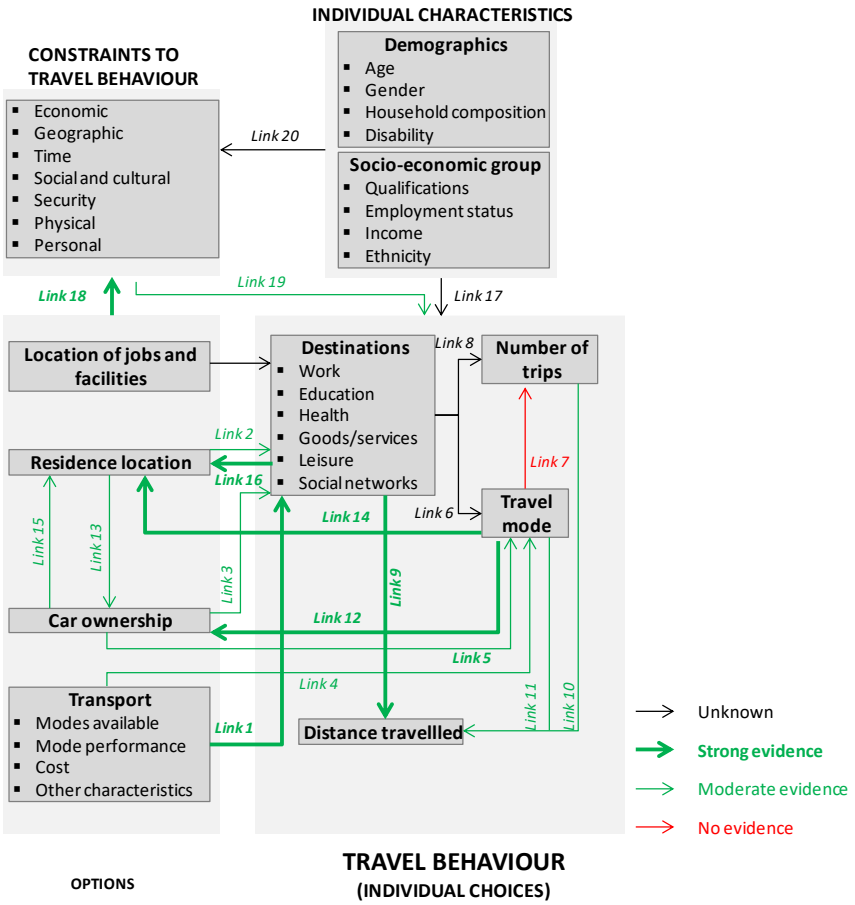
Figure 2 shows how constraints to travel behaviour related to travel behaviour, the available options, and the characteristics of individuals. The following subsections synthesize the evidence (of lack of evidence) that the study provides on each link.

The study found strong evidence that individuals in the North face constraints to their travel behaviour derived from restrictions to the set of transport options available and their residence location and desired travel destinations (*Link 18* in Figure 2). However, we found only moderate evidence on the extent to which those constraints to travel imply changes to actual travel behaviour (*Link 19* in Figure 2).

While the study found that constraints to travel behaviour differed according to user segment, it is not possible to pinpoint any relationship between the extent of those constraints and individual characteristics (*Link 20* in Figure 2). However, the results suggest some relationships between socio-economic status and travel constraints. For example, the more economically-deprived segments, i.e. those with high percentage of individuals with no qualifications or students, including Inner City Cosmopolitans, Multiculturals, Constrained City Dwellers, and Hard Pressed Living 1 and 2, showed a

higher propensity to change where they live if they had faster, more reliable, more comfortable, or safer public transport, compared with other segments.

Figure 163: Conceptual framework (Part 2)



6.3.1. Geographic constraints

The review of secondary data suggests that the population in some areas face geographic constraints to travel. For example, we found that access to opportunities such as employment and amenities such as town centres and health-related facilities is unequally distributed across the North, with the population in peripheral areas living much more distant from those destinations than those in central areas, especially when considering travel time by public transport.

The role of geographic constraints to travel was then confirmed in the quantitative survey, which found that the distance to the places where one wants to go was the main reason (cited by 9% of all participants) for travelling shorter distances than desired. Travel distance was also one of the top 10 reasons for travelling beyond the local area less often than desired and for travelling to fewer places than desired (cited by 8% and 9% of all participants, respectively).
These results suggest that distance is a factor limiting the propensity for pan-northern travel and supports the vision of the Strategic Transport Plan for improving connectivity

across the region, which can widen the reach of labour markets and contribute for a wider range of job and other opportunities available to the population.

6.3.2. Economic constraints

We found strong evidence of the existence of economic constraints to travel in the North. For example, the cost of using public transport was the second most identified reason (cited by 10% of all participants in the quantitative survey) for travelling beyond the local area less frequently than desired and the third most frequent reason for travelling to fewer places than desired (cited by 11%) and for travelling shorter distances than desired (cited by 7%). It was also one of the top 10 reasons for travelling by car to places participants would ideally travel by public transport.

These constraints were confirmed in the qualitative study. One of the recurring themes in the group discussions was that the current cost of rail and/or bus limits the number of trips made across the North. Economic aspects were a key barrier to greater use of public transport in 7 of the 9 user segments, i.e. all segments except Small Town Suburbs and Rural Residents).

The costs of owning and using a car were less relevant as constraints to travel behaviour. In fact, in the quantitative survey, this was only in the top 10 reasons for one of the constraints analysed (travel beyond the local area less often than desired), cited by 6% of all participants.

Overall, the results suggest that economic factors limit the mobility and accessibility of the population living in the North and support the vision of the Strategic Transport Pan for providing improved access while avoiding transport poverty (TfN 2017, p.13).

6.3.3. Time constraints

There was also fairly strong evidence of the existence of time constraints to travel. In the quantitative survey, several of the main reasons for constraints to travel behaviour were related to time. Some of these time constraints originate from the participants' difficulty in finding the time to travel. This was a top 10 reason for travelling beyond the local area less often than desired, travelling to fewer places than desired, and travelling shorter distances than desired (cited by 9%, 11%, and 7% of all participants, respectively). The qualitative study also found that participants in some segments, such as Inner City Cosmopolitans, had particularly impactful time pressures. In the business quantitative survey, time-related reasons were also the first and second reason for constraints to the number of places visited and one of the main reasons for constraints to distance travelled.

Other time-based constraints to travel behaviour originate from insufficiencies of public transport. In the quantitative survey, unreliable, slow, and infrequent services were the top 3 reasons for using car to go to places where participants would ideally like to go by public transport. Those reasons were also in the top 10 reasons for travelling beyond

the local area less often than desired, travelling to fewer places than desired, and travelling shorter distances than desired.

The importance of time constraints was also emphasized in the qualitative study, which found that lack of confidence with reliability and predictability of journey times (both road and rail) means that travel in the North has a negative impact on personal time. This was particularly the case for participants in the Inner City Cosmopolitans segment.

These results suggest that time is an important factor limiting the mobility and accessibility of the population of the North. This supports the priority given in the Strategic Transport Plan for investments that reduce average travel times (by all modes of transport) and the variation of those times, increasing travel time reliability.

6.3.4. Social and cultural constraints

Feeling uncomfortable with some individuals or groups when using public transport was one of the top 10 reasons given by participants in the quantitative survey for travelling beyond the local area less often than desired, travelling to fewer places than desired, and travelling shorter distances than desired (cited by 6%, 6%, and 5% of all participants, respectively). However, it should be noted that feeling uncomfortable could be related not only to social or cultural issues but also to personal security issues.

6.3.5. Personal security constraints

As mentioned above, feeling uncomfortable with some individuals or groups when using public transport was regarded as a travel constraint by many participants in the quantitative survey. In addition, feeling safe from theft/attack when travelling alone was cited as a reason for travelling beyond the local area less often than desired, travelling to fewer places than desired, travelling shorter distances than desired, and travelling by car to places one would like to go by public transport. However, this was not in the top 10 reasons, being cited by 2-5% of all participants.

6.3.6. Physical constraints

Difficulties in getting onto/off public transport vehicles were cited in the quantitative survey as a reason for travelling beyond the local area less often than desired, travelling to fewer places than desired, travelling shorter distances than desired, and travelling by car to places one would like to go by public transport, but it was not in the top 10 reasons, being cited by 2-4% of all participants. Difficulties in getting onto/off cars were cited even less frequently. These results apply to all 9 user segments.

6.3.7. Personal constraints

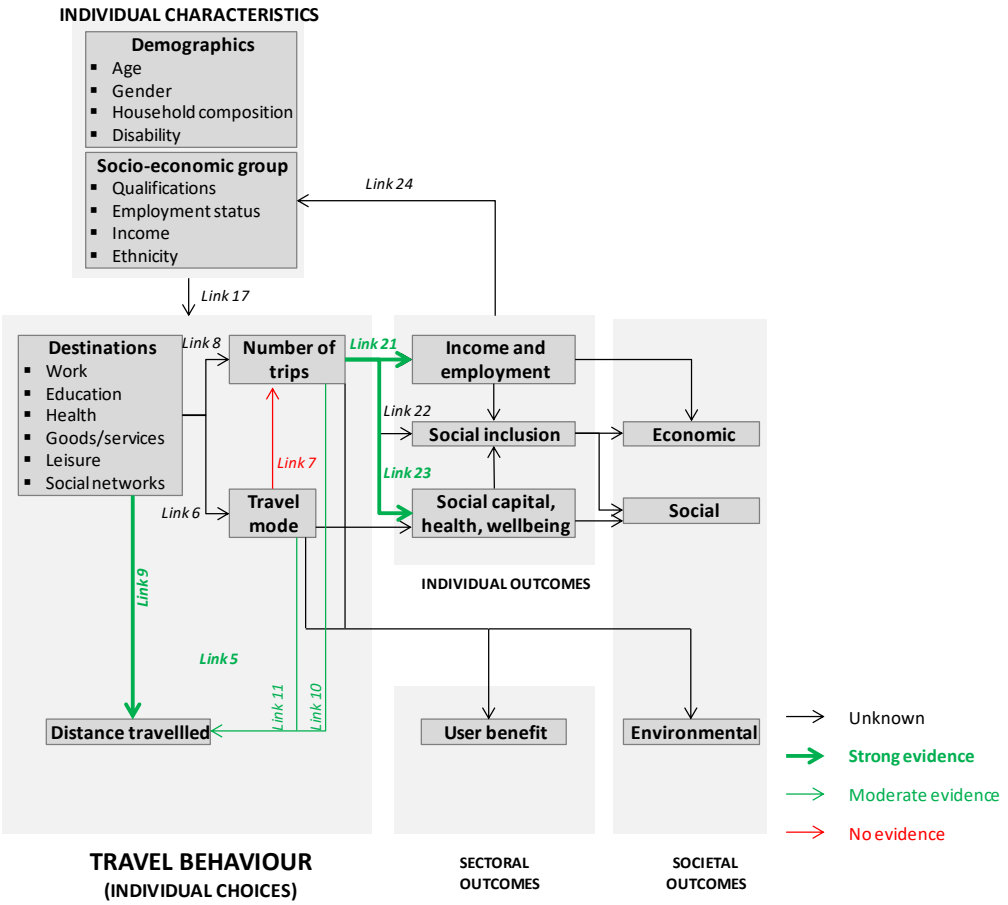
Not being able to drive was the main reason given by participants in the quantitative survey for travelling by public transport to places they would ideally like to travel by car. This reason was cited by 8% of all participants. It was also in the top 10 reasons for travelling beyond the local area less often than desired, travelling to fewer places than

desired, and travelling shorter distances than desired (cited by 9%, 9%, and 7% of all participants, respectively). In the business quantitative survey, the fact that not all relevant staff can drive was also one of the top 10 reasons for constraints to the number of places visited.

