

**Large-scale workforce relocations:
What are the opportunities to
influence travel behaviour towards
sustainable modes?**

Andrew Binder

School of Environment and Life Sciences,
University of Salford

Contents

Contents	i
List of Figures.....	iii
List of Tables	v
Acknowledgments	vii
List of Abbreviations	viii
Abstract	ix
1 Introduction.....	1
1.1 Overview	1
1.2 Background and rationale.....	2
1.3 Expected research contribution	11
1.4 Aim and objectives.....	11
1.5 Overview of research methodology	12
1.6 Author’s involvement	13
1.7 Structure of the thesis	14
2 Influences on travel behaviour.....	15
2.1 Introduction	15
2.2 Non-spatial influences	17
2.3 Spatial influences	22
2.4 Summary.....	33
2.5 Synthesis	34
3 Large-scale workforce relocations as an opportunity to influence travel behaviour ..	38
3.1 Introduction	38
3.2 Examples	39
3.3 Reasons for relocation	42
3.4 Future trends	43
3.5 Theoretical opportunity to influence travel behaviour	44
3.6 Impact on travel behaviour.....	46
3.7 Knowledge gap.....	51
3.8 Summary.....	51
4 Measures to influence travel behaviour during a large-scale workforce relocation..	53
4.1 Introduction	53
4.2 Transport Demand Management	53
4.3 TDM delivery mechanism - Land use planning.....	61
4.4 Summary.....	88
5 Research gap	89
5.1 Introduction	89
5.2 Literature review recap.....	89
5.3 Identified research gap	89
6 Research design.....	93
6.1 Introduction	93
6.2 Overview of the research approach	93
6.3 Research philosophy/worldview	94
6.4 Approaches	96
6.5 Research strategies.....	97
6.6 Methodological choices.....	102

6.7	Time horizons.....	105
6.8	Techniques and procedures.....	106
6.9	Summary.....	110
7	Findings.....	112
7.1	Introduction	112
7.2	Case study details	114
7.3	Pre-relocation	137
7.4	During relocation	147
7.5	Post-relocation.....	152
7.6	Spatial influences on travel behaviour	179
7.7	Non-spatial influences on travel behaviour.....	208
7.8	Summary.....	232
8	Discussion	233
8.1	Introduction	233
8.2	The effect of a large-scale workforce relocation on travel behaviour	234
8.3	The role of hard and soft measures in facilitating sustainable travel during a relocation.....	252
9	Conclusions.....	266
9.1	Implications.....	266
9.2	Limitations	275
9.3	Dissemination	275
	References.....	277
	Appendix A – Travel survey forms	304
	Survey 1 (2014).....	304
	Survey 2 (2016).....	321
	Appendix B – Travel Diary Form	327
	Appendix C – Interview Guide	332
	Appendix D – Ethical Approval	334
	Appendix E – Secondary Data.....	336

List of Figures

Figure 1.1 – UK passenger transport by mode 1952–2017 (Source: DfT, 2018).....	3
Figure 1.2 – UK domestic greenhouse gas emissions by source category, 2016* (Source: DfBEIS, 2018)	4
Figure 1.3 – The dynamics of diminishing accessibility experienced by non-car users (Source: Lucas, 2004).....	7
Figure 1.4 – Thesis structure	14
Figure 2.1 – Acceptable travel time concept (Source: Milakis et al., 2015).....	18
Figure 2.2 – Example of urban form diversity near the workplace.....	25
Figure 2.3 – Examples of urban form design (Source: Rodrigue et al., 2013).....	26
Figure 2.4 – Spatial arrangement of land uses and transport system (Source: authors own)	28
Figure 2.5 – Ecological Model.....	36
Figure 2.6 – Influences on travel behaviour and relationship with Ecological Model	37
Figure 4.1 – Travel Plan cycle	67
Figure 4.2 – The role of different actors in the Travel Plan process	69
Figure 4.3 – Travel Plan guidance timeline.....	70
Figure 4.4 – Front cover of ‘Delivering Travel Plans through the Planning Process’ (DfT/DCLG, 2009).....	71
Figure 4.5 – Travel Plan delivery structure with organisation as planning applicant	80
Figure 4.6 – Travel Plan delivery structure with developer as planning applicant	81
Figure 6.1 – Layers of the Research Onion (adapted from Saunders et al., 2009)	94
Figure 6.2 – Types of case study and types of case study design, adapted from Yin (2014)	99
Figure 6.3 – Case and context definition for this research	102
Figure 6.4 – Explanatory design: participation selection model (QUAL emphasised) (Adapted from Creswell & Plano-Clark, 2007)	105
Figure 7.1 – Stages in the relocation process.....	113
Figure 7.2 – Location of Greater Manchester within the UK (Source: Open Street Map with author’s annotation).....	115
Figure 7.3 – Location of Salford Quays within Greater Manchester (Source: Open Street Map with author’s annotation)	115
Figure 7.4 – Aerial view of Salford Quays in 1987 (Source: Transport Archive)	116
Figure 7.5 – Aerial view of Salford Quays circa 2016 (Source: APEM)	117
Figure 7.6 – BBC departments relocated to MediaCityUK (Source: National Audit Office)	118
Figure 7.7 – MediaCityUK site map (Source: BBC)	119
Figure 7.8 – MediaCityUK Phase 2 plans (Source: Construction Enquirer)	120
Figure 7.9 – Light rail and rail network around Salford and Manchester (Source: Author’s annotation on Google Maps).....	121
Figure 7.10 – Location of MediaCityUK within Salford Quays Manchester (Source: Author’s annotation on Google Maps).....	121
Figure 7.11 – Quayslink bus service	122
Figure 7.12 – Bus services near to MediaCityUK (Source: Open Street Map)	123
Figure 7.13 – Concept drawing showing the density of routes radiating out from Quays Point and central Piazza (Source: TMBC/SCC, 2007).....	125
Figure 7.14 – MediaCityUK aerial view (Source: Wikimedia commons)	125
Figure 7.15 – Pedestrian and bicycle bridge over the Manchester Ship Canal.....	126

Figure 7.16 – Primary data collection process	130
Figure 7.17 – Travel diary example	133
Figure 7.18 – Primary and secondary data timeline	136
Figure 7.19 – Example of interview transcript with coding applied	137
Figure 7.20 – BBC London location within Greater London (Source: Open Street Map with author’s annotation).....	138
Figure 7.21 – BBC London and the local area (Source: Open Street Map with author’s annotation).....	139
Figure 7.22 – BBC Manchester location within Greater Manchester (Source: Open Street Map with author’s annotation)	142
Figure 7.23 – BBC Manchester and the local area (Source: Open Street Map with author’s annotation).....	143
Figure 7.24 – MSOA E02001184: Salford 028 (Source: 2011 Census).....	172
Figure 7.25 – Land use in the local area to MediaCityUK (Source: Open Street Map)	173
Figure 7.26 – Lack of permeability in local area to MediaCityUK (Source: Open Street Map)	174
Figure 7.27 – Spatial distribution of BBC employees	177
Figure 7.28 – Spatial distribution of BBC employees and primary mode of travel.....	178
Figure 7.29 – Awareness of motor vehicle infrastructure measures.....	183
Figure 7.30 – Light rail stations near to MediaCityUK (Source: Google Maps with authors annotation).....	184
Figure 7.31 – Metrolink tram at MediaCityUK	185
Figure 7.32 – Bus services near to MediaCityUK (Source: Author’s annotation on Open Street Map).....	185
Figure 7.33 – Location of Cornbrook light rail interchange (Source: author’s annotation on Open Street Map).....	188
Figure 7.34 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, Greater Manchester area* (Source: TfGM)	190
Figure 7.35 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, focus on Manchester city centre and Salford Quays* (Source: TfGM).....	191
Figure 7.36 – Awareness and uptake of cycle infrastructure measures	199
Figure 7.37 – Age and primary mode of travel.....	217
Figure 7.38 – Awareness and uptake of soft/non-spatial measures.....	222
Figure 7.39 – Awareness of the Travel Plan	223
Figure 7.40 – Cycling promotion event at MediaCityUK, June 2018.....	226
Figure 7.41 – Travel Choices website	230
Figure 8.1 – Case and context conceptualisation from Chapter 7: Research Design	241
Figure 8.2 – Ecological model.....	242

List of Tables

Table 1.1 – Greenhouse gas emissions by transport mode, 2015 (Source: DfT, 2017e)	5
Table 1.2 – Research objectives and study elements	13
Table 2.1 – Influences on travel behaviour	17
Table 2.2 – Dimensions of urban form (adapted from Ewing & Cervero, 2010)	23
Table 3.1 – Large-scale workforce relocations in the UK	39
Table 3.2 – Large-scale workforce relocations outside of the UK.....	40
Table 4.1 – Juxtaposition of the characteristics of Hard and Soft TDM measures (Adapted from Roby, 2010a)	54
Table 4.2 – Hard TDM categories and measures*	56
Table 4.3 – Soft TDM categories and measures*	57
Table 4.4 – Key stages in securing a Travel Plan for a new development (adapted from DfT, 2009a).....	76
Table 4.5 – Summary of findings on the impact of Travel Plans	84
Table 6.1 – Types of mixed methods designs (Adapted from Creswell & Plano Clark, 2007)	104
Table 6.2 – Primary data collection methods and research type.....	107
Table 7.1 – Summary of transport infrastructure interventions at or around MediaCityUK	128
Table 7.2 – Interviewee information	135
Table 7.3 – Mode share of BBC London and local area.....	140
Table 7.4 – Mode share of BBC Manchester and the local area	144
Table 7.5 – Mode share of people based in other locations.....	147
Table 7.6 – Intended mode of travel prior to relocation (n=773).....	148
Table 7.7 – Pre and post-relocation mode share (all employees, n=249)	154
Table 7.8 – Changes in primary mode of travel: all previous locations to MediaCityUK..	155
Table 7.9 – Changes in primary mode of travel by modal group	156
Table 7.10 – Net change in mode use for public transport.....	157
Table 7.11 – Net change in mode use for car	157
Table 7.12 – Net change in mode use for active travel.....	157
Table 7.13 – Pre and post-relocation mode share (BBC London, n=49)	158
Table 7.14 – Changes in mode share: BBC London to MediaCityUK.....	159
Table 7.15 – Changes in primary mode of travel of ex-BBC London employees by modal group.....	160
Table 7.16 – Net change in mode use for public transport (BBC London).....	160
Table 7.17 – Net change in mode use for car (BBC London).....	161
Table 7.18 – Net change in mode use for active travel (BBC London).....	161
Table 7.19 – Pre and post-relocation mode share (BBC Manchester)	162
Table 7.20 – Change in primary mode of travel: BBC Manchester to MediaCityUK.....	163
Table 7.21 – Changes in primary mode of travel of ex-BBC Manchester employees by modal group.....	164
Table 7.22 – Net change in mode use for public transport (BBC Manchester)	165
Table 7.23 – Net change in mode use for car (BBC Manchester)	165
Table 7.24 – Net change in mode use for active travel (BBC Manchester)	165
Table 7.25 – Stated mode share intention compared to observed mode share	166
Table 7.26 – Post-relocation primary mode of travel	170
Table 7.27 – Wider geographies for mode share comparison	171
Table 7.28 – Mode share comparison with wider geographies	172

Table 7.29 – Arrival mode at MediaCityUK for rail users	186
Table 7.30 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, journeys stations in bold require interchange* (Source: TfGM)	189
Table 7.31 – Pre and post relocation mode share by sub-group	211
Table 7.32 – Cross tabulation of previous workplace with primary mode of travel to MediaCityUK (smaller frequencies have been combined)	212
Table 7.33 – Mode share by gender	215
Table 7.34 – Cross tabulation of gender and primary mode	215
Table 7.35 – Cross tabulation of age and primary mode	218
Table 7.36 – Days travelled to MediaCityUK per week	221
Table 7.37 – Days working at home or off-site per week	221
Table 7.38 – Travel Plan and Stages of Change comparison	225
Table 9.1 – Implications summary	273

Acknowledgments

Firstly, I would like to thank my supervisors Professor Richard Knowles, Ralph Henson and Dr. Mags Adams for their support, guidance and encouragement throughout this research. Their combined knowledge and expertise have helped make this study what it is and their input and guidance through the more challenging aspects of the work was highly valued. I wish to express my appreciation to my examiners Professor Marcus Enoch and Dr. Graeme Sherriff for their helpful and valuable comments. I would also like to acknowledge the support from the staff of the two schools I have been part of during this research – the School of Computing, Science and Engineering and the School of Environment and Life Sciences at the University of Salford.

I would like to thank the BBC for facilitating this research and their support in gaining participation from their employees. I would also like to thank each of the BBC employees who gave their time to take part in the study, particularly those who completed travel diaries and interviews and showed a real interest in the work. It goes without saying that this research would not have been possible without your inputs.

Thank you to my former colleagues at the University of Salford, who supported the proposal to undertake the study from the outset, appreciating the value and relevance of the work. Thanks also to current and former colleagues at Mouchel/WSP for supporting the study through their technical input but also for their commitment to supporting my career development. I appreciate all your encouragement and interest over the last few years while we're all trying to get the day job done as well!

Finally and most importantly, I would like to thank my family for their continuous encouragement, patience and support throughout this research. I would not have been able to achieve the work I have without you all, from proof-reading to cups of tea, your support has been immense. Thank you especially to Joel who always wanted to come and help do 'Daddy's work'.

List of Abbreviations

(Defunct Government departments are denoted by their dates of operation)

BBC	British Broadcasting Company
CBD	Central Business District
CIL	Community Infrastructure Levy
DCLG	Department for Communities & Local Government (2006–2018)
DECC	Department of Energy and Climate Change (2008–2016)
DETR	Department for Energy, Transport and the Regions (1997–2001)
DfBEIS	Department for Business, Energy and Industrial Strategy
DfT	Department for Transport
EZ	Enterprise Zones
GHG	Greenhouse Gases
HMG	Her Majesty's Government
LPA	Local Planning Authority
LPG	Local Planning Guidance
LSTF	Local Sustainable Transport Fund
LTDS	London Travel Demand Survey
MCHLG	Ministry of Housing, Communities and Local Government
Metrolink	Light rail/tram system in Greater Manchester
MSOA	Middle Layer Super Output Area
NBH	New Broadcasting House
NPPF	National Planning Policy Framework
NTS	National Travel Survey
ODPM	Office of the Deputy Prime Minister (2001–2006)
PINS	Planning Inspectorate for England and Wales
PPG	Planning Policy Guidance
RCEP	Royal Commission on Environmental Pollution
SACTRA	Standing Advisory Committee on Trunk Road Assessment
SCC	Salford City Council
SRF	Strategic Regeneration Frameworks
SPT	Social Practice Theory
S106	Section 106 Agreement
TDM	Transport Demand Management
TOC	Theory of Constraints
TOD	Transit Oriented Development
TP	Travel Plan
TPC	Travel Plan Co-ordinator
TfGM	Transport for Greater Manchester
TfL	Transport for London
TSG	Transport Steering Group (at MediaCityUK)
TUG	Transport User Group (at MediaCityUK)
VMT	Vehicle Miles Travelled

Abstract

Individual behaviour, including that of travel behaviour, can become habitual when repeated within a stable context. The context change or disruption brought about by a biographical event can remove the habitual automation, necessitating people to revert to a decision making process in order to manage their new context or norm. Workplace relocation is a type of disruption that offers an opportunity to break travel habits and influence travel behaviour towards more sustainable patterns. In the last few decades, large-scale workforce relocations (involving over 250 employees) have been frequently occurring in both the private and public sector. Current drivers of relocation include cost savings but also policy and infrastructure developments, such as Government decentralisation plans and high-speed rail which will increase time-space convergence, creating potential for more organisations to consider where they base their operations. The uncertainty regarding the UK exit from the European Union is also resulting in organisations considering where they should be located.

Previous research has shown how travel behaviour is influenced by both spatial (urban form e.g. density, diversity, design, accessibility) and non-spatial factors (attitudes towards travel and urban form and socio-demographics). Large-scale workforce relocations offer the opportunity to influence travel behaviour towards sustainable modes through both spatial and non-spatial interventions.

Between 2010 and 2012, a workforce of approximately 2,300 people relocated to the new BBC site at MediaCityUK, Salford predominantly from existing sites in London and Manchester. MediaCityUK was planned as a sustainable, Transit Oriented Development and has a site Travel Plan with a target to achieve a minimum of 45% of trips to the site by non-car modes, such as active travel (cycling and walking) and transit (light rail, heavy rail and bus). A mixed methods case study approach (involving surveys and interviews) was utilised to research the influences on travel behaviour during a large-scale workforce relocation. The study also aimed to understand the opportunity that a large-scale workforce relocation provides for positively influencing travel behaviour towards sustainable modes.

The study showed the importance of sustainable transport infrastructure being in place from the outset and how soft measures needed to be utilised as early as possible in the

relocation process. The study highlighted the many complexities that influence individual travel behaviour and that can constrain sustainable mode use. However, the study has shown that large-scale workforce relocations provide a key opportunity to be capitalised on and their potential can be expanded through the effective use of hard and soft measures.

1 Introduction

1.1 Overview

This research aims to examine a specific opportunity to influence and facilitate sustainable travel that is presented during a large-scale workforce relocation. Large-scale workforce relocations have been identified as a context change that can break the habitual nature of peoples travel behaviour as they disrupt the location of where people work and in some cases where they live, or even both (Lanzendorf, 2003; Scheiner & Holz-Rau, 2013; Verplanken et al., 2008). Research into travel behaviour during workplace relocations has shown that changes to mode use occur, with shifts both towards private vehicle use and towards sustainable modes (Aarhus, 2000; Bell, 1990; Hanssen, 1995; Walker et al., 2014). Conversely, research has also shown that a large proportion of people do not change their mode following relocation (Vale, 2013). It has also been noted how there have been few publications concerning a major workplace relocation (Vale, 2013).

This thesis aims to understand how travel behaviour can be influenced towards sustainable modes during a large-scale workforce relocation. Through the implementation of an original research methodology this thesis presents the findings on the impact of a large-scale workforce relocation in relation to travel behaviour. The thesis aims to create further knowledge through analysing the role of interventions implemented to increase sustainable mode use.

This introductory chapter provides the background and rationale for this research in terms of establishing the need to influence travel behaviour towards more sustainable patterns. The chapter also presents the expected contribution of the research followed by the aims and objectives. An overview of the research methodology is provided along with an outline of the thesis structure.

1.2 Background and rationale

1.2.1 The context for needing to influence travel behaviour

1.2.1.1 The growth in private vehicle use

The effective integration of transport planning and land use to improve living conditions is one of the most important policy challenges that society faces. When done well, it can result in thriving settlements and increased connectivity; however, when done badly it often leads to undesirable outcomes (Headicar, 2015). In the UK, like many other developed countries, the twentieth century saw towns and cities remodelled to cater for private vehicles, often with vehicle traffic prioritised at the expense of other modes, such as pedestrian traffic (Newman & Kenworthy, 1999).

The concept of providing road capacity to meet future forecast traffic growth or ‘predict and provide’ was the dominant paradigm in transport policy in the second half of the twentieth century where road capacity was created to meet the increasing demand for private motor vehicle travel (Goodwin, 2004). Predict and provide was challenged in the prominent paper *Traffic in Towns* which emphasised the impact that increased road traffic would have on people’s lives due to congestion and pollution (Buchanan et al., 1963). However, predict and provide shaped travel behaviour by making it easier to undertake trips by private vehicles. New road infrastructure provided faster and more direct paths for vehicles moving within and between urban areas. This coupled with the increasing affordability of car ownership influenced an increase in private vehicle usage at the expense of trips by public transport, walking and cycling.

In the decades since the Second World War, the annual distance travelled by private vehicles increased from 58 billion passenger kilometres in 1952 to 286 billion kilometres in 1969, taking its share of total distance travelled from 27% to 72% by the end of the 1960s. The share increased to around 85% of all passenger kilometres travelled from 1990 onwards. In the same period the percentage of households without access to a private motor vehicle reduced significantly from 86% in 1951 to 24% in 2017 (DfT, 2018). This growth came at the expense of what today are considered sustainable modes of travel: bus and coach, rail and pedal cycle (DfT, 2018).

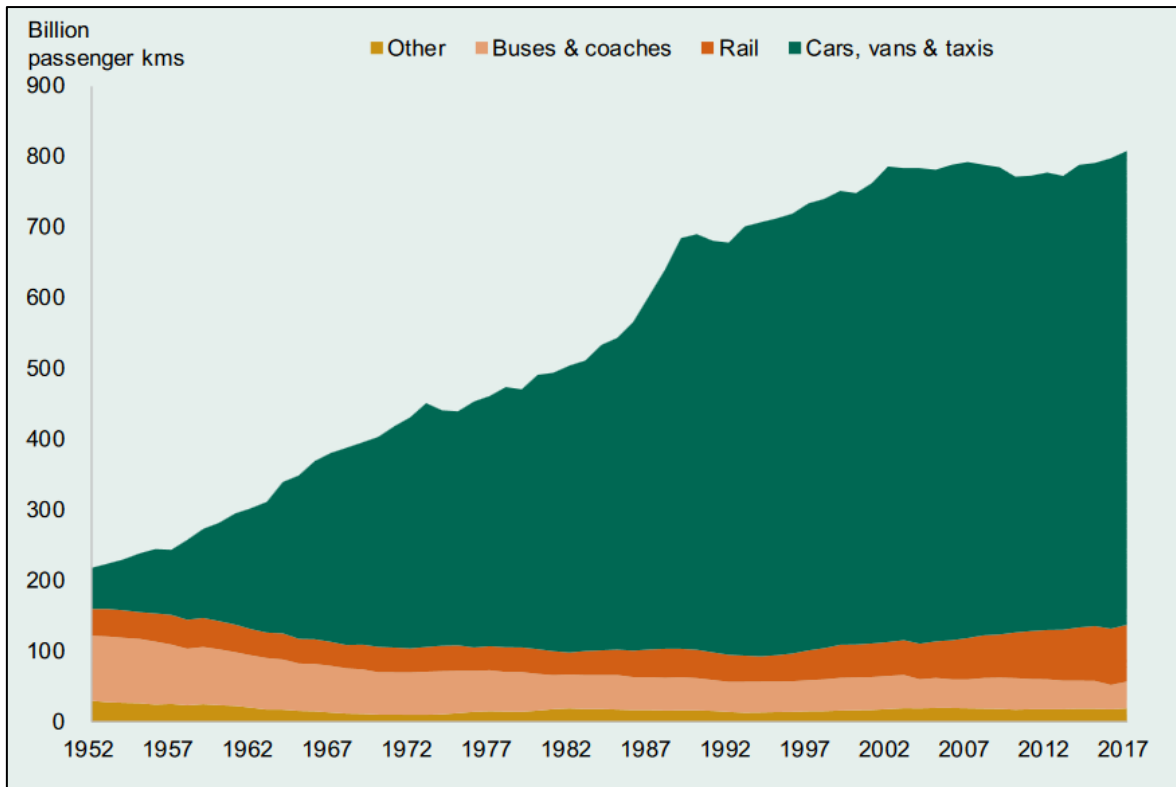


Figure 1.1 – UK passenger transport by mode 1952–2017 (Source: DfT, 2018)

Another important factor in the growth in private vehicle use over the last century has been land use planning that was considerably oriented around the private vehicle. The development of the urban periphery for housing created a dispersion of homes and jobs that was structured around car movement and high levels of car ownership (Banister, 2012). The effects of this policy became known as ‘urban sprawl’ and featured parcels of land being developed for residential use providing people with spacious, affordable properties that they aspired to move into from older and smaller properties in the inner city. English national travel statistics show how commuting trip lengths have increased in distance from 7.3 miles in the 1988/1992 to 8.8 miles in 2013/14, meaning people are living further away from their places of work (DfT, 2017a).

The decentralisation of economic activity from urban areas to sites on the urban periphery encouraged vehicle use through plentiful and cheap parking provision and new or upgraded access roads. The requirement to travel to developments in these areas by private vehicle was further exacerbated by the limited range of alternative modes, such as public transport or cycling. The dispersed nature of the suburban areas means that public transport provision is often poor or non-existent due to the cost associated with operating

attractive and frequent services to a greater number of locations across a wider area (Rodrigue et al., 2013). The distances from the suburban areas to key destinations are too far for walking to be an option and cycling is discouraged due to high vehicle numbers and speeds. Headicar (2015) highlights how so many aspects of contemporary life are predicated on car use that those that do not have car access are regarded as disadvantaged.

1.2.1.2 The impact of the growth in private vehicle use

This section looks at the impact of the growth in private vehicle use discussed in the previous section in relation to the three dimensions of sustainability – environmental, social and economic (UNWCED, 1987).

1.2.1.2.1 Environmental impact

Economic growth and activity through the twentieth century caused a large increase in emissions released into the atmosphere that cause climate change (Barker, 2008). In the UK domestic transport makes up 26% of all greenhouse gas emissions (Figure 1.2), making it the largest source of domestic greenhouse gas emissions (DfBEIS, 2018).

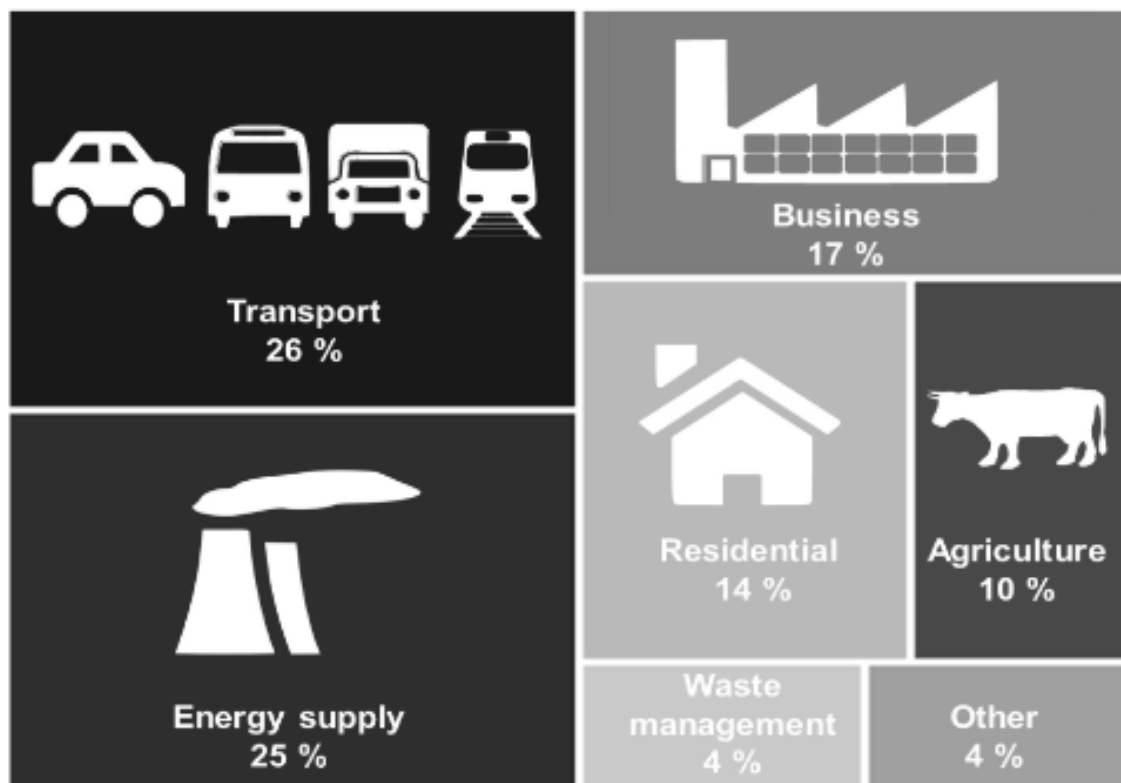


Figure 1.2 – UK domestic greenhouse gas emissions by source category, 2016* (Source: DfBEIS, 2018)

** Other includes Public and Industrial Process sectors (the Land Use, Land Use Change and Forestry (LULUCF) sector is excluded from the sector statistics above as it acted as a net sink of emissions). Please note the percentages above do not sum to 100% due to rounding*

Of this share, road transport makes up a significant 92.8% of the domestic transport emissions (Table 1.1). Within this, passenger cars are by far the greatest contributor, attributable to 57.6% of road transport emissions (DfT, 2017e).

Table 1.1 – Greenhouse gas emissions by transport mode, 2015 (Source: DfT, 2017e)

Transport mode	Percentage of total transport emissions
Cars and taxis	57.6%
Heavy goods vehicles	16.3%
Light vans	15.0%
Buses and coaches	3.1%
Motorcycles & mopeds	0.4%
Other road transport emissions*	0.4%
Road transport total	92.8%
Rail	1.6%
Domestic aviation	1.3%
Domestic shipping	2.1%
Other**	2.2%

**Consists of emissions from road vehicles running on liquefied petroleum gas (propane and butane) and emissions from the evaporation of engine lubricants as well as urea use.*

*** Mainly consists of 'military aircraft and shipping' & 'aircraft support vehicles'.*

The UK set a target to reduce greenhouse gas emissions by 80% compared to 1990 levels by 2050 as part of the Climate Change Act (DECC, 2008). If emissions targets are going to be met, then the emissions from travel and transport need to be reduced due to their sizeable proportion of total emissions. Technological advances, such as low or zero emissions vehicles can play their role in reducing the emissions from road transport. However, Bristow et al. (2004) highlight uncertainty, efficiency gains offset by increased demand, and the need to secure reductions sooner rather than later to meet the key targets as risks of relying on technology to deliver emissions reductions. Gross et al. (2009) identified that changing behaviour by incentivising sustainable modes of travel or reducing travel demand needs to be paired with technological improvements in order for the climate benefits to be realised. Merely addressing the emissions and not unsustainable travel

patterns is akin to addressing the symptom and not the cause and it is evident that changes in behaviour are needed to achieve this. It is clear, therefore, that changes to behaviour that include less travel overall and more travel by sustainable modes is imperative if the UK is to meet its climate targets (Stern, 2006).

1.2.1.2.2 Social impacts

The negative impacts of a car-orientated society are particularly felt by those at the lower end of the economic scale. Car ownership levels of citizens in lower income households are below the national average in the UK, with less than 50% of the lowest income quintile households owning a car, compared to an average of 85% (Lucas, 2012). Those without car access suffer from diminishing accessibility as a result of market and policy factors that are skewed against them as Figure 1.3 displays.

Those who have the lowest levels of car use disproportionately suffer the negative effects of car use through noise and air pollution and a higher likelihood of being in traffic collision. Their reliance on public transport and local services is impacted by the reduced levels of public transport services (particularly buses) and the availability of local services as they have been relocated to more car-orientated locations. This lack of accessibility can result in social exclusion, whereby people are excluded from participating in the normal activities available to society, such as employment and access to goods and services (Lucas, 2004).

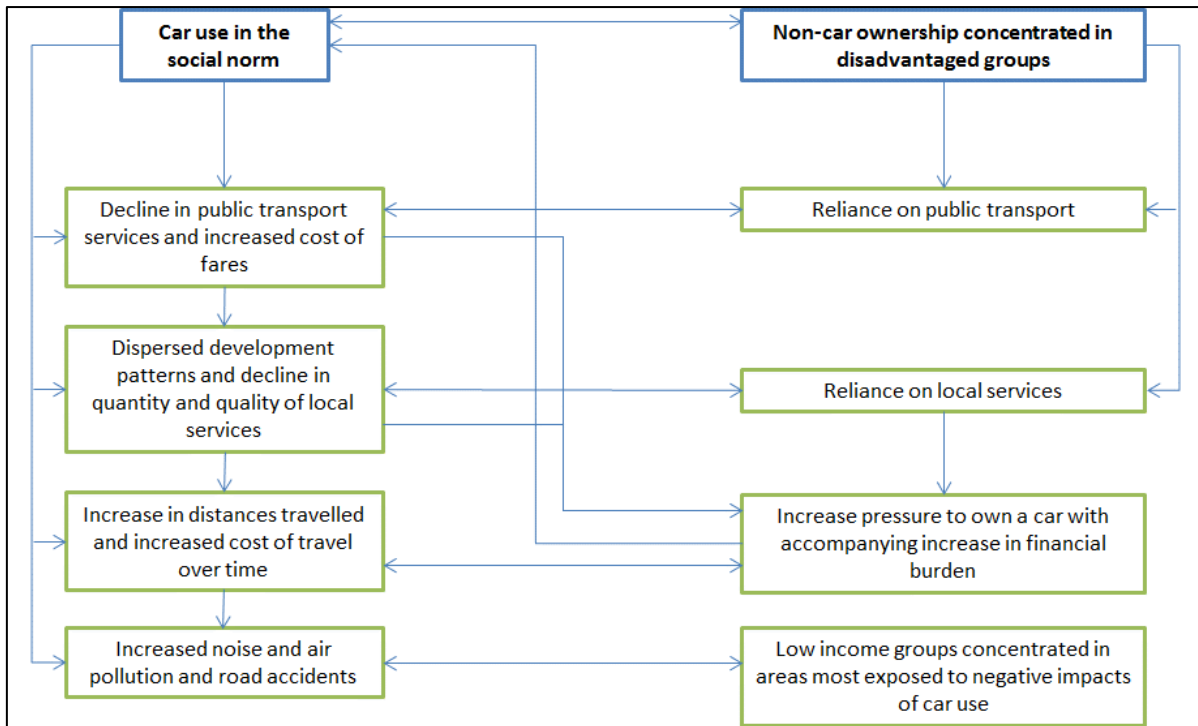


Figure 1.3 – The dynamics of diminishing accessibility experienced by non-car users (Source: Lucas, 2004)

Figure 1.3 can be expanded on by considering other non-car modes that are available to non-car owners, such as walking and cycling. Both of these modes are low cost (once a bicycle has been obtained) and offer door-to-door on-demand mobility in a similar way to motor vehicles. Therefore, they are not affected by declining public transport services and increased public transport costs. However, cycle users and pedestrians are still exposed to the other issues of the car-orientated society with the dispersal of amenities and the health issues associated with pollution and exposure to road collisions. Highway networks designed around the motor vehicle have created environments that are hostile to pedestrian and cycle users in many places (Parkin et al., 2007; Pooley et al., 2013), representing barriers to the use of modes that are economically viable but also shown to have numerous physiological and psychological benefits.

1.2.1.2.3 Economic impacts

The growth in car ownership, car use and the ubiquity of private vehicles within modern society means that the car industry is a substantial element of the national economy. However, the widespread use of private vehicles causes a daily issue in the form of traffic congestion, particularly in large urban areas with high levels of travel demand. The cost of

congestion to the economy has been estimated at approximately £10 billion per year due to lost time and the impacts of unreliability on locations and markets (Shaw & Docherty, 2014). Wider economic costs to the public budget such as healthcare for illnesses related to diminished air quality and low levels of physical activity can also be seen as economic impacts of private vehicle use. The key point of concern with all these impacts is that they are predicted to increase into the future, further heightening the need to address them when opportunities, such as large-scale workforce relocations, come along.

1.2.1.3 Summary

This section has presented the impacts of the growth in private vehicle usage and how this is contributing towards negative environmental, social and economic outcomes with the benefits of the private car are becoming outweighed by a range of negative effects (Gärling & Schuitema, 2007). While technological advances, such as electric vehicles will have an impact on emissions, there is considerable argument that some level of behaviour change is required if carbon emissions from transport are to be reduced significantly (Schwanen et al., 2012).

1.2.2 Opportunities to influence travel behaviour

The previous sections have highlighted the environmental, financial and social unsustainability of the reliance on private vehicles. The combined environmental, economic and social costs drove a change in thinking concerning transport and land use policy in the 1990s (Newman & Kenworthy, 1996). Rather than meeting the demand for movement with only 'supply' side solutions, most of which significantly increased road capacity, there was a need to address the 'demand' side (Goodwin et al., 1991). Encouraging and facilitating the use of sustainable modes of travel, such as walking, cycling and public transport was recognised as a key priority.

The prevailing 'predict and provide' approach to transport planning estimated travel demand at an aggregate level and increased capacity where it would be required. No in-depth understanding of travel behaviour at the individual level was needed. However, as concerns about the negative environmental, economic and social impacts of travel grew, sustainability moved to the forefront of thinking in transport and other related areas such as land use planning and development (DCLG, 2001; DETR, 1998; DfT, 2000; Goodwin et al., 1991). Research into the influences on travel behaviour gained popularity and

importance in relation to these concerns and a wide body of research now exists. From the reviewed literature, three themes have been identified as having a significant impact on travel behaviour: urban form (Ewing & Cervero, 2001; Litman, 2017; Van Acker et al., 2010; Van Acker & Witlox, 2005; Van Wee, 2002), socio-demographics & socio-economics (Curtis & Perkins, 2006; Guiliano & Narayan, 2003; Polk, 2003; Ryley, 2006) and psycho-social factors (Anable, 2005; Bagley & Mokhtarian, 2002; Handy, 2005; Prillwitz & Barr, 2011).