6.4 Wider impacts of travel behaviour

Figure 3 shows how the outcomes of travel behaviour relate to the characteristics of individuals. Overall, the study found several negative associations between aspects of travel behaviour and/or constraints to travel behaviour and the outcomes examined, including employment, social capital, health, and wellbeing. The evidence on these links is examined in sub-sections that follow.

Figure 164: Conceptual framework (Part 3)



6.4.1. Individual impacts

Employment and income

The quantitative survey found moderate evidence (significant at the 10% level[1]) that among the economically active population, individuals are more likely to experience unemployment if they have constraints to the number of places they visit outside their local area are associated with higher odds of being unemployed, and stronger evidence (significant at the 5% level) that individuals are more likely to experience unemployment if they have constraints to the travel mode they can choose (in particular, the situation where they have to travel by public transport and not by car, as desired) (*Link 21* in Figure 3).

This was confirmed in the qualitative study, as one of the themes identified in the group discussions was the idea that poor transport infrastructure limits life opportunities, including the type of job. This is particularly the case for participants in the Constrained City Dwellers segment.

The link between travel behaviour and income was not tested in the study. However, as mentioned above, we found evidence of a link between travel behaviour and employment opportunities, which could in turn affect income. The qualitative study also found that poor transport infrastructure and the cost of rail and bus was felt to limit educational opportunities, which may also affect income.

These results show support the vision of the Strategic Transport Plan for providing residents in the North with access to job opportunities and ensuring that economic growth in the North is inclusive as possible (TfN 2017, p.13).

Social capital, health, and wellbeing

The study found strong evidence that some aspects of travel behaviour are negatively related to social capital, health, and wellbeing (*Link 22* in Figure 3)

For example, the quantitative survey found strong evidence (significant at the 1% level) that making fewer trips outside the local area and travelling to less distant places was associated with higher odds of not being a member of any association, and that visiting fewer places outside the local area was associated with lower odds of meeting friends and family at least once a year.

These results were confirmed in the qualitative study, as participants in the group discussions consistently mentioned that poor transport infrastructure limits social activities and visiting friends and family.

[1] This means that there is a 10% probability that the results are due to chance and not to a relationship occurring in the population.

The quantitative survey also found strong evidence (significant at the 1% level) that constraints to the number of places visited outside the local area were associated with higher odds of having bad or very bad health.

Finally, the quantitative survey found strong evidence (significant at the 1% level) that visiting fewer places outside the local area and having constraints to the distance travelled were associated with higher odds of having low subjective wellbeing (defined as a wellbeing score in the bottom 10% of all participants), and moderate evidence (significant at the 10% level) that constraints to the number of places visited outside the local area were associated with higher odds of having low subjective wellbeing.

These results are consistent with those found in previous literature (reviewed in section 2.2.3. of this report) and support the vision of the Strategic Transport Plan for delivering an efficient Northern transport network as "a fundamental part of everyday life, connecting homes, businesses, jobs, health and education facilities and leisure opportunities" (TfN 2017, p.8), affecting society and "improving the health and wellbeing of residents and visitors to the North" (TfN 2017, p.11) . As shown in the current study, the increased connectivity to these opportunities has the potential for improving social capital, health, and wellbeing.

Social inclusion

The link between travel behaviour and social inclusion was not tested in the quantitative survey (*Link 23* in Figure 3). However, travel behaviour could be indirectly associated with social inclusion via the association with employment, social capital, health, and wellbeing, as shown above.

Social mobility

The link between changes in travel behaviour and social mobility was not tested in this (*Link 24* in Figure 3).

6.4.2. Societal outcomes

The economic, social, and environmental outcomes of travel behaviour at the level of communities or society were not assessed in the quantitative survey.

6.5 Final conceptual framework

Figure 4 brings together the different parts of the conceptual framework presented in the last three sections. Figure 166 is the final framework, including only the links analysed in the study. As shown in the figures, the study provided evidence on several of the hypothesized links, especially those related to the choices over travel destinations and travel modes.

Figure 165: Complete conceptual framework (all links)

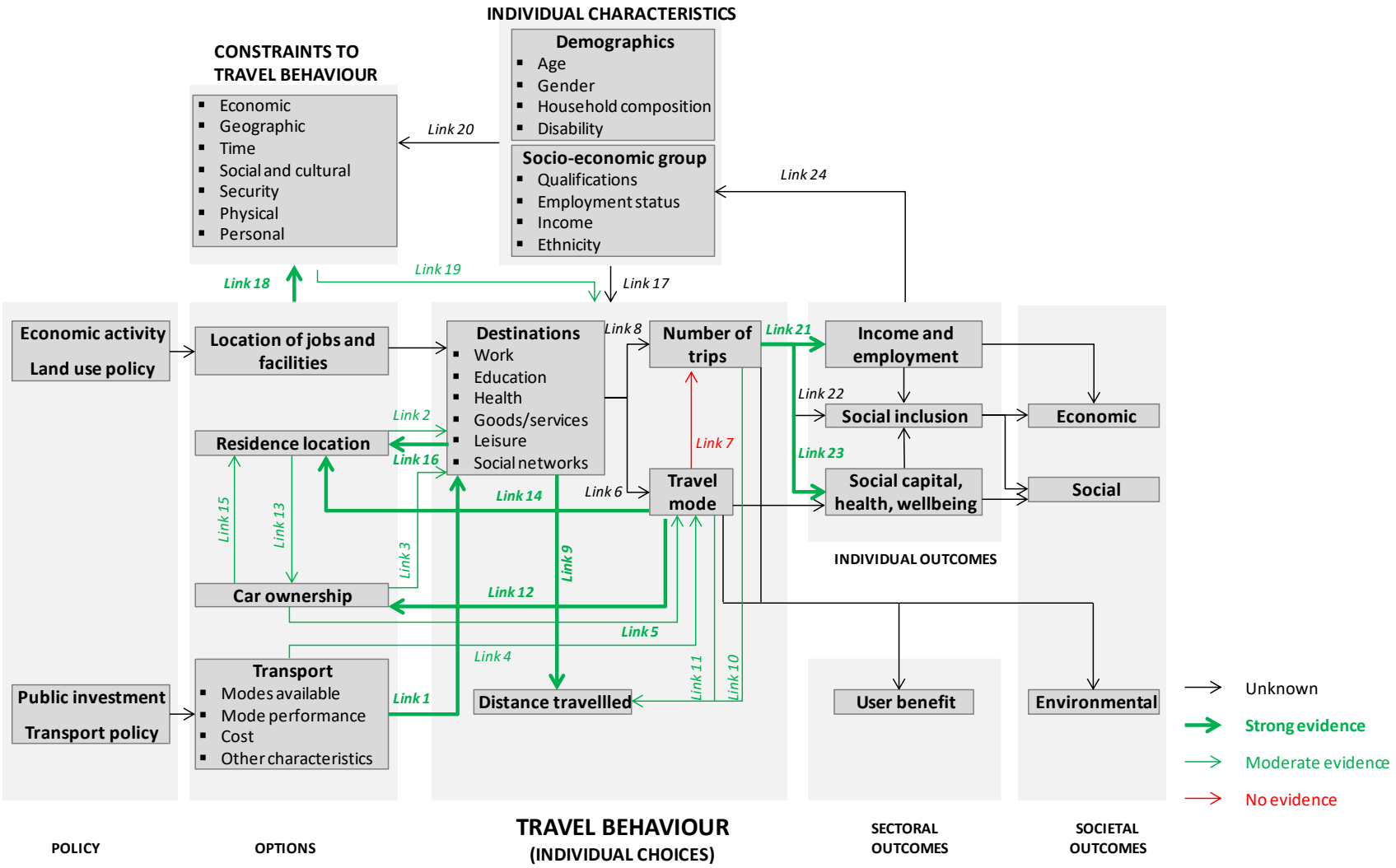
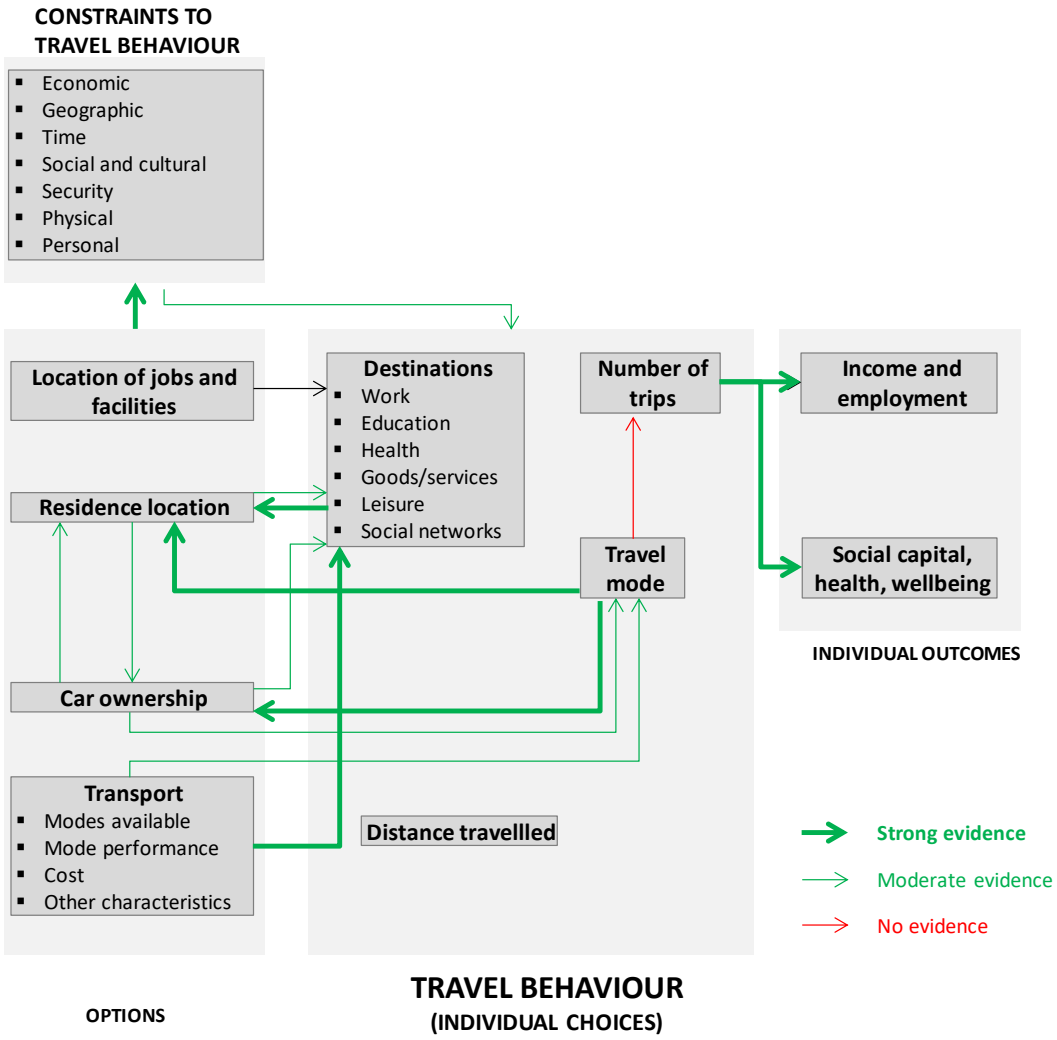


Figure 166: Final conceptual framework



6.6 Conclusions

This chapter reviewed the evidence provided by the current research programme on the causes and consequences of travel behaviour in the North. The study found evidence on a range of links between the choices made by individuals regarding travel, the constraints they face to those choices, and individual outcomes.

The links with stronger evidence are:

- Levels of access to private transport and levels of access to and quality of public transport could influence not only the places where people go but also their choice of residence location and decision to own a car
- The choice of trip destinations may also influence choice of residence location
- Individuals in the North face several constraints to their travel behaviour, including geographic, economic, time-related, and social/cultural constraints.

- Constraints to travel behaviour are associated with wider negative impacts such as unemployment and reduced social capital, health, and wellbeing.

The results also support the vision of TfN's Strategic Transport Plan for providing a more efficient transport network which can improve connectivity across the North and increase accessibility to jobs and other opportunities that support the economic vitality of the region and the health and wellbeing of its residents.

7 OVERALL CONCLUSIONS

This study was commissioned by TfN to analyse the causes and effects of travel behaviour of the different socio-economic groups in the North, in order to have a fuller understanding of the relationships between transport connectivity, opportunities, and economic growth, and to strengthen the case for the planned transport investments. The objective was to add to the evidence that TfN has already gathered on the effects of the planned investments on overall travel demand, by providing insights on the possible effects of the investments on the travel behaviour of the different groups.

The study comprised several stages:

- A review of the literature on the causes and consequences of travel behaviour and how they might be brought together within an analytical framework.

- Analysis of primary quantitative data, based on the results of a survey to 3,017 households, and focusing on current travel behaviour; satisfaction with current trips; constraints to travel; likely effect of STP improvements; possible long-term changes (change of workplace, change of residence location, and selling car); and wider impacts of travel behaviour and constraints to travel behaviour.

- Analysis of primary quantitative data, based on the results of a survey to 151 businesses, and focusing on current travel behaviour; satisfaction with current; constraints to travel; likely effect of STP improvements; and possible long-term changes (change of business location place, selling vehicles).

- Discussion groups with individuals representing each segment, and with businesses, to explore in detail the causes and consequences of travel behaviour.

- Analysis of secondary data on levels of accessibility to three types of destinations (employment centres, health-related facilities, and town centres) and how they differ with the characteristics of the areas and of the population.

The literature review suggested that the determinants of transport behaviour are complex, with a range of possible links between the choices made by individuals regarding travel, the constraints they face to those choices, and individual outcomes.

This was confirmed in the quantitative and qualitative analysis described in Chapters 4 and 5, which found that a sizeable proportion of households reported being constrained in their travel behaviour, including number of trips, number of places visited, and distance travelled. However, there are important differences between the travel behaviour of different segments of the population.

We also found that variables measuring travel behaviour (number of trips made outside the local area, number of places visited, and maximum distance travelled) and

constraints to travel behaviour are associated with five potential wider impacts: employment, social engagement, social contacts, health, and wellbeing.

The analysis of secondary data on levels of accessibility then confirmed that some segments of the population face constraints to travel to access destinations such as employment centres, health facilities, and town centres. These constraints derive both from geographic isolation and from the difference in the accessibility provided by public transport and by car.

The results of the primary and secondary data analysis were reviewed in Chapter 6 in the light of the framework developed in Chapter 2, concluding that the study provided evidence on several of the hypothesized links, especially those related to the choices over travel destinations and travel modes.

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Appendix A

Models of Wider Impacts of Travel Behaviour

Table 38: Model explaining probability of being unemployed (for active population)

	Odds ratio	Lower est.	Upper est.	Significance
Constant	0.05	0.03	0.08	***
Age<25	3.27	1.85	5.78	***
Age 45-54	1.63	1.00	2.66	*
No formal qualifications	5.89	2.35	14.76	***
Single parent	2.96	1.49	5.90	***
Household with children 11-17	0.41	0.23	0.72	***
Social housing	2.36	1.49	3.76	***
Number of memberships in associations	0.51	0.36	0.72	***
Health: bad or very bad	2.67	1.43	4.98	***
County: South Yorkshire	0.29	0.10	0.80	**
Constrained to number of places visited	**1.43**	**0.95**	**2.14**	*
Constrained to use public transport and not car	**1.60**	**1.05**	**2.44**	**

Significance: *** 1% ** 5% * 10%

Table 39: Model explaining probability of not belonging to any association

	Odds ratio	Lower est.	Upper est.	Significance
Constant	4.06	2.63	6.27	***
Age>=65	0.61	0.49	0.76	***
Income	1.00	1.00	1.00	***
Income: missing	0.85	0.61	1.17	
Qualifications: degree	0.68	0.56	0.81	***
Student	0.57	0.36	0.91	**
Housework	1.67	1.18	2.38	***
Unemployed	1.86	1.12	3.08	**
Providing care (>20 hours/week)	0.76	0.61	0.94	**
Social housing	1.43	1.12	1.82	***
Not seeing family /friends more often than 2-3 times/week	2.00	1.26	3.16	***
Health: bad or very bad	1.39	1.04	1.87	**
Wellbeing index	0.98	0.96	1.00	**
County: Greater Manchester	0.79	0.64	0.97	**
Number of trips made outside local area	**0.989**	**0.984**	**0.995**	***
Maximum distance travelled outside local area	**0.998**	**0.997**	**0.999**	***

Significance: *** 1% ** 5% * 10%

Table 40: Model explaining probability of seeing friends and family less than once a year

	Odds ratio	Lower est.	Upper est.	Significance
Constant	0.99	0.47	2.11	
Female	0.47	0.31	0.70	***
Age 25-34	0.46	0.23	0.92	**
No formal qualifications	2.78	1.40	5.53	***
Number of memberships in associations	0.60	0.41	0.87	***
Wellbeing score	0.89	0.85	0.92	***
County: Cumbria	3.16	1.48	6.77	***
County: ER of Yorkshire	2.45	1.21	4.95	**
Number of places visited outside local area	**0.83**	**0.74**	**0.94**	***

Significance: *** 1% ** 5% * 10%

Table 41: Model explaining probability of reporting bad or very bad health status

	Odds ratio	Lower est.	Upper est.	Significance
Constant	15.67	6.75	36.36	***
Age<25	0.35	0.19	0.66	***
Age 35-34	0.48	0.28	0.83	***
Income	1.00	1.00	1.00	***
Income: missing	1.31	0.60	2.83	
Number of benefits received	1.66	1.49	1.85	***
Full-time work	0.34	0.22	0.53	***
Housework	0.48	0.23	1.01	*
Providing care (>20 hours/week)	0.63	0.41	0.97	**
Living in UK for less than 1 year	6.24	1.74	22.40	***
Household with children (<10 years old)	0.33	0.20	0.53	***
Crowding (People/room)	0.52	0.39	0.68	***
Wellbeing index	0.77	0.74	0.80	***
County: West Yorkshire	1.52	0.98	2.35	*
County: Cumbria	0.39	0.16	0.96	**
Constrained to number of places visited	**1.51**	**1.11**	**2.07**	***

Significance: *** 1% ** 5% * 10%

Table 42: Model explaining probability of being unemployed (for active population)

	Odds ratio	Lower est.	Upper est.	Significance
Constant	0.33	0.20	0.56	***
Age<25	2.06	1.29	3.27	***
Age:25-34	1.85	1.31	2.61	***
Age:55-64	0.48	0.33	0.69	***
Age:>65	0.14	0.09	0.23	***
Income	1.00	1.00	1.00	***
Income: missing	0.59	0.35	1.01	*
Housework	0.42	0.25	0.69	***
Providing care (>20 hours/week)	1.55	1.13	2.13	***
Disability (limiting activities a lot)	1.60	1.04	2.46	**
Living in local area for less than 1 year	0.33	0.14	0.79	**
Living in UK for less than 1 year	4.62	0.91	23.52	*
Single household	1.66	1.11	2.49	**
Crowding (People/room)	1.34	1.04	1.74	**
Not seeing family /friends once/year	7.71	1.91	31.02	***
No membership in associations	1.54	1.16	2.04	***
Health: good or very good	0.27	0.20	0.37	***
Health: bad or very bad	2.64	1.72	4.05	***
County: Manchester	0.55	0.39	0.78	***
County: Merseyside	0.50	0.31	0.82	***
County: West Yorkshire	0.43	0.27	0.68	***
County: North Yorkshire	0.61	0.35	1.05	*
Number of places visited	**0.89**	**0.84**	**0.95**	***
Constrained to number of places visited	**1.31**	**0.99**	**1.72**	*
Constrained to distance travelled	**1.51**	**1.15**	**1.98**	***

Significance: *** 1% ** 5% * 10%

Appendix B

Quantitative: Household Questionnaire

Introduction

Thank you very much for agreeing to complete this on-line survey which is being conducted by Accent. We are carrying out research on behalf of Transport for the North, who were formed to transform the transport system across the North of England. They want to hear from residents from the North of England to understand more about their travel behaviour in order to develop a new transport plan for the North.

The research is being conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm Accent's credentials, please call the MRS free on 0800 975 9596.

We will just ask you a couple of questions to check that you are eligible to take part in this research.
The questionnaire will take about 20 minutes.

Any answer you give will be treated in confidence in accordance with the Code of Conduct of the Market Research Society. If you would like to confirm Accent's credentials type Accent in the search box at: https://www.mrs.org.uk/researchbuyersguide.

IF MOBILE DEVICE SHOW: **This survey is best undertaken on a tablet or a PC. If you do use a smartphone you can switch between desktop mode and mobile mode at any time by clicking the button at the bottom of the screen.**

Scoping questions

For the purposes of administering the questionnaire and for analysis, we may collect demographic information. You do not have to answer any questions that you do not wish to and if you do you can withdraw your consent for us to process this information at any time. Any personal data collected over the course of this interview will be held securely and will not be shared with any third party unless you give permission (or unless we are legally required to do so). Our privacy statement is available at www.accent-mr.com/privacy/.

Q1 Do you agree to proceeding with the interview on this basis?
Yes
No **THANK AND CLOSE**

Q2 Firstly, to make sure we are hearing from people in the right areas of the country, please could you give us your full postcode? Please be assured that this information will remain confidential and will not be reported to the client alongside any of the other information you provide during the interview.
Part 1
Part 2
Don't know **THANK AND CLOSE**

Would rather not say **THANK AND CLOSE**

Thank you, I can confirm you are in scope for the survey. The questionnaire will take about 20 minutes to complete. For convenience you can stop and return to complete the questionnaire as many times as you wish, although once submitted you will not be able to enter again.

Main Survey

Current Travel Behaviour

Q3 In the next few questions we will ask you about the trips that you make beyond your local area. By your local area we mean the area within 15 miles of your home, as shown on this map.