Large-scale workforce relocations have been frequently occurring and look set to continue occurring regularly based on the frequency of previous occurrences and the underlying trends that will result in further occurrences (see sections 3.2–3.4 for full details). In the UK, the Government and the public sector has been at the forefront of recent relocations, such as the Met Office (relocated 1,150 staff in 2003) and the Office of National Statistics (relocated 900 jobs 2004-2010). Looking forward, the Government has developed a decentralisation strategy to relocate many departmental offices out of London and into the regions by 2020 (Cabinet Office, 2014). However, it is not just the public sector that is undertaking relocations, large private organisations, such as KPMG (1,000 staff relocated in 2008), are relocating their workforce for reasons related to lack of space, the costs of a lease and the physical condition of properties (Elgar & Miller, 2010). The opportunity is not limited to the UK with examples of significant large-scale workforce relocations taking place in Europe and the USA in both the private and public sectors (see section 3.2 for details). This means that opportunities to influence travel behaviour are potentially being created, providing frequent opportunities to influence travel behaviour towards more sustainable patterns.

Sprumont et al. (2014) argue how private companies and major public institutions are important trip attractors and generators and therefore have an important role in the mobility debate. Whatever the reasons organisations choose to relocate, relocations of a significant scale will have an impact on travel both internally for employees, customers or suppliers and externally in terms of changing the demand on the transport network. Due to the nature of this impact and how redevelopment provides the chance to have facilities to support sustainable travel (e.g. cycle parking, bus stops) in place from the outset, the Government recognises workplace relocations as ‘major opportunities to bring about comprehensive changes in travel conditions’ (DfT, 2005). This opportunity will only be

feasible for certain organisations but when it does occur it offers a means of influencing more people to travel using sustainable modes (Cairns et al., 2010; Walker et al., 2014).

Large scale workforce relocations and site redevelopments are likely to involve the land use planning system as part of the new or expanding development gaining planning consent from the local planning authority (LPA) (DCLG, 2001, 2012). LPAs can require a site to mitigate its impact on the local transport network through conditions requiring new infrastructure, or 'hard' measures (e.g. new highway links, public transport stops). LPAs can also condition the requirement of 'soft' measures that do not feature infrastructure but are aimed at encouraging and facilitating the use of sustainable travel modes (DCLG, 2014b). It is in this role that Travel Plans are key as they attempt to make people aware of the potential benefits of reducing travel altogether, reducing private vehicle use and utilising more sustainable travel options.

Travel Plans emerged as key policy tools in the UK in the late 1990s as part of the Government strategy for an integrated transport system and reduced traffic congestion (Enoch, 2012). Travel Plans are part of a wider strategy to reduce the impact that transport has on the environment, in particular emissions from private road transport during the commuter peak period. A Travel Plan presents a strategy for facilitating and encouraging a modal shift away from single-occupancy vehicle use towards sustainable modes such as public transport, cycling, walking and car sharing – each of which has a lower or zero impact on the environment.

Travel Plans are well established within the planning system following their inclusion in *Planning Policy Guidance note 13 (PPG13): Transport* (DCLG, 2001) and later the National Planning Policy Framework (NPPF) (DCLG, 2012). Despite now being around for a while and some evidence of where correctly implemented Travel Plans can have benefits for organisations, individuals and wider society, in many instances there remains a discrepancy between the level of Travel Plan implementation, monitoring and enforcement across the UK.

The rationale for this study is to understand the opportunity that large-scale workforce relocations offer for influencing travel behaviour towards more sustainable patterns. The research also aims to explore the role that hard and soft measures have in encouraging and facilitating sustainable travel during large-scale workforce relocations.

1.3 Expected research contribution

The findings of this original piece of research augment the established research into travel behaviour and the growing body of research into the opportunities to influence travel behaviour during disruptions. Understanding more about how spatial and non-spatial factors and hard and soft measures influence travel behaviour during a large-scale workplace relocation will allow this opportunity to be capitalised on further in practice. Therefore, the research contributes towards knowledge in this area by providing recommendations of how large-scale workplace relocations can be utilised to influence travel behaviour towards more sustainable patterns.

1.4 Aim and objectives

Given the contextual background and the knowledge gap identified in the previous sections, the overarching aim is to understand how travel behaviour can be influenced towards sustainable travel during a large-scale workforce relocation. To meet this aim a number of objectives have been developed, the objectives of this research are:

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.
5. To analyse the effect of a large-scale workforce relocation on travel behaviour.
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

Objectives 1, 2 and 3 have been met through a comprehensive literature review on the topics pertinent to the individual objectives and covered in Chapters 2-4. Objective 4 has

been achieved through the development of the original research element of this study (Chapter 6). Objectives 5 and 6 are fulfilled through the findings and discussion following in Chapters 7 and 8 respectively.

1.5 Overview of research methodology

The research design for this study has been developed to fulfil the research objectives presented in the previous section. The original research element of this study is underpinned by a pragmatic philosophy and takes a mixed-methods, explanatory case study approach. The relocation of 2,300 people by the British Broadcasting Corporation (BBC) to a purpose-built site at MediaCityUK, Salford provides the case study within which this research explores the connotations relating to travel behaviour. The quantitative component of the mixed-methods approach features data collection and analysis through descriptive and inferential statistics. The qualitative component adds depth to the quantitative findings through data collection and analysis that looks at the emerging themes and how they relate to the existing theoretical context. The original research is supported by the findings of the literature review and secondary data and combined they are designed to meet the research objectives presented in the previous section. Chapter 6 presents the full research methodology, discussing the rationale for utilising the chosen research design and providing details of the case study.

Table 1.2 presents how each of the six research objectives are linked to one or more elements of the study.

Table 1.2 – Research objectives and study elements

Research objective		Study element
1	To critically review travel behaviour literature and analyse the influences on travel behaviour.	Literature review
2	To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.	Literature review
3	To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.	Literature review
4	To formulate and implement an appropriate research design methodology to investigate the impacts of a large-scale workforce relocation on travel behaviour.	Research design Findings
5	To analyse the effect of a large-scale workforce relocation on travel behaviour.	Findings Discussion
6	To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.	Discussion

1.6 Author's involvement

The author of this research was previously employed in the development and delivery of the Travel Plan for the University of Salford. As such, they were involved in the delivery of the MediaCityUK site-wide Travel Plan within the University of Salford campus at the site. As part of this role, the author was the University's representative at the site-wide Transport Steering Group (see section 7.2.3 for full details) responsible for the delivery of hard and soft transport measures. As a result of this role, the author has a working knowledge of the implementation of transport measures at the site from 2012–2014.

The role gave the author insights into the post-relocation delivery of hard and soft measures at the site and an understanding of issues faced by the BBC and their employees related to travel. The knowledge about the context at the site helped to inform the

research strategy in terms of utilising the appropriate methods and relevant questions at the data collection stage.

1.7 Structure of the thesis

The structure of the thesis is presented in Figure 1.4 and is designed around the study process from introduction and background through to conclusions.

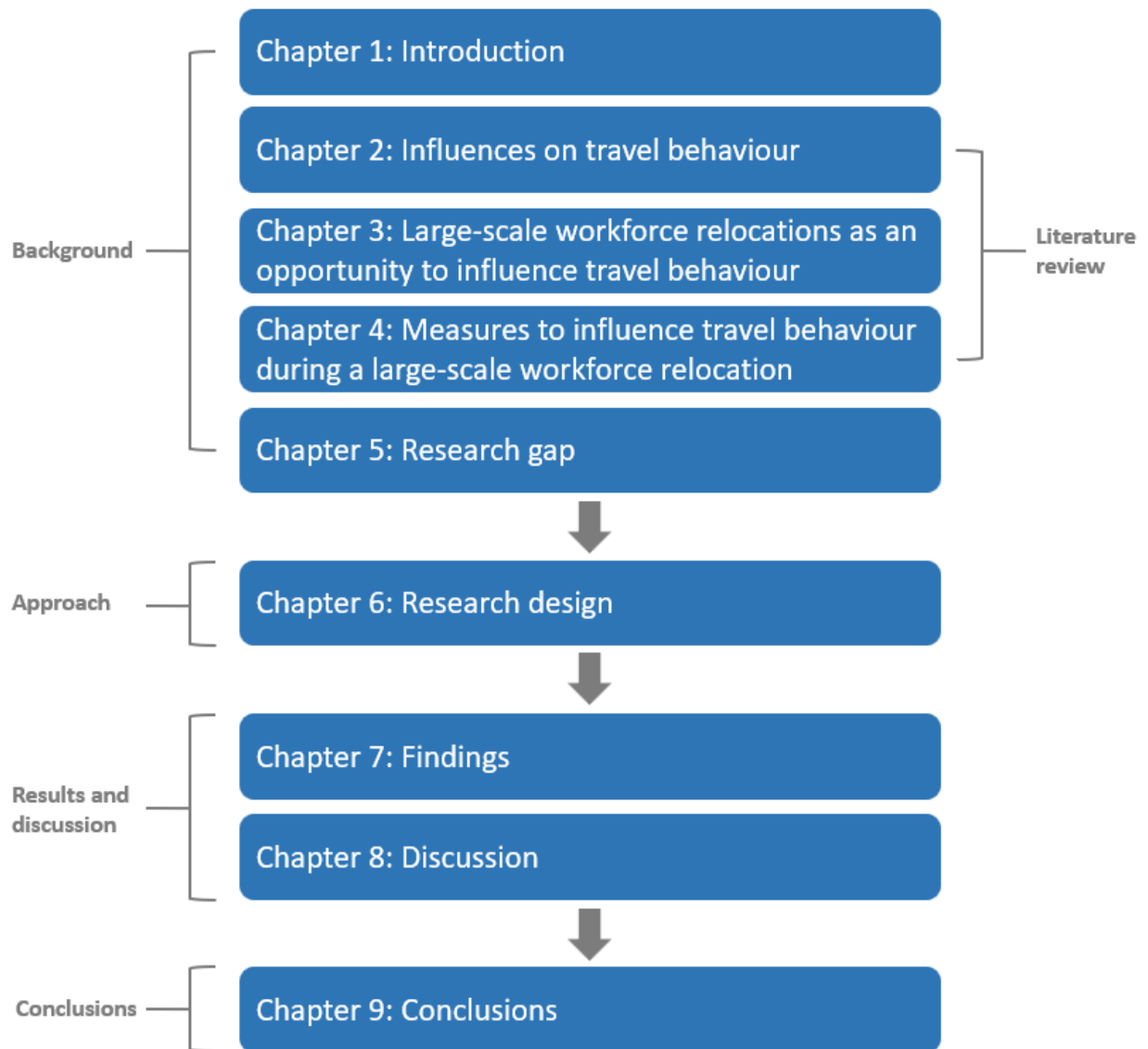


Figure 1.4 – Thesis structure

2 Influences on travel behaviour

2.1 Introduction

The need to influence travel behaviour towards more sustainable patterns was established in the introductory chapter. This first chapter of the literature review establishes what is currently understood about the influences on individuals travel behaviour. This chapter reviews the literature regarding the influences on travel behaviour within a general context and more specifically within the context of a large-scale workforce relocation. The chapter links directly with the first of the study objectives presented in the Introductory chapter:

- 1. To critically review travel behaviour literature and analyse the influences on travel behaviour.**
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.
5. To analyse the effect of a large-scale workforce relocation on travel behaviour.
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

2.1.1 Contextual introduction – influences on travel behaviour

Traditional transport planning assumptions are that travel behaviour is a product of a deliberate and rational decision-making process where the individual considers time and cost as the dominant influencing factors (Sherwin et al., 2014). The idea that an individual is rational and wishes to maximise the net benefit of travel that is valued against a 'generalised cost' is seen as the most widely accepted theory to explain travel behaviour (Scheiner, 2018). However, in practice decisions over travel are far more complex with multiple factors interacting that ultimately shape an individual's travel behaviour.

A review of the literature into the influences on travel behaviour has identified three key themes that have a significant impact on travel behaviour – urban form (Ewing & Cervero, 2001; Litman, 2017; Van Acker et al., 2010; Van Acker & Witlox, 2005; Van Wee, 2002), socio-demographics & socio-economics (Curtis & Perkins, 2006; Giuliano & Narayan, 2003; Polk, 2003; Ryley, 2006) and psycho-social factors (Anable, 2005; Bagley & Mokhtarian, 2002; Handy, 2005; Prillwitz & Barr, 2011). Based on the reviewed literature and to present the findings on travel behaviour within the context of a large-scale workforce relocation, the literature review has been structured by putting the three key themes into two high-level categories: spatial and non-spatial. The spatial category includes urban form while the non-spatial category encompasses socio-demographic, socio-economic and psycho-social factors (Table 2.1). Within the three key themes there are several variables that can impact on individual travel behaviour to different degrees depending on the individual and the nature of the variables. The structure presented in Table 2.1 provides a framework for reviewing the literature with the subsections in this chapter based on the variables in the table. The chapter utilises this framework to understand, analyse and review the impact of these variables on individual travel behaviour.

Table 2.1 – Influences on travel behaviour

Category	Key themes that influence travel behaviour	Variables
Non-spatial	Socio-demographics & socio-economics	Household type
		Age
		Gender
		Income
		Employment requirements
	Psycho-social	Attitudes towards travel
		Attitudes towards modes of travel
Previous experiences of travel		
Spatial	Urban form	Density
		Diversity
		Design
		Destination accessibility
		Site level accessibility
		Distance to transit

2.2 Non-spatial influences

The non-spatial category encompasses the attitudinal, socio-demographics and socio-economics elements identified as being key to influencing travel behaviour.

2.2.1 Attitudes

Research has highlighted the importance of attitudinal, lifestyle and socio-demographic variables in that when they are accounted for, neighbourhood urban form has little influence on travel behaviour (Bagley & Mokhtarian, 2002). Looking specifically at attitudes towards travel and transport modes, previous travel behaviour is understood to be a strong predictor of current behaviour (Dargay & Hanly, 2007; Thøgersen, 2006). From a residential perspective, it has also been found that people that lived in the same area had different travel habits based on where they previously lived. For example, people who moved from central to suburban areas had fewer vehicles than those who had previously resided in

suburban areas (Weinberger & Goetzke, 2010). This indicates that behaviours learnt in the past may have a strong influence on how people adapt to new situations following life events (Clark et al., 2016). This could potentially have an impact when people relocate to a new workplace where people may wish to continue their previous travel behaviour when they relocate to the new location. Their attitude towards modes could be established based on previous experiences of using a mode or observing a mode. From a sustainability perspective this could be positive or negative and it could be constrained or supported by the spatial factors of the new location.

As well as wishing to minimise or maintain their commuting time, it was also found that sometimes people valued their travel to work time (Jain & Lyons, 2008). The sense of the space-time transition between home and work having an optimum length that is ‘a bit but not too far’ seemed to be important to people (Vale, 2013). Milakis et al. (2015) conceptualised this as ‘acceptable travel time’ which has a behavioural threshold defined by intrinsic and derived utility (Figure 2.1). The intrinsic utility reflects travel-related benefits or dis-benefits while the derived utility reflects the activity-related benefits at the trip destination, for example the workplace (Milakis et al., 2015; Milakis & van Wee, 2018).

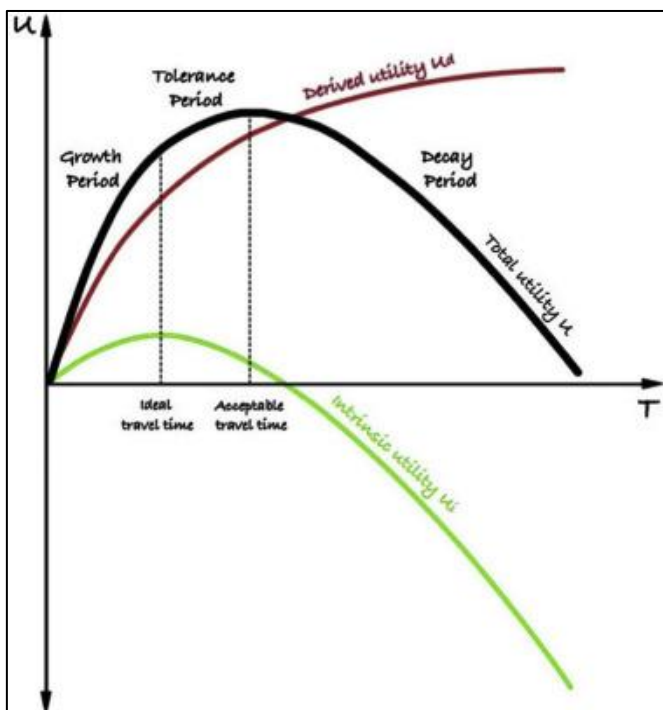


Figure 2.1 – Acceptable travel time concept (Source: Milakis et al., 2015)

Total utility increases initially as the travel and activity related benefits are positive. Once a person's ideal travel time, or 'travel time budget' (Mokhtarian & Salomon, 2001) is reached the travel (intrinsic) utility begins to diminish, however, the activity (derived) utility still increases, resulting in a tolerance phase. The acceptable travel time is reached when the intrinsic utility starts to decay faster than the derived utility increases. The longer the travel time beyond that acceptable threshold the lower the total utility becomes (Milakis et al., 2015). In terms of the duration of ideal travel times, Redmond and Mokhtarian (2001) found a mean ideal commute time of 16 minutes while Milakis and Van Wee (2018) reported ideal times of 20 minutes in a US context and 14.7 minutes in the Netherlands. In terms of acceptable travel time, Milakis and Van Wee (2018) found averages 42.5 minutes in the USA and 36.4 minutes in the Netherlands. Previous research in the USA by Wachs et al. (1993) found similar results with dissatisfaction in travel time increasing at around 46 minutes. Some modes had higher acceptable travel times, such as public transport (60 minutes in the USA and 42.5 minutes in the Netherlands) (Milakis & van Wee, 2018). Interaction with other passengers was found to have a strong link to travel satisfaction on public transport (Ettema et al., 2012) and as such is a reason why people may have a higher acceptable travel time for this mode.

Going further, the mode used for this optimum length journey could also increase the value of the journey. For example, travel on public transport can allow time to be utilised for other purposes such as reading for leisure or working. Other modes do not offer the same flexibility but car users can utilise their journey by catching up on current affairs through their vehicle radio. Users of active modes can find benefit from their journey to work through the positive health and wellbeing outputs associated with physical activity, despite this not being a primary motivation for walking or cycling (Jones & Ogilvie, 2012).

2.2.2 Socio-demographics and socio-economics

Socio-demographics and socio-economics cover a wide range of factors related to the individual and their personal circumstances, such as household type, gender, income and car ownership. This section discusses their influences on travel behaviour.

2.2.2.1 Household type

Household type or composition is widely recognised as being a key variable relating to travel demand. Household type relates to the number and relationship of the people

residing in the household. For example, single occupier households, working age households with/without children, or retirement age households. Households with children were found to have a positive association with car use and negative association with public transport for the travel to work journey (Chen et al., 2008; Dargay & Hanly, 2007; Ryley, 2006). The need to trip-chain on the way to and from work was an important factor in increased car use in this demographic as people have to pick up and drop off children as part of their journey (Castellani et al., 2016). Age and household type were shown to relate due to how younger adults are more likely to live in childfree households. This demographic had different influencing factors for their travel choices, with cycling being popular due to the high levels of autonomy it provides (Simons et al., 2014). However, social factors were shown to affect the decision to travel by bicycle. Willis et al. (2015) highlight how this means it is important to think beyond the role of spatial or hard infrastructure measures and understand the role of non-spatial or soft measures when facilitating cycle use.

2.2.2.2 Gender

Comparing travel behaviour within gender it was found that women are more likely than men to travel to work by car due to concerns over personal safety (Dickinson et al., 2003). Cycling was specifically noted with regards to the gender differences with females having negative attitudes towards using this mode for utility purposes (Garrard, Handy, et al., 2012). However, it has also been found that the majority of consistent users of sustainable modes are females (Prillwitz & Barr, 2011). Additionally, in Sweden it was identified that females had a greater acceptance of measures to reduce car use than males (Polk, 2003).

2.2.2.3 Age

Car use was mainly associated with people in the middle-age groups (age 30-59) with more consistent users of sustainable modes in the younger age group (Prillwitz & Barr, 2011). There is a cross over here with household type (Section 2.2.2.1) in that people in the over 30 age groups are more likely to have children in the household and therefore more likely to use a car rather than other modes (Scheiner & Holz-Rau, 2007). While the travel behaviour of people over 30 with children in the household may be more car orientated, it may still feature sustainable mode use at different points in time. For example, cycle use

during the summer months when the weather is better and schools are closed so the need to trip-chain on the way to work is not present (Castellani et al., 2016).

Among young adults, the reasons not to drive and to cycle instead were shown to relate to the high levels of autonomy of cycling, along with shorter travel times. Secure bicycle parking at destinations was also identified as being a key factor that also incentivised cycling (Simons et al., 2014). More public transport use among young adults aged 16-34 was attributed to urbanisation, with young adults choosing to live in urban centres with good public transport links that reduces the need for car use (Melia et al., 2018).

2.2.2.4 Income and cost

Personal income has been linked with car ownership as more affluent areas generate a higher number of car trips due to the population being able to afford one or multiple vehicles (Dargay & Hanly, 2007; Kitamura, 2009). Car ownership is shown to have a negative impact on demand for public transport, in particular bus with a significant loss in bus trips once individual have access to car (Paulley et al., 2006; Susilo et al., 2012).

The way people consider the cost of travel is important to mode choice and can be a challenge in relation to choices between public transport and car use. This is due to how the cost of public transport is more explicit and defined through the price per trip (fare) while the costs of using a car per trip are less clear due to how tax and servicing costs are not paid on a daily basis (Castellani et al., 2016). It was also found that people drove due to the price of alternative modes, such as public transport as well as the lack of availability of alternative modes (Handy et al., 2005).

2.2.2.5 Employment

The place of employment and type of job can have an influence on travel behaviour. Working hours are understood to be a factor when people are choosing transport modes. For example, travelling to or from work during hours of darkness was shown to have an impact on people choosing to cycle (Heinen et al., 2013). As such, if a job requires regular travel during hours of darkness this could be a significant barrier to cycle use. This is not necessarily limited to people who have to travel to/from work outside of core working hours (08:00–18:00) due to how in the winter months hours of darkness are extended.

Advances in Information and Communications Technology (ICT) have enabled 'telecommuting' or 'teleworking' where people can work in locations other than their workplace, for example at home (Crosbie & Moore, 2004; Golden & Veiga, 2005). Teleworking can reduce overall travel demand due to people not having to travel to their place of work to undertake their job (Brewer, 1998) and specifically vehicle miles travelled where journeys would have been taken by private motor vehicle (Choo et al., 2005). Individuals employed in jobs that are compatible with teleworking therefore have opportunities to reduce their travel demand compared to those whose job would not permit this type of working. However, there are several reasons why teleworking may not be undertaken even if a job role would permit it. Preferences relating to working environment and social interaction contact with colleagues are reasons for not doing it from a personal perspective while company policy was also identified as a barrier to uptake (Brewer, 1998).

2.3 Spatial influences

2.3.1 Urban form

Several terms are used in the literature to describe the spatial features of an area, urban form being one of them. Others include the built or physical environment and urban structure. Within this review, these terms are used interchangeably. Urban form considers the physical features of an area that are human-made or human-altered, in this context land use patterns and the transport system. Rodrigue et al. (2013, p. 190) define urban form as the 'spatial imprint of an urban transport system as well as the physical infrastructures'. The transport system encompasses highways, railways, footways and cycle routes along with the service provided, such as bus or rail services. Within the context of research into the influences on travel behaviour, urban form has been considered as a factor constraining travel behaviour (Van Acker & Witlox, 2007) in that travel behaviour has to take place within the particular urban form context and what that includes. Existing research demonstrates how the design of urban form can be utilised to influence travel behaviour towards sustainable modes with successful examples found in Copenhagen, Freiburg, Toronto (Newman & Kenworthy, 1996) and Curitiba (Smith & Raemaekers, 1998). Three dimensions of urban form were classified by Cervero and Kockelman (1997) as the 'three Ds' of density, diversity and design. The further dimensions of destination

accessibility and distance to transit have since been considered in the literature around travel behaviour and urban form (Ewing & Cervero, 2010). The definitions of the urban form dimensions are presented in Table 2.2.

Table 2.2 – Dimensions of urban form (adapted from Ewing & Cervero, 2010)

Urban form dimension	Definition
Density	The number of variables of interest e.g. dwelling units, population or employment per unit of area (e.g. per hectare).
Diversity	The number of different land uses in a given area e.g. residential, employment or retail.
Design	The characteristics of the street network from dense urban grids to sparse suburban networks. Design can be measured by a range of variables e.g. block size, frequency of intersections and pedestrian crossings, average street widths.
Destination accessibility	The ease of access to trip attractors which can be measured by distance or time required to travel to a destination.
Distance to transit	The distance from a site to the nearest public transport stops.

Although they influence travel behaviour the density, diversity and design dimensions are not specifically related to transport. They pertain to characteristics of urban form and the functions that land is used for e.g. employment or residential. Destination accessibility and distance to transit are more directly related to transport due to their focus on how people reach a location. It is accepted that there is a general ambiguity and overlap between the different dimensions (Ewing & Cervero, 2010). For example, the design of urban form relates to the distance to transit, such as how direct the route is to the transit stops.

It was decided to base the literature review around these five dimensions of urban form. However, it became apparent that there were a range of factors that influence travel behaviour at site-level which do not fit directly with the 5D's of urban form as these are based around a wider spatial scope than a single site, for example at a regional level. As such, an additional category of site-level accessibility is also included.

2.3.1.1 Density

The density of urban areas (e.g. household, employment, population density) can be linked to supporting environmental, economic and social sustainability due to reducing resource use, concentrating labour and consumer markets and facilitating access to services and amenities (Tonkiss, 2014). Each of these factors can be reflected in relation to transport in terms of reducing the distance required to be travelled to access employment and services and therefore reducing the use of resources required to travel. Where development is constructed with low density, it is typically in areas where land is available, such as the fringes or denser urban areas. As discussed in Section 2.3, this type of development became known as urban sprawl and was commonplace during the twentieth century as developments took into account the mass adoption of the private motor vehicle for personal travel. Compared to the efficiency that high densities bring about, low density urban sprawl has been shown to exert costs on environmental, economic and social sustainability (Ewing, 1997). Environmentally and economically, sprawl can result in increased energy and resource consumption required to connect and service low-density land uses. Socially, sprawl can negatively impact on certain people's levels of accessibility, such as those without car access (Lucas, 2004) while reducing a sense of community through constraining the likelihood of social interaction.

A significant piece of research in relation to the link between density and travel behaviour was conducted by Newman and Kenworthy who in 1989 reviewed 32 global cities and found those with the higher levels density had lower levels of car use (Newman & Kenworthy, 1989). Since this research, the link between density and travel behaviour has been explored in greater depth with the findings correlating with what Newman and Kenworthy observed from their sample. Cervero (2002) found that the density of land uses has a significant effect on decisions to use a car or sustainable modes. More compact, higher density neighbourhoods increased the amount of public transport use, walking or cycling among residents (Cervero et al., 2009; Greenwald & Boarnet, 2001; Guiliano & Narayan, 2003; Schwanen, 2002; van Wee, 2011). In relation to workplaces, higher density of land use around the workplace can reduce vehicle miles travelled (VMT) by car while increasing use of public transport, walking and cycling (Chatman, 2003; Verhetsel & Vanelslander, 2010). Research has indicated that the density of the workplace destination

has a more important role than density at the residential origin with regards to non-car mode use (Chen et al., 2008). Barnes' (2005) findings went further in that they concluded that large and dense destinations have a substantial impact on transit share, regardless of the nature of the trip origin. This is corroborated by Lee et al. (2011) who found that workplace attributes (including density, design and accessibility) matter more than residential neighbourhood types with regards to commuting by transit.

2.3.1.2 Diversity

The diversity or mix of land uses refers to how different types of land use, such as residential, commercial or educational, are located close together (Litman, 2017). Figure 2.2 provides an example of land use diversity near to a workplace with a mix of retail types, open space and car parking provision.

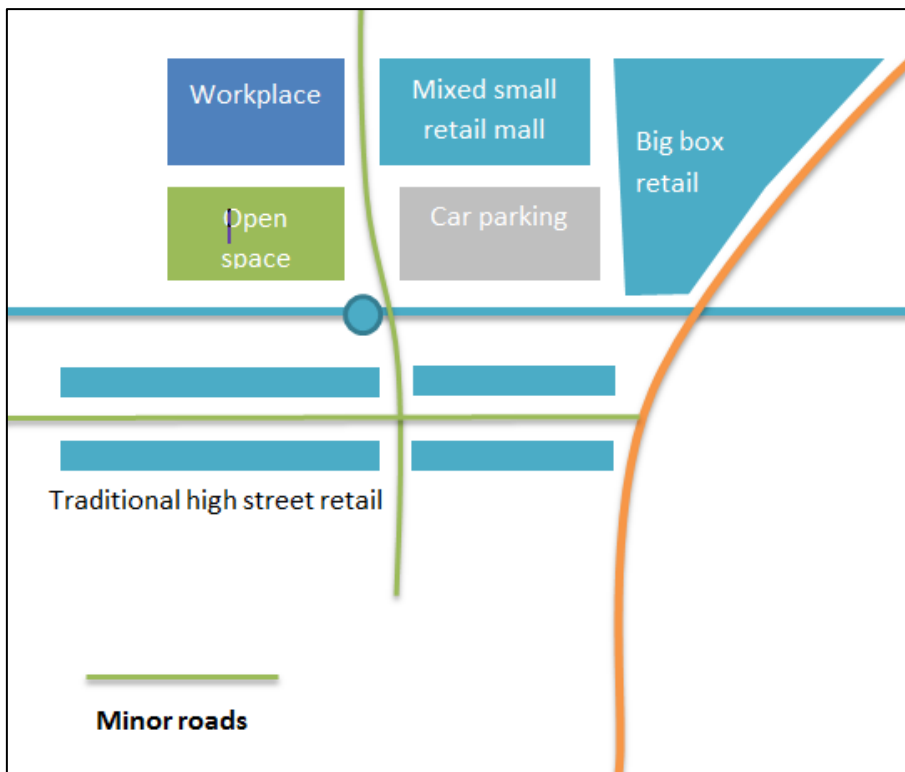


Figure 2.2 – Example of urban form diversity near the workplace

A meta-analysis of research into travel and the built environment by Ewing and Cervero (2010) found how walking was strongly linked to land use diversity as well as having amenities within walking distance. This is further enhanced by research showing that a mixture of land uses, with short distances between residential areas, employment areas and amenities is associated with people switching to walking or cycling (Clark et al., 2016;

Ewing & Cervero, 2010; Handy & Clifton, 2001). Around workplaces, it was found that high levels of diversity reduced the amount of VMT by private car (Chatman, 2003) and encouraged walking (Cervero & Duncan, 2003). Davidson (1994) found that the presence of amenities at the workplace, such as banking services, child-care, eateries and fitness facilities could reduce car travel due to people being able to access the amenities on site and not via a separate trip. Although mixed land use was shown to favour cycle use at trip origins, diversity was less clear at destinations (Cervero & Duncan, 2003). Looking at the relationship between diversity and density, if the diversity of land use is not appropriate then high-density development can be limited in its impact on influencing travel behaviour towards more sustainable patterns. For example, high density residential developments that are located significant distances from services and amenities may be as car-dependent as traditional low density, suburban sprawl neighbourhoods (Tonkiss, 2014).

2.3.1.3 Design

The design of urban form in the context of transport includes a range of characteristics that relate to the layout of the local highway network. The main defining factor of urban form design is whether an area is oriented towards pedestrian or vehicle travel. For example, dense urban grids that facilitate short walking trips or sparse suburban networks with curvilinear patterns and cul-de-sacs that increase walking distances as shown in Figure 2.3 (Ewing & Cervero, 2010; Rodrigue et al., 2013).

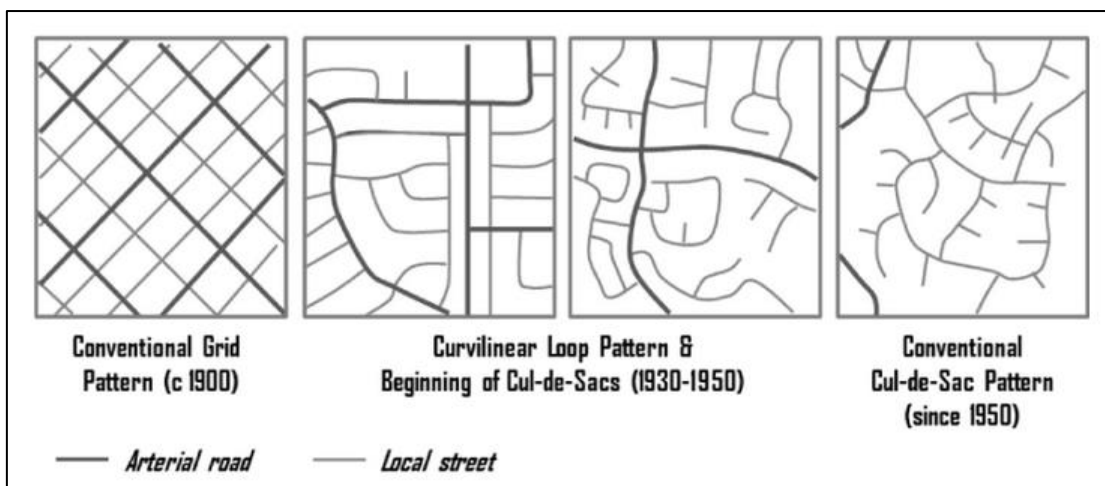


Figure 2.3 – Examples of urban form design (Source: Rodrigue et al., 2013)

Heath et al. (2006) reviewed the outputs of several studies looking into how street-scale urban design and land use policies increase physical activity through increased walking or

cycling. These included improvements to the continuity of footways, the introduction of traffic calming and enhancements to street aesthetics, such as landscaping. The findings showed that the median increase in walking and cycling across all measures of this type was 35%. In terms of the main design-related barriers to active travel, traffic volume and lighting were shown as being important factors (Lee & Moudon, 2008). In a more general sense Handy et al. (2002) argue how street connectivity and good design along with mixed used development reduces the physical and psychological barriers associated with walking and cycling. This view is supported by the findings of Dill and Wardell (2007) who found that designing areas that are attractive for walking had a positive effect on people travelling by foot but also by cycle, directly from their home or from a nearby public transport stop. The associated positive impact on public transport use that the design of intersections and street connectivity has, due to how it promotes walking, was also identified by Ewing and Cervero (2010). World renowned urban designer and architect Jan Gehl identifies the design of streets as being significant to peoples' attitudes towards the space, including their propensity to walk or cycle. Designing urban form at a scale commensurate with humans rather than motor vehicles fundamentally alters how people use the space in terms of both movement and place (Gehl, 2010). The findings discussed in this section emphasise the importance of how the design of urban form has an influence on how people decide to travel. A key point being that the orientation of urban form towards sustainable modes is important in terms of facilitating people to travel by these modes.

2.3.1.4 Destination accessibility

The fourth dimension of urban form relates to the level of accessibility provided by the transport infrastructure and services that serve a destination. There are many definitions of accessibility; however, it could be defined as 'the extent to which land-use and transport systems enables (groups of) individuals to reach activities or destinations by means of a (combination of) transport mode(s)' (Geurs & Van Wee, 2004). Factors such as mobility, transport options, transport system connectivity and land use patterns impact on levels of accessibility (Litman, 2008). Destination accessibility relates to the ease of access to destinations or trip attractors, may be regional or local and is the dominant environmental influence on trip length (Ewing and Cervero, 2010).

Figure 2.4 demonstrates an example of destination accessibility where the workplace ‘W’ is the destination. ‘W’ is shown spatially in terms of where it is located within the context of the urban area and the transport infrastructure that provide a level of accessibility to the site.