Please place a marker on the map to mark each of the places beyond your local area where you travel to, in a typical month **[RECORD LOCATION CO-ORDINATES, ONLY ALLOWING THOSE THAT ARE OUTSIDE THE LOCAL AREA]**

ASK SUB-QUESTIONS 3.1-3.4 FOR EACH RECORDED DESTINATION ALONGSIDE THE MAP SHOWING THAT LOCATION

Q3.1 How many return trips do you make in a typical month to the place shown on this map, for each of these reasons? **[ALLOW NUMBER OR DON'T KNOW]**

a) Commuting to work
b) Employer's business
c) Education/study
d) Shopping
e) Other purposes

Q3.2 What is the main mode of transport you normally use to go to this place? **[SINGLE CODE]**

Car (driver)
Car (passenger)
Bus
Coach
Train
Tram
Other [Please state]

Q3.3 How satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) are you with the journeys you make to this place?

Q3.4 [IF Q3.3=1 OR 2"] Why are you dissatisfied with your journey? [RECORD VERBATIM]

Constraints

In the next few questions we will ask you about things that affect how often you travel, where you go and how you get there.

Q4 Do you have access to a private car?

I or someone in my household owns a car and I use it
I do not own a car but I can use somebody else's car, as a driver
I do not own a car but I can travel in somebody else's car, as a passenger
No **GO TO** Q6

Q5 How many cars or vans are available for your household to use?

PLEASE WRITE IN:
Would rather not say

Q6 On a scale of 1 to 5, whereby 1 is disagree strongly and 5 is agree strongly, how strongly do you agree or disagree with each of the following statements:

	1 Disagree strongly	2	3	4	5 Agree strongly	Don't know
I travel beyond my local area less often than I would ideally like to						
I travel to fewer places (e.g. cities or towns outside my local area) than I would ideally like to						
I travel to places that are nearer than the ones I would ideally like to go to						
I travel by car to places I would ideally like to go to by public transport						
I travel by public transport to places I would ideally like to go to by car						

Q7 **ASK IF Q6.1=4 OR 5, ELSE SKIP**: Why do you travel beyond your local area less often than you would ideally like to? Please tick all that apply. - **MULTICODE**

Difficult to find the time to travel
I don't have anywhere to go
The places I want to go to are too far

I can't drive
I do not own or have access to a car
There are many delays when I travel by car (because of congestion)
I find it difficult to cover the costs of owning and using a car
I find driving stressful
I find it physically difficult to get onto/off the car

I find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when I travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
Buses/trains/trams are not available in the weekend
I don't know clearly which buses/trains/tram I should take
I don't know clearly at what time I can take buses/trains/trams
I do not know exactly where to get off when I use public transport
The stations/bus stops are too far from my home
The stations/bus stops are too far from where I want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
I find it physically difficult to get onto/off buses/trains/trams
I find it difficult to walk to stations
I find it difficult or cannot use stairs or escalators in stations
I need help to get around on my own
I do not feel safe from theft/attack when travelling on my own
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q8 **IF Q7 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you travel less often than you would like to.

OR

IF Q7 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you travel less often than you would like to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q7 INCLUDES EXACTLY TWO RESPONSES]**

Q9 **ASK IF Q6.2=4 OR 5, ELSE SKIP**: Why do you travel to fewer places (e.g. cities or towns outside your local area) than you would ideally like to? Please tick all that apply. **MULTICODE**

Difficult to find the time to travel
I don't have anywhere to go
The places I want to go to are too far

I can't drive
I do not own or have access to a car
There are many delays when I travel by car (because of congestion)

I find it difficult to cover the costs of owning and using a car
I find driving stressful
I find it physically difficult to get onto/off the car

I find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when I travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
Buses/trains/trams are not available in the weekend
I don't know clearly which buses/trains/tram I should take
I don't know clearly at what time I can take buses/trains/trams
I do not know exactly where to get off when I use public transport
The stations/bus stops are too far from my home
The stations/bus stops are too far from where I want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
I find it physically difficult to get onto/off buses/trains/trams
I find it difficult to walk to stations
I find it difficult or cannot use stairs or escalators in stations
I need help to get around on my own
I do not feel safe from theft/attack when travelling on my own
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q10 **IF Q9 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you travel to fewer places than you would ideally like to.

OR

IF Q9 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you travel to fewer places than you would ideally like to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q9 INCLUDES EXACTLY TWO RESPONSES]**

Q11 **ASK IF Q6.2=4 OR 5, ELSE SKIP**: Why do you travel to places that are nearer than the ones you would ideally like to go to? Please tick all that apply. **– MULTICODE**

It's difficult to find the time to travel
I need to go to too many places
I don't have anywhere to go
The places I want to go are too far

I cannot drive
I do not own or have access to a car
There are many delays when I travel by car (because of congestion)
I find it difficult to cover the costs of owning and using a car
I find driving stressful
I find it physically difficult to get onto/off the car

I find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when I travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
Buses/trains/trams are not available in the weekend
I don't know clearly which buses/trains/tram I should take
I don't know clearly at what time I can take buses/trains/trams
I do not know exactly where to get off when I use public transport
The stations/bus stops are too far from my home
The stations/bus stops are too far from where I want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
I find it physically difficult to get onto/off buses/trains/trams
I find it difficult to walk to stations
I find it difficult or cannot use stairs or escalators in stations
I need help to get around on my own
I do not feel safe from theft/attack when travelling on my own
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q12 **IF Q11 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you travel to places that are nearer than the ones you would ideally like to go to.

OR

IF Q11 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you travel to places that are nearer than the ones you would ideally like to go to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q11 INCLUDES EXACTLY TWO RESPONSES]**

Q13 **ASK IF Q6.4=4 OR 5, ELSE SKIP**: Why do you travel by car to places you would ideally like to go to by public transport? Please tick all that apply. – **MULTICODE**

I find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when I travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
Buses/trains/trams are not available in the weekend
I don't know clearly which buses/trains/tram I should take
I don't know clearly at what time I can take buses/trains/trams
I do not know exactly where to get off when I use public transport
The stations/bus stops are too far from my home
The stations/bus stops are too far from where I want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
I find it physically difficult to get onto/off buses/trains/trams
I find it difficult to walk to stations
I find it difficult or cannot use stairs or escalators in stations
I need help to get around on my own
I do not feel safe from theft/attack when travelling on my own
I feel uncomfortable with some individuals or groups when using buses/trains/trams or stations/bus stops

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q14 **IF Q13 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you travel by car to places you would ideally like to go to by public transport.

OR

IF Q13 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you travel to travel by car to places you would ideally like to go to by public transport.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q13 INCLUDES EXACTLY TWO RESPONSES]**

Q15 **ASK IF Q6.4=4 OR 5, ELSE SKIP**: Why do you travel by public transport to places you would ideally like to go to by car? Please tick all that apply. – **MULTICODE**

I cannot drive
I do not own or have access to a car
There are many delays when I travel by car (because of congestion)

I find it difficult to cover the costs of owning and using a car
I find driving stressful
I find it physically difficult to get onto/off the car

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q16 **IF Q15 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you travel by public transport to places you would ideally like to go to by car.

OR

IF Q15 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you travel by public transport to places you would ideally like to go to by car.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q15 INCLUDES EXACTLY TWO RESPONSES]**

Improvements to Transport in the North

Transport for the North is considering a programme of investments that will improve transport throughout the region. The next few questions will ask how different aspects of these improvements might affect the trips that you make outside of your local area.

By your local area we again mean the area within 15 miles of your home, as shown in this map. Please consider only the trips that you might make beyond this area.

ROAD IMPROVEMENTS

Q17 Transport for the North is planning investments that that will improve trip times and reliability on the major roads in the North, so that a commuter or freight operator can expect a consistently good journey time. For example, the door-to-door speed for trips over 15 miles on major roads will be at least 45-50mph, and travel time will be no longer than 35-40 minutes.

Considering this potential future situation, how would you expect the number of trips you typically make beyond your local area to change, if at all, for each of the following travel reasons and modes of transport? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW AS DROPDOWNS IN EACH CELL EXCEPT WHERE** Q3**.2=0 IN WHICH CASE DELETE 'FEWER TRIPS' OPTION]**

Purpose	Car	Public transport
a) Commuting to work		
b) Employer's business		
c) Education/study		
d) Shopping		
e) Other purposes		

Q18 Given the road improvements just described, would you expect to travel to new places beyond your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW AS DROPDOWNS IN EACH CELL]**

a) Commuting to work **[ONLY SHOW IF** Q3.**2a>0 OR Q17a(Car or Public transport)='More trips']**
b) Employer's business **[ONLY SHOW IF** Q3.**2b>0 OR Q17b(Car or Public transport)='More trips']**
c) Education/study **[ONLY SHOW IF** Q3.**2c>0 OR Q17c(Car or Public transport)='More trips']**
d) Shopping **[ONLY SHOW IF** Q3.**2d>0 OR Q17d(Car or Public transport)='More trips']**
e) Other purposes **[ONLY SHOW IF** Q3.**2e>0 OR Q17e(Car or Public transport)='More trips']**

Q19 **[IF Q18a,b,c,d or e='New places'] [SHOW MAP]** Please mark on this map any new places that you think you might travel to in a typical month if the improvements described were made.

FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q18 **SELECTED WITH 'NEW PLACES', ASK:**

Q19.1 For what reason(s) would you travel to this place? [Please tick all that apply] **[RECORD LOCATION COORDINATES]**

a) Commuting to work **[ONLY SHOW IF Q18a='New places']**
b) Employer's business **[ONLY SHOW IF Q18b ='New places']**
c) Education/study **[ONLY SHOW IF Q18c ='New places']**
d) Shopping **[ONLY SHOW IF Q18d='New places']**
e) Other purposes **[ONLY SHOW IF Q18e='New places']**

RAIL IMPROVEMENTS

Q20 Transport for the North is also planning investments that will increase the capacity, frequency, speed, and quality of the rail network linking the North's largest cities with each other and with the rest of the North. This would involve the creation of new rail lines and the reduction of travel time and increase in the number of services in the existing lines. For example, there would be a dependable "turn up and go" service, that got you from one city to another in under half an hour, and meant you could get to lots more places easily and in comfort. Travel times between major cities would be reduced by up to 35-45%.

Considering this potential future situation, how would you expect the number of trips you typically make outside your local area to change, if at all, for each of the following travel reasons and modes of transport? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW AS DROPDOWNS IN EACH CELL EXCEPT WHERE** Q3**.2=0 IN WHICH CASE DELETE 'FEWER TRIPS' OPTION]**

Purpose	Car	Public transport
a) Work or study		
b) Employer's business		
c) Education/study		
d) Shopping		
e) Other purposes		

Q21 Given the rail improvements just described, would you expect to travel to new places outside your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW AS DROPDOWNS IN EACH CELL]**

a) Commuting to work **[ONLY SHOW IF Q3.2a>0 OR Q20a='More trips']**
b) Employer's business **[ONLY SHOW IF** Q3**.2b>0 OR Q20b ='More trips']**
c) Education/study **[ONLY SHOW IF Q3.2c>0 OR Q20c ='More trips']**
d) Shopping **[ONLY SHOW IF Q3.2d>0 OR Q20d='More trips']**
e) Other purposes **[ONLY SHOW IF Q3.2e>0 OR Q20e='More trips']**

Q22 **[IF Q21a,b,c,d or e='New places'] [SHOW MAP]** Please mark on this map any new places that you think you might travel to in a typical month if the improvements described were made.

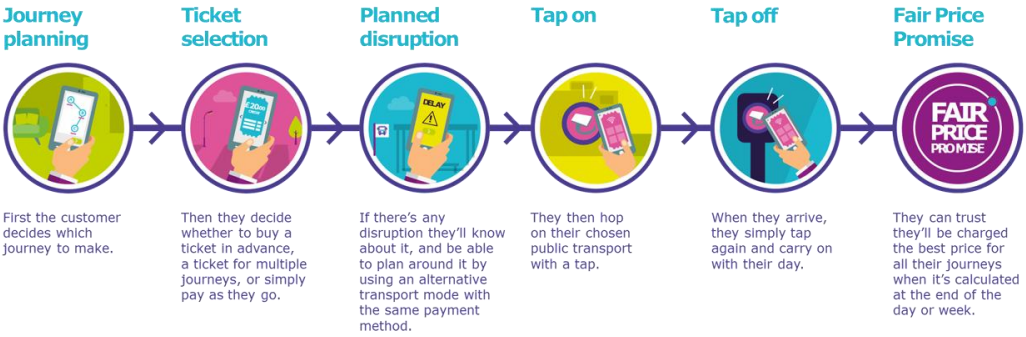
FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q18 **SELECTED WITH 'NEW PLACES', ASK:**

Q22.1 For what reason(s) would you travel to this place? [Please tick all that apply) **[RECORD LOCATION COORDINATES]**

a) Commuting to work **[ONLY SHOW IF Q21a='New places']**
b) Employer's business **[ONLY SHOW IF Q21b ='New places']**
c) Education/study **[ONLY SHOW IF Q21c ='New places']**
d) Shopping **[ONLY SHOW IF Q21d='New places']**
e) Other purposes **[ONLY SHOW IF Q21e='New places']**

INTEGRATED AND SMART TRAVEL

Q23 The investments also include developing smart tickets (tap in, tap out), new ways of buying and paying for tickets and, new ways of getting relevant information. Passengers will also benefit from a 'fair price promise' when travelling on any bus, train, or tram in the North. All of this will mean less queuing, more accurate and timely travel information, and a consistent travel experience throughout the North.



Considering this potential future situation, how would you expect the number of trips you typically make outside your local area to change, if at all, for each of the following travel reasons and modes of transport? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW AS DROPDOWNS IN EACH CELL EXCEPT WHERE** Q3**.2=0 IN WHICH CASE DELETE 'FEWER TRIPS' OPTION]**

Purpose	Car	Public transport
a) Work or study		
b) Employer's business		
c) Education/study		
d) Shopping		
e) Other purposes		

Q24 Given the improvements just described, would you expect to travel to new places outside your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW AS DROPDOWNS IN EACH CELL]**

a) Commuting to work **[ONLY SHOW IF Q3.2a>0 OR Q23a='More trips']**
b) Employer's business **[ONLY SHOW IF** Q3**.2>0 OR Q23b ='More trips']**
c) Education/study **[ONLY SHOW IF** Q3**.2>0 OR Q23c ='More trips']**
d) Shopping **[ONLY SHOW IF** Q3**.2>0 OR Q23d)='More trips']**
e) Other purposes **[ONLY SHOW IF** Q3**.2>0 OR** Q17**e)='More trips']**

Q25 **[IF Q24a,b,c,d or e='New places'] [SHOW MAP]** Please mark on this map any new places that you think you might travel to in a typical month if the improvements described were made.

FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q18 **SELECTED WITH 'NEW PLACES', ASK:**

Q25.1 For what reason(s) would you travel to this place? [Please tick all that apply] **[RECORD LOCATION COORDINATES]**

a) Commuting to work **[ONLY SHOW IF Q24a='New places']**
b) Employer's business **[ONLY SHOW IF Q24b ='New places']**
c) Education/study **[ONLY SHOW IF Q24c ='New places']**
d) Shopping **[ONLY SHOW IF Q24d='New places']**
e) Other purposes **[ONLY SHOW IF Q24e='New places']**

LONGER TERM IMPACTS

Q26 Would you consider changing **where you work or look for work**, in the medium or long term (ie more than 1 year from now), in any of the following scenarios?

	Yes	No	Don't know
If I had access to a car			
If I could reach more places by public transport from my area			
If I had faster public transport in my area			
If I had more reliable public transport in my area			
If I had more comfortable public transport in my area			
If I felt safer using public transport in my area			

Q27 And would you consider changing **where you live**, in the medium or long term, in any of the following scenarios?

	Yes	No	Don't know
If a better job opportunity appeared in a place that it is too far from where I live now			
If I had access to a car			
If I could reach more places by public transport from my new location			
If I had faster public transport in my new location			
If I had more reliable public transport in my new location			
If I had more comfortable public transport in my new location			
If I felt safer using public transport in my new location			

Q28 **[IF Q4=1]** Would you consider **selling your car**, in the medium or long term, under any of the following scenarios?

	Yes	No	Don't know
If I could reach more places by public transport from my area			
If I had faster public transport in my area			
If I had more reliable public transport in my area			
If I had more comfortable public transport in my area			
If I felt safer using public transport in my area			

Demographics and other characteristics

Q29 We would now just like to ask a few questions which will help us to understand some of the information you have provided us with. Please be assured that all details you give will be treated with the strictest confidence. The personal information you provide during this survey will be kept confidential by Accent and will not be disclosed to third parties.

Q30 How long have you lived in this area?

----- ----- years (---- ---- months *if less than one year)*
Would rather not say

Q31 How long have you lived in the UK?

----- ----- years (---- ---- months *if less than one year)*
Would rather not say

Thinking about where you live, do you:

Own it outright
Buying it with the help of a mortgage or loan
Pay part rent and part mortgage (shared ownership)
Rent it privately
Rent it from a Local Authority/Housing Association/registered social landlord
Live here rent free
Other
Would rather not say

Q32 How many adults, including yourself, live in your household? An adult is aged 18 years or older.

Please write in:
Would rather not say

Q33 How many children in the following age brackets live in your household?

10 or under
11-17
Would rather not say

Q34 How many bedrooms does your home have?

1
2
3
4
5
More than 5
Would rather not say

Q35 What is your gender?

Male
Female
Other
Would rather not say

Q36 Which one of the following age groups do you belong to?

16-17
18-24
25-34
35-44

45-54
55-64
65-74
75-79
80+
Would rather not say

Q37 What is your ethnic group?

White
Mixed
Asian or Asian British
Black or Black British
Other ethnic group
Would rather not say

Q38 Which of these statements best describes your current employment status?

Self employed
Employed full-time (30+ hrs)
Employed part-time (up to 30 hrs)
Student
Unemployed – seeking work
Unemployed – other
Looking after the home/children full-time
Retired
Unable to work due to sickness or disability
Other (please specify)……

Q39 [IF Q38>4 (NOT WORKING)] When did you last work, if ever?

I never worked
2-3 months ago
About 6 months ago
About 1 year ago
More than 1 year ago
More than 2 years ago
Would rather not say

Q40 At what level did you complete your education? If still studying, which level best describes the highest level of education you have obtained until now?

O levels / CSEs / GCSEs (any grades)
A levels / AS level / higher school certificate
NVQ (Level 1 and 2). Foundation / Intermediate / Advanced GNVQ / HNC / HND
Other qualifications (e.g. City and Guilds, RSA/OCR, BTEC/Edexcel))
First degree (e.g. BA, BSc)
Higher degree (e.g. MA, PhD, PGCE, post graduate certificates and diplomas)
Professional qualifications (teacher, doctor, dentist, architect, engineer, lawyer, etc.)
No qualifications

Q41 We would now like you to think about the annual income of your **household** as a whole. Please note that, like all information in this survey, this data will be confidential and used for analysis purposes only. Which of the following best

represents the gross annual income, before deductions for tax and National Insurance, for your household?

Under £4,999
£5,000 to £9,999
£10,000 to £14,999
£15,000 to £19,999
£20,000 to £29,999
£30,000 to £39,999
£40,000 to £49,999
£50,000 to £74,999
£75,000 or over
Don't know
Would rather not answer

Q42 Do you or any other member of your household receive any of the following? Please note that, like all information in this survey, this data will be confidential and used for analysis purposes only. **PLEASE TICK ALL THAT APPLY**

Housing benefit
Income support
Jobseeker's Allowance
Employment and Support Allowance
Working Tax Credit
Incapacity Benefit
Disability Living Allowance
Carers Allowance
Attendance Allowance
Council Tax Benefit
Universal Credit
Free School Meals
Pension Credit/State Pension
None of These **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q43 How many hours of unpaid care do you provide for an adult relative/partner, disabled child, or friend/neighbour?

I am not responsible for caring for any adult relative/partner, disabled child, or friend/neighbour?
0-20 hours a week
20-50 hours a week
More than 50 hours a week
Would rather not say

Q44 How would you describe your health in general?

Very good
Good
Fair
Bad
Very bad
Would rather not say

Q45 Do you have a disability or a long standing health problem?

Yes, limiting my daily activities a lot
Yes, limiting my daily activities a little
No
Other, please write in
Would rather not say

Q46 **[IF** Q45=**"Yes, a little" OR "Yes, a lot"]** Does your disability or long standing health problem make it difficult for you to do any of the following?

Go out on foot
Use local buses
Get in or out of a car
No difficulty with any of these
Would rather not say

Q47 How often do you meet members of your family?

I live with my family
5 days a week of more
2-3 days a week
About once a week
About once a month
2-3 times a year
About once a year
Less than once a year
Never
Would rather not say

Q48 How often do you meet up with friends?

I live with my friends
5 days a week of more
2-3 days a week
About once a week
About once a month
2-3 times a year
About once a year
Less than once a year
Never

Q49 Are you a member of any of these organisations, clubs or societies? **PLEASE TICK ALL THAT APPLY**

Political party, trade union or environmental groups
Tenants groups, resident groups, Neighbourhood Watch
Church or other religious groups
Charitable associations
Education, arts or music groups or evening classes
Social clubs
Sports clubs, gyms, exercise classes
Any other organisations, clubs or societies
No, I am not a member of any organisations, clubs or societies

Q50 Below are some statements about feelings and thoughts that people might have about life and their personal circumstances. Please tick the box that best describes your experience of each over the last 2 weeks. Please note that, like all information in this survey, this data will be confidential and used for analysis purposes only.

	None of the time	Rarely	Some of the time	Often	All of the time	Would rather not say
I've been feeling optimistic about the future						
I've been feeling useful						
I've been feeling relaxed						
I've been dealing with problems well						
I've been thinking clearly						
I've been feeling close to other people						

Q50a. Overall, how easy or difficult was it to understand the questions in this survey?

I found most of these questions very easy to understand
I found most of these questions quite easy to understand
I found most of these questions quite hard to understand
I found most of these questions very hard to understand

Q50b Do you have any suggestions that would help improve this survey?

Yes: please write in as much information as you can:
No

Thank you. That was the last question in this survey. This research was conducted under the terms of the MRS code of conduct and is completely confidential.

Q51 We really appreciate the time that you have given us today. Would you be willing to be contacted again for clarification purposes or be invited to take part in other research for Transport for the North?

Yes, for both clarification and further research
Yes, for clarification only
Yes, for further research only
No

Q52 Please provide an email address if you wish to receive a copy of the final report.