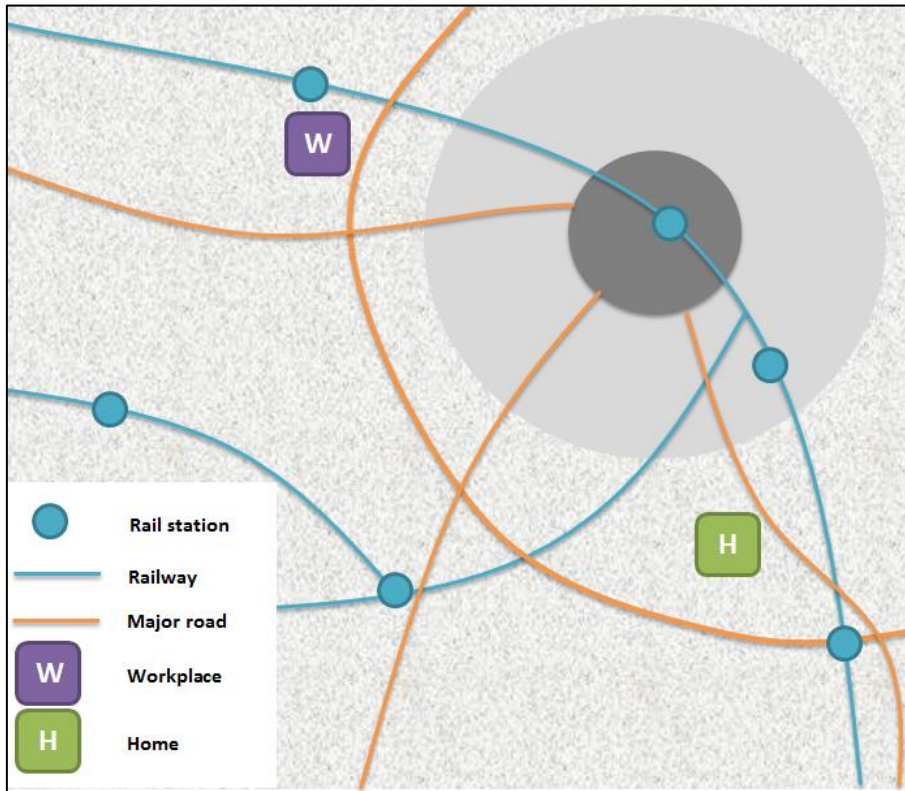


Figure 2.4 – Spatial arrangement of land uses and transport system (Source: authors own)

In relation to how public transport contributes to destination accessibility, service frequency has been shown to be an important factor in determining mode share (Foth et al., 2014). The need to interchange can be important with regards to public transport mode share, with the generalised cost of travel being increased due to the interchanging between services or modes (Paulley et al., 2006; Wardman & Hine, 2000). If the provision of public transport accessibility is good then this can reduce the average distance travelled and mode share of private motor vehicles (Ewing & Cervero, 2010). This overlaps with what was found regarding urban form diversity whereby a mix of land uses can reduce the distance required to travel (by any mode) between origins and destinations.

Literature on destination accessibility is primarily focused on private vehicle and transit modes due to the regional nature of how destination accessibility is analysed, such as

access from the wider region into the CBD. It may be appropriate for walking not to feature due to the distances involved, however, bicycle travel offers potential for longer trips and warrants further consideration. Previous work has shown that the presence and length of an urban bicycle network was a key indicator of bicycle use increasing (Beenackers et al., 2012; Monsere et al., 2014; Santos et al., 2013). However, Moudon et al. (2005) found that this was not always true as their research in Washington State, USA presented. Research by Parkin et al. (2007) recommended that a bicycle network needs to extend at least 2km but as far as 5km from trip attractors to facilitate cycle use. A consistent network for up to 5km relates to utility trips that can be achieved without undue exertion. An assessment of the consistency and suitability of a bicycle network around a particular site is an important part of the strategic approach to facilitating cycling to reach the site from other key locations, such as urban centres and transport hubs. As well as the presence of a cycle network, the specific characteristics of the cycle network, such as wide or segregated cycle lanes, were shown to be key to encouraging cycling (Hull & O'Holleran, 2014). This was due to the importance of actual and perceived safety when cycling on roads with other traffic. Parkin et al. (2007) highlighted how attractiveness and comfort were also important features of a cycle network in addition to the safety aspect. When new cycle network facilities are added, research has shown the increase in cycle mode share (Heinen et al., 2015; Krizek et al., 2009).

2.3.1.5 Site level accessibility

The literature above looks at destination accessibility, which takes into account the spatial arrangement of an area and the possible transport links between origins and destinations. The literature review uncovered spatial factors that affect travel behaviour but do not fit neatly within any of the dimensions and were more linked to accessibility at the granular, site level.

Firstly, is motor vehicle parking which most closely relates to destination accessibility, however, as the parking provision is at the destination site it does not relate to the level of accessibility to the site. Large developments built during the 20th century would have typically included provision for the storage of vehicles for those using the development, in many cases free of charge. Access to free parking is a key determinant of people choosing to drive to their place of work (Hess, 2001). As such, the move towards more sustainable

development questioned the rationale of providing car parking, particularly where there is no charge. Research has demonstrated how limiting access to parking provision is an effective way to reduce car use (Melia & Clark, 2017). Restrictions are particularly effective in high density, compact urban areas where the availability of alternative modes is greater (Christiansen et al., 2017). In these areas there is greater potential for parking restrictions (push measures) to be combined with sustainable transport facilitation (pull measures), an approach that is advocated (Cairns et al., 2010).

Where parking is included in a development there are other methods of reducing the likelihood of people driving to work. For example, Christiansen et al. (2017) found that as the distance to a parking place increases, the likelihood of people driving decreases. It is evident that people make a series of trade-offs when determining where to park in relation to their place of work, such as walking time to the workplace and the cost of parking compared to other modes. The cost element also includes generalised cost as walking time to the destination is valued more highly than time spent searching for space or the time spent in the vehicle (Axhausen & Polak, 1991). As such, the likelihood of someone driving decreases with increasing distance between the parking place and their destination. Therefore, designing a development so that parking provision (excluding accessible parking and potentially car-share parking) is less accessible than other modes is one way of reducing the attractiveness of driving to a destination.

The second factor is the bicycle facilities at the site. Section 2.3.1.4 presented literature on how the presence and type of cycle network can influence the decision to travel by bicycle. In addition to the infrastructure that facilitates people travelling to the site by bike, the infrastructure available to cycle users once they arrive on site is also related to having high levels of cycling. Predominantly this relates to cycle parking and storage but can also include the availability of showers, lockers and changing areas (Bartle et al., 2016). Wardman et al. (2007) identified how facilities such as this help improve the share of people cycling to work but only as long as other measures, such as cycle route facilities, are present.

2.3.1.6 Distance to transit

The distance from a site to the nearest transit stop is usually measured as an average of the shortest possible routes from a site to the nearest public transport stop. Alternatively,

it can be measured by the density of transit routes or the number of stations/stops in an area (Ewing & Cervero, 2010). The proximity of public transport stops and services has a significant impact on the level of public transport use (Ewing & Cervero, 2010; Susilo et al., 2012). particularly if relocation means that there is an increased or improved provision of public transport services following relocation (Aditjandra et al., 2016; Clark et al., 2016). Research has also shown that living near a transit stop does not in itself increase the likelihood of using non-car modes for travelling to work but if the work destination is near to a transit stop, people are less likely to drive a car to work (Kwoka et al., 2015). If both home and work are near to a transit stop, people are more likely to use non-car modes for both work and personal trips (Kwoka et al., 2015). As with other areas of travel behaviour research the research into distance to transit has focused on the origin end of the trip, looking at the how the distance from home to transit stop influences travel behaviour. Less is known about this specific element of urban form at the destination end of the trip. As discussed previously, research has found that specific urban form elements, such as density (Barnes, 2005) or multiple elements (Lee et al., 2011) can have more influence at the destination end of the trip than at the origin end. This links with the findings of Chen et al. (2008) in terms of how sustainable accessibility to the work location is important in facilitating travel by sustainable modes.

2.3.2 Residential self-selection

The previous sections have presented how the literature shows that the built environment does influence travel behaviour. However, research has also questioned the causality of this association. This is because the phenomenon of 'residential self-selection' confounds the relationships between the built environment and travel behaviour due to how people may consciously choose to reside in areas that are more conducive to their preferred mode or modes of travel (Cao, 2014; Cao et al., 2009; Handy et al., 2005; Schwanen & Mokhtarian, 2005). For example, people who place importance on the proximity of key amenities that can be accessed by walking or cycling try to self-select themselves into higher density, mixed use neighbourhoods because they can use their preferred mode of travel for a range of trip purposes. The choice of mode therefore becomes a function of peoples preferences rather than the built environment (van Wee & Handy, 2016). In relation to the influence of urban form on travel behaviour residential self-selection

therefore suggests that it is not known if peoples travel behaviour is influenced by the built environment around them or by their own personal preferences which has led them to reside in an area favourable to their preferred method of travel.

The extent to which residential self-selection threatens to undermine the validity of what is understood about how residential location and built environment effect travel behaviour has been the subject of much study. Studies have found that although residential self-selection may have an impact to a certain extent, residential location and the built environment have an effect on travel behaviour after controlling for attitudinal variables, when compared to attitudes and preferences and even after accounting for self-selection (Cao et al., 2009; Handy et al., 2005; Krizek, 2003; Næss, 2005; Schwanen & Mokhtarian, 2005).

Næss (2009, 2014) argues a position whereby the effects of residential self-selection are exaggerated and that the threat to the accepted knowledge of how residential location and built environment impacts travel behaviour is minimal once 'traditional' socio-demographic and socio-economic variables are accounted for. A key point of the argument is how transport-related residential self-selection itself demonstrates the influence of residential location on travel behaviour. Much research has shown how residents of higher density, mixed use neighbourhoods tend to drive less than residents of lower-density, suburban areas. Therefore, from a policy perspective it still makes sense to design areas in a way that enables desirable travel outcomes (Næss, 2014).

There is also an argument for how other factors, such as childcare, leisure activities or shopping, may prevent someone from utilising a preferred mode of travel to work regularly (or at all) (Næss, 2014). This could mean that travel behaviour is sensitive to the context in which people live and not always a result of self-selection (Scheiner & Holz-Rau, 2013). Jones and Ogilvie (2012) go further, arguing a contrasting opinion about the self-selection hypothesis in that there is a constant negotiation, reassessment and adjustment of travel behaviour following relocation rather than linear process of deciding how they prefer to travel, relocating and then travelling the expected way. From a sustainability perspective, this potentially offers an extended opportunity for travel behaviour change. It was also identified by Prillwitz et al. (2007) how the literature demonstrates that travel behaviour and personal choices about residential relocation influence one another bi-directionally

with decisions influenced by consideration of distance, time and financial costs. If one of those decisions relates to car ownership, for example, the acquisition or disposal of a vehicle, it was found that the decision is made after the move as people may not have enough knowledge of what the new area will be like (Oakil et al., 2014). This highlights how there could be a delayed decision made regarding mode choice and that people may not select where they live based on a preferred mode of travel.

A further complicating factor relating to self-selection in the context of workplace relocation is if the decision to move to a new workplace is made by the individual. If this is the case then travel preferences are likely to be part of a wider mix when self-selecting where to work, much in the same way as in a residential relocation (Scheiner, 2014). If travel preferences are particularly important to a person, then it could influence their decision one way or the other about if they stay with their employer when relocation is to take place. Self-selection of the new workplace location could also determine which job they choose, assuming there is a choice available. The focus on travel behaviour in relation to the urban form of residential areas (Vale, 2013) is mirrored in the self-selection literature with the attention very much on how residential self-selection influences travel behaviour. However, if the relocation is a decision made by the employer and a person wishes to stay with their employer they may not be able to influence the new location of the workplace. Therefore they can be less self-selective about where their workplace is located compared with a purely residential relocation (Walker et al., 2014). They have little or no influence in initiating or controlling the move, which can potentially raise issues of autonomy, control and perceived trust in leadership. These can all be important with regards to what might influence decisions about travel behaviour (Thomas et al., 2014).

2.4 Summary

This chapter has provided a review of the literature on the spatial and non-spatial influences on travel behaviour. In summary, it was found that urban form can facilitate more sustainable travel if it is designed with high density and diversity allowing people to travel short distances by foot or cycle to a range of amenities. Designing urban form in a way that allows high levels of route choice for walking and cycling is also a key factor in facilitating their use on their own, or to reach public transport services.

The strategic accessibility of destination by sustainable modes is vital to allow for trips from a wide range of destinations. If the workplace is near to public transport, then this was shown to be more important than if the home is near to public transport in terms of people travelling by this mode. However, it was also identified how less is known about the trip end in relation to the characteristics of the destination and their impact on travel behaviour. What was identified about site level attributes is that they need to be carefully considered as these can have a significant impact on travel behaviour. For example, car parking availability was shown to be a crucial factor in people driving to their destination rather than using sustainable modes. Meanwhile, cycle parking was deemed vital for people cycling to work.

Looking at the non-spatial influences, it was recognised how attitudes can be deciding factor in people's travel behaviour when controlling for urban form factors. The academic discussion around 'residential self-selection' highlighted the debate around the impact of urban form or attitudinal factors relating to how people make decisions around travel. From a policy perspective however, it was argued that despite the uncertainties, urban form should be designed in ways that we understand facilitates sustainable travel.

Previous experiences were also identified as being key in current decisions around travel. This is pertinent in the workplace relocation context due to how people will bring those previous experiences of a different location to their new location. Socio-demographic characteristics are additionally understood to have influences on travel behaviour adding complexities about how people make decisions based on their age, gender and household type.

2.5 Synthesis

This chapter has categorised and appraised the influences on travel behaviour and how urban form (spatial) along with socio-demographics & socio-economics and psycho-social (non-spatial) factors have been identified empirically as key influences on individual travel behaviour.

An important point emerging from this chapter is how individual travel behaviour influenced by these factors must also be considered within the social and spatial environment that the individual is within (Van Acker et al., 2010; Van Acker & Witlox, 2005).

It is within this context that the ecological model is a relevant way to understand and explain the complexities of individual travel choices. The concept of the ecological model is that individual behaviour is influenced at multiple levels that relate to the physical and social environment. The levels are: intrapersonal, interpersonal, organisational, physical environment and policy (Sallis et al., 2015). A decision about travel behaviour can therefore be simultaneously influenced by factors across the individuals' physical and social environment. The ecological model was developed for use in health fields and provides a useful framework for understanding physical activity, including active travel, and potentially travel behaviour more generally (Handy, 2005). A limitation of the ecological model is that it does not allow for detailed understanding of the interaction between different levels (Sallis et al., 2015). However, Handy (2005) highlights that travel behaviour researchers could benefit from reconsidering their questions within the perspective of the ecological model. For example, it can allow for understanding of individual attitudes and beliefs that explain why they choose a certain travel behaviour. This can inform a utility-maximising approach by providing guidance on the attitudes and beliefs that might influence individual assessment of the utility of choices (Handy, 2005).

When the ecological model has been applied to active travel behaviour research the variables used have included individual (intrapersonal), social (interpersonal), organisational, physical environment and policy (Christensen et al., 2012; Handy et al., 2010). By taking this approach to using the ecological model the influences on travel behaviour can be structured around the five levels of influence, as presented in Figure 2.5. This literature review chapter has analysed previous research into the influences on travel behaviour and categorised them into spatial and non-spatial categories. Utilising the ecological model adds further explanation to the influences on travel behaviour from the perspective of the individual and their context.

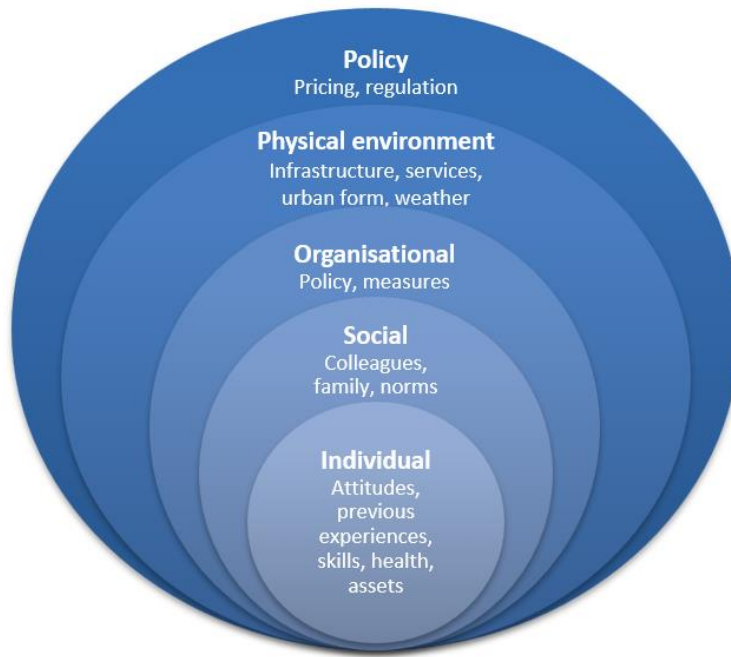


Figure 2.5 – Ecological Model

Each of the factors within the three key themes (urban form, socio-demographics & socio-economics and psycho-social) influence individual travel behaviour at one or more of the levels within the ecological model. Figure 2.6 presents the synthesis of what is understood about the influences on travel behaviour and the ecological model.

The spatial factors relate to the policy and physical environment levels of the model with land use and transport policy being examples of where these can influence the different elements of urban form. For example, land use planning policy determining the land use mix or diversity of a locale, such as a mixture of residential and employment land use. The actual built environment that these policies enact can then directly influence travel behaviour. Using the same example of land use mix, when a diverse urban form is implemented this can influence travel behaviour as this chapter presented.

The non-spatial factors link with the organisational, social and individual levels of the ecological model. Individuals' attitudes and attributes were found to be important in decisions regarding travel and predominantly relate to influences at the individual level of the ecological model. Certain factors, such as employment requirements and household type are related to the organisational and social levels.

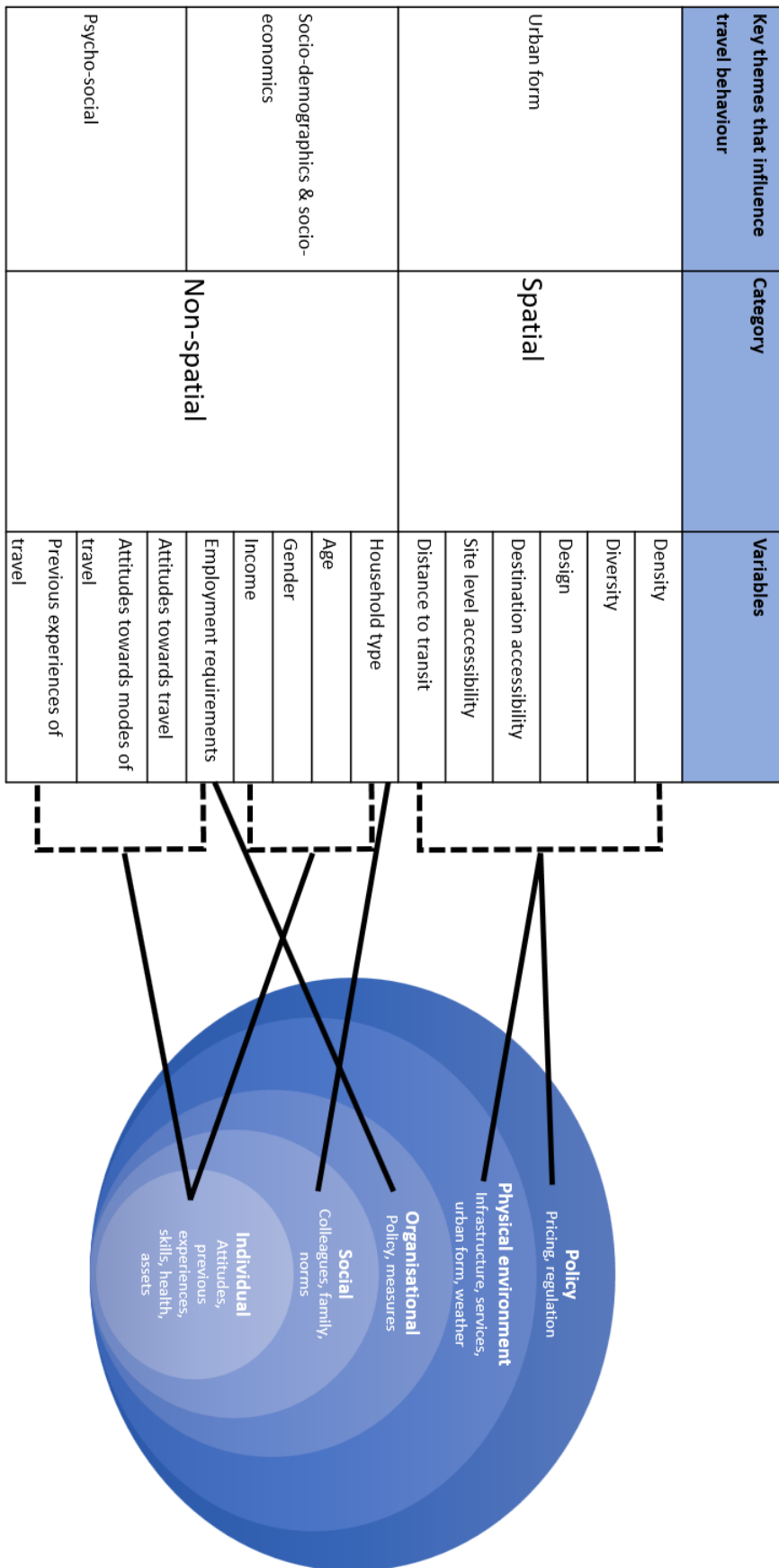


Figure 2.6 – Influences on travel behaviour and relationship with Ecological Model

3 Large-scale workforce relocations as an opportunity to influence travel behaviour

3.1 Introduction

The purpose of this part of the literature review is to provide background into large-scale workforce relocations and to understand why they provide an opportunity to influence travel behaviour towards sustainable patterns. For this study, large-scale workforce relocations have been defined as those that involve the relocation of 250 or more people or jobs to a new site. This definition is based on how in the UK, businesses that employ over 250 employees are considered 'large' (Rhodes, 2018). The new site can be somewhere within the same urban area or to a new area completely.

First, the chapter presents examples of large-scale workforce relocations from the UK and international locations that were found through a desktop search. Recent and ongoing relocations are presented along with those that are planned to take place to demonstrate the frequency of this opportunity to influence travel behaviour. The chapter then investigates the reasons why organisations decide to relocate a large number of people or jobs. The theoretical background to how large-scale workforce relocations provide an opportunity to influence travel behaviour is presented followed by a review of the impacts of previous large-scale workforce relocations on travel behaviour.

The chapter is relevant to the second of the study objectives presented in the Introductory chapter:

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. **To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.**
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.

5. To analyse the effect of a large-scale workforce relocation on travel behaviour.
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

3.2 Examples

3.2.1 Previous/current/planned large-scale workforce relocations

Several large-scale workforce relocations have taken place in recent years with both public and private sector organisations relocating operations to locally, regionally or further afield. Table 3.1 presents a summary of large-scale workforce relocations in the UK involving 250 or more people or jobs since the year 2000 that were found through a desktop search.

Table 3.1 – Large-scale workforce relocations in the UK

Dates	Organisation	Number of employees or jobs relocated	From – To (approx. distance)	Source
2003	Met Office	1,150 employees	Bracknell to Exeter (210km)	(BBC News Devon, 2002)
2004–2010	Office of National Statistics	900 jobs	London to Newport (200km)	(Swinney & Piazza, 2018)
2008	KPMG	1,000 employees	Central London to east London (5km)	(Boucher, 2009)
2009	Qualifications and Curriculum Authority	400 employees	London to Coventry (140km)	(Davis, 2018)
2009	Qualifications and Curriculum Authority	300 employees	London to Manchester (260km)	
2009	Reed Smith	600 employees	Central London to central London (<5km)	(Choppin, 2009)
2011–2013	BBC (Several departments and local media)	2,300 employees	London and Manchester to Salford (260km & 4km)	(National Audit Office, 2013)

Dates	Organisation	Number of employees or jobs relocated	From – To (approx. distance)	Source
2013	Manchester Metropolitan University	500 employees	Various to central Manchester (5km-40km)	(AECOM, 2013)
2015	Department for Education	400 employees	Edge of Darlington to central Darlington (<5km)	(BBC News, 2015)
2016	BBC (BBC Three)	300 jobs	London to Birmingham (160km)	(Sweney, 2015)
2018	HSBC	1,000 jobs	London to Birmingham (160km)	(Neate, 2017)
2019	Channel 4	300 employees	London to Leeds (280km)	(Sweney, 2018)

From looking internationally, it is evident the large-scale workforce relocations are not unique to the UK with examples taking in place in Europe and the USA. In some cases, the relocations involve several thousand jobs or employees being relocated.

Table 3.2 – Large-scale workforce relocations outside of the UK

Country	Dates	Organisation	No. of employees or jobs relocated	From – To (approx. distance)	Source
USA	2013–2014	Coca-Cola	2,000	Cumberland, GA to Atlanta, GA (15km)	(Williams, 2017)
	2016–2017	Toyota	3,000	Torrance, CA to Plano, TX (2,000km)	(Felton, 2017)
	2017–2018	General Electric	800	Fairfield CT to central Boston, Ma (225km)	(Williams, 2017)
	2018	McDonald's	2,000	Oak Brook, Il to central Chicago, Il (25km)	

Country	Dates	Organisation	No. of employees or jobs relocated	From – To (approx. distance)	Source
	2018	Home Advisor	300	Golden, Co to Denver, Co (20km)	
	2019–2020	Expedia	3,000	Bellevue, Wa to Seattle, Wa (15km)	
	2020–2021	Amazon	TBC estimated 1,000 initially	New York City, NY* and Crystal City, Va	(Bendix, 2019)
	2022	Marriott	3,500	Suburbs to central Bethesda, Md (5km)	(Williams, 2017)
Norway	2000	Statens Hus (Public offices)	1,000	Three sites in outer Trondheim to central Trondheim (4km)	(Pritchard & Frøyen, 2019)
	2005–2006	Trondheim Municipality	1,000	Three sites in outer Trondheim to central Trondheim (1km-4km)	
	2013	Glensidige (Insurance firm)	1,000	Sollerud to central Oslo (6km)	
	2015–2016	Adresseavisen (News media)	300	Heimdal to central Trondheim (10km)	
Denmark	2002	Ferring Pharmaceutical	450	Malmo, Kiel and Copenhagen (1km-220km)	(Knowles, 2012)
	2005–2007	DR (Danish Broadcasting Company)	3,000	Multiple sites in central Copenhagen to Ørestad New Town (1km-3km)	

Country	Dates	Organisation	No. of employees or jobs relocated	From – To (approx. distance)	Source
	2010	Rambøll (Engineering consultancy)	1,200	Central Copenhagen and Virum to Ørestad New Town (3km/20km)	

** Amazon had chosen to relocate to New York City and Crystal City; however, they reversed their decision to relocate to New York City following political opposition (Bendix, 2019).*

3.3 Reasons for relocation

Organisations have different reasons for deciding to relocate some or all their operations. Organisational attributes, such as size, age and growth rate were found as key determinants of relocation (Brouwer et al., 2004; de Bok & van Oort, 2011). Internal attributes relating to preferences also influence relocation decisions with lack of space, the costs of a lease and the physical condition of properties were consistently the most important. Accessibility was among several other factors being considered by organisations but not seen as a main priority (Elgar & Miller, 2010). This is understandable as it could be argued that these factors are more directly related to the operation of the business than accessibility to the site. If the accessibility to the site is affecting deliveries or customer access, then it could be stated that site accessibility is directly affecting the core operation of the business. However, proximity to their employees and customers is just one more locating factor among many others (Gutierrez & Garcia-Palomares, 2007).

Externally, agglomeration and accessibility were found to be key considerations within the literature concerning where firms choose to locate themselves. Agglomeration provides benefits due to organisations being geographically close to each other with large urban areas being highly preferred for company headquarters (Klier & Testa, 2002). A key benefit of agglomeration is transport costs are reduced through short distance between organisations and accessibility levels are high. Despite transport costs reducing over time and digital technologies facilitating instantaneous global communication, agglomeration economies remain important (Glaeser, 2010). De Bok and Van Oort (2011) argue that agglomeration and accessibility have less influence on decisions to relocate than internal factors and as such proximity to transport infrastructure that facilitates sustainable

accessibility may not be a priority. An adequate skills base and the potential for the expansion and development of the local skills base were also seen as key factors (O'Mara, 1999).

It is evident that there are different motivating factors that for public and private sector organisations. Relocation of public sector jobs is a key element of the Government's cost saving agenda. Decisions to relocate away from London are also political in terms of distributing departmental operations into the regions (Cabinet Office, 2014). Meanwhile, the private sector is also reviewing the costs of property as part of their estates strategies albeit with a different motivating factor in terms of profit margins and delivering value for shareholders (Lindholm et al., 2006). While decisions related to organisational operations may be the primary factor that drives relocation, decisions around travel and transport are included within the myriad of decisions made about relocation to a new site.

3.4 Future trends

As discussed in section 3.3 relocation of public sector jobs away from London is a key element of the Governments cost saving agenda and will continue to be so into the near future. The Smith Review in 2010 highlighted the savings to be made from relocating a third of civil servants from London over a ten-year period, continuing a process already underway by that stage (Cabinet Office, 2014) Following on from the recommendations of the review the Government's Estate Strategy aims to relocate many departmental offices out of London and into the regions by 2020 (Cabinet Office, 2014). Likewise, the private sector is being driven by cost-savings through their estate strategies, particularly in London and the South East, which could lead to further wholesale or part-relocations to other UK locations (Brooke, 2017; Savills, 2016).

The proposed high-speed rail link (HS2) has the potential to induce further workforce relocations. Phase 1 of the route between London and Birmingham is scheduled to open in 2026 with Phase 2 continuing to Manchester and Leeds by 2033 (DfT, 2017c). The reduced journey times on the high-speed link have potential to decrease the importance of businesses needing to be in or near to London (Wiggins, 2017). Previous research on the impact of high speed rail has shown increases in accessibility for cities served by the route (Albalade & Bel, 2012) supporting the notion of businesses considering relocation to cities on a new high speed line. This could facilitate further large-scale workforce relocations to

the major cities on the proposed route, some of which have already had organisations decentralise from London, such as HSBC moving their head office to Birmingham in 2018 (Table 3.1).

The possible exit of the United Kingdom from the European Union has emerged as potential factor in organisations undertaking large-scale workforce relocations since the referendum on EU membership in June 2016. Since the vote, 34% of companies have said they are considering or have confirmed they are moving some of their operations to Europe from the UK (Ernst & Young, 2018). The relocation of the European Medicines Agency from London to Amsterdam is an example of large-scale workforce relocation linked to the uncertainties regarding the UK's relationship with the EU. Approximately 700 employees relocated from London to Amsterdam in March 2019 as the organisation shifted its operations to Europe (European Medicines Agency, 2019). In the financial sector, large companies such as Bank of America and Citigroup are considering reducing their UK operations in favour of a location in mainland Europe (Rey, 2019). Given the fact that it is likely that large-scale workforce relocations will continue to occur, their potential opportunity for influencing travel behaviour warrants further study.

3.5 Theoretical opportunity to influence travel behaviour

3.5.1 Travel behaviour as habit

The previous sections have demonstrated how large-scale workforce relocations are an established trend and that they can offer an opportunity for influencing travel behaviour. This section explores the literature around why they are an opportunity to influence travel behaviour.

Behaviour in general is initially the product of rational decision process where people consider the range of options available and choose the one they deem most appropriate based on their individual preferences. However, the repeated choice of a behaviour within a stable context can over time lead to this behaviour becoming automatic and taking place without the consideration that was undertaken at the outset (S. Fujii & Garling, 2003; Thomas et al., 2014; Verplanken et al., 2008). Once the behaviour becomes automatic, information on a range of other behavioural options has limited impact resulting in change becoming inhibited (Verplanken et al., 1997). This is particularly pertinent for travel behaviour whereby choice of mode becomes habitual and is no longer affected by external

devices, such as encouragement and promotion or changes in travel options. It has been shown that once a pattern for travelling to work that fits with work and personal duties has been established, there is little incentive to make the effort required to change it (Castellani et al., 2016).

3.5.2 Disruption and habit discontinuation

However, when the context of people's lives changes, it can have potential to disrupt this habitual behaviour. Research into travel behaviour in the context of life events and changes has become a particular area of focus, in what has become known as 'mobility biographies' research. The context change includes life events that are not directly related to travel such as moving home, moving job or extending a family and those that are related such as purchasing a vehicle (Lanzendorf, 2003). Viewing travel behaviour in the context of peoples' changing lives can help with the development of policies to take advantage of the opportunity provided by these contextual changes, such as relocation. For example, it was found that residential relocations increased the likelihood of disposing of a car, particularly if the area has good public transport accessibility (Chatterjee et al., 2014; Clark et al., 2015). Scheiner & Holz-Rau (2013) categorise biographical events that have transport relevance into three categories:

- Household and family biography – leaving the parental home, formation of a household with a partner/founding a family, birth of children, divorce, children moving out;
- Employment biography – commencement of job training or university entry, entry into the labour market, change of job or education and income changes;
- Residential biography – residential move.

The context change or disruption brought about by a biographical event can remove the habitual automation, necessitating people to revert to a decision making process in order to manage their new context or norm (Verplanken et al., 2008; Verplanken & Wood, 2006; Walker et al., 2014; Whitmarsh, 2012). Results of studies indicate that biographical events or 'mobility milestones' offer potential for targeted policies that seek to promote sustainable travel (Beige & Axhausen, 2012; Rau & Manton, 2016; Walker et al., 2014).

Walker et al. (2014) studied the travel behaviour of employees during a UK workplace relocation and found that habit strength weakened for all employees whether they changed modes or not. For those who changed modes the habit strength for the old mode did not disappear abruptly but rather decayed while strength for the new mode grew concurrently. This represents the longitudinal aspect of disruption and habit discontinuation. The study also found that as well as there being a 'window of opportunity for change' due to the disruption, there was also a 'window of vulnerability to relapse'. In this window the new habit is not fully established and the old habit is not fully extinguished. However, it was also found that the weakening of habit strength can only last for a short period, emphasising the importance of targeting people during this key window of opportunity (Thomas et al., 2016). This finding accentuates the importance of targeted policies and interventions during the disruption period in order to maximise potential for influencing travel behaviour.

3.6 Impact on travel behaviour

The previous sections have established the reasons why organisations relocate along with the theoretical understanding of the potential opportunity to positively influence travel behaviour that large-scale workforce relocations offer. Within this context, it has also been identified that large-scale workforce relocations are a key and relevant example of a disruption that can offer potential for habit discontinuation relating to travel behaviour. As such, they offer potential for targeted interventions to increase sustainable travel use.

This section provides a review of previous research into the impacts of large-scale workforce relocations on travel behaviour.

3.6.1 General findings on relocation and travel behaviour

It was found that although people will need to re-evaluate how they travel for a range of purposes following a relocation, travel to access employment is one of the most common journey purposes and subsequently most habitual (Stanbridge & Lyons, 2006). Previous work has shown that relocation offers an opportunity to influence travel behaviour towards more sustainable patterns (Bamberg, 2006; Walker et al., 2014). In particular, research has shown that people are more likely to alter their commuting behaviour when they start work for a new employer or when they move home (Clark et al., 2016; Thøgersen, 2006). It has also been shown that people who move both home and job (which is more

typical or large-scale relocations) are more likely to change mode of travel than those who only have one disruption, either a home or job move (Dargay & Hanly, 2007), the propensity for change is not uniform and depends on people's values towards travel and transport. If people hold particular values towards transport, the disruption of relocation can intensify these values, accounting for a greater potential to change mode compared to if the values or the disruption existed on their own (Verplanken et al., 2008).

In terms of the influences on travel behaviour following a disruption, it was found that spatial factors are a larger determinant of travel behaviour than non-spatial factors (Beenackers et al., 2012; Giles-Corti et al., 2013; Walker et al., 2014). The implications of this are that it is important that spatial measures are in place to support sustainable travel behaviour regardless of the pre-disruption travel behaviour.

3.6.2 Relocations away from urban centres

As presented in Section 3.5.1 organisations have also prompted relocations for a range of organisational reasons, with lack of space, lease costs and the physical condition of properties being reported as among the most important (Elgar & Miller, 2010). As highlighted in section 1.2.1.1, relocations from central areas to the urban periphery were a trend during the 20th century as land use planning was oriented around the growth in private vehicle ownership and development occurred outside of central areas (Banister, 2012). The case study in focus as part of this research (see Section 7.1 for full details) is an example of decentralisation with people relocating predominantly from sites in central London and Manchester to a site outside of the city centre. As such, this review into relocation and travel behaviour focuses on the impacts of relocations to sites outside of central areas.

When relocations have taken place from city centres to a location on the urban fringe and suburban areas, an increase in car use has been observed (Aarhus, 2000; Bell, 1990; Cervero & Landis, 1992; Hanssen, 1995). The literature finds several reasons for this change in travel behaviour following relocation to a less central area, which this section explores.

3.6.2.1 Car parking availability

A reason for the increase in car use is that sites in less central locations are more likely to have land available for car parking capacity due to lower levels of density. This is significant

because of how the prevalence of car parking has been shown as being central to people's choice of whether to drive or to seek out alternative modes (Aarhus, 2000; Hess, 2001). Therefore, as well as encouraging more car use due to not being in the city centre with higher levels of sustainable access, less central sites can potentially provide additional incentive for car use due to greater availability of car parking capacity (Aguilera et al., 2009).

3.6.2.2 Less congested highway network

Another reason for higher levels of car use was that due to less congested roads employees can get to work faster and more conveniently by car following relocation from the urban centre to the suburbs (Cervero & Landis, 1992). These factors support existing car users while appealing to those who may become car users at the expense of sustainable modes. Accessibility to suburban sites may therefore be good for those with car access but poor in comparison to central areas for those who travel by sustainable modes out of choice or due to lack of access to a private vehicle.

3.6.2.3 Lower levels of public transport accessibility

Public transport accessibility, or the lack of it, was found to be another reason for the increase in car use, having a considerable impact on increasing the mode share of cars at the expense of public transport (Næss & Sandberg, 1996). The reduction in public transport use when relocating to less central areas is related to an increase in the 'interchange penalty' that people receive when wishing to travel to less central locations by public transport (Hanssen, 1995; Sprumont et al., 2014). Interchange penalty can include various factors such as unproductive waiting time, uncertainty about connections and increased costs due to paying additional fares (Palmer et al., 2011). Urban public transport networks are generally shaped around trips being made into the urban centre, with direct services from across the conurbation available for this purpose. When a trip is from one side of the conurbation to the other, the likelihood of having to change services and/or modes increases and as such, people are likely to encounter a level of interchange penalty.

Workforce relocation creates questions about how employees will adapt to the destination accessibility characteristics of the new site. The Central Business District (CBD) of a city is the location of choice for many employers due to the proximity to customers, suppliers and services (such as financial or legal). CBDs generally have high levels of accessibility and

research shows that proximity to the CBD means lower vehicle miles travelled (VMT) (Næss, 2005).

3.6.2.4 Increase in distance from home to work

The distance of the journey to work is something that people cannot always control following a workplace relocation (Prillwitz et al., 2007) but it has been found that an increase in distance of work from home is strongly linked to the decision to switch to car commuting (Chatterjee et al., 2014) along with an increase in VMT (Cervero & Wu, 1998). While distance may be difficult to address the time it takes to travel is something that can be addressed and an increase in commuting time is something that people particularly want to avoid following relocation. Where an increase in travel time was encountered following relocation, people switched to car use to compensate (Vale, 2013). This is particularly pertinent for cycling and walking as they are more distance sensitive than motorised modes (Pucher & Buehler, 2012a). The closer people live to the city centre the more likely they are to walk or cycle to get to facilities located there, including their place of work, and the less likely they are to drive (Næss, 2003, 2005). However, if their place of work is relocated to the urban fringe, the time and distance advantages of living near to the city centre are reduced with regards to one of their most common trip purposes – the journey to work. This could result in a shift away from walking and cycling, potentially towards private vehicle use.

For some people, workplace relocation coincides with residential relocation due to the new workplace being in a different town, city or region (Oakil et al., 2014; Scheiner, 2014). This brings about additional complexities to understanding travel behaviour following relocation as both the origin and destination of the travel to work trip are affected and have the potential to mask the effects of one another (Rau & Manton, 2016). There is limited research into what influences travel behaviour more, workplace or residential location. However, one study from Denmark found that workplace location was found to be more important than household location in determining mode choice for the journey to work (Næss & Sandberg, 1996).

The trip origin and destination will have their own accessibility characteristics which will impact on the travel behaviour of the employees. For example, changes to accessibility features of the built environment following relocation, such as the provision of public

transport services can have a significant impact on the level of public transport use (Aditjandra et al., 2016). It has also been found that people who relocated to areas that had increased access to destinations, such as services and recreation, increased their levels of transport-related walking (Giles-Corti et al., 2013). This goes along with the general understanding of how the travel consequences of a residential move lie in changes to access to amenities which add or remove mode choice options (Scheiner & Holz-Rau, 2013). People may choose where they are to reside based on where the new workplace is located, however, it is noted that the choice of residence is only partially influenced by where the workplace is located. The cost and type of housing, urban environment, services and contact with nature were also all found to be important (Gutierrez & Garcia-Palomares, 2007). As such, many people live far from their workplace which hinders the potential for use of sustainable modes for journeys to work (Kingham et al., 2001).

The increase in walking found by Giles-Corti et al. (2013) to reach neighbourhood destinations also emphasises how the location of desired amenities may play a key role in where people choose to reside following a workplace relocation. This choice of residential location may relate to travel for other purposes, such as local trips to shops and outdoor spaces. These trips may be done sustainably; however, journeys to work may still be car-based due to the distance or levels of accessibility between the home and the workplace. The proximity of public transport stops and services has a significant impact on the level of public transport use (Ewing & Cervero, 2010; Susilo et al., 2012) particularly if relocation means that there is an increased or improved provision of public transport services following relocation (Aditjandra et al., 2016; Clark et al., 2016).

An example of where relocation to a suburban location did not result in an increase in car use was in Singapore where a workplace was relocated to a planned regional suburban centre (Sim et al., 2001). Vale (2013) adds a caveat to this example in that Singapore has very high levels of commuting by public transport and low levels (5%) of people commuting by car.

Looking at the opposite type of relocation, when organisations relocate to central locations, research has shown that the use of sustainable modes can increase (Christiansen & Julsrud, 2014; Meland, 2012; Paulsen et al., 2008). In some cases, the increase has been significant, for example a tripling in the number of cycle users, pedestrians and public

transport users following a relocation to the city centre (Pritchard & Frøyen, 2019). The greater sustainable accessibility to central areas being a key contributor for this trend.

3.7 Knowledge gap

Despite the potential that they offer, research into the impacts of large-scale workforce relocations on travel behaviour is limited in a general sense (Vale, 2013) but particularly limited within the UK context. The literature reviewed in this chapter was predominantly from outside of the UK, such as the USA and Europe and although this can be related to the UK, it must be interpreted within that context. While data on the number of relocating organisations in the UK is not available, around 6%-8% of organisations were found to relocate in the Netherlands every year (van Wee et al., 1997). In the UK, there are an estimated 8,000 private sector businesses that employ over 250 employees each, totalling 10.7 million people or 40% of total UK employment (Rhodes, 2018). Assuming a similar relocation rate to that of the Netherlands results in approximately 480–640 large-scale workforce relocations per year in the private sector. Adding in public sector relocations that we understand are set to occur results in a potentially considerable number of relocations taking place. It would therefore be beneficial to study a UK example of a large-scale workforce relocation to add to the existing body of literature from other countries and provide insights for policy and practice within the UK.

3.8 Summary

This chapter has established that organisations relocate for a range of reasons but concerns over space, cost and the condition of properties were key internal factors in their decision-making. It was also identified that agglomeration and accessibility are external factors that influence where organisations relocate to; however, it was argued that these have less influence than internal factors. The implications for travel are that organisations may consider transport accessibility when considering whether to move and where to move to, however, internal factors related to their operations are likely to take precedent.

Theoretically, we understand that people can become habitual in their daily travel behaviour that can make it difficult to influence behaviour towards more sustainable patterns where that behaviour is reliant on private motor vehicle use. However, disruptions, of which a large-scale workforce relocation is an example, can create habit

discontinuation, forcing people to resort to a decision-making process. This can make them more likely to consider alternative travel behaviour as they adapt to their new norm. The challenge when organisations relocate to locations that are not within urban centres, is that this can result in increased use of the private car for travelling to work at the expense of all other sustainable modes.

Linking this theory into what has been understood through previous research, the fundamental finding is that employment relocation can change peoples' travel behaviour in terms of their journeys to work. However, we also understand there are challenges in capitalising on this disruption for the purposes of facilitating more sustainable travel use. The previous chapter discussed the ecological model and it is evident that a large-scale workforce relocation can affect all levels of the ecological model with changes ensuing in relation to individual, social, organisational, environmental and policy factors.

4 Measures to influence travel behaviour during a large-scale workforce relocation

4.1 Introduction

We understand from the previous chapters what influences travel behaviour and the impacts that relocation has on travel behaviour. To understand the opportunity to influence travel behaviour during a large-scale workforce relocation it is necessary to understand what measures can be utilised to positively influence travel behaviour towards sustainable modes.

The chapter links to the third of the study objectives presented in the Introductory chapter:

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
- 3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.**
4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.
5. To analyse the effect of a large-scale workforce relocation on travel behaviour.
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

4.2 Transport Demand Management

The influencing of travel behaviour during a large-scale workforce relocation is part of a transport planning paradigm known as Transport Demand Management (TDM). TDM involves managing the demand for travel to meet a range of objectives, including reducing congestion, reducing emissions and increasing transport system efficiency (Litman, 2003).

4.2.1 Components of TDM

From reviewing the literature on TDM (Black & Schreffler, 2009; Enoch, 2012; Hendricks, 2008; Litman, 2003; Rodrigue et al., 2013), TDM measures can be divided into two types – ‘hard’ and ‘soft’ measures. Hard measures feature some form of infrastructure to reduce car use and/or increase sustainable travel use. Soft measures do not include infrastructure and are based around adapting behaviour towards sustainable travel through information and incentives.

Table 4.1 juxtaposes the characteristics of hard and soft TDM measures.

Table 4.1 – Juxtaposition of the characteristics of Hard and Soft TDM measures (Adapted from Roby, 2010a)

Hard TDM	Soft TDM
Can be large or small projects	Small scale projects
Can have central or dispersed control	Dispersed control
Can be long or short term projects	Sustained initiatives
May involve information	Information central
Behaviour change important	Behaviour change central
No individual emphasis	Strong individual emphasis
Often uses disincentives	Uses incentives and disincentives
Limited interdependency between projects	Greater interdependency between measures
Demand management instruments	Delivery mechanisms

4.2.2 Hard measures

Section 2.2 has highlighted what the spatial influences are on travel behaviour in general and in the context of a large workforce relocation. As identified in Chapter 2 the need to influence travel behaviour towards more sustainable patterns is well established. The growth of car use has brought benefits but has also created significant sustainability challenges. The understanding of how the dimensions of urban form can be utilised to positively influence travel behaviour has resulted in the creation of the smart growth and

new urbanism paradigms. Both smart growth and new urbanism have similar overarching aims to create high-density, mixed use environments that facilitate the use of public transport, walking and cycling and reduce car use (De Vos & Witlox, 2013; Knaap & Talen, 2005). However, as Knaap and Talen (2005) highlight, there are differences between the two concepts. For example, the smart growth movement originated with environmentalists and policy planners while new urbanism was more a product of architects and physical planners. Their relationship in practice is reflective of their origins in that new urbanism sets out the strategies for accomplishing the policy goals of smart growth, defining the tools to be used to design urban areas to support sustainable growth (Poticha, 2000). Ellis (2002) points out how new urbanism brings together a way of designing the 5d's of urban form in a way that provides sustainability benefits but also contributes towards good urban design.

An important part of the broader smart growth and new urbanism approach to urban development is Transit Oriented Development (TOD) (Goetz, 2013). TOD focuses on residences and workplaces being clustered near to public transport stations, facilitating high levels of public transport use and multi-modal trips that may include walking or cycling as the means to reach the transit stop (Cervero, 2004; De Vos et al., 2014; van Wee, 2011). The concept of TOD was formulated in the 1980s but the phenomenon can be traced further back with 19th and 20th century examples of real estate development being served by transit (Carlton, 2009; Knowles, 2012). Although TOD and new urbanism developed separately, Boarnet and Crane (2001) discuss how they share many characteristics in that new urbanist developments built around transit stations are in effect TOD.

There are several categories within which hard TDM measures can be placed, as presented in Table 4.2.

Table 4.2 – Hard TDM categories and measures*

Infrastructure that increases provision for sustainable transport modes
<ul style="list-style-type: none"> • Public transport facilities (lines/routes, stops/stations) • Public transport services (new services, improvements to existing services such as capacity and quality of vehicles) • Cycle infrastructure (routes, storage) • Walking infrastructure (routes, public realm improvements) • Low emission vehicle infrastructure (electric vehicle charging outlets)
Infrastructure that constrains the priority of car use
<ul style="list-style-type: none"> • Road space reallocation (for public realm, cycle or bus infrastructure) • Traffic calming (speed reduction measures)
Systems that disincentivise car use
<ul style="list-style-type: none"> • Road user charging (cordon charging, distance charging) • Parking management (car parking tariffs, time restrictions)

* Source: Black & Schreffler, 2009; Enoch, 2012; Hendricks, 2008; Litman, 2003; Rodrigue et al., 2013

4.2.3 Soft measures

As looked in the previous section there are spatial measures that can be used to influence travel behaviour towards more sustainable patterns. However, research has indicated that even with these spatial measures in place, such as TOD, this may not by itself be sufficient to generate modal shift (Vale, 2013). Therefore, additional support in the form of non-spatial measures is required to maximise the spatial measures that provide the possibility of sustainable access.

In contrast to spatial measures, non-spatial measures are:

- Non-physical/non-infrastructurel;
- Aim to influence attitudes towards travel and transport by incentivising, encouraging and facilitating people to travel more sustainably; and
- Advance the effectiveness of spatial measures.

Referring to Section 1 these measures are predominantly related to the attitudinal theme in how they aim to influence people’s attitudes towards travel and modes of transport. They seek to change these attitudes in a way that people then view sustainable modes more positively and are therefore more likely to use them.

Non-spatial measures that aim to influence attitudes towards travel and modes of transport and subsequently modify travel behaviour represent a part of Transport Demand Management (TDM). Carpooling, or car sharing, is a non-spatial measure, representing the points above on the characteristics of non-spatial measures.

In the UK, they were branded as ‘Smarter Choices’ (Cairns et al., 2004) in the USA they are referred to as Mobility Management (Enoch, 2012) but are known more generally as ‘soft’ measures. The definition of them as soft delineates them from TDM measures that feature infrastructure or ‘hard’ measures, which this research considers as spatial measures. Soft measures aim to advance the cause of hard measures by engaging, encouraging and facilitating people to shift towards sustainable modes through highlighting the benefits of using alternatives to the private motor vehicle. As with the hard TDM measures, there are several categories within which soft TDM measures can be placed, as presented in Table 4.3.

*Table 4.3 – Soft TDM categories and measures**

Provision of information and awareness raising
<ul style="list-style-type: none"> • Paper-based and digital information on sustainable transport services (maps, timetables) • Personalised journey planning (tailored information for individual journeys)
Tax incentives and financial support
<ul style="list-style-type: none"> • Salary sacrifice schemes allowing tax efficient savings on sustainable travel (Cycle to Work scheme) • Interest free loans (for purchase of public transport season tickets)
Subsidised or reduced sustainable travel
<ul style="list-style-type: none"> • Subsidised or free public transport services (bus services serving employment or educational organisations) • Season ticket offers (reduced public transport season tickets)
Reducing the need to travel
<ul style="list-style-type: none"> • Homeworking • Teleworking (working remotely while not at work or at home) • Virtual meetings (use of technology such as telephone and video conferences) • Flexible working hours (reducing travel during peak periods, condensing working week into less days to reduce total number of days travel takes place)

Marketing, communication and promotion
<ul style="list-style-type: none"> • Marketing of sustainable travel in terms of benefits (health and wellbeing, reduced emissions, cost savings) • Positive messaging and leadership (promotional events, embed sustainable travel culturally within organisation)
Facilitation
<ul style="list-style-type: none"> • Car share database (support in finding a car share partner) • Transport user group (support users of sustainable modes, such as cycling, understand and prioritise improvements for sustainable modes)

* Source: Black & Schreffler, 2009; Enoch, 2012; Hendricks, 2008; Litman, 2003; Rodrigue et al., 2013

4.2.4 TDM background and historical context in the UK

TDM emerged as a concept in the United States during the 1970s where its origin can be traced back to the 1973 oil crisis and the Federal Government's efforts to reduce car use through carpooling or ridesharing programmes (Berman & Radow, 1997). In the UK it was in the 1990s that TDM gained governmental credence when the concept of sustainable development was becoming embedded in thinking after the publication of *Our Common Future* (The Brundtland Report) in 1987. Initially emerging predominantly from an environmental perspective, the notion of sustainability was later adapted to other contexts, such as economic and social sustainability, forming what is known as the three pillars of sustainability (Forsyth, 2011). It had become internationally recognised that the accumulation of greenhouse gases (GHGs) attributable to climate change were a consequence of economic growth and activity, from vast industrial production to increased individual energy demands due to more resource-demanding lifestyles (Barker, 2008). The emergence of the importance of sustainability coincided with the publication of a significant Government White Paper entitled *Roads for Prosperity* in 1989. The White Paper responded to the growing problems of traffic congestion during the economic boom of the late-1980s by proposing a substantial increase to the Government road-building programme (Beatty & Haywood, 1997; Glaister et al., 2006; Parkhurst & Dudley, 2008). Following the White Paper, the growing opposition to further road building culminated in several large-scale protests that highlighted the environmental issues associated with road building and garnered a significant amount of press coverage (Glaister et al., 2006).

A significant response to *Roads for Prosperity* from academics took place in the early 1990s who discussed and proposed ways in which transport policy could be reformed to ease congestion while supporting economic, environmental and social causes. *Transport: A New Realism* (Goodwin et al., 1991) responded to how delivering the capacity required for high traffic growth forecasts was both economically undeliverable as well having social and environmental impacts and that a demand management approach should be taken. The report discussed the concept of integrated transport and how a package of measures for all modes, rather than purely private road transport, was the best way of relieving congestion and the associated detriments. Jones (1992) emphasised the importance of a mixture of measures in order to maintain some acceptable balance between demand and supply, particularly in urban areas where spatial constraints are higher.

The emergence of *New Realism* in transport during this period challenged the Governments actions and strategy with regards to the future of transport policy and in particular, planning for a sustainable transport future. The 1994 White Paper: *Sustainable Development Strategy* responded to the growing concerns of environmental damage but more directly to the 1992 Earth Summit legislation (Agenda 21) which addressed the need for greater use of sustainable modes of travel as part of the concept of sustainable development. The strategy drew attention to the forthcoming updates to Planning Policy Guidance note 13: *Transport* (PPG13) as a way of managing future demand (Glaister et al., 2006). PPG13, published in 1994 under joint co-ordination of the Department of Transport and the Department of the Environment, provided guidance for local authorities for managing future traffic growth through integrating transport and land-use planning when considering new planning applications. As Vigar and Stead (2003) point out, PPG13 represented a clear statement that in the future, planning should aim to reduce the need to travel, particularly by car.

The New Realism concept was further validated by the by the Standing Advisory Committee on Trunk Road Assessment (SACTRA). SACTRA published evidence of how the central government methodology for appraising new road schemes was flawed due to the paradox that they did not alleviate congestion but actually generated more traffic (Glaister et al., 2006; Hull, 2008). A prominent example of this was the A34 Newbury Bypass where 30,000-36,000 vehicles were predicted to use the new road every day by 2010, twelve years after

it opened in 1998. However, by 2004, surveys showed that 43,800 vehicles were using the link each day (Taylor et al., 2006). By 1996, the Government had completely abandoned the road-building programme because of the public concern in the wake of the Royal Commission on Environmental Pollution (RCEP) report *Transport and the Environment* but mainly due to budgetary concerns (Goodwin, 2004). Goodwin (2004) argues how *Roads to Prosperity* was the high point of predict and provide as well as ironically being its final hour. Travel Plans were first mentioned as a solution to increasing sustainable travel use during this period at the end of the Conservative term in office in the 1996 Green Paper *Transport: The Way Forward* (Dickinson et al., 2003). However, it was not until a change of government in May 1997 that brought about significant top down changes to the direction of transport policy that they significantly entered national policy. During the first term of their administration, the Labour Government made several moves that changed the direction of transport policy, particularly in the way it was integrated with other aspects of government, such as environment, planning and the economy. The strategic integration of transport and land-use planning was brought about through the creation of the unified Department of the Environment, Transport and the Regions (DETR) under the direction of one Secretary of State. The move demonstrated recognition of the interdependencies of these policies as well as that of the environmental agenda, with particular reference to climate change (Glaister, 2002).

The key document that instigated the change in policy and was to provide an overarch for several other documents was the White Paper *A New Deal for Transport: Better for Everyone* (DETR, 1998). The White Paper acknowledged the rhetorical shift put forward in academic fields during the 1990s (such as New Realism) and laid out the steps the Government was going to take towards embedding this shift in transport policy at a national level. NDFT focused on creating an 'integrated' and 'sustainable' transport system with four principles of sustainability: social progress, environmental protection, prudent use of natural resources and maintenance of high and stable levels of economic growth and employment (Hull, 2005). The need to create a sustainable transport system that mitigated transports impact on those four areas was a key underpinning notion of NDFT. Overall, the White Paper prescribed how the new approach to transport policy would not meet demand through 'predict and provide' but by managing demand through increasing

the accessibility and quality of all modes in order to provide alternatives that would benefit the country environmentally, economically and socially (DETR, 1998; Hull, 2008).

4.3 TDM delivery mechanism - Land use planning

The previous sections have provided a background to the development of TDM and the characteristics of the different types of measures that are included within TDM. This section explores how TDM can be delivered during a large-scale workforce relocation to influence travel behaviour towards sustainable patterns.

Large-scale workforce relocations are likely to require planning permission from the Local Planning Authority (LPA) due to the requirement for the construction of new buildings or the significant redevelopment of existing properties. The previous sections have highlighted how urban form has the potential to influence travel behaviour towards more sustainable patterns and how smart growth, new urbanism and TOD offer methods of creating more sustainable urban environments. UK government policy does not specifically mention any of these concepts, however, planning policy references how land use planning can make it easier for people to use sustainable modes of travel or reduce the need to travel (DCLG, 2012). It is within this policy area that the hard and soft measures for influencing travel behaviour towards more sustainable patterns can be delivered.

In a static situation, it may be difficult to utilise these measures to influence travel behaviour due to several constraints, such as economic, land ownership and regulatory issues. However, the planning and implementation of a new development offers an opportunity to ensure measures are delivered directly or indirectly as part of the development.

In the UK, the planning system enables, to a certain extent, the Local Planning Authority (LPA) to influence the spatial factors associated with significant developments, which are:

- The location of the development (how it links with existing transport infrastructure and services and the wider area);
- The land use type of the development;
- The density, diversity and design of the development; and
- The spatial measures that must be included related to accessibility to and within the site.

In terms of the location of the development, the Local Planning Authority can have some influence over where it would like development to take place by making locations attractive to developers. This can be done through the establishment of Strategic Regeneration Frameworks (SRF), Local Planning Guidance (LPG) or Enterprise Zones (EZ). In the case of SRFs and LPGs the LPA defines a vision for a particular area that aims to attract developers through promotion of the site by the LPA and where the agglomeration of development can offer a good investment opportunity for developers. EZs go further in terms of granting prior approved planning permission for certain land uses and offering fiscal incentives, such as discounts on business rates.

With regards to influencing the land use type of the development the LPA will review the general principles of a proposal at the pre-application stage with the key focus being on whether the proposed land use type is commensurate with the LPAs land use strategy as laid out in their Local Plan (DCLG, 2012, 2014). This allows the LPA to assess if the proposed land use is complementary to the surrounding land use types. These can be either existing land use types or other proposed land use types as part of a SRF or LPG for a particular area. For example, if the framework details the development of land for office premises (Planning Use Class B1) then a proposal for a shop or retail outlet (Class A1) may not be accepted.

The decision on the location of development at the outline stage, whether as part of an SRF, LPG or EZ, will consider access to the development at a strategic level. Accessibility to the existing transport network will be reviewed in terms of how well connected the proposed site will be. How much demand it could add to the network and if additional infrastructure or services in terms of mitigation may be required as a condition of the development gaining permission are also assessed. Through these considerations the LPA has the opportunity to influence the accessibility of the development in line with their relevant transport strategies, such as a Local Transport Plan (DfT, 2009b).

The detail of the proposed development is addressed at the 'reserved matters' stage where the specifics relating to appearance, means of access, landscaping, layout and scale needs to be addressed. At this stage the detail of the elements related to density, diversity, design and accessibility are agreed both to and within the development. Within the development boundary this can include ensuring the site is permeable for cycling and walking access and

that there are good levels of natural surveillance to provide a safe and secure environment for active travel. All of this is then instigated through the construction of the development as it becomes intrinsic to the new urban form being created. Immediately outside of the development boundary, the LPA can also influence accessibility through leveraging developer funding for transport infrastructure, such as cycle routes that link the development with the wider network, further enhancing the sustainability of accessibility. Such leverage is secured through Section 106 agreements (S106) or a Community Infrastructure Levy (CIL) which are mechanisms to make the development proposal acceptable in planning terms to the LPA and which without the development would not be acceptable (PAS, 2015).

In addition to what spatial measures the LPA can deem the developer is responsible for delivering as a condition of the development going forward, the LPA can also implement other supporting measures where feasible. The significant of large developments to the local economy of an area means that LPAs can justify utilising their budget to implement additional supplementary measures that are outside the remit of the associated planning application. This can include cycle or walking infrastructure and public transport infrastructure (e.g. bus stops, or bus priority measures) that enhances the sustainable accessibility of the development but which will not be delivered as part of the development, for example, if it is not immediately adjacent to the development and cannot be conditioned through S106. LPAs can employ this approach to create Transit Oriented Development (TOD) by either adding the transit infrastructure to an existing site or by instigating the approach from the outset with 'blank canvas' developments, as is often the case with SRFs.

LPA budgets can also be used to fund non-infrastructure measures such as enhanced or additional public transport services, either as standalone funding or in combination with S106 funding. As well as drawing on their own budgets, LPAs can seek additional public-sector funding from their relevant Local Enterprise Partnership, central Government or the European Union through either competitive bidding or the submission of business cases. If a proposed development is of a significant size and deemed fundamental to the regional or national economy, these other public-sector bodies can provide significant funding to support sustainable accessibility.

4.3.1 Travel Plans

A key factor that has emerged is that when hard and soft measures are implemented together there is greater potential for their combined effectiveness (Cairns et al., 2004; Enoch, 2012). For example, the introduction of new cycle infrastructure (hard TDM) can be supported by the provision of information and publicity to raise the profile of the new infrastructure to existing or potential cycle users (soft TDM). This packaging of measures is evident on a site-specific basis (as in large workforce relocations) and at city/town level in the UK through Travel Plans (Cairns et al., 2004; Enoch, 2012; Sloman et al., 2010; TfGM, 2011). Travel Plans can encompass some or all the measures in the Table 4.2 (page 56) and Table 4.3 (page 57).

The following sections look at Travel Plans in more detail given their status as the only statutory method to deliver both hard and soft measures in the UK. Travel Plans are particularly relevant in the case of large-scale employment relocations due to how they are a sanctioned method for the relocating organisation to manage their employees travel. As such, the following sections provide background on Travel Plans how they can be utilised to influence travel behaviour.

Travel Plans are commonly referred to within lists of soft measures; however, as a starting point it is important to highlight how Travel Plans should be separated from soft measures. It is understandable how Travel Plans are considered a soft TDM measures given how they take the form of a strategy document rather than a physical piece of infrastructure. However, Travel Plans are not a measure in themselves but a mechanism or strategy for the delivery of other soft and hard measures (Enoch, 2012).

The Department for Transport define a Travel Plan as follows:

“A travel plan is a package of measures to encourage use of alternatives to single-occupancy car-use and in some cases, reduce the need to travel. Measures included in a travel plan could include, car sharing schemes, improved cycle facilities, discounted public transport, restrictions to car park capacity or flexible and home working.” (DfT, no date provided)

A key term in the DfT definition is that of Travel Plans being a package of measures rather than a single measure. A further key point highlighted by Enoch (2012, p.35) is that of the

measures being 'targeted at a specific site by an agent with a strong relationship with the local transport users'. This emphasises how Travel Plans are delivered by organisations that will have strong relationship with the local transport users because they will be their employees predominantly but also potentially customers or visitors. This provides a comparison with where traditional transport measures (e.g. infrastructure) are delivered by local or national government, with the end users being less specific in scope and where the relationship is not as close. Outside of the UK, there are a myriad of alternative names given to Travel Plans, such as: 'site-based mobility management', 'employer transport plans', 'employers commute option programmes' and 'green commuter plans' (Enoch, 2012).

4.3.1.1 Brief history

Prior to their emergence in the UK, Travel Plans were in place in the USA and the Netherlands. In the USA, they emerged as a response to the 1970s oil crises, when several Arab countries issued an embargo on oil exports in reaction to US support of Israel. The Federal government provided funding to establish carpooling programmes as part of the Emergency Energy Conservation Act (1974) which was directly related to the 1973 oil crisis. Carpooling also became more common when large employers moved offices from the inner cities out to new developments in the suburbs where it was less accessible or feasible for their employees to travel by the modes they used in the city, such as public transport, walking or cycling (Berman & Radow, 1997). Trip Reduction Programs were adopted by a number of US cities in the 1990s whereby organisations over a certain size were required to submit annual trip reduction plans (Dill, 1998; Enoch, 2012). The Netherlands adopted the approach that was observed in the USA with experimental Travel Plans established in organisations across the country and plans for all organisations with more than 50 employees to be required to have a Travel Plan (Enoch, 2012).

Section 4.2.1 presented the background to the development of Transport Demand Management (TDM) in the UK. A key policy document to the development of TDM was the White Paper *A New Deal for Transport: Better for Everyone (NDFT)* (DETR, 1998) that marked a change in government transport policy. The methodology of bringing about this change included empowering local authorities to manage traffic demand with central government intervention a possibility where necessary, for major capital schemes for

example. Through integration of transport and land-use planning, the generators of travel, such as workplaces, leisure or retail sites, would now be expected to play their part in the process of managing travel demand (Roby, 2010a). This was where Travel Plans were introduced into national policy, described in the context of reducing private vehicle trips generated by commuter and business travel (Coleman, 2000; Enoch, 2012). Travel Plans can be considered as epitomising the new process of transport planning brought about in *A New Deal for Transport* in terms of how they use a range of measures that are interdependent in their nature but integrated in a strategy package (Roby, 2010b).

PPG13: *Transport* was reviewed and supplemented in 2001 and introduced objectives related to land use planning within the integrated transport policy context that was provided through NDFT. A key addition to the new version of PPG13 was guidance on producing Travel Plans, which for many development sites would be a mandatory condition of planning. Specifically, PPG13 stated that Travel Plans should be submitted alongside any planning application that is likely to have significant transport implications (DCLG, 2001). In addition to the statutory instrument that was available through land use planning policy, NDFT emphasised how a national programme of guidance, support and marketing would be used to attract businesses to the wider benefits of implementing a Travel Plan on a voluntary basis. The voluntary adoption of Travel Plans by large private and public sector employers, such as Boots, Nottinghamshire County Council and Addenbrooke's hospital in Cambridge had been taking place since the mid-1990s, representing the early stages of diffusion of Travel Plans in the UK (Cairns et al., 2004; Enoch, 2012).

4.3.1.2 Process overview

Travel Plans are designed to be live documents that are updated and amended through their period of implementation, which, from a statutory perspective, is usually five years from occupation. Figure 4.1 displays the cycle of how a Travel Plan should be delivered based on a synthesis of reviewed literature (DfT, 2005, 2008, 2009a; Enoch, 2012; Roby, 2010a; Rye, 2002).

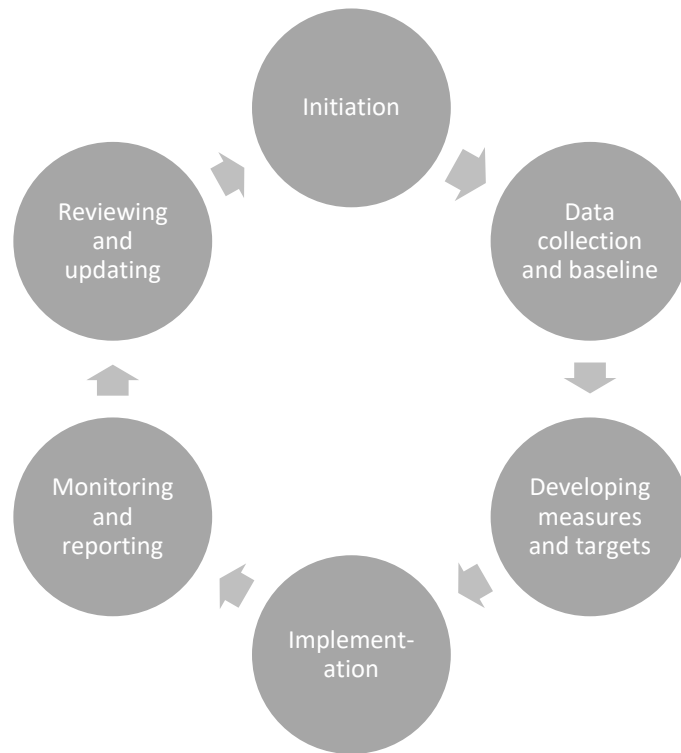


Figure 4.1 – Travel Plan cycle

4.3.1.2.1 Initiation

The cycle begins with the initiation of the Travel Plan whether that be for statutory or voluntary reasons. At the Initiation stage, the scope of the Travel Plan is established, for example, is it for one site or does it have broader geographical coverage as in the case of an area-wide Travel Plan for several sites.

4.3.1.2.2 Data collection and baseline

The next phase involves the collection of data and information that establishes a baseline of the current situation. If the Travel Plan is for an entirely new site with no current occupants, then this stage will refer to what is planned to be included as part of the proposed development. If the future occupants (e.g. employees) are known, then a survey can be conducted looking into how they travel to their existing location in order to provide an indicative baseline mode share. In this case, a travel survey is usually conducted upon occupation and the indicative data is updated with actual mode share.

4.3.1.2.3 Developing measures and targets

The development of measures and targets forms the basis of the action plan or strategy element of the Travel Plan. The measures should relate to the findings of the data

collection and baseline phase, responding to opportunities, such as the proximity of public transport services meaning the promotion of such services being a key measure. The targets generally relate to the mode share of sustainable modes increasing or maintaining an acceptable level. They should strike a balance between being challenging but not unrealistic and should be straightforward to measure otherwise monitoring will be difficult.

4.3.1.2.4 Implementation

This stage involves the delivery of the measures from the previous section and forms the bulk of the Travel Plan cycle. Some measures will have elements that require one-off and on-going actions as part of their implementation, such as the setting up of a public transport season ticket loan scheme followed by promotion and operation of the scheme.

4.3.1.2.5 Monitoring and reporting

Monitoring of a Travel Plan may be required yearly or every two years whereby a travel survey will be implemented to gather mode share data and allow comparison with the baseline survey. Other forms of monitoring can take place, such as the number of people using certain sustainable travel offers, such as the public transport season tickets. The LPA will usually request a monitoring report to be submitted for review and to allow them to assess the level of progress and implementation.

4.3.1.2.6 Reviewing and updating

Once the review has been completed, the LPA and applicant will agree to make any updates to the Travel Plan, in particular the measures to be implemented. The update takes into account any changes since the Travel Plan was initiated. This includes measures that have been fully implemented or external changes, such as a new public transport service becoming available. Once the updated Travel Plan has been agreed, the process moves back to the Implementation stage where the updated Travel Plan is taken forward.

4.3.1.3 Implementation

Based on the review of the literature it has been deemed that an appropriate way to analyse the implementation of Travel Plans is to focus on the key actors involved in their delivery. In the UK, seven different actors have been identified from the literature review (Enoch, 2012; Roby, 2009, 2010a; Yeates & Enoch, 2013) and are presented below in Figure 4.2 along with a summary of their role.

Government	<ul style="list-style-type: none"> •Overarching TP policy •TP Guidance
Local authorities	<ul style="list-style-type: none"> •Initiating TP (applying national Government policy) •Monitoring TP •Supporting TP
Developers	<ul style="list-style-type: none"> •Developing TP •Delivering TP (not in all cases)
Organisations	<ul style="list-style-type: none"> •Developing TP (not in all cases) •Delivering TP
Transport users	<ul style="list-style-type: none"> •Input into TP (responding to surveys, input through working groups) •Supporting TP (assisting in promotion of measures)
Transport operators	<ul style="list-style-type: none"> •Supporting TP (delivering new services as part of the TP)
Transport consultants	<ul style="list-style-type: none"> •Developing TP (when required) •Delivering TP (when required) •Monitoring TP (when required)

Figure 4.2 – The role of different actors in the Travel Plan process

Government, local authorities, developers and organisations are the main actors as they are on the implementation side as opposed to the users who are the audience of Travel Plans. Transport operators feed into Travel Plans and can be key partners without being implementers themselves. Transport consultants can sometimes take the role of implementer on behalf of a local authority, developer or organisation if their services are procured to develop, deliver or monitor a Travel Plan.