WRITE IN:

Thank you. This research was conducted under the terms of the MRS code of conduct and is completely confidential.

Appendix C

Quantitative: Business Questionnaire

Introduction

Thank you very much for agreeing to complete this on-line survey which is being conducted by Accent. We are carrying out research on behalf of Transport for the North, who were formed to transform the transport system across the North of England. They want to hear from businesses from the North of England to understand more about their travel behaviour in order to develop a new transport plan for the North.

The research is being conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm Accent's credentials, please call the MRS free on 0800 975 9596.

We will just ask you a couple of questions to check that you are eligible to take part in this research.
The questionnaire will take about 20 minutes.

Any answer you give will be treated in confidence in accordance with the Code of Conduct of the Market Research Society. If you would like to confirm Accent's credentials type Accent in the search box at: https://www.mrs.org.uk/researchbuyersguide.

IF MOBILE DEVICE SHOW: **This survey is best undertaken on a tablet or a PC. If you do use a smartphone you can switch between desktop mode and mobile mode at any time by clicking the button at the bottom of the screen.**

Scoping questions

For the purposes of administering the questionnaire and for analysis, we may collect demographic information. You do not have to answer any questions that you do not wish to and if you do you can withdraw your consent for us to process this information at any time. Any personal data collected over the course of this interview will be held securely and will not be shared with any third party unless you give permission (or unless we are legally required to do so). Our privacy statement is available at www.accent-mr.com/privacy/.

Q1. Do you agree to proceeding with the interview on this basis?
Yes
No **THANK AND CLOSE**

Q2. Firstly, to make sure we are hearing from people in the right areas of the country, please could you give us the full postcode of the main site of your organisation? If you have more than one site please answer for the location where the majority of the organisation's employees are based. We will refer to this throughout the survey as the 'main site' for your business. Please be assured that this information will remain confidential and will not be reported

to the client alongside any of the other information you provide during the interview.
Part 1
Part 2
Don't know **THANK AND CLOSE**
Would rather not say **THANK AND CLOSE**

Thank you, I can confirm you are in scope for the survey. The questionnaire will take about 20 minutes to complete. For convenience you can stop and return to complete the questionnaire as many times as you wish, although once submitted you will not be able to enter again.

Main Survey

Your Organisation

Q3. What is your organisation's main sector of activity **[SINGLE CODE]**

Agriculture, forestry & fishing
Production
Construction
Motor trades
Wholesale
Retail
Transport & Storage (including postal)
Accommodation & food services
Information & communication
Finance & insurance
Property
Professional, scientific & technical
Business administration & support services
Public administration & defence
Education
Health
Arts, entertainment, recreation & other services
Other, please write in

Q4. How many people are based at your organisation?
I have no other employees, there is just myself
2 to 9
10 to 49
50 to 249
250 or more

Q5. How many sites does your organisation have in the North of England, other than the main site referred to above?

Zero - no other sites
Write in number of sites

Q6. Approximately how long has your organisation been based at your current location: that is the main site?

Less than a year
1 to 2 years
2 to 5 years
More than 5 years

Travel and Transport in Your Organisation

Q7. **[IF Q4 = codes 2-5] else skip to Q11:** Approximately what proportion of the organisation's employees live **outside** the local area? By the local area we mean the area within 15 miles of the organisation's main site, as shown on this map.

All
At least 75%
50-75%
25-50%
0-25%
Don't know

Q8. **[IF Q4 = codes 2-5]** Approximately what proportion of the organisation's employees travel to work by public transport?

All
At least 75%
50-75%
25-50%
0-25%
Don't know

Q9. **[If Q4 = codes 2-5]** Does the company have any kind of travel plan for employees?

Yes
No

Q10. **[If Q9= yes]** Please explain what sort of plan is in place

Please write in

Q11. How often does your organisation receive deliveries directly from suppliers to your main site or other site(s) in the North of England? [ANSWER FOR 'MAIN SITE' AND 'OTHER SITE(S) WITHIN THE NORTH OF ENGLAND']

More than twice a day
Once or twice a day
3-4 times a week
1-2 times a week
1-2 times a month
Less than once a month
Never/Don't know

Q12. Where are most of your suppliers based? **[SINGLE CODE]**

Mainly within the local area (within 15 miles of the organisation's main site location)
Mainly outside the local area but within the North of England
Mainly all over the UK
Mainly UK wide and international

Q13. How many of each type of vehicle does the company own or lease?

PLEASE WRITE IN (if none please write 0):
Motorcycles
Cars
Vans
HGVs

Q14. **[If Q13 = >0 for any category of vehicle]** How often does your organisation deliver or transport products or other items from your main site or other sites in the North of England **using company vehicles** (rather than external couriers/transport companies)? **[ANSWER FOR 'MAIN SITE' AND 'OTHER SITE(S) IN THE NORTH OF ENGLAND']**

More than twice a day
Once or twice a day
3-4 times a week
1-2 times a week
1-2 times a month
Less than once a month
Never

Q15. **[f Q14 = codes 1-6]** Where are most of the customers to whom you deliver or transport items using company vehicles based?

Mainly within the local area (within 15 miles of the despatch location)
Mainly outside the local area but within the North of England
All over the UK
UK wide and international

Q16. **[If Q13 = >0 for any category of vehicle]** How often does your organisation deliver or transport products or other items **from** your main site other sites in the North of England **using external couriers or transport companies**? **[ANSWER FOR 'MAIN SITE' AND 'OTHER SITE(S) IN THE NORTH OF ENGLAND']**

More than twice a day
Once or twice a day
3-4 times a week
1-2 times a week
1-2 times a month
Less than once a month
Never

Q17. **[If Q16 = codes 1-6]** Where are most of the customers to whom you deliver or transport items using external couriers or transport companies based?

Mainly within the local area (within 15 miles of the despatch location)

Mainly outside the local area but within the North of England
All over the UK
UK wide and international

Q18. How often do senior managers in the organisation travel each of the following distances on business (that is to visit customers/clients/suppliers etc.)? **[SELECT FREQUENCY FOR EACH DISTANCE]**

Within 15 miles from the business/home address
More than 15 miles but less than 50 miles from the business/home address
More than 50 miles from the business/home address but within the North of England
Within the UK but outside the North of England

Daily
3-4 times a week
1-2 times a week
1-2 times a month
Less than once a month
Never

Q19. **[IF ANY BUSINESS TRAVEL MADE AT Q18]** Which mode of transport do senior managers in the organisation normally use to travel each of the following distances on business (that is to visit customers/clients/suppliers etc.) ? **[SELECT ONE MODE FOR EACH DISTANCE]**

Within 15 miles from the business/home address
More than 15 miles but less than 50 miles from the business/home address
More than 50 miles from the business/home address but within the North of England
Within the UK but outside the North of England

Company car
Other company vehicle (eg van)
Own car/van
Bus
Coach
Train
Tram
Other [Please state]

Q20. **[ASK IF Q4 = CODES 2-5]** How often do other staff in the organisation travel each of the following distances on business (that is to visit customers/clients/suppliers etc)? **[SELECT FREQUENCY FOR EACH DISTANCE]**

Within 15 miles from the business/home address
More than 15 miles but less than 50 miles from the business/home address
More than 50 miles from the business/home address but within the North of England
Within the UK but outside the North of England

Daily
3-4 times a week
1-2 times a week
1-2 times a month
Less than once a month
Never

Q21. **[IF ANY BUSINESS TRAVEL MADE AT Q20]** Which mode of transport do other staff in the organisation normally use to travel each of the following distances on business (that is to visit customers/clients/suppliers etc.) ? **[SELECT ONE MODE FOR EACH DISTANCE]**

Within 15 miles from the business/home address
More than 15 miles but less than 50 miles from the business/home address
More than 50 miles from the business/home address but within the North of England
Within the UK but outside the North of England

Company car
Other company vehicle (eg van)
Own car/van
Bus
Coach
Train
Tram
Other [Please state]

Satisfaction and Challenges in relation to Transport

In the next few questions we are going to ask you about your satisfaction with travel and transport in relation to your business and any related challenges you face.

Q22. **[IF ANY BUSINESS TRAVEL MADE AT Q18 OR Q20]** Generally how satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) are you with the business travel that you and others within your organisation make (that is to visit customers/clients/suppliers etc)?

Q23. **[IF Q22=1 OR 2]** Why are you dissatisfied with the business travel that you and others within your organisation make? [RECORD VERBATIM]

Q24. **[if Q11 = codes 1-6]** Generally how satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) are you with the deliveries made from suppliers to your organisation? (please think about travel related factors, such as timeliness rather than accuracy of orders etc)

Q25. **[IF Q24=1 OR 2]** Why are you dissatisfied with the deliveries made from suppliers to your organisation? [RECORD VERBATIM]

Q26. **[If Q14 = codes 1-6]** Generally how satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) are you with the deliveries/transport of products and other items made **from** your organisation using **company vehicles**?

Q27. **[IF Q26=1 OR 2]** Why are you dissatisfied with the deliveries/transport of products and other items made from your organisation using company vehicles? [RECORD VERBATIM]

Q28. **[If Q16 = codes 1-6]** Generally how satisfied, on a scale from 1 (very dissatisfied) to 5 (very satisfied) are you with the deliveries/transport of products and other items made **from** your organisation using **external courier/transport companies**?

Q29. **[IF Q28=1 OR 2]** Why are you dissatisfied with the deliveries/transport of products and other items made from your organisation using external courier/transport companies? [RECORD VERBATIM]

Q30. On a scale of 1 to 5, whereby 1 is disagree strongly and 5 is agree strongly, how strongly do you agree or disagree with each of the following statements about business travel in your organisation:

	1 Disagree strongly	2	3	4	5 Agree strongly	Don't know
I and/or others in my organisation travel beyond our local area less often than we would ideally like to						
I and/or others in my organisation travel to fewer places (e.g. cities or towns outside the local area) than I/we would ideally like to						
I and/or others in my organisation travel to places that are nearer than the ones we would ideally like to go to						
I and/or others in my organisation travel by car to places I/we would ideally like to go to by public transport						
I and/or others in my organisation travel by public transport to places I/we would ideally like to go to by car						

Q31. **ASK IF Q30.1=4 OR 5, ELSE SKIP**: Why do you or others in your organisation travel beyond your local area less often than you would ideally like to? Please tick all that apply. – **MULTICODE**

Difficult to find the time to travel
The places we want to go to are too far
Not all relevant staff can drive
Not all relevant staff have access to a car
There are many delays when we travel by car (because of congestion)
We find it difficult to cover the costs of owning and using company vehicles
We find it difficult to cover the costs of using public transport

Public transport is too slow
Public transport is unreliable
There are many delays when we travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
The stations/bus stops are too far from our business
The stations/bus stops are too far from where we want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
Travelling further afield takes up too much of the working day

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q32. **IF Q7 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you or others in your organisation travel less often than you would like to.

OR

IF Q31 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you or others in your organisation travel less often than you would like to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q31 INCLUDES EXACTLY TWO RESPONSES]**

Q33. **ASK IF Q30.2=4 OR 5, ELSE SKIP**: Why do you or others in your organisation travel to fewer places (e.g. cities or towns outside your local area) than you would ideally like to? Please tick all that apply. **MULTICODE**

Difficult to find the time to travel
The places we want to go to are too far
Not all relevant staff can drive
Not all relevant staff have access to a car
There are many delays when we travel by car (because of congestion)
We find it difficult to cover the costs of owning and using company vehicles
We find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when we travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
The stations/bus stops are too far from our business
The stations/bus stops are too far from where we want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
Travelling further afield takes up too much of the working day

Other, please write in:
Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q34. **IF Q9 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you or others in your organisation travel to fewer places than you would ideally like to.

OR

IF Q9 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you or others in your organisation travel to fewer places than you would ideally like to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q9 INCLUDES EXACTLY TWO RESPONSES]**

Q35. **ASK IF Q30.2=4 OR 5, ELSE SKIP**: Why do you or others in your organisation travel to places that are nearer than the ones you would ideally like to go to? Please tick all that apply. **– MULTICODE**

Difficult to find the time to travel
The places we want to go to are too far
Not all relevant staff can drive
Not all relevant staff have access to a car
There are many delays when we travel by car (because of congestion)
We find it difficult to cover the costs of owning and using company vehicles
We find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when we travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
The stations/bus stops are too far from our business
The stations/bus stops are too far from where we want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
Travelling further afield takes up too much of the working day

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q36. **IF Q11 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you or others in your organisation travel to places that are nearer than the ones you would ideally like to go to.

OR

IF Q11 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you or others in your organisation travel to places that are nearer than the ones you would ideally like to go to.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q11 INCLUDES EXACTLY TWO RESPONSES]**

Q37. **ASK IF Q30.4=4 OR 5, ELSE SKIP**: Why do you or others in your organisation travel by car to places you would ideally like to go to by public transport? Please tick all that apply. **– MULTICODE**

We find it difficult to cover the costs of using public transport
Public transport is too slow
Public transport is unreliable
There are many delays when we travel by bus (due to congestion)
Buses/trains/trams do not run frequently enough
Buses/trains/trams are not available in the evening/night
The stations/bus stops are too far from our business
The stations/bus stops are too far from where we want to go
There are no connections between buses/trains/trams
Buses/trains/trams are not comfortable
Buses/trains/trams are too crowded
We often have to transport products of other items when we are travelling
Using public transport takes more time out of the working day than using the car

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q38. **IF Q13 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you or others in your organisation travel by car to places you would ideally like to go to by public transport.

OR

IF Q13 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you or others in your organisation travel to travel by car to places you would ideally like to go to by public transport.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q13 INCLUDES EXACTLY TWO RESPONSES]**

Q39. **ASK IF Q30.4=4 OR 5, ELSE SKIP**: Why do you or others in your organisation travel by public transport to places you would ideally like to go to by car? Please tick all that apply. **– MULTICODE**

Some staff cannot drive
Some staff do not own or have access to a car
There are many delays when we travel by car (because of congestion)
Public transport is a more reliable way of getting to meetings on time
We find it difficult to cover the costs of owning and using a company vehicle
Using public transport takes more time out of the working day than using the car

Other, please write in:

Don't know **SINGLE CODE**
Would rather not say **SINGLE CODE**

Q40. **IFQ15 INCLUDES MORE THAN TWO RESPONSES, SHOW LIST OF RESPONSES AND ASK:** Please indicate which of these is the most important, which is the second most important and which is the third most important reason why you or others in your organisation travel by public transport to places you would ideally like to go to by car.

OR

IF Q15 INCLUDES EXACTLY TWO RESPONSES, SHOW BOTH RESPONSES AND ASK: Please indicate which of these is the most important and which is the second most important reason why you or others in your organisation travel by public transport to places you would ideally like to go to by car.

Most important
2nd most important
3rd most important **[DO NOT SHOW IF Q15 INCLUDES EXACTLY TWO RESPONSES]**

Improvements to Transport in the North

Transport for the North is considering a programme of investments that will improve transport throughout the region. The next few questions will ask how different aspects of these improvements might affect the business trips that you make outside of your local area.

By your local area we again mean the area within 15 miles of your main site, as shown in this map. Please consider only the trips that you might make beyond this area.

ROAD IMPROVEMENTS

Q41. Transport for the North is planning investments that that will improve trip times and reliability on the major roads in the North, so that a commuter or freight operator can expect a consistently good journey time. For example, the door-to-door speed for trips over 15 miles on major roads will be at least 45-50mph, and travel time will be no longer than 35-40 minutes.

Considering this potential future situation, how would you expect the number of trips you or others in your organisation typically make beyond your local area to change, if at all, for each of the following travel reasons and modes of transport (where relevant)? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW AS DROPDOWNS]**

Purpose	Car	Public transport
f) Senior managers travelling on business		
g) Other staff travelling on business		
h) Deliveries using company transport	**N/A Don't show**	**N/A don't show**
i) Deliveries using couriers/transport companies	**N/A Don't show**	**N/A don't show**
j) Provision of services		

Q42. Given the road improvements just described, would you expect you or other members of your organisation to travel to new places beyond your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW AS DROPDOWNS IN EACH CELL]**

a) Senior managers travelling on business
b) Other staff travelling on business
c) Deliveries using company transport
d) Deliveries using couriers/transport companies
e) Provision of services

Q43. **[IF Q18 a,b,c,d or e='New places'] [SHOW MAP]** Please mark on this map any new places that you think you or others in your organisation might travel to in a typical month if the improvements described were made.

FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q42 SELECTED WITH 'NEW PLACES', ASK:

Q44. Q19.1 For what reason(s) would you or others in your organisation travel to this place? [Please tick all that apply) **[RECORD LOCATION COORDINATES]**

f) Senior managers travelling on business **[ONLY SHOW IF Q18a='New places']**
g) Other staff travelling on business **[ONLY SHOW IF Q18b ='New places']**
h) Deliveries using company transport **[ONLY SHOW IF Q18c ='New places']**
i) Deliveries using couriers/transport companies **[ONLY SHOW IF Q18d='New places']**
j) Provision of services **[ONLY SHOW IF Q18e='New places']**

RAIL IMPROVEMENTS

Q45. Transport for the North is also planning investments that will increase the capacity, frequency, speed, and quality of the rail network linking the North's largest cities with each other and with the rest of the North. This would involve the creation of new rail lines and the reduction of travel time and increase in the number of services in the existing lines. For example, there would be a dependable "turn up and go" service, that got you from one city to another in under half an hour, and meant you could get to lots more places easily and in comfort. Travel times between major cities would be reduced by up to 35-45%.

Considering this potential future situation, how would you expect the number of trips you or others in your organisation typically make outside your local area to change, if at all, for each of the following travel reasons and modes of transport? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW/NOT APPLICABLE AS DROPDOWNS IN EACH CELL]**

Purpose	Car	Public transport
f) Senior manager travelling on business		
g) Other staff travelling on business		
h) Other purposes		

Q46. Given the rail improvements just described, would you expect yourself or others in your organisation to travel to new places outside your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW/NOT APPLICABLE AS DROPDOWNS IN EACH CELL]**

f) Senior managers travelling on business **[ONLY SHOW IF Q20f)='More trips']**
g) Other staff travelling on business **[ONLY SHOW IF Q44g) ='More trips']**
h) Other purposes **[ONLY SHOW IF Q20h) ='More trips']**

Q47. **[IF Q21 a,b,or c ='New places'] [SHOW MAP]** Please mark on this map any new places that you think you or others in your organisation might travel to in a typical month if the improvements described were made.

FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q21 SELECTED WITH 'NEW PLACES', ASK:

Q22.1 For what reason(s) would you or others in your organisation travel to this place? [Please tick all that apply) [RECORD LOCATION COORDINATES]

Senior managers travelling on business	[ONLY SHOW IF Q21f)f)='New places']
Other staff travelling on business	[ONLY SHOW IF Q21g) ='New places']
Other purposes	[ONLY SHOW IF Q21h)='New places']

INTEGRATED AND SMART TRAVEL

Q48. The investments also include developing smart tickets (tap in, tap out), new ways of buying and paying for tickets and, new ways of getting relevant information. Passengers will also benefit from a 'fair price promise' when travelling on any bus, train, or tram in the North. All of this will mean less queuing, more accurate and timely travel information, and a consistent travel experience throughout the North.

Q49. Considering this potential future situation, how would you expect the number of trips you or others in your organisation typically make outside your local area to change, if at all, for each of the following travel reasons and modes of transport? **[ALLOW 'FEWER TRIPS'/'SAME NUMBER OF TRIPS'/'MORE TRIPS'/DON'T KNOW/NOT APPLICABLE AS DROPDOWNS IN EACH CELL]**

Purpose	Car	Public transport
f) Senior Managers travelling on business		
g) Other staff travelling on business		
h) Other purposes		

Q50. Given the improvements just described, would you expect yourself or others in your organisation to travel to new places outside your local area or to the same places that you usually go to? Please answer for each of the following travel reasons. **[ALLOW 'NEW PLACES'/'SAME PLACES'/DON'T KNOW AS DROPDOWNS IN EACH CELL]**

f) Senior managers travelling on business **[ONLY SHOW IF Q23f)='More trips']**

g) Other staff travelling on business **[ONLY SHOW IF Q23g) ='More trips']**
h) Other purposes **[ONLY SHOW IF Q47e)='More trips']**

Q51. **[IF Q248a,b,or c='New places'] [SHOW MAP]** Please mark on this map any new places that you think you or others in your organisation might travel to in a typical month if the improvements described were made.

FOR EACH SELECTED LOCATION, IF MORE THAN 2 PURPOSES AT Q48 SELECTED WITH 'NEW PLACES', ASK:

Q25.1 For what reason(s) would you or others in your organisation travel to this place? [Please tick all that apply) **[RECORD LOCATION COORDINATES]**

f) Senior managers travelling on business **[ONLY SHOW IF Q24f)='New places']**
g) Other staff travelling on business **[ONLY SHOW IF Q48g) ='New places']**
h) Other purposes **[ONLY SHOW IF Q24h)='New places']**

LONGER TERM IMPACTS

Q52. Would you consider changing **where your business is based** in the medium or long term in any of the following scenarios?

	Yes	No	Don't know
If we could reach more places by public transport from our new location			
If we had faster public transport in our new location			
If we had more reliable public transport in our new location			
If we had more comfortable public transport in our new location			
If we could reach more places by car/van from our new location			
If we had a faster road network in our new location			
If we had better road connections in our new location			

Q53. **[IF Q13=>0 for any category of vehicle]** Would you consider reducing the number of vehicles owned or leased by the company, in the medium or long term, under any of the following scenarios?

	Yes	No	Don't know
If we could reach more places by public transport from our area			
If we had faster public transport in our area			
If we had more reliable public transport in our area			
If we had more comfortable public transport in our area			

Thank you. That was the last question in this survey. This research was conducted under the terms of the MRS code of conduct and is completely confidential.

Q54. We really appreciate the time that you have given us today. Would you be willing to be contacted again for clarification purposes or be invited to take part in other research for Transport for the North?
Yes, for both clarification and further research
Yes, for clarification only

Yes, for further research only
No

Q55. Please provide an email address if you wish to receive a copy of the final report.