The section focuses on the main actors involved in the delivery of Travel Plans: the Government, local authorities, developers and organisations.

4.3.1.3.1 Government

As discussed in section 4.3.1.1 the Government introduced Travel Plans into policy through *A New Deal for Transport* in 1998 and then mandated their delivery through the planning process through *PPG13: Transport* in 2001. Beyond these policies the Government has no direct role in the development and implementation of Travel Plans. The Governments role

has been to act as a guide for the delivery actors of Travel Plans: local authorities, developers and organisations.

During the 2000s, a series of Government produced and co-produced guidance documents were published to assist in the development and delivery of Travel Plans. The documents utilised best practice examples based on experience in practice and through research conducted in academia and consultancy. The timeline of the documents is presented in Figure 4.3 and shows how a publication was released every 2-3 years.

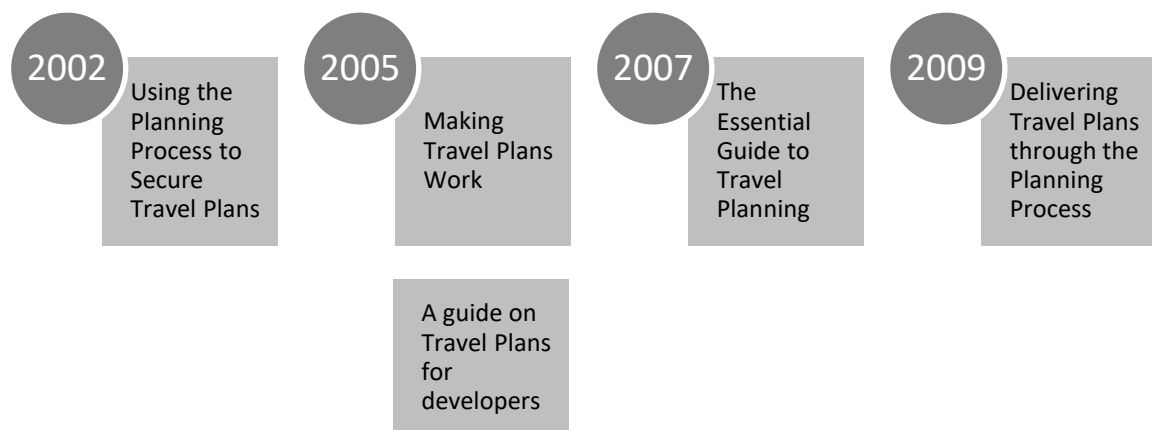


Figure 4.3 – Travel Plan guidance timeline

Using the Planning Process to Secure Travel Plans (DfT, 2002) was published to assist local authorities in making the most of the planning process for securing Travel Plans following the publication of PPG13 in 2001. *Delivering Travel Plans through the Planning Process* (DfT, 2009a) moved the focus onto how local authorities could help ensure Travel Plans are delivered once they have been secured. *Making Travel Plans Work* (DfT, 2005) drew extensively from the findings of the Smarter Choices project (Cairns et al., 2004) and guided readers on how to make Travel Plans of different types work in practice. *The Essential Guide to Travel Planning* (DfT, 2008) focused on helping businesses establish and operate Travel Plans, aiming to emphasise the benefits to businesses of doing so. *A guide on Travel Plans for developers* was produced by Transport Energy, a division of the Energy Saving Trust that was established by the Government to reduce the UK's impact on climate change. The guide was produced in partnership with the DfT with the purpose of demonstrating the benefits of making sustainable travel integral to their proposals (DfT & Transport Energy, 2005).

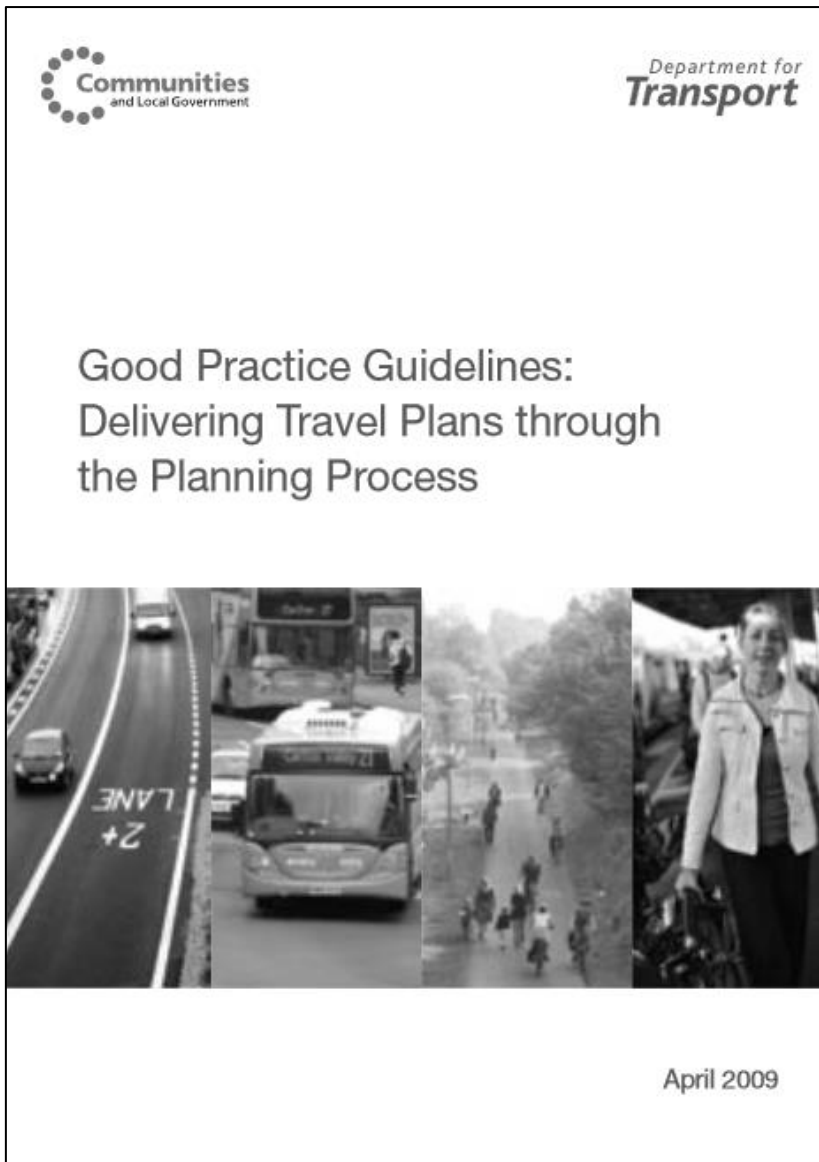


Figure 4.4 – Front cover of ‘Delivering Travel Plans through the Planning Process’ (DfT/DCLG, 2009)

Since the 2009 document *Delivering Travel Plans through the Planning Process* there have been no further Government publications of this type relating to Travel Plans. The guidance documents are still available within Government website archives but they have not been updated, appended or augmented since their publication. The current guidance on Travel Plans consists of one webpage containing less than 1,000 words on when a Travel Plan is required, the need and scope of a Travel Plan, what information should be included and how a Travel Plan should be monitored (DCLG, 2014).

It is also notable that this guidance is now owned by the Department for Communities and Local Government who have responsibility for the National Planning Policy Framework. The

original approach saw Travel Plans come from the policy of a Government body (Department or the Environment, Transport and the Regions) that had integrated responsibility for transport and planning. The department also had responsibility of ensuring Travel Plan creation through the planning process. This department was later divided with planning policy coming under the Office of the Deputy Prime Minister and later the Department for Communities and Local Government and transport now the remit of the Department for Transport. The policy for Travel Plans now came from the Department for Transport with their statutory instigation the responsibility of the ODPM and later DCLG. In the current situation, DCLG remain as the responsible body for ensuring Travel Plans are part of the planning process, however, the Department for Transport no longer provide detailed policy guidance or prioritisation of Travel Plans. The 2013 White Paper – *Door to Door: A Strategy for Improving Sustainable Transport Integration* (DfT, 2013a) referenced the use of station Travel Plans but did not refer to any other type of Travel Plans. The White Paper did, however, mention how ‘We (the DfT) are reviewing the Department for Transport Travel Plan guidance to support developers and local planning authorities in designing, monitoring and evaluating travel plans to develop best practice’ (p. 43). It can be assumed that, as of late-2018, as no guidance akin to the publications released in the 2000s has been published by the DfT, that this is not anticipated to take place, or the guidance they are referring to is the DCLG webpage, which went online in March 2014. Despite the lack of recent in-depth guidance documents published by the Government, many local authorities have produced up-to-date guidance of their own drawing on best practice examples to assist in the development and delivery of Travel Plans.

This section has highlighted how the Governments approach to Travel Plans has been predominantly in the form of guidance rather than legislation. Even when a Travel Plan is mandated through the planning process the guidance predominantly aims to provide stakeholders with the right tools to implement instead of legislation. In this way, Travel Plans have become an additional element in the wider framework of policy choices for managing travel demand, alongside more traditional measures related to increasing transport network capacity. The Governments emphasis is on increase rather than restrict

the choice of measures, attempting to avoid accusation of bias towards particular measures or transport modes.

This approach to Travel Plans draws parallels with the Government's approach to individual travel. In recent years 'libertarian paternalism' has become part of Government policy in different areas, such as public health (Jones et al., 2011). Libertarian paternalism seeks to create 'nudges' within the environment of choice-making that highlights better choices for the individual, without restricting freedom of choice. The popularity of 'choice architecture' with policy makers, particularly in senior government, stems from the fact that it does not require high cost, large scale interventions and it has a less controversial appearance (Avineri, 2012). The parallel relates to how the Government has sought to increase choice of travel mode for individuals, such as through improved cycle infrastructure (Cycle City Ambition Grants (DfT, 2014)) or improvements to bus services (Kickstart Bus Funding (DfT, 2009c)). At the same time, the Government has opted not to implement policy that directly restricts use of private motor vehicles, such as road user charging. A feasibility study highlighted the benefits of implementing a nationwide road user charging scheme (DfT, 2004) but has not led to advanced proposals. Decisions over local road user charging schemes have been delegated to the public through referenda (Sturcke, 2008) or in the case of London, came under the powers granted to the Mayor under the Greater London Authority Act (HMG, 1999).

4.3.1.3.2 Local authorities

Section 4.3 highlighted how the land use planning process could be used to shape hard measures to influence travel behaviour. In terms of soft measures, the planning process has a more limited role; however, this role does include the instigation of Travel Plans. Local Planning Authorities (LPAs) are responsible for the implementation of planning policy within their areas and are therefore key actors in the initiation of Travel Plans.

The Government integrated transport and land-use planning through the creation of the Department for the Environment, Transport and the Regions (DETR) in 1997. Government policy now expected the generators of travel, such as workplaces, leisure or retail sites, to play their part in the process of managing travel demand through the implementation of Travel Plans (Roby, 2010b). Planning Policy Guidance note 13: *Transport* (DCLG, 2001) established the Government's policy for LPAs to initiate statutory Travel Plans through the

planning process whereby significant developments would be required to generate a Travel Plan as part of gaining planning permission (Enoch & Potter, 2002). In March 2012, PPG13, along with all other PPGs, were replaced by the National Planning Policy Framework (NPPF). The mechanisms for securing Travel Plans through the planning process remained unchanged within the new framework.

There are two principal mechanisms within the planning process that can be used to secure Travel Plans – conditions and obligations (DCLG, 2015; MHCLG, 2018). Both of these mechanisms were not specifically designed for transport-related measures but to secure developer contributions or activity related to the development (Rye et al., 2011). Conditions require certain measures to be put in place as a condition of the development going ahead, e.g. cycle parking or regulation of car parking operation. Conditions must tangibly relate to the development and not be unreasonable in terms of what the developer is required to do (MHCLG, 2018). Conditions are limited by their rigidity, lack of scope and inability secure funding for Travel Plan measures (TfL, 2013). As such, conditions are generally recognised as being a lesser means of securing Travel Plans compared to obligations (Rye et al., 2011).

Obligations are used to secure funds from a developer to provide infrastructure and services on or off the site (DCLG, 2015) An example is funding for public transport connections to a development for a specified period. A planning obligation is a contract that sits alongside the planning permission, enforced through the Lands Tribunal. An Obligation becomes part of legal title of the land and must be discharged by subsequent owners as well as the owner when the obligation is signed (Rye et al., 2011). Obligations often involve lengthy negotiations but are seen by some planning authorities, such as Transport for London (TfL), as ‘often the most appropriate mechanism for securing an effective Travel Plan’. The reasons for which include how they:

- Allow for greater level of detail to be agreed than could be achieved through a planning condition;
- Are the only mechanism which enables financial contributions to be secured; and
- Run with plot of land so are enforceable against the original applicant and anyone subsequently acquiring the land (TfL, 2013).

It is suggested that planning obligations have the potential to allow more complex Travel Plans to be secured (Yeates & Enoch, 2013) potentially offering a more tailored approach to delivery than a fixed condition the developer may be eager to meet and 'tick off'. Despite this potential, a consensus has not been reached within local government with regards to if the planning system can be used in that way (Rye et al., 2011). As such, many local authorities only use planning conditions to secure Travel Plans to avoid potential legal challenges if they use obligations.

The process of initiating a Travel Plan should begin at the earliest opportunity when the scope of the development and associated planning requirements are being agreed. At this stage the need for the Travel Plan is established. As the planning application progresses but prior to any occupation, the interim or framework Travel Plan is submitted for review by the LPA. The applicant will then usually have to submit the full Travel Plan upon occupation or within a time period, such as 3 or 6 months from occupation. Hard infrastructure measures that support the Travel Plan and sustainable access to the development are usually required to be in place for when the development is occupied so that sustainable travel patterns can be created from the outset. Post-occupation the Travel Plan moves into a monitoring stage where the applicant delivers the Travel Plan, monitors progress and reports to the LPA. If the LPA is not satisfied with the level of progress they can consider the use of default mechanisms such as financial penalties paid to the LPA to fund appropriate measures to address the cause of the default (DfT, 2009a). Table 4.4 provides an overview of the key stages involved in securing a Travel Plan for a new development through the planning process.

Table 4.4 – Key stages in securing a Travel Plan for a new development (adapted from DfT, 2009a)

Planning Stage	Development Stage	Actions
Scoping and pre-application	Pre-occupation	<ul style="list-style-type: none"> The need for the TP is established based on criteria set out by the LPA. Type of TP and requirements are agreed between LPA and applicant.
Planning application		<ul style="list-style-type: none"> Interim or framework TP is submitted.
	Occupation	<ul style="list-style-type: none"> Full TP is submitted and any hard measures agreed to be in place upon occupation (e.g. cycle parking) are so.
Monitoring	Post-occupation	<ul style="list-style-type: none"> Occupier delivers and monitors the TP in line with LPA guidelines. TP updated to take into account progress against targets and changes to context (e.g. new transport services becoming available). LPA considers use of default mechanisms if TP delivery is not satisfactory.

Organisations seeking planning permission for new sites, or expanding existing sites, remains the only way Travel Plans can be mandatorily secured. The limitation of statutory Travel Plans is that their implementation can only be enforced during the planning process for the development of a new site or the addition of new facilities to an existing site (Roby, 2010b). Therefore, the legislation within the NPPF cannot necessitate existing occupiers of sites to create Travel Plans to manage the access. This means that in some cases the organisations or locations with the greatest need to reduce reliance on single-occupancy vehicle trips fall outside of the scope of regulation.

Regulation outside of the planning process would require a policy whereby significant organisations would be required to implement measures to mitigate private vehicle use, regardless of whether they are seeking planning permission. Examples of this sort of requirement are in place in Europe, for example, in Paris, employers have been required to refund half the cost of season tickets (Carte Oranges) since 1983, following city authority

legislation (Flowerdew, 1993 in Enoch and Potter, 2002). Cairns et al. (2004) suggest the use of legislation, similar to that which requires disabled access and affordable housing quotient, as a way of ensuring all organisations are required to have a Travel Plans. The complexities of securing such legislation include how local authorities would not want to dissuade existing organisations from remaining in their location if the neighbouring authority did not have a similar policy. There could be potential for this type of legislation in localities that are uniquely attractive such as significant economic centres, which typically also suffer from high demands for movement that often translates into substantial private vehicle movements and the associated negative effects.

Despite the lack of regulation outside of the planning process Enoch (2012) argues that the regulation of Travel Plans through the planning process is perhaps best developed in the UK. However, it is still evident that progress in how local authorities use the planning system to encourage the development of Travel Plans is not as advanced as would be expected (Enoch & Ison, 2010). The difference between the number of established Travel Plans and the number being actively implemented is an area that has been shown to have discrepancies even where statutory requirements are in place for a Travel Plan. Nearly half of local authorities surveyed stated that there were Travel Plans in their area that had not been implemented or were likely to be in breach of their condition/obligation for some reason (Rye et al., 2011). Insufficient resources within local authorities has been cited as a reason for the low level of monitoring taking place as well as a lack of expertise in terms of how to go about taking enforcement action where a planning condition or obligation is in breach (Enoch & Ison, 2010). Government recognition of the monitoring issue was referenced in *Delivering Travel Plans through the Planning Process (DfT, 2009a)* where it was highlighted that 'the limited nature of current monitoring activity and the inadequacy of it for benchmarking and policy functions as well as travel plan implementation' (p. 108). The guidance highlighted the options available to LPAs to monitor and enforce Travel Plans by looking for alternatives in response to the non-compliance and then requesting corrective actions if a further default occurs. Any additional measures are undertaken at the developer's expense or if further defaults occur, the local authority can request payments for appropriate measures to address the cause of the non-compliance (DfT, 2009a).

The position of local authorities concerning monitoring was further challenged by a High Court decision in 2015. The Court found in favour of the planning inspector's ruling that developers should not have to pay fees towards the monitoring of Section 106 obligations following a case where a developer was required to pay fees to Oxfordshire County Council as part of their planning agreement (PINS, 2015). These fees are typically how local authorities fund the monitoring or Travel Plans that they have included as a requirement as part of giving consent to a development. The ruling does not encroach on the requirement for a Travel Plan, however, the fees may form an important part of the budget allocated to monitor the Travel Plan and ensure the developer is complying with what they are required to do through gaining planning consent.

The strategic priorities of LPAs, such as encouraging growth and development, may mean that LPAs loosen their policies relating to traffic growth to accommodate development. This is particularly pertinent in the post-recession world where the pursuit of economic growth is a fundamental tenet of Government policy. LPAs are faced with the risk of losing developments (and related income through business rates) to a neighbouring authority if their policies are more restrictive than other LPAs (Enoch & Potter, 2002). To deter this from occurring a national policy would be required; however, this would go against the shift towards more delegated powers and autonomy for the regions and local authorities as laid out in the Localism Act (DCLG, 2011).

As well as taking a statutory function as a regulator of Travel Plan delivery, it is also in the LPAs interests to actively encourage and support Travel Plans within their areas as contributing elements of their Local Transport Plan. Local Transport Plans may include a target for a certain number of organisations to have a Travel Plan implemented, for example (Rye et al., 2011).

Outside of the statutory framework for securing Travel Plans, organisations are encouraged to voluntarily implement Travel Plans by national and local government. Voluntary Travel Plans are less common than those that originated through a statutory requirement. Roby (2010a) identified several large organisations that had started Travel Plans on a voluntary basis with facilities management and environmental reasons being the basis by which they were progressing their Travel Plans. The research also highlighted how for some organisations their motivation to have a Travel Plan was originally statutory. However, over

time the motivations had changed from being externally driven to more internally driven and were therefore maintaining the Travel Plan beyond its mandatory term (Roby, 2010a).

4.3.1.3.3 Developers

The majority of developments that come forward for planning are promoted by the private sector (Rye et al., 2011). Some developments are of public sector origin, for example, for the expansion or creation of new schools, hospitals or university campuses. In new or expanding large-scale sites, the site developer is usually the applicant applying the Local Planning Authority (LPA) for permission to construct their development. However, the developer may not be the final occupier of the site; they may sell the site in parts or as whole to other parties who would then take occupancy. The developer may also retain ownership of the site and lease out parts or the whole of the development, maintaining their ownership of the site but not taking occupancy. Regardless of their final role upon completion, the developer takes a pivotal role in the initiation, planning and development of all aspects of a site, of which transport and accessibility are key elements. As such, developers are responsible for developing a site Travel Plan for submission to the LPA as part of gaining planning consent. The LPA developing a positive relationship with the developer can be vital in terms of this sole opportunity to mandate a Travel Plan being maximised.

Due to the importance of the planning process in ensuring developers play a key role in shaping long term sustainable travel to developments through spatial and non-spatial measures, the area has been the subject of analysis. Previous research (Cullingworth & Nadin, 2006; Dill, 1998; Hendricks, 2008; Roby, 2010b; Rye, 2002; Rye et al., 2011; Yeates & Enoch, 2013) has highlighted the following key issues:

- A developer's primary concern is to generate profit in as short a period as possible, whereas planning is concerned with long-term land use and spatial form.
- Monitoring is inadequate which means enforcement is difficult or not possible, despite the availability of monitoring tools.
- The ultimate occupier, who is often not known to the developer or involved in the creation of the Travel Plan, is not motivated to engage in the process.
- Planning system is imperfect tool to secure Travel Plans because it does not embed objectives into the organisation's business processes.

- Travel Plans are considered too late into the land use planning process.
- The planning process ensures Travel Plans are implemented where new development occurs but not necessarily where they are most needed.

Looking specifically at Travel Plans from the perspective of the developer Yeates and Enoch (2013) found that developers had a good understanding of Travel Plans and what they generally involved. Developers identified benefits relating to cost savings for both themselves and the occupiers and how Travel Plans contribute to the wider sustainability agenda. However, this sustainability agenda was predominantly related to carbon reduction but without citing traffic congestion as being important in relation to this. The significant concerns of developers related, perhaps unsurprisingly, to financial penalties and long-term costs that they could be tied into. The traffic mitigation element of the Travel Plan (through modal shift targets) was seen as a concern in terms of how highway improvements were also required to gain planning permission seemingly based on the assumption that mode shift would not occur (Yeates & Enoch, 2013).

4.3.1.3.4 Organisations

Like that of the developer, the role of organisations (both public and private) in the Travel Plan process differs from case to case. There are different contexts in which organisations can have differing roles.

The simpler arrangement is whereby the organisation is the existing landowner and wishes to develop on their land. In this case, the organisation acts as developer during the process of seeking planning permission, as they will be responsible for any conditions of gaining consent. This includes the development of a Travel Plan assuming the development proposals trigger this condition as per the LPA guidance. Figure 4.5 displays the arrangement showing the actions of the organisation and the LPA and the relationship between the two parties.

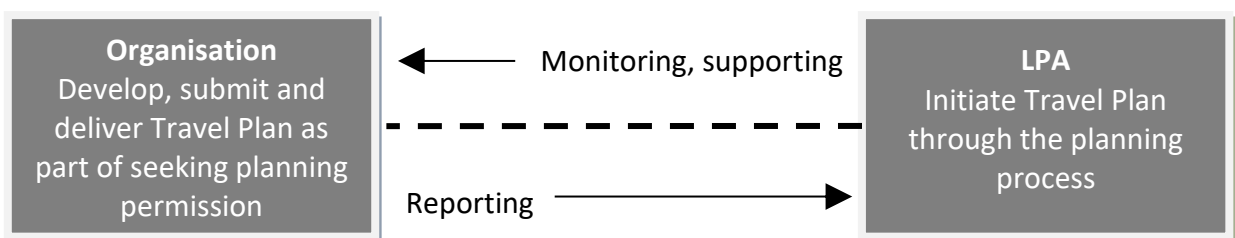


Figure 4.5 – Travel Plan delivery structure with organisation as planning applicant

The more complex arrangement is where a developer is developing a site with the intention to lease parts of the new site to other organisations for them to occupy and conduct their business operations. In this case, the developer is not an occupier of the site; however, they are still responsible for the Travel Plan condition or obligation. As such, the developer will need to develop and submit the Travel Plan for the site as part of the planning submission. As they are still liable for the delivery of the Travel Plan, it is in the developer’s interest to engage with the tenant organisation(s) to ensure delivery takes place. If the site has multiple organisations, the LPA will usually require a framework Travel Plan to be delivered. A recommended approach for this type of delivery involves the developer establishing and leading a delivery group that involves each of the tenant organisations. Figure 4.6 displays an example of a relationship of this type with the developer overseeing delivery of the Travel Plan for the site by working with each of the tenant organisations while being monitored and supported by the LPA.

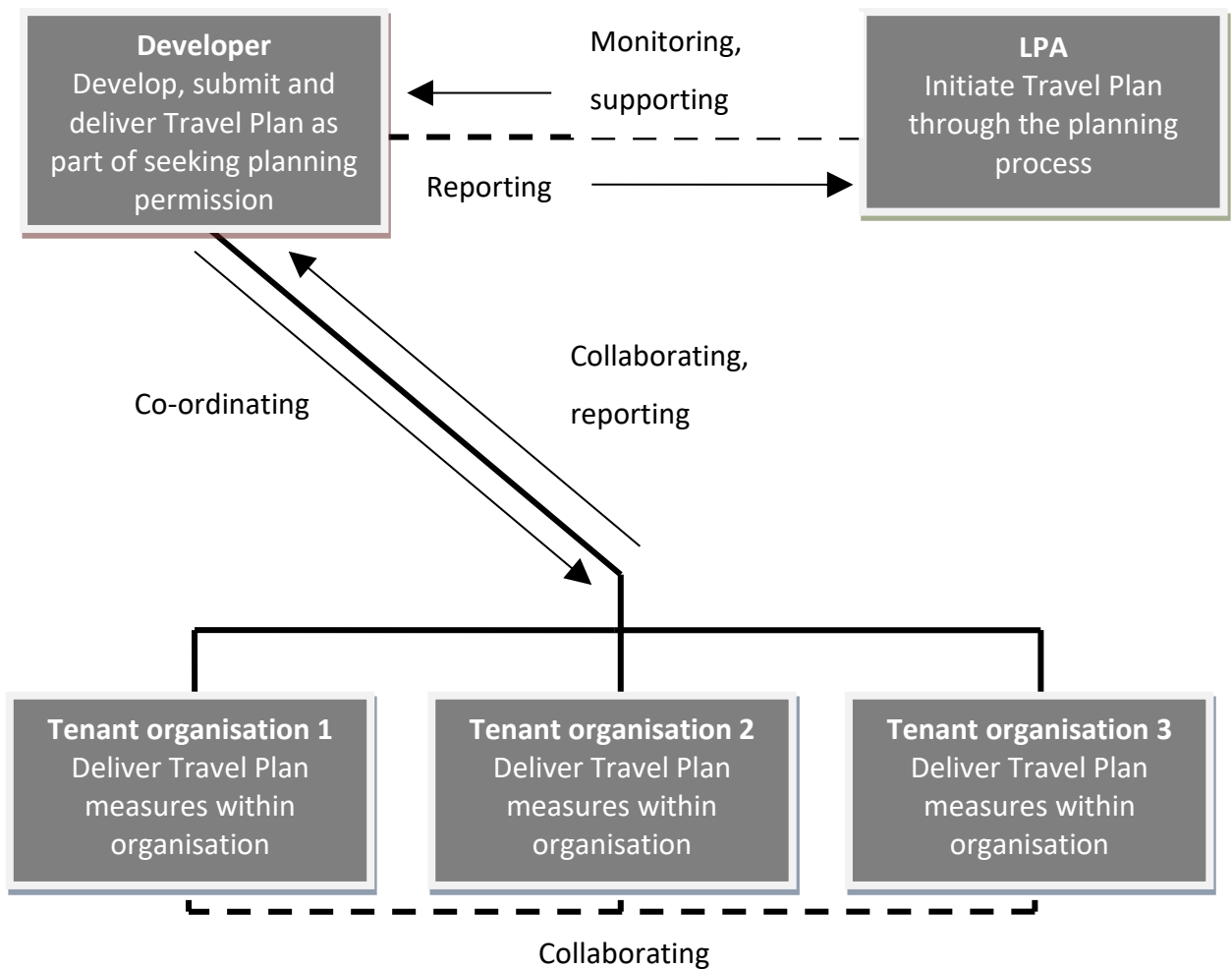


Figure 4.6 – Travel Plan delivery structure with developer as planning applicant

The previous paragraphs have explained how an organisations role in the Travel Plan process can differ depending on the context. The literature also identified how the nature of the organisation within which the Travel Plan is being delivered as being relevant to implementation. The Travel Plans reviewed by Cairns et al. (2010) included a number of prominent private sector organisations with large UK sites, such as Boots, Orange and Marks and Spencer along with several large public sector organisations including large hospitals and universities. As was highlighted in Table 4.5, an average reduction in car use of 18% was observed across the case studies and the levels of mode shift ranging from 5% to 66%.

An underpinning notion that these case studies represent is that there will be different degrees of success depending on the characteristics of the organisation. The characteristics include the size and structure of an organisation and if it is in a steady or changing state, for example, is the organisation expanding or contracting. Success will also have some dependency on the spatial factors looked at in Section 2.2, such as the location of the workplace and the transport infrastructure and services near to the site.

Some of the Travel Plans included in the study were high-profile examples of successful Travel Plans. However, away from this relatively small sample it is evident that many Travel Plans are developed less strategically and on an ad-hoc basis (Enoch & Ison, 2010) that is more reactive to a need (e.g. for planning permission) rather proactive as part of a wider sustainability agenda. Indeed, there is also the issue that many large private organisations are not implementing Travel Plans at all, with only 10% of those with over 100 employees having one in place (Enoch & Ison, 2008). Where an organisation has had a Travel Plan requirement enforced on them, there is also a risk that they will view it as a burden to their primary function rather than something that can be embedded into their existing operation and deliver benefits for the organisation, their staff and beyond. Where an organisation is a tenant at a development (Figure 4.6) the lack of direct regulation on them may mean they are not co-operative in the delivery of the Travel Plan, causing an issue for the developer responsible for the Travel Plan condition. The developer may therefore add terms into the lease contract that requires a certain level of participation in delivering the Travel Plan for tenants of their site.

4.3.1.4 Impacts on travel behaviour

As has been identified the primary aim of Travel Plans is to reduce levels of single occupancy vehicle use by facilitating use of sustainable modes or reducing the need to travel at all. Therefore, the focus of much of the literature that has looked to assess the impact of Travel Plans is what level of modal shift they have achieved. Table 4.5 provides a summary of the findings of a range of research into Travel Plans and their equivalents in other countries concerning reductions in car use and vehicle trips.

The focus on mode shift is understandable given the rationale of Travel Plans being mandated as a way of mitigating the impacts of new or expanding developments. However, the benefits of Travel Plans can be more far reaching if implemented well. Other benefits of a Travel Plan can include increases in health and wellbeing through active travel use, a better offer for current and potential employees, good public relations relating to corporate sustainability and financial savings, for example related to needing to operate less car parks (Cairns et al., 2004; DfT, 2008; Enoch, 2012; Roby, 2010a). Travel Plans also benefit from how they are relatively cheap compared to more traditional, hard infrastructure measures (Roby, 2010a) with research showing that every £1 spent could bring about £10 of benefit in reduced congestion (Cairns et al., 2004).

Travel Plans are one soft measure; however, they encompass many other soft (and hard) measures. Previous research has analysed the impact of soft measures and while this section is not intended to be an exhaustive review of the impact of soft measures, it is useful to gain an understanding of their impact. Previous research has concluded that soft measures are effective in influencing car users to reduce car use (Cairns et al., 2008; Möser & Bamberg, 2008; Richter et al., 2009; Taniguchi et al., 2007; TAPESTRY, 2003). Research by Fujii et al. (2001) has also found that mode shift occurred without soft measures when a disruption occurred, in that case the closure of a road. This indicates that a disruption has the potential to influence mode choice without soft measures with people adapting to the disruption. However, in this instance, the disruption was temporary and in more permanent disruptions, such as a large-scale workforce relocation, it is not known what the impact on mode choice would be if no soft measures were implemented. What the research has found challenging is how much of the car use reduction can be attributed to soft measures due to methods used in soft measure evaluation work that fail to control for

certain factors or were based on non-representative samples (Bamberg et al., 2011). As such, they continue to be a key area of interest and research.

Table 4.5 – Summary of findings on the impact of Travel Plans

Study	Findings	Country
Cairns et al. (2004, 2010)	Average of 18% reduction in car use across 20 Travel Plans.	UK
Cairns and Newson (2006)	Average reduction in pupil car use of 23% at 28 case study schools.	UK
Sloman et al. (2010)	A 4.2% reduction in commuter car trips across all employers with Travel Plans.	UK
Rye (2002)	A reduction in car use of between 5% and 25% across seven Travel Plans.	UK
Ligtermoet (1998)*	A reduction of in car use of between 6% and 10% for a Travel Plan with basic, low cost measures (e.g. provision of information) and between 15% and 23% for higher cost measures such as additional bus services and disincentives to use car parking, such as increased charges.	
Touwen (1999)*	A reduction of 8% for basic measures and 20% for higher cost measures, e.g. additional bus services.	
Smith and Emmerson (2009)*	Three Travel Plans supported by the Highways Agency resulted in 1%, 10% and 12% reductions in single occupancy car use.	UK
TCRP (1994)*	49 US employers with Travel Plans achieved an average vehicle reduction of 15%.	USA
Petrunoff, Wen and Rissel (2016)	A Travel Plan that only included strategies to encourage active travel to work achieved a 4%-6% increase over 3 years.	
Schreffler (1996)*	20 US Travel Plans had reduced vehicle trips by 19%.	USA
Mutrie et al. (2002)**	Employees in 3 workplaces were given active travel information and safety accessories and an increase of 1,500 metres in weekly walking distance was observed for those in the 'contemplation' stage of behaviour change.	UK

Study	Findings	Country
Sargeant et al. (2004)**	Personalised travel advice, a travel information pack and ongoing travel advice were provided to employees at a hospital and county council. A 0.2% increase in single occupancy car use was observed at the hospital while a decrease of 6.6% was observed among county council employees.	UK
Atherton et al. (1982)**	After the introduction of a compressed working week of either a 4-day week or a 9-day fortnight there was an 18% decrease in car mileage per week.	
Young and Lau (1995)***	Average reduction in car use of 6.3 percentage points (from 73.5% to 67.2%) across 5,000 employers in Southern California.	USA
De Gruyter, Rose and Currie (2015)	On average, new residential developments with Travel Plans were observed to have 14% less car use than matching control sites without Travel Plans.	Australia

*Studies denoted by * are cited in Rye et al. (2011), studies denoted by ** are cited in Macmillan et al. (2013) and the study denoted by *** are cited in De Gruyter et al. (2015).*

Stepping back from the methodological debate what is evident from reviewing the literature and from the personal experience of the researcher is that where a Travel Plan is effectively and consistently delivered it can generate modal shift towards more sustainable modes of travel at a site level. Evaluating a Travel Plan (in terms of modal shift) that has not been effectively and consistently delivered would not provide a fair representation of the Travel Plan as method for achieving modal shift. No known examples of where a Travel Plan has been fully and comprehensively implemented and not delivered actual or relative modal shift at a site level have been identified. Evaluating their impact at network level provides a less clear picture as once the geographical scope has been widened it becomes difficult to attribute change in mode share to certain sites or locations. Additional to this, the car trips removed from the network due to the modal shift could have been replaced by others, further hindering any clear monitoring process (Rye, 2002). So, at best, the evidence shows that Travel Plans can be effective and at worst the evidence is inconclusive. The lack of conclusions from the evidence is linked to how there is general lack of robust monitoring data for Travel Plans. As highlighted earlier, Travel Plans are only

mandatory for organisations that are seeking planning permission to build a new site or expand their existing operations. Therefore, many large organisations may never have to produce a Travel Plan as they may not require planning permission. It was also highlighted how that even when Travel Plans are mandatory there are many cases of them not being implemented and local planning authorities being aware of this issue (Rye, 2002). Even the Travel Plans that have been implemented may not be able to contribute substantial evidence of benefits because appropriate monitoring has not been taking place, with 63% of businesses in one study reporting that monitoring had not commenced (DfT, 2001).

4.3.1.5 Success factors

This section discusses the factors that are important to the success of Travel Plans once they move to delivery phase based on a review of the literature.

The literature on Travel Plans identified the following factors as being key to a successful Travel Plan (Cairns et al., 2010; Cairns et al., 2004; Roby, 2010a; Rye, 1999, 2002):

- Car park management;
- Suitably skilled Travel Plan Co-ordinator with time dedicated to the Travel Plan;
- Senior management buy-in; and
- Appropriate measures.

The management of car parking is seen as an important factor (Cairns et al., 2010) and can encompass the availability of parking space (on or off site), how access is managed (e.g. permits) and that the charges are for parking. A parking policy that does not adequately prompt people to consider reducing their car use could potentially mitigate the impact of a Travel Plan. A reduction in car use was double at sites where the Travel Plan addressed parking in some way compared to those that did not (Cairns et al., 2010). Car park demand management at Manchester Metropolitan University contributed towards reducing the share of staff driving to the University from 58% in 2007 to 42% in 2010 as part of a wider Travel Plan strategy (AECOM, 2013). Travel Plans that have someone dedicated to the role of Travel Plan co-ordinator (TPC) greatly benefit from this resourcing (Rye, 2002) particularly if the TPC is within a strategic area of the organisation (Roby, 2010a). Workplaces with this dedicated resource are more active in the promotion and implementation of Travel Plan measures. Employees of workplaces with a TPC use car

alternatives more than those of other workplaces even when background conditions at the workplaces are less favourable to these car alternatives (Van Malderen et al., 2013). The skillset of the TPC is also important in terms of the success of the Travel Plan. As well as having an appropriate level of knowledge relating to transport, they must possess enthusiasm, diplomacy and the capability of working with employees at all levels in an organisation (Rye, 1999).

As important as having a dedicated TPC is to the success of a Travel Plan, the support of senior management within an organisation is also pivotal (Bartle et al., 2016). This is for several reasons relating to buy-in, leading by example, company processes and access to budgets. Embedding the Travel Plan at the executive level provides the opportunity for the objectives to become part of wider organisational aims or corporate strategy, for example, in relation to sustainability (Cairns et al., 2010). More successful cases of Travel Plan implementation have featured the Travel Plan becoming embedded within an organisation in a way that it becomes part of their everyday operations. A barrier to embedding is how Travel Plans can become siloed within a certain part of the organisation, such as the estates/facilities management department that are traditionally viewed as being responsible for transport. This can lead to the Travel Plan becoming marginalised and not seen as relevant across the organisation due to lack of recognition and visibility (Roby, 2010a). One way of ensuring this does not happen is for the Travel Plan to closely relate to the business objectives of the organisation. This would ensure that there are clear internal motivations to maintain the Travel Plan once the external requirement to have a Travel Plan due to a planning application is less pressing (Roby, 2010a). Organisations with a well embedded Travel Plan understand the need for implementation to be the responsibility of multiple stakeholders even though there may be one person with overall responsibility for co-ordination. An example being how a Human Resources (HR) department will need to be involved in administering measures like a 'cycle to work scheme' or season ticket loans for public transport (Roby, 2010b). The processing of such measures requires the knowledge and permissions that the HR department has concerning employee details and payroll; therefore, they are central to these measures being implemented. The TPC can then focus on the promotion and marketing of such measures unless HR are also involved in this through an organisational strategy to recruit and retain staff by advertising staff benefits,

which the two schemes mentioned above can feature (Roby, 2010b). The support from both senior managers and colleagues across the organisation also helps to not overburden the TPC (Cairns & Newson, 2006) which could potentially result in frustration and a loss of enthusiasm in taking the Travel Plan forward.

The content of the Travel Plan itself is important in terms of it being relevant and appropriate to the organisations within which it is being implemented. Appropriate measures will vary between organisations relating to different organisational needs but also the potential for mode shift towards sustainable modes. Organisations that are based close to public transport services or a cycle network may prioritise these modes compared to organisations without these amenities who may deem that car sharing is the most appropriate way to reduce single-occupancy car use (Cairns et al., 2004).

4.4 Summary

This chapter has explored and analysed the methods available to influence travel behaviour during a large-scale workforce relocation. It is evident that large-scale workforce relocation provides a unique opportunity to implement both hard and soft TDM measures on a large population of people to positively influence their travel behaviour. The measures can impact on the spatial and non-spatial variables that influence travel behaviour (as discussed in Chapter 2) relating to the ecological model at all levels. The opportunity is further augmented by what is understood from Chapter 3 about how relocation can result in people re-evaluating their travel behaviour, providing the opening for hard and soft measures to facilitate sustainable travel behaviour.

It is evident, however, that the hard and soft measures need to be carefully planned and implemented and this requires the collaboration of multiple actors at different levels of the public sector as well as the private sector.

5 Research gap

5.1 Introduction

The purpose of this chapter is to establish the research gap that this study aims to contribute towards through the generation of new knowledge. The research gap has been established through a comprehensive review of existing literature related to the subject area.

5.2 Literature review recap

Chapters 2–4 have explored various themes within the existing literature related to this study. Chapter 2 explored what is understood about the key influences on peoples travel behaviour, an area of particular research focus in the last few decades. Chapter 3 established the theoretical rationale as to why large-scale workforce relocations provide an opportunity to influence travel behaviour, building on what was found in Chapter 2. The chapter also reviewed the empirical research that has been conducted into relocations in general and more specifically workforce relocations. Finally, Chapter 4 reviewed the measures that are available in practice to influence travel behaviour towards more sustainable patterns during a large-scale workforce relocation.

5.3 Identified research gap

Research into the influences on travel behaviour has become an increasingly important area of focus for transport geographers across the philosophical spectrum in the last few decades. There is a significant body of research looking into why people make the travel choices they do in range of contexts. A key research question in this area is whether spatial factors (urban form) or non-spatial factors (attitudes and socio-demographics) have greater influence on travel behaviour, with no consensus having been reached.

A major focus of research into travel behaviour has focused on residential areas (see for example: Bagley & Mokhtarian, 2002; Cao et al., 2009; Handy et al., 2005; Schwanen & Mokhtarian, 2005). Less is known about the influence of destinations, in particular mixed-use, transit-oriented suburbs or metropolitan areas (Vale, 2013). This offers an opportunity for this research in terms of how the case study site is a destination with similar characteristics.

Despite the potential that they offer for facilitating sustainable travel behaviour, research into the impacts of large-scale workforce relocations on travel behaviour is limited in a general sense (Vale, 2013) but particularly limited within the UK context. Previous research into this area has been limited to studies predominantly conducted outside of the UK. For example, in Europe (Aarhus, 2000; Christiansen & Julsrud, 2014; Hanssen, 1995; Meland, 2012; Næss & Sandberg, 1996; Sprumont et al., 2014; Vale, 2013), the USA (Cervero & Landis, 1992), and Australia (Bell, 1990). One recent study has been conducted in the UK where Walker et al. (2014) found that large-scale workforce relocations do provide an opportunity for UK policy makers to enact changes in travel behaviour towards more sustainable modes. However, the study acknowledged that as the case study organisation was an environmental charity, it might have offered a 'best-case scenario' due to the unusually high levels of environmental concern.

Although generalisations and comparisons can be drawn from studies conducted in other countries, it is important to understand large-scale workforce relocations within the current UK context, both spatially and temporally. This is particularly important given what was highlighted in Section 3.4 regarding the trend of UK large-scale workforce relocations and the potential for the trend continuing.

The case study focused on in this research therefore offers an opportunity to explore influences on travel behaviour within a current UK context where there is presently limited knowledge. Given the fact that it is likely that large-scale workforce relocations will continue to occur, their potential opportunity for influencing travel behaviour warrants further study.

As well as the relocation as a disruption requiring further study, there is also a knowledge gap relating to how organisations can impact on their employees travel behaviour in general (Hebes et al., 2013) but particularly within the context of a large-scale workforce relocation. Sprumont et al. (2014) argue how private companies and major public institutions are important trip attractors and generators and therefore have an important role in the mobility debate. Understanding what the organisation can do to influence travel behaviour when relocating a large number of employees will be valuable due to their pivotal role in the process.

As highlighted in Chapter 4, Travel Plans are the only statutory method of enacting the delivery of soft measures in the UK. Large-scale workforce relocations, such as the one in this case study, have the potential to require planning permission and therefore include the requirement for Travel Plan to be in place. Travel Plans are therefore a key delivery mechanism within the context of large-scale workforce relocations.

Since Travel Plans became a feature of transport and land use policy limited research into them has taken place with the work restricted to a small number of authors. Analysis of Travel Plans has looked into their motivations, implementation and their impacts (Cairns et al., 2010; Cairns et al., 2004; Coleman, 2000; Roby, 2010a; Rye, 2002). Rye (2002) reviewed several Travel Plans and showed that they can change behaviour and contribute to modal shift at a site level. Cairns et al. (2010) also presented examples of a range of travel plans that showed an average reduction of 18% in the proportion of commuting journeys being made as a car driver. Assessing where a Travel Plan had failed to achieve modal shift was addressed also by Cairns et al. (2010). It was accepted that this would be difficult because Travel Plans deemed as failures were so because they were not properly implemented rather than because the approach itself is not successful. Therefore, uncertainty remains about the impact of Travel Plans. At best, analysis shows they can be successful; at worst, the outcomes are inconclusive. Other reasons that complicate the analysis of the effectiveness of Travel Plans are to do with the general variability of travel data that masks underlying trends, particularly at a disaggregated level and the difficulty in attributing change to specific causes.

Rye et al. (2011) and Enoch (2012) looked further at the role of planning authorities and the land-use planning process as a mechanism for securing and encouraging the uptake of Travel Plans. Copsey (2012) studied the development and implementation processes of a Travel Plan within a large organisation through personal insight of being a Travel Plan co-ordinator. Yeates & Enoch (2013) focused on looking at Travel Plans from the developer perspective, given the key role private developers have first creating the need for a Travel Plan, then developing the Travel Plan and ultimately being responsible for delivery. The future of Travel Plans has been given some consideration, asking the question of why, given the supporting evidence of their effectiveness and relatively low cost, the significant potential of Travel Plans remains largely ignored (Enoch, 2012; Enoch & Ison, 2013).

In addition to there being limited research into Travel Plans in general, research has been particularly limited concerning the role of Travel Plans within a disruption, such as a large-scale workforce relocation. As stated, the significance of Travel Plans as the only statutory method for delivering soft measures makes study of them in this context important.

6 Research design

6.1 Introduction

The purpose of this chapter is to present the philosophical underpinning of this PhD research and to define the methodology by which the research will meet the study objectives.

The introductory chapter presented the research objectives of this study, this chapter relates to the fourth objective of this study:

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
4. **To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.**
5. To analyse the effect of a large-scale workforce relocation on travel behaviour.
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

6.2 Overview of the research approach

The overall approach to the design process of conducting research includes several phases from the philosophical underpinning of the study to the collection of data. It is important to discuss each of these phases to understand how the research design has come together and why research methods have been chosen. Saunders et al. (2009) developed the 'Research Onion' to describe the different layers that the researcher must address when formulating an effective research methodology. The layers involved in the approach to the designing the research approach are displayed in Figure 6.1, which represents the honing

of the research design from the philosophical underpinning at the top to the specifics of the data collection techniques at the bottom.

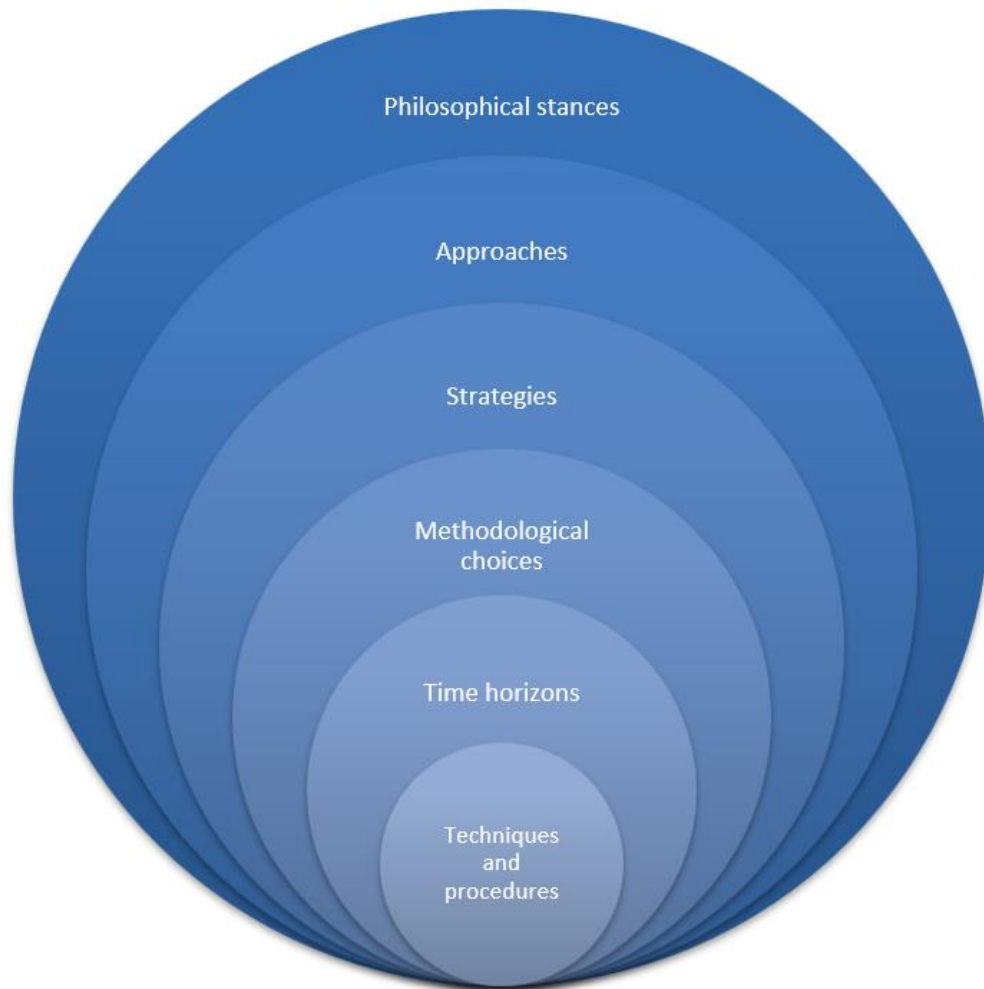


Figure 6.1 – Layers of the Research Onion (adapted from Saunders et al., 2009)

The chapter is structured around these layers or phases; it is not intended to be an exhaustive review of research philosophies and methodologies but aims to discuss how the chosen research design has been formulated. The chapter discusses the various elements in a general sense and the implications for this piece of research.

6.3 Research philosophy/worldview

A research philosophy or worldview is how a researcher views the world and makes assumptions about human knowledge and the nature of that knowledge inevitably shape how research is understood and undertaken. The philosophy or worldview explains the assumptions that underpin the research strategy and the methods chosen as part of that strategy (Saunders et al., 2009). Creswell (2009) highlights that even though philosophies

can be hidden in research work, they influence the practice of research and therefore need to be identified. A research philosophy is made up of epistemological, ontological and axiological assumptions about the development of knowledge and the nature of that knowledge.

6.3.1 Epistemology

Epistemology concerns what constitutes acceptable knowledge in a field of study and this can differ depending on the philosophical viewpoint of the researcher (Saunders et al., 2009). If a researcher is of a positivist viewpoint they will 'argue that objectively collecting data on social phenomena, we can determine laws to predict and explain human behaviour in terms of cause and effect' (Kitchin & Tate, 2000, p. 7). Quantitative research methods are most applicable to this epistemological stance, such as statistical testing of survey data in order to test a hypothesis. Conversely, a researcher with an interpretivist viewpoint will discern that is necessary to explore the subjective meanings that motivate human behaviour and actions in order to understand these actions (Saunders et al., 2009).

6.3.2 Ontology

Ontology is a branch of philosophy which is concerned with the nature of reality and whether social entities are to be considered as objective or subjective (Saunders et al., 2009). The ontological spectrum has objectivism at one end where realities are viewed as external to social actors while at the other end subjectivism (or constructivism) asserts that social phenomena and their meanings are continually being accomplished by social actors (Bryman, 2012).

6.3.3 Axiology

Axiology studies judgements relating to the values and opinions that the researcher brings to the study. If the research is of a positivist stance then it is undertaken in a way that the researcher and their values are independent from the data. At the opposite end of the Axiology spectrum research that is interpretivist is value laden with the researchers involvement meaning they are subjective (Saunders et al., 2009).

6.3.4 Implications for this research – Pragmatic philosophy

This study attempts to understand the reasons for the travel behaviour and mode choice of employees following a major workplace relocation. It endeavours to gain the perspective

of employees about how they interact within a changing life context, new geographies and physical environments. The study seeks to find out what impacts them in that interaction and how their behaviour could be influenced towards sustainable modes of travel for the reasons presented in the introductory chapter.

With this in mind, it would appear to align this study with an interpretivist epistemological stance with a subjective ontology and value-laden axiology. However, this study is focused on helping to solve the issue of the need to influence travel behaviour towards more sustainable patterns which is a particular problem that has relevance in practice and real-world policy. Saunders et al. (2009) argue that choosing between an epistemological, ontological and axiological position is unrealistic in practice and the most important determinant of the epistemology, ontology and axiology adopted is the research question. Furthermore, Teddlie and Tashakkori (2009) suggest how the researcher should think of the adopted philosophy to be more a continuum rather than being fixed in either opposite positions.

Pragmatism recognises the limitations of different approaches but also how different approaches can complement each other within the constraints of a practical application. Pragmatism also argues the validity of both interpretivism and objectivism as ways to approach a research problem. Interpretivist research requires depth in order to provide rich answers into the 'why', 'what' and 'how' questions relating to travel behaviour in the context of workplace relocation. A constraint of this approach is the time required to undertake such in-depth research. Therefore, to address this weakness an objective approach to gain more aggregated data from a greater number of respondents will add breadth to the data. The constraint of this approach is how important points may be missed through lack of flexibility in the apparatus used to gain the broader data. The lived experiences and intricacies of travel behaviour would not be picked up using this approach, which is where the in-depth approach comes in. Therefore, a pragmatic perspective not restricted by a particular worldview but taking a pragmatic approach to solving a research problem is being taken in this study (Creswell, 2009).

6.4 Approaches

There are two main research approaches: deduction and induction. With deduction a theory and hypothesis (or hypotheses) are developed and a research strategy designed to

test the hypothesis. With induction, data are collected and a theory developed as a result of the data analysis (Saunders et al., 2009). This study is not setting out to answer a particular hypothesis but is instead seeking to create knowledge as a result of gathering and analysing data; therefore, the approach for this study is inductive.

6.5 Research strategies

6.5.1 Main types of research strategy

There are three main strategies that are used for research that focuses on contemporary events: experiment, survey and case study (Saunders et al., 2009). The different characteristics of the strategies link them to deductive or inductive approaches and positivist or interpretivist philosophical stances. The choice of a research strategy is linked to the research questions that the study is seeking to address.

Survey seeks to understand the 'who, what, where, how many and how much' in a deductive approach that produces rich statistical data. Experiment asks 'how' and 'why' questions to test the causal relationships using both a test group and a control group. Both of these strategies are underpinned by the positivist stance and with deductive approaches.

This study is concerned with 'what' has an effect on the travel behaviour of employees following a large-scale workplace relocation, 'how' the employees choose to travel and 'why' they make those choices as part of their travel behaviour following relocation. A strength of the third principal research strategy – case study – is in its ability to answer 'why' questions but also 'what' and 'how' questions (Saunders et al., 2009). The characteristics of case studies are that they:

- Focus on depth rather than breadth;
- Take place in a natural or real-life setting;
- Are holistic in terms of assessing the complexity and relationship of different factors and from a variety of different perspectives; and
- Can feature multiple sources and methods that enables triangulation (Kitchin & Tate, 2000; Oates, 2006; Saunders et al., 2009).

As well as case studies being considered when the researcher wants to answer 'how' and 'why' questions, Yin (2014) states that a case study should be considered when the

researcher cannot manipulate the behaviour of those involved and when they believe that the contextual conditions are significant to the study. One of the common criticisms of case study research (whether it is single or multiple case study) is that the findings derived from the study cannot be generalised. Bryman (2012) highlights how survey researchers (or broadening this out to researchers of a positivist and deductive stance) are concerned with being able to generalise from their findings and will apply a sampling method that seeks to make their data as representative as possible.

Case study researchers argue that:

- This is not the purpose of case studies;
- They aim to generate intensive examination of a single case;
- Being representative is not key but how well theory can be defined from the findings;
- Case studies are inductive; and
- They do not delude themselves that it is possible to identify typical cases that can be used to represent a certain class or object – the case study is not a sample of one (Bryman, 2012).

Advantages of the case study strategy include data collection and analysis within the context of a phenomenon, the ability to capture complexities of real-life situations so that the phenomenon can be studied in greater levels of depth and the integration of qualitative and quantitative data in data analysis (Saunders, 2009). The mix of quantitative and qualitative data is of particular note because although case studies are generally qualitative in nature (Kitchin & Tate, 2000), they can also include a mix of quantitative and qualitative methods, for example a survey could be used as part of the overarching case study strategy (Saunders et al., 2009; Yin, 2014). Reviewing these characteristics in the context of this study, it is evident that they align well in terms of the research problem and questions.

6.5.2 Types of case study

There are three basic types of case study: exploratory, descriptive and explanatory. An exploratory case study seeks to identify research questions to be used in subsequent research. Descriptive case studies provide a rich, detailed analysis of what is occurring while an explanatory case study goes further than the descriptive case study by attempting

to explain how or why a particular condition came to be (Oates, 2006; Yin, 2014). As this study aims to address ‘what’ has occurred and is currently occurring but also ‘how’ and ‘why’ these occurrences came to be, the type of case study to be implemented is of an explanatory form.

6.5.3 Types of case study design

As well as there being different types of case study based upon the type of research questions being proposed, case studies can also be categorised into different forms based on the relationship between the case and context, the number of cases and the units of analyses. Figure 6.2 displays the three types of case study and the four forms of case study design that can be utilised for exploratory, descriptive or explanatory case studies. As highlighted earlier the importance of the contextual conditions to the case are understood to be fundamental to the researcher choosing this strategy. Therefore, the dotted lines between context and case represent the fact that the boundaries between the two are unlikely to be well defined (Yin, 2014).

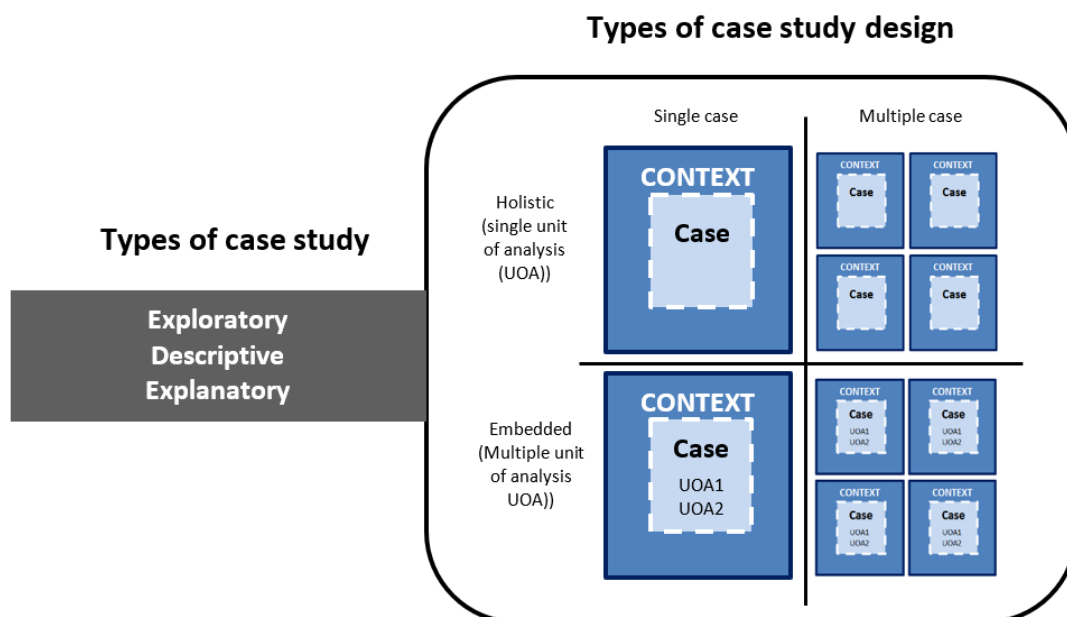


Figure 6.2 – Types of case study and types of case study design, adapted from Yin (2014)

6.5.3.1 Single and multiple case studies

Single case studies are appropriate under several circumstances, they may be used as a single critical case to test theory, to examine a unique or extreme case or where the case

is a common, everyday situation. Single case studies may also be used where the case is revelatory and the situation has been previously inaccessible for research. A revelatory case can uncover aspects of a topic that may have only been understood to limited extent before and may provide a trigger for further in-depth research into a particular area. Finally, single case studies may also be used where the study is longitudinal and seeking to look at a case at different points in time (Yin, 2014). A case study may involve one or a combination of these elements or that the original rationale for undertaking the single case study may evolve, for example a critical case may become an extreme case (Bryman, 2012).

Multiple case studies may be chosen for a range of reasons, for example, they allow for replication of findings or for exploring contrasts by selecting cases from two extremes. Their advantage over single case studies is that they can generate a more compelling evidence base which may be regarded as more robust. However, the a key constraint of multiple case studies is that they can require extensive resources and time which may not be practicable (Yin, 2014).

6.5.3.2 Embedded and holistic case studies

An embedded case study gives attention to a subunit or subunits within an organisation that is the focus of the case study, for example, employees in different departments or of differing levels of seniority. A holistic case study would be employed if the study is looking at an organisation as a whole (Yin, 2014). Embedded and holistic case studies both have their strengths and weaknesses. A typical problem with holistic case studies is that the study may be unduly abstract and lack clarity; however, it is advantageous when no obvious subdivision can be done (Yin, 2014). An embedded case study can address the shortfalls of the holistic study by enhancing the insights of the study but they can also be problematic. For example, if the case study is overly focused on one or more of the subunits then the holistic aspects of the case may be ignored (Yin, 2014).

6.5.3.3 Units of analyses

Case studies can be used to understand a single person, community, organisation or an event in time (Bryman, 2012; Miles & Huberman, 1994). Determining what the case or unit of analysis under question in the case study is a fundamental starting point (Baxter & Jack, 2008). It is important the case is well defined and linked to the research questions to avoid clarity issues. Yin (2014) describes this as 'bounding the case' where the study distinguishes

between those that are inside or outside of the case. Those that are outside provide context within which the individual or case is being analysed. In this study, the BBC workforce at MediaCityUK is the case being studied and the primary unit of analysis. This is described by Yin (2014) as a classic case study approach, typically used to study individuals in different contexts. As well as other individuals (actors) outside of the cases providing context, other factors also contribute to the contextual landscape. One example is location and when conducting case study research at a specific geographic location as this study is doing, it is important to reference how the employees based at this location are the cases rather than the location they are based at (Bryman, 2012).

6.5.4 Implications for this research

Based on a review of the different research strategies, the most applicable strategy for this study is a case study. This is due to how a case study allows for an in-depth study or a real-life setting within which it is necessary to draw upon multiple sources and methods. As this study aims to address 'what' has occurred and is currently occurring but also 'how' and 'why' these occurrences came to be, this study will feature an explanatory case study.

Considering what has been discussed in the previous sections, the definition of the case and context for this study is represented in Figure 6.3. The single case study being investigated through this research is the relocation of employees to the BBC site at MediaCityUK. The elements that make up the context in which the employees are situated are taken from the findings of the literature review in terms of what is understood as influencing travel behaviour. The list included is for illustrative purposes and is not intended to be exhaustive.

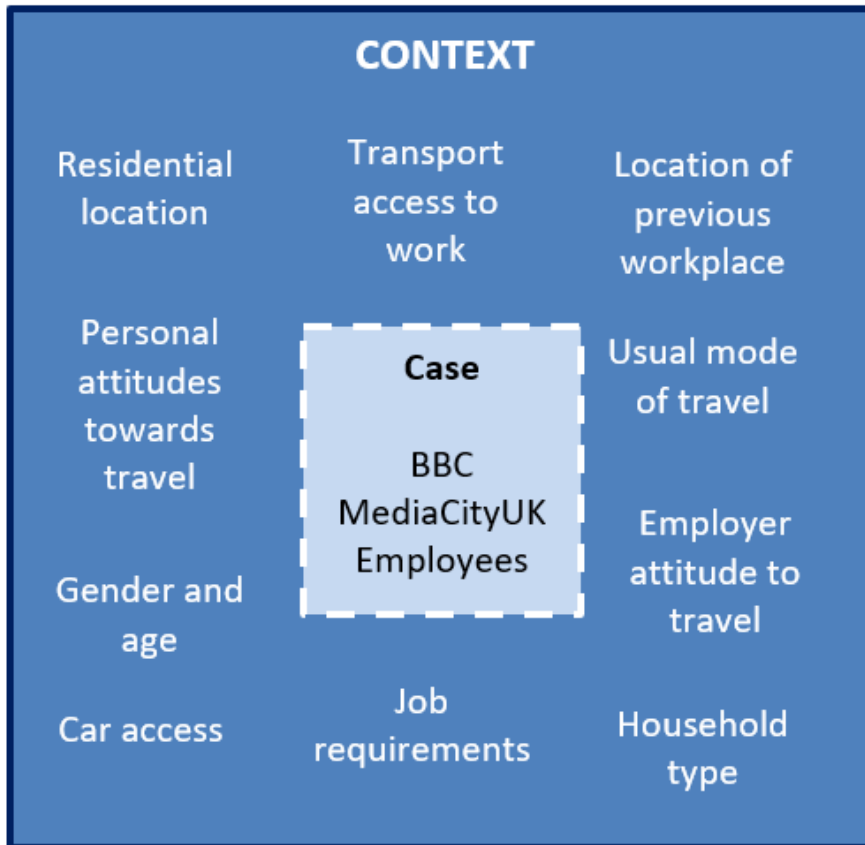


Figure 6.3 – Case and context definition for this research

6.6 Methodological choices

6.6.1 Qualitative and quantitative methods

Methodological choices fall into the categories of quantitative and qualitative methods. Quantitative methods feature data collection and analysis techniques that generate or use numerical data and which attempt to establish general laws and principles in a scientific manner (Burns, 2000). In contrast, qualitative methods use data collection and analysis that generates or uses non-numerical data emphasising the importance of the subjective experience of individuals through a naturalistic approach (Burns, 2000).

Many studies are mono-method whereby only quantitative or qualitative techniques are used. The choice of either technique will depend on the philosophical viewpoint of the researcher as was highlighted in section 6.3. Solely quantitative studies will be positivist and objectivist in their underpinning philosophical stances, with data being collected to determine laws and explain behaviour in terms of cause and effect. Studies that are solely

qualitative will be interpretivist and subjectivist in their approach and will seek data to explore what motivates behaviour in order to understand them.

6.6.2 Mixed methods

Section 6.3.4 discussed why this study has a pragmatic philosophy. Pragmatism is strongly linked with the use of mixed methods or methodological pluralism where quantitative and qualitative methods are used in the same study (Cameron, 2009) in order to provide the best approach to addressing the researching problem. Mixed methods research combines both quantitative and qualitative methods in a way that the overall strength of the study is greater than either qualitative or quantitative methods (Creswell & Plano Clark, 2007). Mixed methods are used for a range of reasons with triangulation, completeness and sampling being identified by Bryman (2006) as the main reasons for employing mixed methods. Triangulation is a key rationale for using mixed methods as it allows the outputs of quantitative and qualitative data collection to be cross-checked against each other to help corroborate research findings (Bryman, 2012; Saunders et al., 2009). In the field of travel behaviour research, the use of qualitative methods in conjunction with quantitative methods has been identified as a powerful tool for helping understand the complexities of travel behaviour (Clifton & Handy, 2001).

Similar to mixed methods research is mixed model research and it is important to distinguish between the two. In mixed methods research quantitative and qualitative data are analysed according to their type. In mixed model research quantitative data is qualitised (or vice versa) to provide a narrative rather than the data being analysed in accordance with its type.

6.6.2.1 Application of mixed methods in Transport Geography

Use of mixed-methods research is not uncommon in the field of Transport Geography, however, it has been rarely applied in the study of travel behaviour (Pooley et al., 2013). One example is Davison and Knowles (2006) who utilised a quantitative self-administered survey and in-depth qualitative interviews as part of research into Bus Quality Partnerships and the travel behaviour of city centre commuters. In reviewing the literature Roby (2010a) discussed how there has been a general concentration on a mixed-method approach of quantitative and qualitative methods in Travel Plan research, with the work being rooted

in applied research, with the purpose of improving the development and implementation of Travel Plans.

6.6.2.2 Types of mixed methods designs

Creswell and Plano Clark (2007) identified four types of mixed methods designs: triangulation, embedded, explanatory and exploratory. The types are based on the timing of when the quantitative and qualitative data collection is conducted, how the data is connected and the weighting that each have in the overall research design. Table 6.1 summarises the types of mixed methods designs.

Table 6.1 – Types of mixed methods designs (Adapted from Creswell & Plano Clark, 2007)

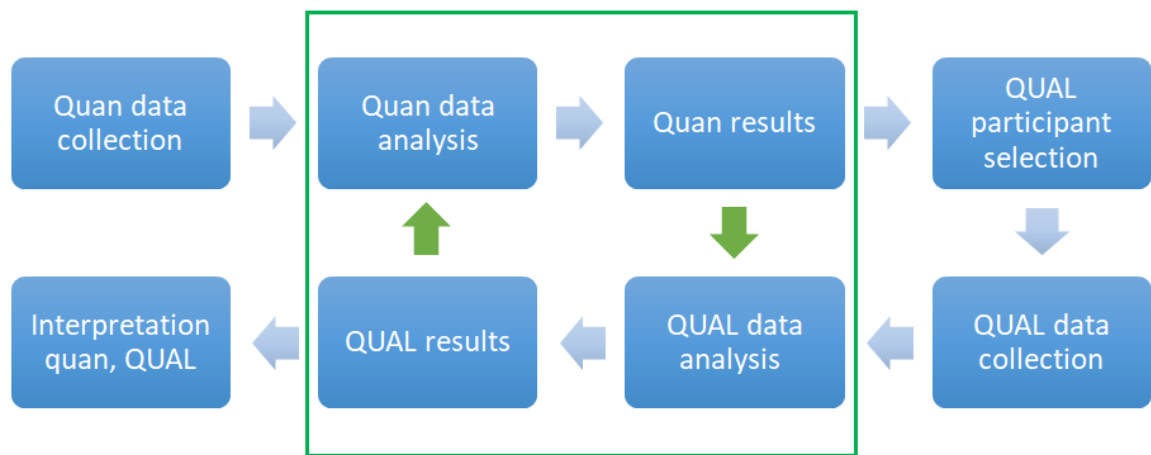
Type	Details
Triangulation	Single phase with quantitative and qualitative data collected at the same time. The data is merged with both having an equal weighting.
Embedded	Single or multiple phase with one set of data providing a supportive, secondary role to the other data type.
Explanatory	Multiple phase with qualitative data collected in the second phase to further explain the quantitative data collected in the first phase.
Exploratory	Multiple phase with qualitative data collected first to explore and a phenomenon with quantitative data following in the second phase to ask questions related to the themes identified in the first phase.

6.6.2.3 Implications for this research

As discussed in Section 6.5 the research strategy for this study is an explanatory case study as it seeks to answer ‘what’, ‘how’ and ‘why’ questions. The ‘what’ questions will be addressed using quantitative data while qualitative data will be utilised to answer the ‘how’ and ‘why’ questions. The explanatory strategy of the research provides a rationale for utilising an explanatory type of mixed methods design as the qualitative data will be collected in the second stage to provide further explanation (‘how’ and ‘why’) to the quantitative (‘what’) data that is collected in the first stage.

Creswell & Plano Clark (2007) describe how the explanatory mixed methods design allows a researcher to build on initial quantitative data with qualitative data, define the sampling approach for the qualitative stage from the quantitative data or using the qualitative stage

to explain surprising or outlier results from the quantitative stage. This type of design is sequential with one type of data collected first followed by the other type, however, the analysis is kept separate with quantitative data analysed quantitatively and qualitative data analysed qualitatively (Cameron, 2009; Saunders et al., 2009). The contrasting type of mixed methods design is concurrent where the quantitative and qualitative data collection occurs at the same time in a single stage. Figure 6.4 displays the process of the explanatory mixed methods design that emphasises the qualitative data and how the qualitative participant selection comes out of the initial quantitative data.



*Figure 6.4 – Explanatory design: participation selection model (QUAL emphasised)
(Adapted from Creswell & Plano-Clark, 2007)*

Figure 6.4 has been adapted to show that although the quantitative and qualitative analysis will take place separately, the quantitative data analysis will be revisited as the qualitative analysis is taking place. This is due to themes emerging at the qualitative stage that requires some of the quantitative data to be further explored based on the data emerging at the qualitative stage.