WRITE IN:

Appendix D

Qualitative: Topic Guides

3251 – TfN – User Insight
HH Group Topic Guide

Welcome 5 Mins (5)

- Welcome and thanks for coming
- Explain independent and exploratory nature of research (conducted in accordance with the Code of Conduct of the Market Research Society (MRS) and also with the Data Protection Act, with whom Accent is registered)
- We are undertaking this research on behalf of Transport for the North who are keen to understand more about your travel behaviour in order to develop a new transport plan for the North.
- Thanks for doing the homework exercise – that would have given you an indication of what we are going to be discussing tonight – it's all about YOU!! (and your travel patterns and behaviour)
- Please remember that there are absolutely no right or wrong answers – we're interested in your views and opinions and these might be different from other people in the room
- Explain about tape-recorder – standard market research procedure and for analysis purposes only. The recordings will not be passed to any third party not associated with the research project, and none of your comments will be attributed to you by name.

Warm-Up

OBJECTIVE – MAKE EVERYONE FEEL COMFORTABLE AND SAFE TO SHARE VIEWS

- Paired introductions: ask participants to pair up with the person they are sitting next to.
- We would like you to find out a bit about the person you are sitting next to so that you can introduce them to the rest of the group

- First name
- Home location
- Who lives at their home
- Favourite mode of transport
- Who would you most like to travel on that transport with – famous/family/deal/alive – anyone, it's just an ice breaker!

Getting to know you 10 mins (20)

OBJECTIVE – LAYERING THE SEGMENTS BY UNDERSTANDING MORE ABOUT THEM & WHO THEY ARE

- Grab your pre-tasks please

- Share the collages
- Pick a few people to go through there collage
  - What does it tell us about you – what's important, what you like, what frustrates you
- Lay all the collages on the table
  - What does it tell us about you as a group
    - what are the similarities between you all
    - what are the differences amongst you

What's important to you 15 mins (35)

OBJECTIVE – LAYERING THE SEGMENTS BY UNDERSTANDING THEIR ATTITUDE TO TECHNOLOGY AND THEIR PRIORITIES

- Just thinking about you and technology
- what technology do you have on you now
- what technology do you have at home
- how quick are you to get the latest technology
- give some examples of when you were quick or sloe to get technology

- We want to play a quick game of 'would you rather' – you might have played this before when you were younger or even out at the pub with friends!!
- We have 3 different cards on the table and we want to understand what are your top priorities right now
  - Category 1 - Financial
    - saving money for the future
    - getting straight or out of debt
    - making more money
  - Category 2 – Health
    - getting the right attention for any illnesses or disabilities
    - exercising everyday
    - focusing on mental wellbeing
  - Category 3 – Time
    - saving time
    - stopping doing some things to give me more time
    - paying someone else to do things for me

- You all have a top, middle or bottom card and we want you to place the top card on the category that's most important, the middle card that's least important and the bottom card on the category that's least important
- Discuss overall category prioritisation and reasons why
- Probe around the different elements and get real life examples of why these are important

Travel Patterns and Behaviour 20 mins (55)

OBJECTIVE – EXPLORE BASELINE TRAVEL PATTERNS

- You also completed the travel diaries for us so let's look through those now

- Develop a journey wheel on the flipchart

- Journey purpose
  - What reasons are you travelling
  - Establish list of journeys that were within local area (up to 15 miles) and outside of local area (beyond 15 miles) USE LOCATION MAPS

- For each journey purpose
  - How are you getting there
  - Why using that mode of transport
  - How well is it working for you at the moment

- Thinking specifically about the journeys outside of your local area (beyond 15 miles)
  - What kind of journeys are these
  - How different are they
  - How do you plan for these
  - What is difficult – stops you from travelling more to these further locations
  - What could be improved – would encourage you to travel more to these further locations

Timeline exercise 10 mins (65)

OBJECTIVE – UNDERSTAND HOW PEOPLE FEEL THEIR TRAVEL PATTERNS MAY CHANGE GOING FORWARD

- We would like to look to take a crystal ball now and look into the future!! We know it can be tricky to think too far ahead so let's start with the next 5 years

- Individual 5 year timeline – a) Travel more OR travel less, b) More by Public transport or less by public transport, c) More by car or less by car
  - Collate on flipchart for each 3 parts
  - What would stop you
  - What is difficult and stops you from travelling more to these further locations
  - What could be improved that would encourage you to travel more to these further locations

Strategic Plan Improvements – Impact 25 mins (90)

OBJECTIVE – UNDERSTAND THE IMPACT OF TRANSPORT CHANGES ON INDIVIDUAL BEHAVIOUR

Transport for the North is considering a programme of investments that will improve transport throughout the region and we want to understand your views on these and what difference it might make to your current travel behaviour

- Localised Showcards with improvements to trip times

- SHOWCARDS A, B and C – ROAD, RAIL, BUS
- Imagine this situation where it's quicker to get to those places
- How might this affect you
- What would you do differently as a result of these changes
  - Think about your work/study situation, how might that change with this newer, faster transport links?
    - Move house, sell car, travel further for a job
    - Explore
  - What about leisure activities like shopping, bowling, cinema, meeting or visiting family and friends
- Why would it change
- Why would it stay the same

- There are also investments that will be made to develop things like ticketing and information
- SHOWCARD D - INTEGRATED AND SMART TRAVEL
  - Improvements to smart tickets (tap in, tap out)
  - New ways of buying and paying for tickets
  - New ways of getting relevant information
  - 'Fair price promise' when travelling on any bus, train, or tram in the North so there is a cap on your ticket
  - All of this will mean less queuing, more accurate and timely travel information, and a consistent travel experience throughout the North

- What do you think about these plans
- +/-
- Which bits do you look at and think are really important
- Which are less important
- What difference do you think this would make to you and your travel plans

- Some people have told us that they would travel more/less outside of their local area as a result of all of these plans
  - Would you travel more or less
  - Individual sentence completion

Wrap and Close

- Talk through next stages

Thank you very much.

3251 – TFN – BUSINESS User Insight
Draft Group Topic Guide

Welcome 5 Mins (5)

- Welcome and thanks for coming
- Explain independent and exploratory nature of research (conducted in accordance with the Code of Conduct of the Market Research Society (MRS) and also with the Data Protection Act, with whom Accent is registered)
- We are undertaking this research on behalf of Transport for the North who are keen to understand more about your travel strategy and policy in order to develop a new transport plan for the North.
- Please remember that there are absolutely no right or wrong answers – we're interested in your views and opinions for your business and these might be different from other people in the room
- Explain about tape-recorder and videos – standard market research procedure and for analysis purposes only. The recordings will not be passed to any third party not associated with the research project, and none of your comments will be attributed to you by name.

- MODERATOR – KEEP REMINDING OF CORE OBJECTIVE IN MIND – WHAT MEASURES/INTERVENTIONS WILL INFLUENCE CHANGES IN EACH SEGMENTS

Warm-Up 10 mins (15)

OBJECTIVE – MAKE EVERYONE FEEL COMFORTABLE AND SAFE TO SHARE VIEWS

- Paired introductions: ask participants to pair up with the person they are sitting next to.
- We would like you to find out a bit about the person you are sitting next to so that you can introduce them to the rest of the group

  - First name
  - Business name
  - Business role and responsibilities
  - Length of time
  - Number of employees

- Business wellness index – scale of 1-10 how well would you say the business is doing (provides baseline level)

Getting to know your Business 10 mins (20)

OBJECTIVE – KNOWING MORE ABUT BUSINESSES IN THE NORTH

- Tell us about your business history

  - How long have you been established
  - What are the business hopes
  - What are the key business fears
  - If you could wish one thing for the business, what would it be e.g. higher orders, ability to recruit good staff, better transport, stable trading, etc

What's important to you 10 mins (30)

OBJECTIVE – UNDERSRANDING BUSINESS PRIORITIES

- What are the 3 key things that are important to your business
- Everyone write on individual piece of paper
- Produce long list on a flipchart
- Discuss business priorities

- If not spontaneous, then explore where does 'better transport links in the North' come up in your priority list

Business Travel Patterns and Behaviour 20 mins (50)

OBJECTIVE – EXPLORE BASELINE BUSINESS TRAVEL PATTERNS

- We would like to explore now the kind of trip that the Business and employees take, where Suppliers are based, etc so we can understand how dependent your Business is on transport links

  - Using map on flipchart that shows 15 mile radius around the core area
    - Where do employees come in from
    - Where are Suppliers based
    - Where are your main customers for deliveries, etc
    - Where do you Senior Manager travel to the most

- What mode of transport does your business rely on the most
- How much does your business rely on rail links within the North
  - Explore where
- How much does your business rely on road links within the North
  - Explore where

- Overall how satisfied are you with the current transport links in the North
  - +/-
  - Reasons why
  - What would you change
  - What could be improved

Timeline exercise 10 mins (60)

OBJECTIVE – UNDERSTAND HOW BUSINESSES FEEL THEIR TRAVEL PATTERNS MAY CHANGE GOING FORWARD

- We would like to look to take a crystal ball now and look into the future!! We know it can be tricky to think too far ahead so let's start with the next 5 years and then think about the longer term Business plans, say 10 years

  - Individual 5 year timeline – a) Business will travel more OR travel less, b) Business will use more public transport or less public transport, c) More by car or less by car
    - Collate on flipchart for each 3 parts
    - What would stop your business growing more

  - What would be the ideal changes that you would make to the Transport infrastructure in the North to improve your Business prospects and plans. Imagine you were writing to the transport planning team, what improvements would you ask for?
    - Spontaneous
      - Road?
      - Rail?
      - Speed?
      - Cost?

Strategic Plan Improvements – Impact 30 mins (90)

OBJECTIVE – UNDERSTAND THE IMPACT OF TRANSPORT CHANGES ON BUSINESS BEHAVIOUR

Transport for the North is considering a programme of investments that will improve transport throughout the region and we want to understand your views on these and what difference it might make to your Business success and plans going forward

- Use localised interventions provided for Bradford and Newcastle and explain time savings

  - SHOWCARDS A, B and C – ROAD, RAIL, BUS

    Transport for the North is planning investments that that will improve trip times and reliability on the major roads in the North, so that a commuter or freight operator can expect a consistently good journey time. For example, the door-to-door speed for trips over 15 miles on major roads will be at least 45-50mph, and travel time will be no longer than 35-40 minutes.

  - Imagine this situation where it's quicker to get to those places
  - How might this affect your business - +/-
  - What would your Business do differently as a result of these changes
    - Think about your plan for your suppliers
    - Think about your employees
    - Think about your customers
  - How would things change
  - Better or worse
  - Why would it stay the same

  - There are also investments that will be made to develop things like ticketing and information
  - SHOWCARD D - INTEGRATED AND SMART TRAVEL
    - Improvements to smart tickets (tap in, tap out)
    - New ways of buying and paying for tickets
    - New ways of getting relevant information
    - 'Fair price promise' when travelling on any bus, train, or tram in the North so there is a cap on your ticket
    - All of this will mean less queuing, more accurate and timely travel information, and a consistent travel experience throughout the North

    - What do you think about these plans
    - +/-
    - Which bits do you look at and think are really important
    - Which are less important

- What difference do you think this would make to you and your Business

- Some Businesses have told us that they (employees, suppliers, customers) would travel more/less outside of their local area as a result of all of these plans
  - Would your Business 'travel' more or less
  - Individual sentence completion

  - Vox Pop to TFN – Dear Transport for the North, I would really like you to focus on x, y, z to make life better for me and my business in the future

Wrap and Close 5 mins (90)

- Talk through next stages

Thank you very much.