6.7 Time horizons

Studies can be interested in various periods in time with the three predominant types of time horizon being: retrospective, longitudinal and cross-sectional. Retrospective studies are interested in the past with the focus being on either a specific moment in time or a broader period and are particularly useful when researching life histories or biographical experiences (Flick, 2009). Retrospective studies can be constrained by the changing of

people's perceptions over time and a lack of primary sources if the period is not within recent history.

A longitudinal study may also be interested in past events but will also feature the collection of data from several different periods. The study may repeat the same data collection process on a cyclical basis as a way of recording changes over time (Flick, 2009). Longitudinal studies can be resource intensive and may also not be possible due to the length of time between the collection of data (Bryman, 2012).

A cross sectional study is interested in a particular phenomenon (or phenomena) at a particular point in time (Saunders et al., 2009). Bryman (2012) highlights how cross sectional studies collect quantitative data at a single point in time to analyse the patterns of association between multiple variables. Saunders et al. (2009) reinforce this by noting that cross sectional studies often employ a survey design and therefore deal with quantitative data. However, they go on to say how cross-sectional studies may employ qualitative methods, for example case studies where interviews are conducted over a short period of time.

6.7.1 Implications for this research

This study features aspects of all three time horizons – retrospective, cross-sectional and longitudinal. The approach is predominantly cross sectional with the case study participants being surveyed and interviewed to capture information on their travel behaviour at the current time. However, the study will also ask them to think retrospectively about their behaviour prior to and immediately after relocation. A longitudinal aspect is introduced in that the quantitative survey will be carried out twice, approximately two years apart.

6.8 Techniques and procedures

The final stage in the research design process features identifying the appropriate tools to be employed to gather the required data. As the previous sections have presented the primary research element of the study employs a mixed-method case study approach of quantitative and qualitative data collection methods. As such, the following methods of data collection were utilised in this study:

- Surveys;

- Diaries; and
- Interviews.

Table 6.2 presents the primary data collection methods and information on the type of data they will seek to capture.

Table 6.2 – Primary data collection methods and research type

Data collection method	Data type
Survey	Quantitative
Diaries	Predominantly qualitative with some quantitative elements
Interviews	Qualitative

This section presents the background and justification for utilising these data collection techniques for this study.

6.8.1 Surveys

Surveys are a well-established element of applied research into travel behaviour. Roby (2010a) highlights how quantitative data collected through surveys has predominantly featured in travel behaviour research around Travel Plans and also when monitoring takes place in practice. The surveys are usually conducted over a substantially sized population to provide discrete and descriptive information that can be assumed is representative.

Surveys can be utilised to gain information such as:

- Modal split/share;
- Reasons for mode use;
- Facilitating people to use sustainable modes more;
- Awareness of sustainable transport options;
- Trip origin; and
- Socio-demographics.

Other information can be sought during a travel survey, depending on the survey objectives, the nature of the organisation undertaking it and the survey population. Along with the information on modal share, reasons for mode choice and propensity to switch to

sustainable modes, a growing number of travel surveys are now including attitudinal questions (Clifton & Handy, 2001).

A limitation of travel surveys is the static nature of the questions, which means there is no opportunity for a respondent to interact instantaneously with the surveyor if they are unsure about a particular question. There is also limited potential for respondents to expand on their answers and explain the 'how' and 'why' of their 'what' answers. This is why the use of additional, qualitative methods are required to ensure the study objectives can be met.

6.8.2 Diaries

A tool that has been used to understand individual and household travel behaviour is the diary where the informant is asked to record events, usually items of behaviour, more or less as they occur (Butcher & Eldridge, 1990). 'Travel diaries' are notably used in the UK for the National Travel Survey (NTS) which has been carried out annually by the government department responsible for transport since 1988. The NTS requests around 8,000 households to complete a 7-day travel diary to assist in monitoring long-term trends in personal travel. In addition, The NTS travel diary is accompanied by one-to-one interviewing to gain further information on what is provided in the travel diary (DfT, 2013b).

The travel diary featured in the NTS is quantitative as it only asks the respondents to provide simple answers to the questions, which include:

- What was the purpose of your journey?
- How far did you travel?
- How much did your ticket cost?

Other transport authority users of travel diaries include Transport Scotland (Scottish Household Travel Survey) and Transport for London (TfL) also utilise travel diaries when they conduct the continuous London Travel Demand Survey (LTDS). The LTDS is issued to 8,000 households where residents over the age of five are asked to complete daily travel diaries for a seven-day period (TfL, 2011).

6.8.3 Interviews

As mentioned above, a one-to-one interview forms part of the National Travel Survey methodology in which respondents are asked questions about the travel diary that they have completed. This approach will be taken by the study to form a third-tier of information gathering around travel behaviour. The study involves two types of interviews, those with employees relating to their travel to work and those with Travel Plan stakeholders to gain insight into the Travel Plan implementation.

Burns (2000) highlights how unstructured interviewing is a central data-gathering technique of a qualitative research approach due to how the aim is to gain the perspectives of those involved and not from the perspectives of the observer. Clifton and Handy (2001) argue how interviews allow for flexibility in the type of information being collected. The freedom of the interview structure allows researchers to mix attitudes, options, and preferences with information that could typically only be quantified using a survey. The interviews will aim to build a rapport with the interviewees in order for a valuable conversation to take place whereby that person's thoughts and experiences can be clearly established. While building a rapport and making the interviewee comfortable it is also important to maintain a position of neutrality so to not influence or guide the interviewee's responses in any way (Kitchin & Tate, 2000).

The aim of the interview is to understand travel behaviour after relocating from an individual viewpoint. Interviews are not meant to provide a representative sample of the general population from which general conclusions can be drawn. Valentine (2005) explains how a common mistaken criticism of the use of interviewing in research is that the interview is *not* to be representative but to understand how individual people experience and make sense of their own lives. The interviews will provide an in-depth insight into the lived experience of travelling to work, supplementing the quantitative research undertaken at an aggregate level. This will be integral to the study in terms of finding out more about the perspectives of the employees in greater depth than the information they have already provided through the travel survey and travel diary. The interviews may confirm what has been recorded through the travel survey or, as Clifton and Handy (2001) point out, they may produce responses that would otherwise have not

been uncovered due to how a survey can limit peoples responses to the pre-selected variables.

6.8.3.1 Sampling

As this study is mixed-methods and employs both quantitative and qualitative data collection, different sampling methods are required.

“Whenever you have a choice about when and where to observe, whom to talk to, or what information sources to focus on, you are faced with a sampling decision. Even a single case study involves a choice of this case rather than others, as well as requiring sampling decisions within the case itself.” (Maxwell, 2009, p. 235)

Sample sizes for qualitative studies are generally much smaller than in quantitative research. Determining an appropriate sample size for qualitative research is the subject of debate and cannot be done in the same statistical way as can be done with quantitative research. Patton (1990, p. 184) explains that “there are no rules for sample size in qualitative inquiry. Sample size depends on what you know, the purpose of inquiry, what’s at stake, what will be useful, what will have credibility, and what can be done with the available time and resources”.

6.8.4 Implications for this research

The travel survey, diary and interview provide an effective combination to gain a breadth of data from a larger sample along with a depth of data from a smaller segment of that sample. The utilisation of these techniques will allow for triangulation of the quantitative and qualitative data to build up a rich picture of the influences on travel behaviour among the relocated workforce, a key strength of mixed-methods research.

The chosen methods align with the pragmatic research philosophy of this study in terms of how the methods will complement each other within the constraints of their practical application. Recognising the constraints of employing a solely interpretivist or positivist approach to this research question, pragmatism justifies using methods aligned with different epistemological viewpoints.

6.9 Summary

This chapter has presented the details of how the research design for this study will meet the study objectives defined in the Introductory chapter. The chapter has also presented

how the techniques and procedures used in the study are philosophically underpinned, providing a robust and transparent approach to undertaking the research.

The following chapter presents the findings that were generated from the implementation of this research design. The details of the data collection techniques and procedures discussed in this chapter (surveys, diaries and interviews) are included in the following chapter with information on their application.

7 Findings

7.1 Introduction

7.1.1 Chapter purpose and structure

The previous chapter (Research Design) presented the theoretical background and justification for using an explanatory mixed methods approach for this study. The purpose of this chapter is to present the findings from the data collection stage of this study, which was conducted among employees at the case study location – BBC MediaCityUK – where a large-scale workforce relocation took place, primarily between 2010 and 2012. This chapter presents the details of the case study in question before presenting the findings of the original research element. The findings are directly linked to the study objectives 4 and 5 (as presented in the Introductory chapter):

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
- 4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.**
- 5. To analyse the effect of a large-scale workforce relocation on travel behaviour.**
6. To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.

The chapter is structured around the different stages that were involved in the BBC's relocation to MediaCityUK: pre-relocation (section 7.3), during relocation (section 7.4) and post-relocation (section 7.5). Sections 7.6 and 7.7 go on to explore the findings related to the key influences on travel behaviour throughout the relocation process. Figure 7.1 presents the different stages in the relocation process.

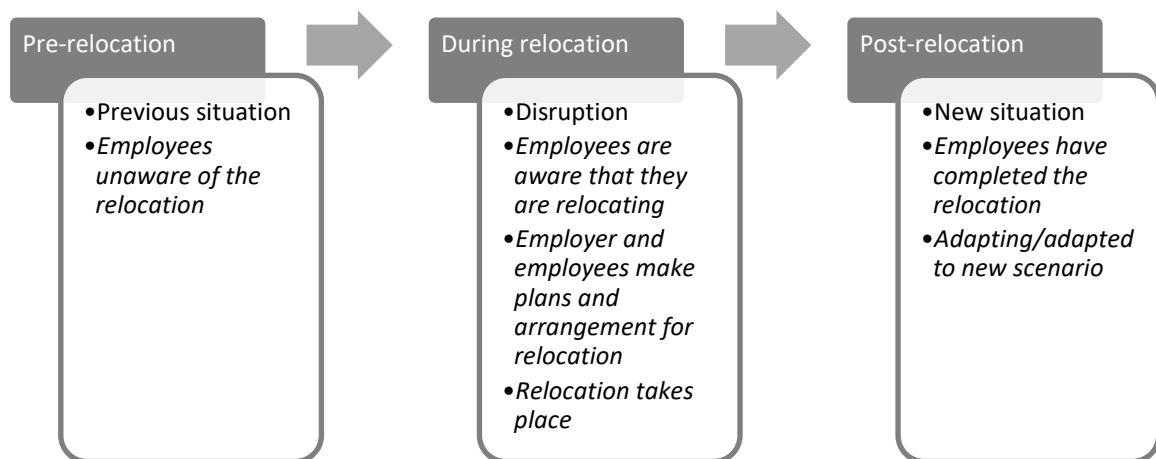


Figure 7.1 – Stages in the relocation process

7.1.2 Notes on this chapter

7.1.2.1 Modal groups

For some of the analysis, modes are analysed individually, for example, car (as driver), car share, bicycle, walking, train, tram, bus. In some sections, modes are grouped into three modal groups: Car (car as driver, car share), Public Transport (train, tram, bus, underground) and Active Travel (cycle, walk). This has been done for the following reasons:

- The frequencies of some of the individual modes were too small for statistical analysis (see 7.1.2.4) and required aggregation;
- Different public transport modes are available in different locations, e.g. underground rail is not available post-relocation; and
- The modal groups include modes whose use is influenced by similar factors based on the literature review.

7.1.2.2 Population sub-groups

Section 7.2.2 presents how the post-relocation population at the BBC MediaCityUK could be approximately divided into equal thirds (as of 2014) based on where people relocated from BBC London, BBC Manchester and those that came from other locations. The sub-groups are analysed separately in this chapter to explore any differences or similarities between them and what this can inform us about travel behaviour for people relocated from different environments.

7.1.2.3 Primary mode determination

To help respondents determine their primary mode they were asked to consider this based on duration spent using that mode. For example, if their trip consisted of a 40-minute train journey and a 15-minute tram journey then train would be their primary mode and tram their secondary mode. As walking is likely to feature in most journeys regardless of mode used, respondents were only asked to state walking as a secondary mode if their walking journey was at least 5 minutes long.

7.1.2.4 Statistical tests

To analyse the quantitative data, two statistical tests have been utilised: chi-square tests and z-tests. Chi square tests have been used to test the independence of variables while Z-tests have been utilised to test if there is significant difference between two populations on different characteristics.

7.2 Case study details

7.2.1 Introduction

Chapter 6 established the philosophical foundation of this study and defined the research design and methodology that was utilised. This section (7.2) provides information on the case study that was utilised to fulfil the research objectives of this study. This is followed with details of the primary data collection methodology along with information on the pilot study that was conducted prior to the actual data collection. Finally, details of the ethical and risk assessments conducted prior to the primary data collation taking place are presented.

7.2.2 Case study overview: BBC MediaCityUK

The case study investigated in this research is the relocation of the several BBC departments from sites in central London and central Manchester to a new, purpose-built development at MediaCityUK, Salford, Greater Manchester.

7.2.2.1 The development of MediaCityUK

MediaCityUK is a 15-hectare mixed-use property development within the site of the former Salford Docks, now redeveloped as Salford Quays. Salford Quays is within the Greater Manchester conurbation in the north west of England, approximately 3km to the west of

Manchester city centre, the principal regional centre of Greater Manchester (Figure 7.2 and Figure 7.3).



Figure 7.2 – Location of Greater Manchester within the UK (Source: Open Street Map with author's annotation)



Figure 7.3 – Location of Salford Quays within Greater Manchester (Source: Open Street Map with author's annotation)

The Salford Quays area has been regenerated from the 1980s onwards with the Lowry Theatre and shopping centre being two key attractors to the area that were built in the 1990s. A range of low and high-rise apartment buildings along with office space has also been constructed from the 1980s onwards.

Figure 7.4 shows an aerial view of the Salford Quays area in 1987 when the site had been cleared ready for the redevelopment.

Figure 7.5 shows the area (from a different orientation) in the present day following 30 years of redevelopment. The location of MediaCityUK and the adjacent Lowry Theatre are shown on both images for orientation purposes and to highlight the level of change taken place at this large brownfield site.



Figure 7.4 – Aerial view of Salford Quays in 1987 (Source: Transport Archive)



Figure 7.5 – Aerial view of Salford Quays circa 2016 (Source: APEM)

MediaCityUK is owned by land owner and developer Peel Group and was developed as a new centre for the creative, digital and media sectors comparable with similar developments in Copenhagen and Seoul (Knowles & Binder, 2017).

7.2.2.2 BBC relocation to MediaCityUK

Between 2010 and 2012, approximately 2,300 people relocated to MediaCityUK from existing BBC sites at Television Centre, London and New Broadcasting House, Manchester along with people previously employed or studying elsewhere (National Audit Office, 2013). The split of the different origins of the workforce was roughly equal with approximately one-third relocating from London, Manchester and elsewhere respectively. Five London-based departments relocated to MediaCityUK: BBC Children's, BBC Radio Five Live, BBC Sport, BBC Formal Learning, BBC Breakfast and parts of BBC Future Media & Technology. These were joined by local and regional programming and network production at BBC Manchester (BBC, 2009).

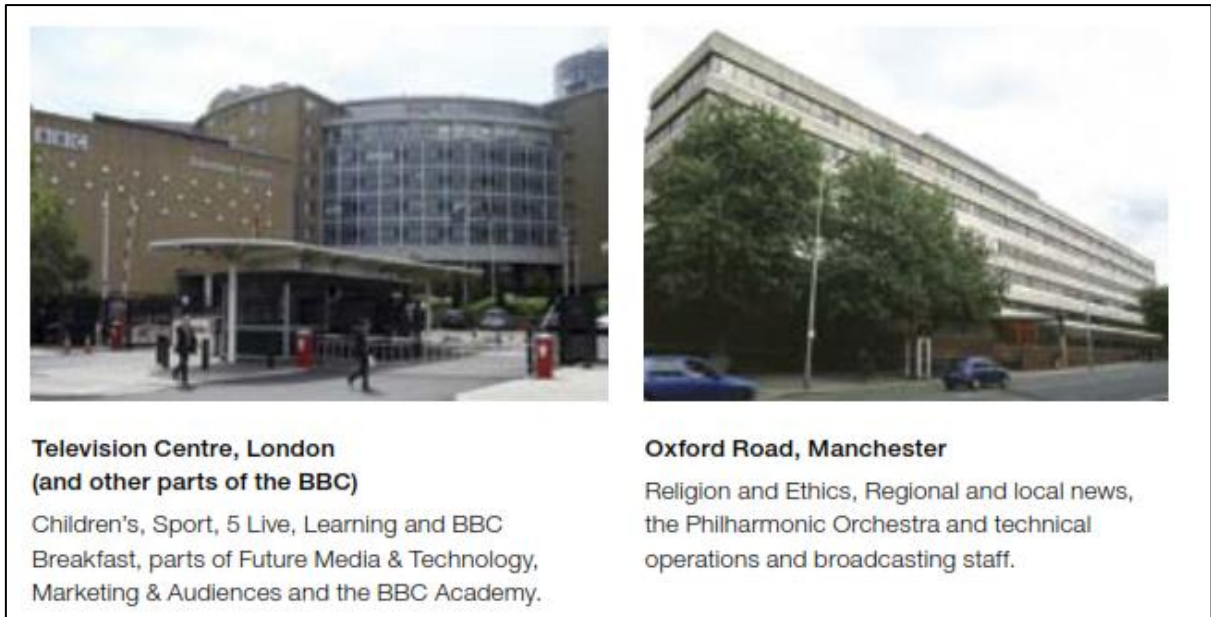


Figure 7.6 – BBC departments relocated to MediaCityUK (Source: National Audit Office)

The relocation to MediaCityUK was a key part of the BBC's strategy to decentralise their operations from London and in 2004, the BBC developed plans to relocate a number of departments to a new regional centre in the north west of England (National Audit Office, 2013). 18 initial sites were reduced to a shortlist of four sites:

- Manchester – Quay Street near Granada Studios;
- Manchester – Whitworth Street (now developed as First Street);
- Salford – Salford Docks, Pier 9 (the only undeveloped part of Salford Quays); and
- Salford – Greengate (Knowles & Binder, 2017)

The Salford Quays site was chosen in June 2006 with four key partners involved in the delivery:

- Peel Group (as landowners);
- Salford City Council;
- Central Salford Urban Regeneration Company; and
- Northwest Regional Development Agency (Knowles & Binder, 2017).

The BBC is the major tenant of the development occupying three buildings. ITV and the University of Salford have also opened facilities at the site along with a range of smaller media, technology and broadcast companies (MediaCityUK, 2018). Retail and commercial

facilities, including a hotel, restaurants and cafés, along with residential properties are located within the site and in the wider Salford Quays area.

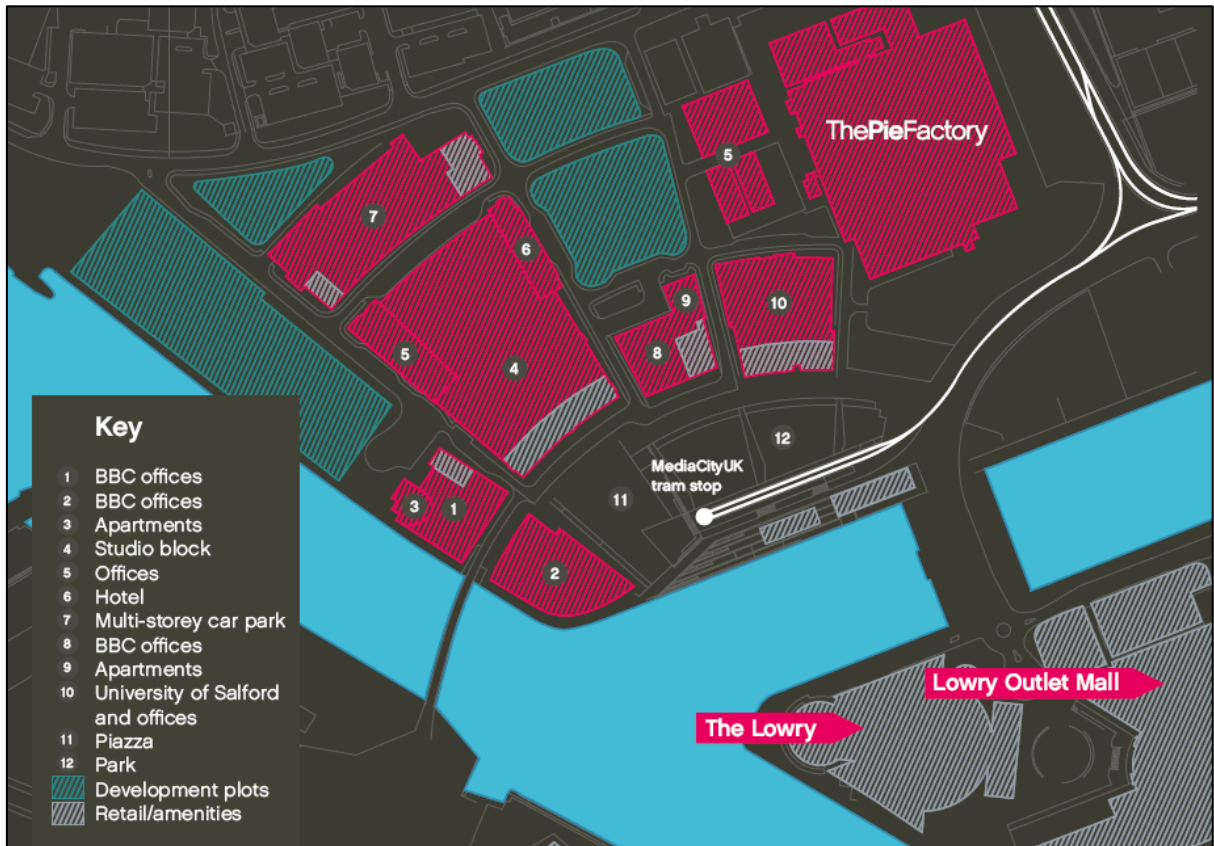


Figure 7.7 – MediaCityUK site map (Source: BBC)

Future proposals are currently being developed for Phase 2 of MediaCityUK, which include 50,000m² of office space, 1,800 apartments along with retail and leisure facilities (MediaCityUK, 2016). The plans were approved by Salford City Council in 2016 and they will see the site double in size over ten years through to 2026 (Morby, 2016). Figure 7.8 displays the scale of the proposed expansion with the Phase 2 buildings in blue next to the existing Phase 1 buildings.

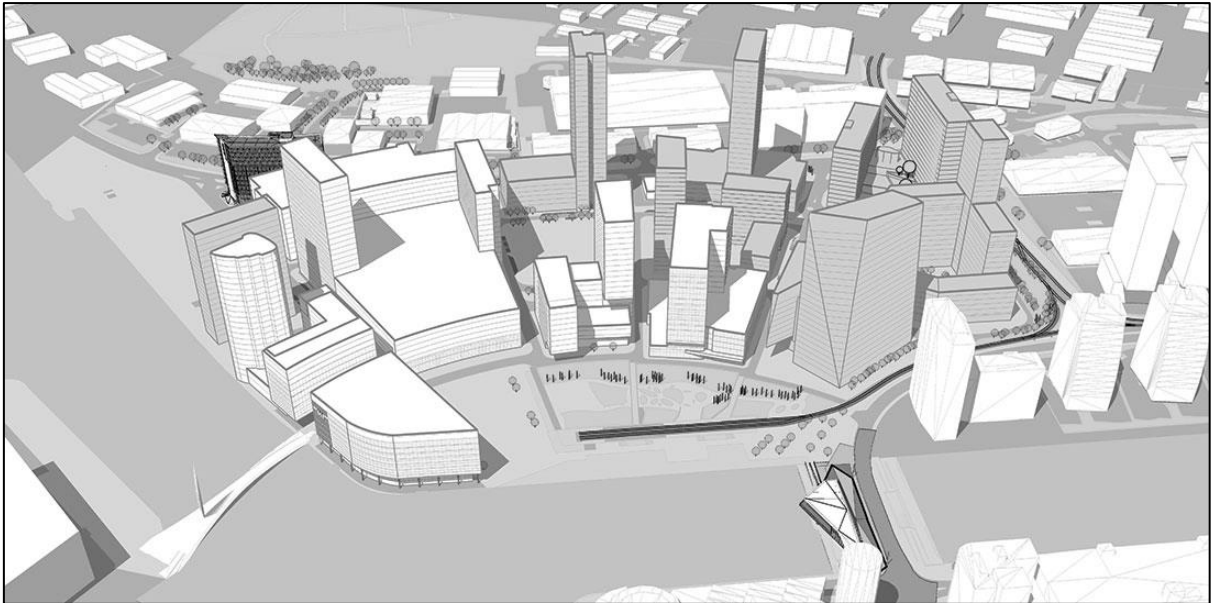


Figure 7.8 – MediaCityUK Phase 2 plans (Source: Construction Enquirer)

7.2.3 Travel and transport at MediaCityUK

This section provides information on the hard and soft transport interventions at and around MediaCityUK that offer ways for people to travel to the site.

7.2.3.1 Light rail

The Salford Quays area is directly served by the regional light rail system ‘Metrolink’ that connects the site to the regional centre and the wider conurbation. The nearest rail stations to the site are at Eccles, Salford Crescent and five stations that make up the Manchester Central Zone – Piccadilly, Oxford Road, Victoria, Deansgate and Salford Central. Onward connectivity from the heavy rail network to MediaCityUK can be made using the light rail network from Eccles, Deansgate, Victoria and Piccadilly.

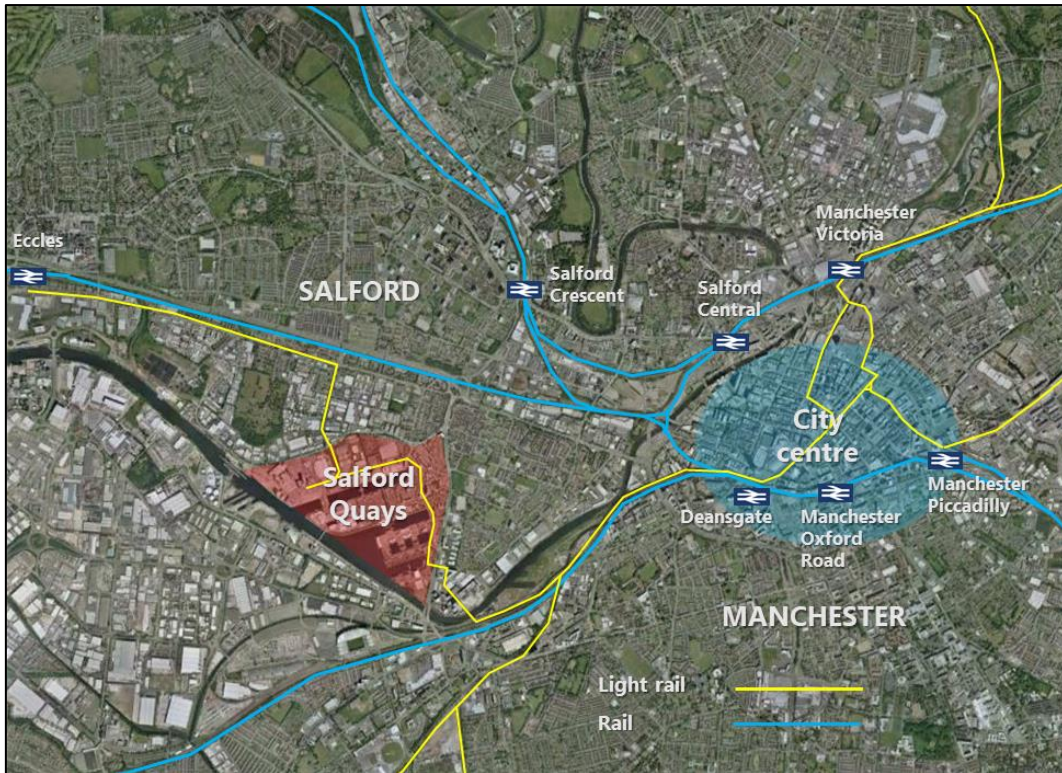


Figure 7.9 – Light rail and rail network around Salford and Manchester (Source: Author's annotation on Google Maps)



Figure 7.10 – Location of MediaCityUK within Salford Quays Manchester (Source: Author's annotation on Google Maps)

There has been a significant investment in transport infrastructure to support the MediaCityUK development. The most noteworthy being a £20m extension to the light rail network to provide a spur and station within the development. The funding also procured four new trams in order to deliver a high frequency service connecting MediaCityUK with key destinations, in particular Manchester city centre.

An extension to the tram network is currently being constructed that will help serve MediaCityUK by 2020. The Trafford Park line will include a stop at the Imperial War Museum (next to ITV) on the Trafford site of the Manchester Ship Canal. The new line will increase the frequency of light rail services near to MediaCityUK (TfGM, 2018a). The Trafford Park line was originally planned to have opened along with MediaCityUK but it was delayed due to the electorate voting against the Greater Manchester Congestion Charging referendum in 2008 (Sturcke, 2008). Revenue from the congestion charge was planned to fund a range of public transport infrastructure projects, including the Trafford Park Line.

7.2.3.2 Bus

In 2011, approximately £400,000 of public sector funding was used to fund a new high frequency bus route that connected MediaCityUK with the nearest railway station at Salford Crescent. The 'Quayslink' service, funded by TfGM, Salford City Council and the University of Salford, included a fleet of small buses providing a shuttle service between Salford Quays and Salford Crescent.



Figure 7.11 – Quayslink bus service

After 14 months of operation, a commercial operator (Stagecoach) took on the service and added it as an extension to their existing 50 service from south Manchester. The changes brought benefits as the 50 service is operated by double-decker buses providing greater capacity than the Quayslink vehicles. The additional capacity was particularly important around student term times as the service connected the University of Salford's main campus and their MediaCityUK site. However, the route changes meant the interchange arrangement at Salford Crescent is not as attractive as when the Quayslink used to terminate at the station. Passengers arriving at Salford Crescent railway station now have to cross the busy A6 without crossing facilities to reach the bus stop for the onward connection towards MediaCityUK.

Bus services to Salford Quays are limited generally with the aforementioned 50 service being one of two high frequency services (every 10 minutes). The other service is the x50 that operates between Manchester city centre and the Trafford Centre shopping mall on the Trafford site of the Manchester Ship Canal.

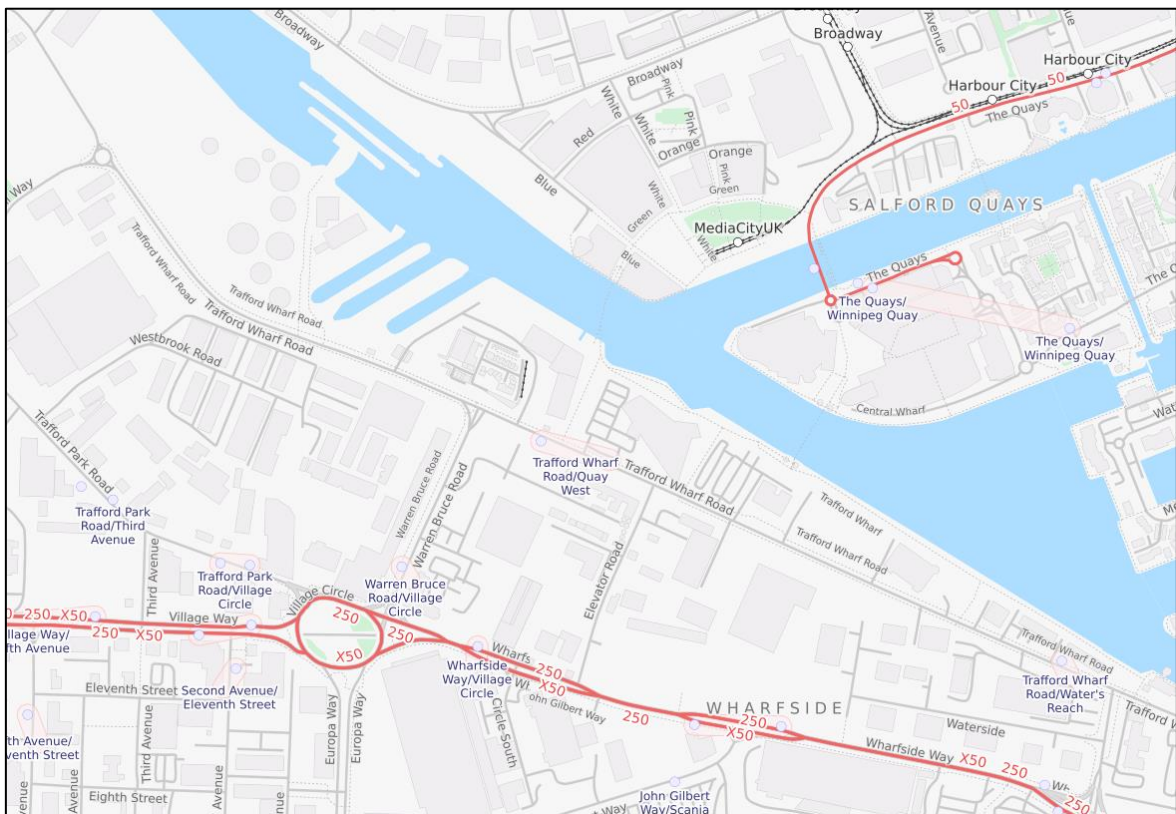


Figure 7.12 – Bus services near to MediaCityUK (Source: Open Street Map)

7.2.3.3 Car

To provide a direct highway connection to the strategic road network to the west, a new 1.2km highway link, the Broadway Link Road, was constructed and opened in 2010 providing access to M602 junction 2. A multi-storey car park, called 'The Garage', was opened in 2009 providing 2,116 car parking spaces for general use.

7.2.3.4 Bicycle

The design of the central piazza included the provision of 300 bicycle storage spaces in the form of uncovered Sheffield stands located near to the BBC buildings and the MediaCityUK tram stop. Through an arrangement with Peel, a free to use secure cycle storage facility was provided for BBC employees within the Greenhouse, an office building to the rear of the BBC buildings in 2012.

Through the wider Local Sustainable Travel Fund (LSTF) funding programme, Transport for Greater Manchester constructed a 300-space secure cycle hub at MediaCityUK in 2015. The hub is open for public use at a price of £100 per year or £200 per year for those wanting to use the shower and locker facilities within the hub.

Bicycle travel within the site unhindered due to the wide, motor vehicle traffic free paths through the site, providing good access to all buildings. In terms of bicycle route provision around the site, LSTF funding was used to construct a 1.8km bicycle route along Broadway to the north of the site (TfGM, 2013). The new off-carriageway link, consisting of a shared cycle and pedestrian footway, provides connection to existing routes towards central Salford (Pendleton and Crescent areas) and to west Salford (towards Eccles).

7.2.3.5 Pedestrian

Pedestrian movement within the MediaCityUK is given a high priority with a high density of pedestrian routes through the development converging on the central Piazza (Figure 7.13). The Piazza contains open space, seating areas, landscaped gardens and grassed areas and faces on to the waterfront. Pedestrian links are in place to serve desire lines to the MediaCityUK tram stop and across the waterways to Trafford (across the new footbridge, see below) and to the Lowry Theatre and shopping centre.



Figure 7.13 – Concept drawing showing the density of routes radiating out from Quays Point and central Piazza (Source: TMBC/SCC, 2007)



Figure 7.14 – MediaCityUK aerial view (Source: Wikimedia commons)

In addition to the pedestrian-focused spaces within the development, a new pedestrian (and cycling) route connecting the site with Trafford to the south was achieved through a new bridge link (Figure 7.15). Prior to the completion of the bridge in 2011, the walking and cycling route between Trafford (and onwards to south Manchester) required a significant deviation from the desire line. The link with the Trafford Wharf area is significant due to the relocation of ITV's Granada Studios from Manchester city centre to the land immediately next to the footbridge in 2013.

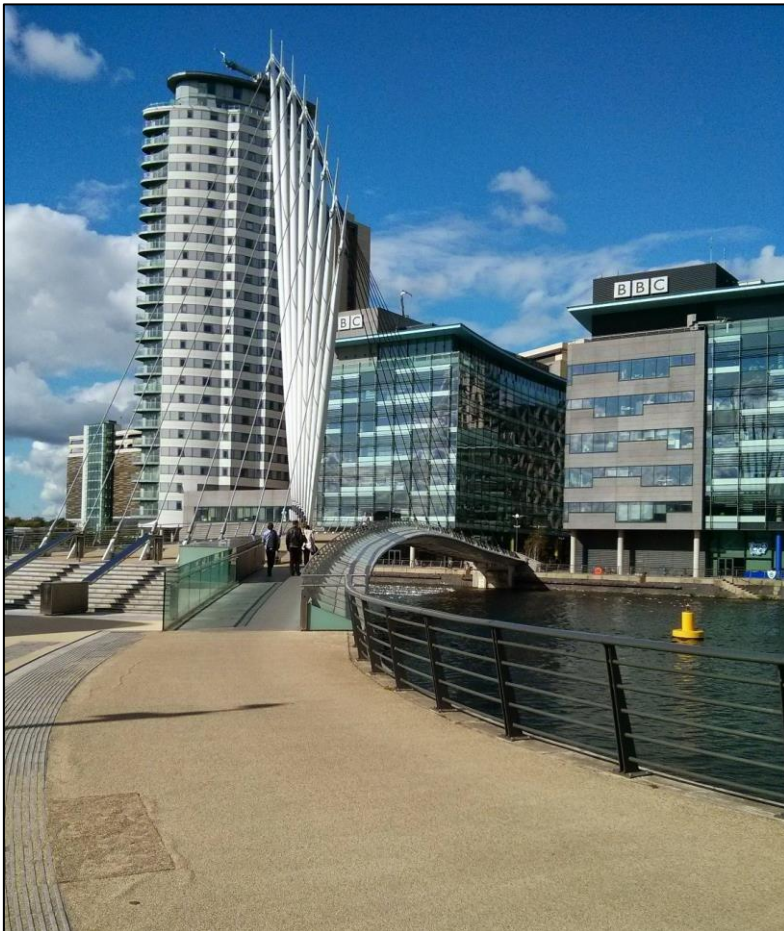


Figure 7.15 – Pedestrian and bicycle bridge over the Manchester Ship Canal

7.2.3.6 Travel Plan

As a condition of planning, MediaCityUK is required to achieve a target of a minimum 45% modal share of non-car modes for trips to the site in the AM and PM peak periods (Urban Vision, 2011). To achieve this target a requirement was put in place for a Travel Plan to be developed and implemented. A Framework Travel Plan was produced in September 2006 (Arup, 2006) to support the outline planning application for the site. This was followed by the Full Travel Plan that was published in April 2011 (Urban Vision, 2011) with targets

(additional to the overall 45% non-car target) based around survey data from people who would be relocating to MediaCityUK.

The developer and site owner Peel are responsible for taking the Travel Plan condition forward and allocated resources towards implementing the Travel Plan in the form of a part-time Travel Plan Co-ordinator (TPC) who was appointed in 2012. The TPC manages the overall delivery of the Travel Plan through partnership with the tenant organisations across the site. A key method of enacting the Travel Plan in this way was the establishment of a MediaCityUK Transport Steering Group (TSG) in 2012. The TSG met monthly initially (later moving to every two months in 2014) with initial actions being to establish the membership of the group and agree the terms of reference and responsibilities of each of the attendees.

The members of the TSG were:

- Peel Media;
- University of Salford;
- BBC;
- ITV;
- Dock 10;
- MediaCityUK marketing;
- Peel Living;
- Peel Leisure;
- Salford City Council; and
- Urban Vision (Salford City Council's Highway and Transport partner).

The action list for the TSG was to implement each of the measures in the Full Travel Plan. Some of the measures could be delivered through joint working by TSG member organisations while other measures required collaborating with external organisations, such as Transport for Greater Manchester and the transport operators. The collaborative delivery of the MediaCityUK Travel Plan aligned with Government guidance on how Travel Plans should be implemented at large sites with multiple organisations (DfT, 2005, 2008, 2009a).

7.2.3.7 Summary

A summary of the transport infrastructure interventions discussed in the sections above is presented in Table 7.1.

Table 7.1 – Summary of transport infrastructure interventions at or around MediaCityUK

Transport mode	Type	Detail	Year completed or in operation
Public transport	New infrastructure and services	MediaCityUK tram stop and spur from Eccles line.	Completed 2010
	New infrastructure and services	Light rail lines to East Didsbury, Rochdale and Manchester Airport.	Completed 2013–2014
	Future infrastructure and services	Light rail line to Trafford Park.	Estimated completion 2020
	New service	Quayslink Bus (replaced by 50 service).	Operational 2011–2012
	Service changes	Stagecoach 50 service extension to MediaCityUK (replaced Quayslink).	Operational 2012–present
	Service changes	X50 service re-routed, proximity to the site increased from 300m to 1km.	Change occurred 2017
Private motor vehicles	New infrastructure	Broadway Link Road.	Completed 2010
	New infrastructure	Multi-storey car park with 2,116 spaces.	Completed 2009
Pedestrian	New infrastructure	Foot (and cycle) bridge across Manchester Ship Canal.	Completed 2011
Bicycle	New infrastructure	Greenhouse cycle storage with 200 spaces.	Completed 2011
	New infrastructure	TfGM Cycle Hub with 300 spaces.	Completed 2015
	New service	'Mobike' bike-share.	Operational 2017–2018
	New infrastructure	Broadway cycle path.	Completed 2013

7.2.4 Case study rationale

The large-scale relocation of employees to MediaCityUK offers a unique, current and relevant case study in which to explore the impacts in relation to travel behaviour and the opportunities for influencing behaviour towards sustainable modes. The relocation of BBC employees is particularly unique due to how the relocation features people relocating regionally (from Manchester), nationally (from London and other locations) and internationally with employees being recruited from a range of other locations.

The MediaCityUK case study is further relevant due to how the site was developed as a blank canvas, brownfield site, the redevelopment of which is a key priority in urban areas wishing to avoid sprawl. The site is an example of planned Transit Oriented Development (TOD) due to the focusing of employment, retail, leisure and residences around a light rail station served by a high frequency service (Knowles, 2012). Understanding how a site such as this can be developed to generate high levels of sustainable travel use will be of interest in the wider urban transport and development research areas. The range of hard and soft transport measures implemented at MediaCityUK add to the uniqueness of the case study opportunity in terms of reviewing how both types of interventions have influenced travel behaviour following relocation to the site.

Linking back to Chapter 3, it is evident that large-scale workforce relocations are an opportunity to influence travel behaviour. Therefore, studying an actual case such as MediaCityUK is important in terms of informing the development of policies to capitalise on the opportunity to increase sustainable travel usage. Future large-scale workforce relocations are likely to take place in the short and medium terms in the UK and it is intended the outputs of this study will be useful in this context. Specific to the site, the planned development of MediaCityUK Phase 2 is likely to involve the relocation of large numbers of people akin to Phase 1. As such, the outputs of this study will be relevant not only in terms of general themes but also specific to the context of the site.

7.2.5 Data collection

As discussed in Section 6.8.4, this study utilised three methods of data collection: surveys, diaries and interviews as part of an explanatory mixed-methods research design. This section provides information on the application of these data collection methods. The

outputs and analysis of the primary data collection process are presented in section 7.3 onwards.

Figure 6.4 in section 6.6.2.3 presented the explanatory case study design that was implemented in this study where quantitative data was collected first followed by qualitative data. This approach allows the researcher to build on the breadth of the quantitative data through adding depth with qualitative data. Figure 7.16 presents the data collection process for this study where quantitative data, collected through travel surveys, was followed up with the collection of qualitative data through travel diaries and most significantly in-depth interviews.

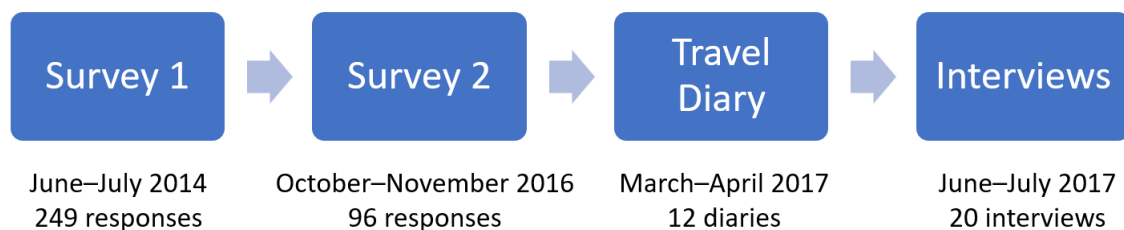


Figure 7.16 – Primary data collection process

7.2.5.1 Survey 1

7.2.5.1.1 Details

Survey 1 was the principal survey that the study analysis was based on and was the main dataset used for determining the pre and post-relocation mode shares. The purpose of the Survey 1 was to gain data from large sample of people and was based around the following topic areas:

- Previous place of work or study;
- Mode of travel to previous place of work or study;
- Mode of travel to MediaCityUK; and
- Reasons for using modes and not using modes.

Participant recruitment for both surveys was facilitated by the Campus Operations team at the BBC who included an invitation to participate in the survey in the site-wide newsletter. Campus Operations also emailed members of the BBC MediaCityUK Transport User Group (TUG), which met monthly to discuss issues and opportunities around travel and transport. The researcher was also invited to speak at a TUG meeting to present the study and

advertise the survey. TUG members were encouraged to share the survey invite within their individual departments. It was requested that an all-staff email be used to invite participants, however, due to internal communications policy, these are restricted for topics of high importance at the site.

7.2.5.1.2 Sample

249 responses were received to the survey with represented a 10.8% response rate based on estimation of there being 2,300 BBC employees at the site at the time of the survey.

The ideal sampling approach for the research would have been to employ probability sampling in order to give every member of the population a known and equal probability of being selected for the sample (Reaves, 1992). The BBC employees can be divided roughly equally into three major categories based on their place of work prior to starting at MediaCityUK. To gain a representative sample of each of the subgroups of BBC employees, stratified sampling would be an effective way of achieving this while still ensuring that the selection of respondents is random (Reaves, 1992). The issues that constrained this approach for the study was not being able to gain a full list of BBC employees at MediaCityUK divided into subgroups based on their previous place of work prior to working at MediaCityUK.

As such, the travel survey took a self-selection, non-probability approach where the population were invited to take part in the survey. This approach is commonly used when travel surveys are conducted in practice or where surveys are being conducted on large populations that cannot easily be defined. The concern with this approach is that the sample may not be fully representative of the population due to bias in the response. Research by Fishburn (2012) indicated that travel surveys (using non-probability sampling) are likely to be biased towards overestimating the mode share of sustainable modes. For example, those that are already users of sustainable travel may be more inclined to participate in the survey as they feel it is more relevant and beneficial to them. Those categorised by Anable (2005) as 'die-hard drivers' may be less inclined to take part due to perceived relevance or may even see a travel survey as a threat in terms of measures to reduce their car use.

Testing if the survey is representative of the population involved comparing the results with those of the 2012 and 2014 travel surveys that were carried out as part of the Travel Plan monitoring by Peel (site owners) and TfGM (transport authority) (see section 7.2.5.5).

The survey forms can be found in Appendix A.

7.2.5.2 Survey 2

7.2.5.2.1 Details

Survey 2 was shorter than Survey 1 and was implemented as a follow up to Survey 1 to gain data on changes between the surveys.

The purpose of Survey 2 was to gain data on the following topic areas:

- Current mode of travel;
- Changes in mode use since relocation; and
- Awareness of hard and soft measures.

The survey also served to recruit participants for the travel diary and interview phase.

7.2.5.2.2 Sample

The response rate for the 2016 survey was 4.2% with 96 responses. As with Survey 1 a self-selection, non-probability sampling approach was taken based around the same constraints discussed in the previous section.

7.2.5.3 Travel diary

7.2.5.3.1 Details

A key aim of the travel diary was to build on the snapshot data from the travel survey, allowing respondents to provide further details of their travel behaviour across a full week, which was useful for those who do not have a typical day.

Respondents were asked to provide the following information for their working days during a seven-day period:

- Method of travel (to and from MediaCityUK);
- Time of departure (from home and from MediaCityUK);
- Time of arrival (at MediaCityUK and at home);
- Additional stops on the route to/from MediaCityUK; and

- Any additional information related to travel each day.

The diary also asked questions around home location, car availability and household structure to provide further background on variables that might influence travel behaviour.

The other aim of the travel diary was to provide the researcher with a background for conducting the one-to-one interview with the respondent.

As part of the travel diary guidance, respondents were provided with an example form (Figure 7.17). The travel diary was issued in electronic and paper form allowing respondents to complete it in a manner they felt most comfortable with.

Monday, November 28	TRAVEL TO MEDIACITYUK FROM HOME				TRAVEL FROM MEDIACITYUK TO HOME				Additional information (Please continue over leaf if necessary)
	Method(s) of travel	Time of departure	Time of arrival	Additional stops between home and MediaCityUK	Method(s) of travel	Time of departure	Time of arrival	Additional stops between MediaCityUK and home	
Monday	Car on own for whole journey	08:20	09:05	Yes, dropped children off at school.	Car on own	17:30	18:00	No	On Monday's I usually drop the children off at school as my spouse has to start work earlier.
Tuesday	Car on own for whole journey	07:45	08:25	No	Car on own	16:50	18:30	Yes, stopped at Sainsbury's Salford for food shopping.	I would've got the tram today if I didn't have to go food shopping this evening.
Wednesday	Worked from home all day	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Thursday	Car to East Didsbury tram stop and then tram to MediaCityUK	07:30	08:20	No	Tram from MediaCityUK to East Didsbury and then car to home	12:15	12:50	No	I worked from home this afternoon.
	Car to Stockport	07:00	09:30	No	Tube to Euston,	16:00	19:00	No	

Figure 7.17 – Travel diary example

7.2.5.3.2 Sample

Respondents to Survey 2 were invited to take part in a travel diary and interview phase. A purposive sampling approach was taken that aimed to select a broadly even number of individuals based on the contextual variables that are identifiable from the survey. These are:

- Current mode of travel to work;
- Previous place of work (based on the three categories of BBC London, BBC Manchester and other); and
- Gender.

The travel diaries were completed during March and April 2017 with 12 completed diaries being submitted.

The travel diary form can be found in Appendix B.

7.2.5.4 Interviews

7.2.5.4.1 Details

In May 2017 arrangements were made to conduct one-to-one interviews with the travel diary respondents. The interviews allowed the researcher to focus on key themes that were relevant to influencing the travel behaviour of the respondents. A semi-structured approach to interviewing was employed whereby the interview was structured around three areas: pre-relocation, the first 6 months after relocation and the time up to the present day. Aside from being sectioned into these three areas, the questions in the interview guide were aimed to be responsive to the answers given by the interviewee rather than following a strict order.

Some questions were only asked to people who travelled a certain way, for example, interviewees were asked about experiences of using other modes compared to their normal mode. The interview guide also featured a range of prompts to be used at the discretion of the interviewer when attempting to gain insight into particular questions. These prompts were based on the findings in the literature and the data from the travel surveys, for example, the influences on travel behaviour such as cost and location of residence.

The interviews were digitally recorded using a digital Dictaphone and uploaded to a computer for transcription. The transcription was completed using a foot pedal (to control play and pause while leaving hands free for typing) and free to download transcription software.

7.2.5.4.2 Sample

As section 7.2.5.2 presented the participants for the travel diary and interview stage were selected from those who participated in the survey stage. As 12 completed travel diaries has been returned it was felt that there was a need to recruit additional participants for the interview phase, which was the fundamental element of the study. The 12 diary respondents were asked to see if they knew any colleagues who may be interested in taking part in an interview. This snowball sampling approach was vital in recruiting further participants as a total of 20 interviews were completed during June and July 2017.

Table 7.2 presents anonymous information on the interview sample with details that relate to the context of understanding their travel behaviour.

Table 7.2 – Interviewee information

Ref.	Primary mode	Other modes	Gender	Age	Household structure
P01	Car	n/a	Female	40-49	2 adults, children
P02	Car share	n/a	Female	30-39	2 adults no children
P03	Train	n/a	Male	50-59	1 adult, children
P04	Public transport	Walk	Female	20-29	1 adult no children
P05	Car	n/a	Male	20-29	2 adults no children
P06	Public transport	Cycle	Male	30-39	2 adults, children
P07	Car	n/a	Female	40-49	1 adult no children
P08	Car	n/a	Male	20-29	1 adult no children
P09	Car	n/a	Female	30-39	1 adult no children
P10	Public transport	Cycle	Male	30-39	2 adults no children
P11	Cycle	Public transport	Male	30-39	2 adults, children
P12	Cycle	Car share	Female	30-39	2 adults no children
P13	Cycle	n/a	Female	30-39	2 adults no children
P14	Car share	n/a	Female	20-29	2 adults no children
P15	Cycle	n/a	Male	<20	1 adult no children
P16	Cycle	n/a	Male	30-39	2 adults no children
P17	Cycle	n/a	Female	50-59	1 adult, children
P18	Public transport	Cycle	Male	40-49	2 adults, children
P19	Public transport	n/a	Female	30-39	2 adults no children
P20	Cycle	Public transport	Female	20-29	2 adults, children

Throughout the presentation and discussion of findings quotes from interview respondents are denoted by the Pxx number in the table above, for example, P01, P02 etc. The interview guide can be found in Appendix C.

7.2.5.5 Secondary data

In addition to the primary data collection conducted for this study several secondary datasets were utilised to provide additional sources of information to inform the findings and conclusions.

Figure 7.18 presents a timeline of the primary and secondary data sources on the data collection process diagram in Figure 7.16.

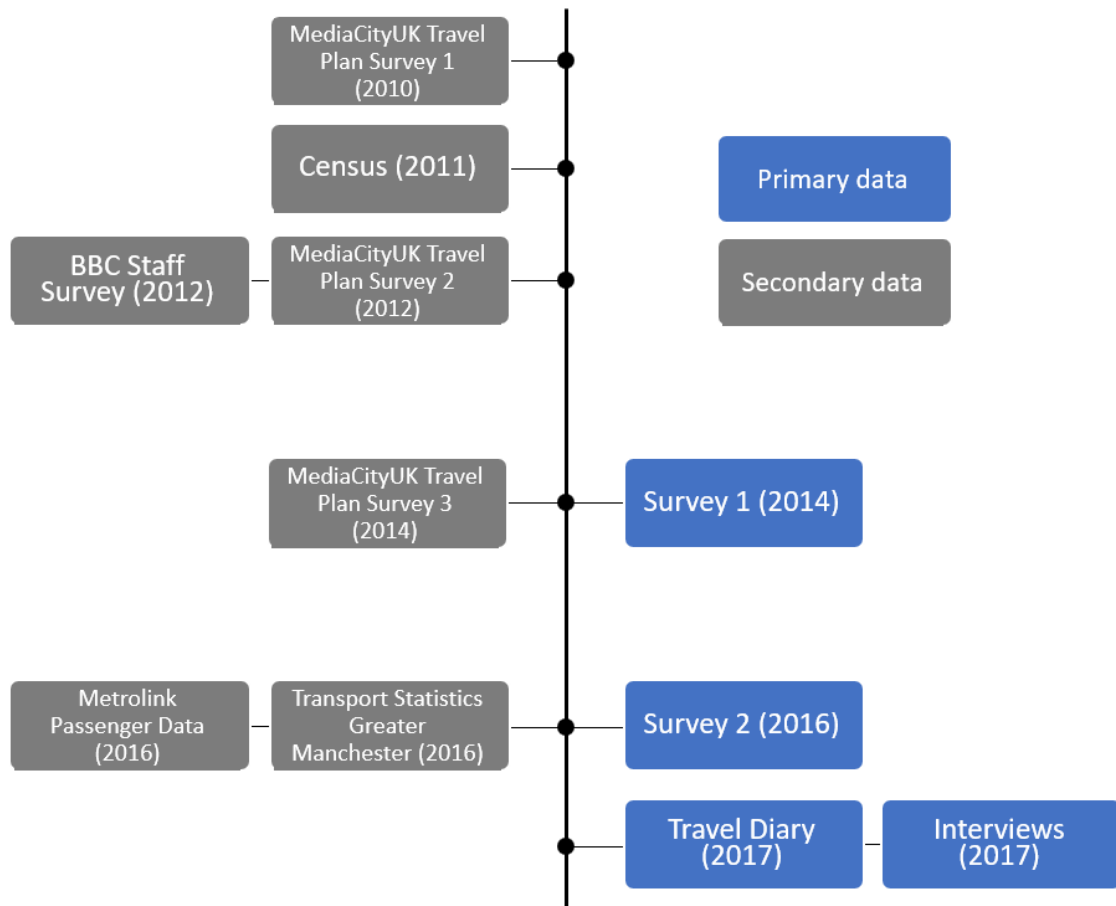


Figure 7.18 – Primary and secondary data timeline

The full details of the secondary data sources and their uses in this study are presented Appendix E.

7.2.5.6 Data analysis

Analysis of the quantitative and qualitative data was done with respect to the type of data as stated in section 6.6.2.2. Statistical analysis of the quantitative data was undertaken using the SPSS software package where appropriate along with freely available web-based test calculators. Analysis of the qualitative data made use of the specialist NVivo software that allows for coding of the data and thematic analysis. Figure 7.19 displays an example of an interview transcript that has been coded with sentences being linked to themes for analysis and interpretation.

The screenshot shows a software interface for a coding query. The main window displays an interview transcript with several lines of text. Some lines are highlighted in yellow, indicating they have been coded. The coding sidebar on the right lists various categories: 'Integration with PT', 'Convenience', 'Positive', 'Car sharing', 'PT services', 'Practicality', and 'Coding Density'. The transcript text includes questions from the interviewer (I) and responses from the participant (P002) about their commute to work, mentioning distances like 'a mile and a half' and 'at the end of a pier', and preferences for walking and cycling.

Participant	Text
P002	One location. Yeah
I	And how far did you live from your workplace?
P002	A mile and a half, I used to walk to work so it was close.
I	Yeah, was it central Chicago?
P002	Essentially yes. (laughs)
I	I don't know it that we'll but I just wondered.
P002	Bizarrely it was at the end of a pier, it was like going into Lake Michigan but yeah it was central
I	Right. Yeah. So tell me a bit about how you used to travel to work prior to relocation and some of the reasons why you chose to travel that way.
P002	So in Chicago?
I	Yeah
P002	I used to walk to work partly because I could, and where we lived was chosen on the basis that that would be an option. We wanted to be able to do that. Yeah that was it I got a taxi once cos the weather was so bad.
I	So it's based around where you lived and preferences about how you wanted to travel.
P002	Yeah I much prefer, I used to before that I lived in London and used to cycle to work, I like, I prefer the option to do something on the way.
I	Yeah. Yeah. So what sort of sustainable transport facilities incentives were promoted in your previous workplaces? Things like public transport, cycling, walking, so how did those operate?

Figure 7.19 – Example of interview transcript with coding applied

7.2.5.7 Pilot survey

Ahead of the implementation of the 2014 travel survey, a pilot survey was conducted in May 2014. Staff from the University of Salford's MediaCityUK campus were invited to complete and test the survey ahead of it being launched at the BBC.

Feedback from respondents to the survey allowed for minor amendments to the questions before it was launched in June 2014.

7.2.5.8 Ethics and risk assessment

In line with the University of Salford policy on conducting research, approval was sought from the University Ethical Approval Panel ahead of any data collection taking place. An initial ethical approval application was submitted for the survey with a separate application submitted for the travel diaries and interview due to the different approaches being used.

Ethical approval for the survey was granted in May 2014 and for the travel diary and interviews, approval was gained in October 2016.

The Ethical Approval Panel decisions can be found in Appendix D.

7.3 Pre-relocation

7.3.1 Introduction

The period used to determine 'pre-relocation' is the time prior to when the employees now based at MediaCityUK knew that they were set to be relocated from the BBC sites in London and Manchester or another place of work or education elsewhere.

7.3.2 Travel to previous place of work

To understand the mode share of people before and after relocation, respondents were asked how they travelled to their previous place of work.

7.3.2.1 BBC London

Most BBC staff that relocated from London were based at Television Centre in the Shepherd's Bush area of west London (Figure 7.20).

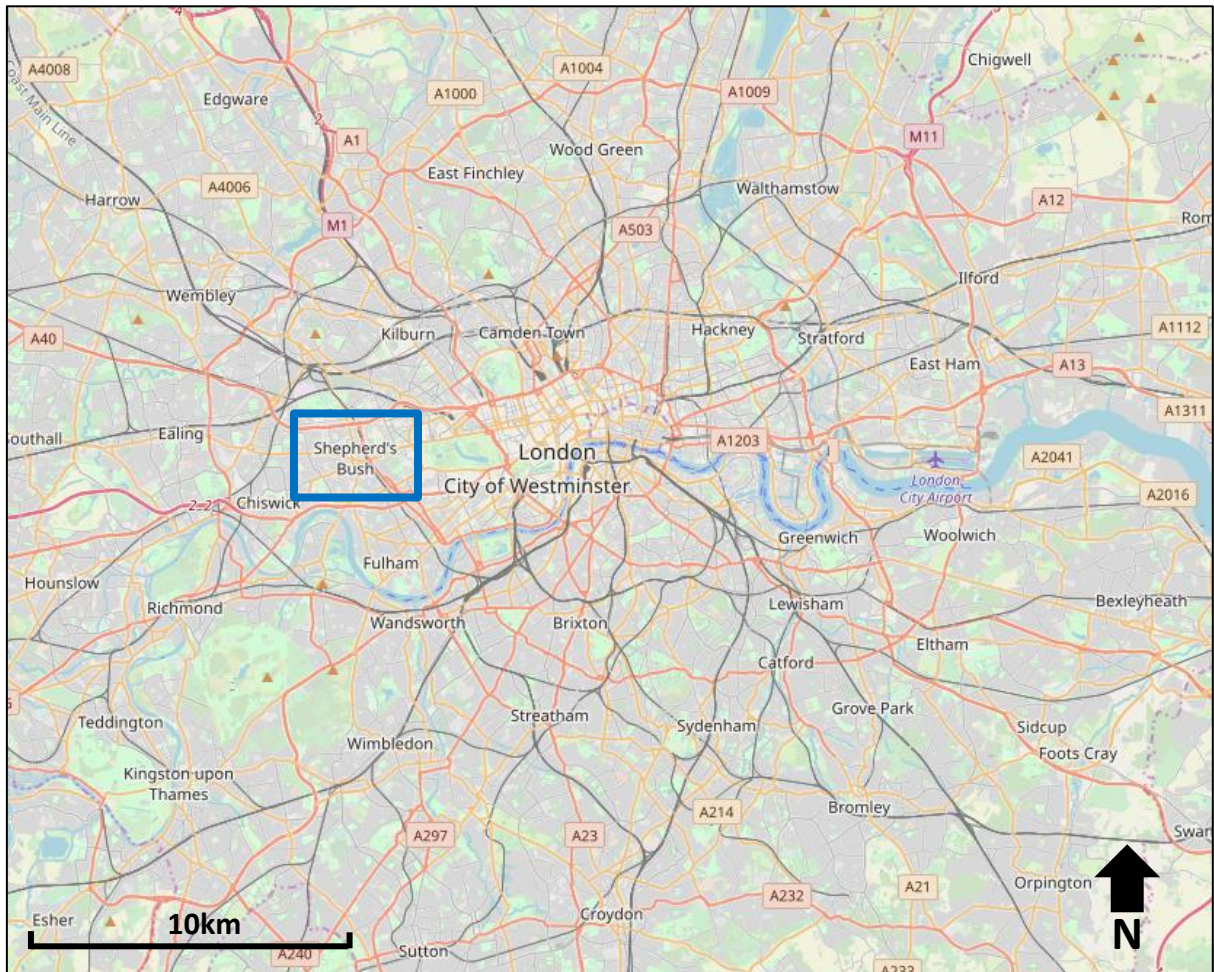


Figure 7.20 – BBC London location within Greater London (Source: Open Street Map with author's annotation)

Figure 7.21 zooms in on the Shepherd's Bush area showing the location of the BBC London site and the local area. Wood Lane station on the Circle and Hammersmith and City Lines is immediately opposite the entrance to the site and White City station on the Central Line is less than 100 metres away to the north. As the map below shows, both lines offered connectivity to key destinations in central London including principal rail termini for onward connectivity outside London.



Figure 7.21 – BBC London and the local area (Source: Open Street Map with author’s annotation)

The site also had high levels of bus connectivity with several high frequency services stopping immediately outside on Wood Lane or at the White City bus station, approximately 50 metres to the south of the site.

Table 7.3 presents the mode share of employees previously based at BBC London and shows that underground rail was the dominant mode for travel to work at 55.1%, with all public transport accounting for over 80% of mode share. In London, public transport ticketing is integrated between the different public transport modes (underground rail, overground rail, light rail, bus, river services and one cable car service) through the ‘Oyster’ smartcard that was launched in 2003 (Blythe, 2004; TfL, 2018). Integrated public transport ticketing has been shown to improve passenger satisfaction (through enhanced convenience and savings on fares) and generate increases in public transport usage (Booz and Company, 2009).

Table 7.3 – Mode share of BBC London and local area

Mode	Mode share (%)		Difference between the samples			
	BBC London (n=49)	Local area*	Difference p.p.	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	8.2	20.9	+12.7	Y	2.2	0.0285
Cycle	6.1	6.1	0.0	N	0.0	1.0000
Public transport	81.6	62.9	-18.7	Y	2.7	0.0067
<i>Bus</i>	4.1	13.3	+17.4	N	-1.9	0.0574
<i>Train</i>	22.4	15.4	-7.0	N	1.4	0.1738
<i>Underground</i>	55.1	34.2	-20.9	Y	3.1	0.0021
Walk	4.1	8.1	+4.0	N	-1.0	0.3030
Motorcycle/scooter	0.0	1.6	+1.6	N	0.89	0.3735
Taxi	0.0	0.2	+0.2	N	0.31	0.7566
Other	0.0	0.2	+0.2	N	0.31	0.7566
Sustainable modes	91.8	77.1	-13.7	Y	2.5	0.0143
Non-sustainable modes	8.2	21.9	+13.7	Y	-2.3	0.0203

*London Borough of Hammersmith and Fulham MSOAs 001, 002 & 004 (n=30,958),
(Source: 2011 Census)

Comparing the public transport mode share with data from the 2011 Census for the immediate surrounding area it shows that a greater proportion of the sample travelled using public transport, 81.6% to 62.9%. This represents a significant statistical difference in the proportions of public transport in the two samples ($z = 2.7$, $p = 0.0067$). In particular, underground rail was shown as having a significantly larger mode share among the BBC employees than people in other employment across the local area ($z = 3.1$, $p = 0.0021$).

The large proportion of underground users (55.1%) is likely to link to how close the BBC site was in comparison to the Wood Lane and White City underground stations (Figure 7.21). There are many underground stations across the wider Hammersmith and Fulham Borough, however, not all workplaces are as closely located to an underground stop as the BBC were.

As well as the proximity to the workplace and the ease of ticketing being reasons for attracting people to public transport, the real and perceived difficulty of making the trip by private motor vehicle was a key contributing factor for people to use alternative modes. Being the largest city in the UK, London has expectedly high levels of traffic congestion. In 2003 the Greater London Authority implemented a congestion charge zone within the

London Inner Ring Road, whereby people are charged to drive their vehicle into the zone at peak times (TfL, 2017). Although the BBC London site was not within the congestion charge zone, the road pricing intervention had an impact on mode shift at a wider level in London with an overall 11% reduction in vehicle kilometres between 2002 and 2012 (TfL, 2014). The combination of perceived and real congestion and the disincentive provided by the congestion charge made driving to work at the BBC in London highly unattractive for employees:

“We wouldn’t drive into London that would be insane...” (P13, female, cycle)

“...we only have one car, I had absolutely no intention of buying another car to drive to West London, it would have been far longer for me to do it that way.” (P19, female, public transport)

Among the BBC population, car mode share at 8.2% was significantly lower than that of the wider population at 20.9% ($z = 2.2$, $p = 0.0285$). Parking was available at the White City site but parking permits were restricted based on criteria related to type of job and responsibilities (O’Carroll, 2001).

In terms of other sustainable modes, cycling was used by 6.1% of people, the same share as in the wider area. Despite the high levels of public transport connectivity around the site, cycling was preferred in some cases from a modal preference perspective but also relating to time and convenience compared to public transport:

“I chose “Boris” bike if I could because it’s—just prefer just getting on a bike than sitting on say the bus.” (P13, female, cycle)

In terms of sustainable modes overall, 91.8% of people travelled to BBC London using a sustainable mode, a significantly higher proportion than that of the wider area ($z = 2.5$, $p = 0.0143$)

A Travel Plan was in place for all the BBC sites within the W12 postal code, which included Television Centre (Environmental Sustainability project manager, personal communication, August 29, 2017); however, the document could not be sourced following correspondence with the BBC so the contents of it are unknown.

7.3.2.2 BBC Manchester

BBC employees that relocated from Manchester were all based at New Broadcasting House (NBH) in the Manchester city centre, located at the centre of the Greater Manchester

conurbation (Figure 7.22). NBH was located on Oxford Road, one of the principal thoroughfares to the south of the city centre (Figure 7.23). Oxford Road is the northern end of the Wilmslow Road bus corridor, one of several strategic bus corridors in Greater Manchester, and has an average frequency of one bus per minute in either direction. This provides a particularly high level of bus connectivity to the south of the city centre and to key destinations in the city centre that allow for onward connectivity with other bus services or transport modes. The site was also approximately 200 metres from Oxford Road railway station which predominantly serves destinations to the west and north of the conurbation but is also called at by services travelling to the east. Less than 1km to the east of the site is the principal hub station of the Greater Manchester region, Manchester Piccadilly. Piccadilly is the hub for inter-city services to Leeds, Birmingham and London as well as the terminus for local services to the south of the conurbation. Approximately 2km to the north of the site is Manchester Victoria station, the city's other rail terminus which is predominantly served by local and regional rail services to the north and east of the city.

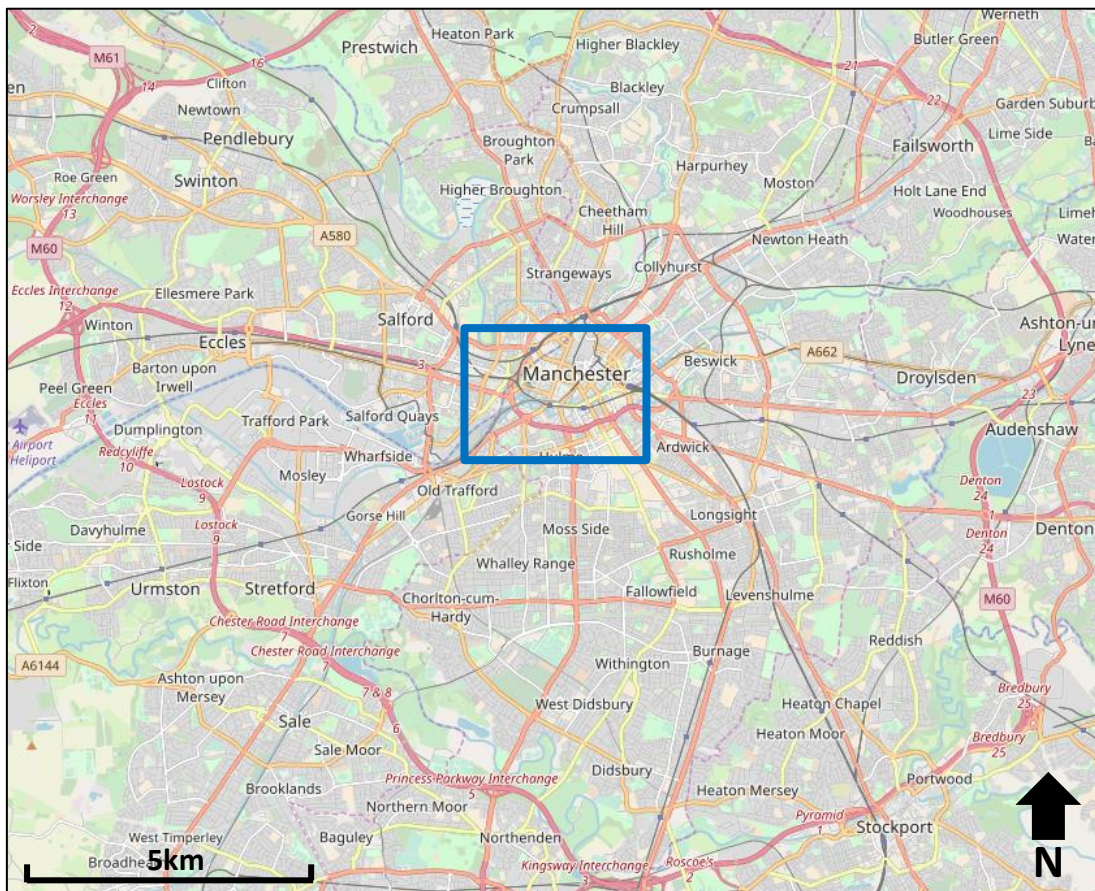


Figure 7.22 – BBC Manchester location within Greater Manchester (Source: Open Street Map with author's annotation)

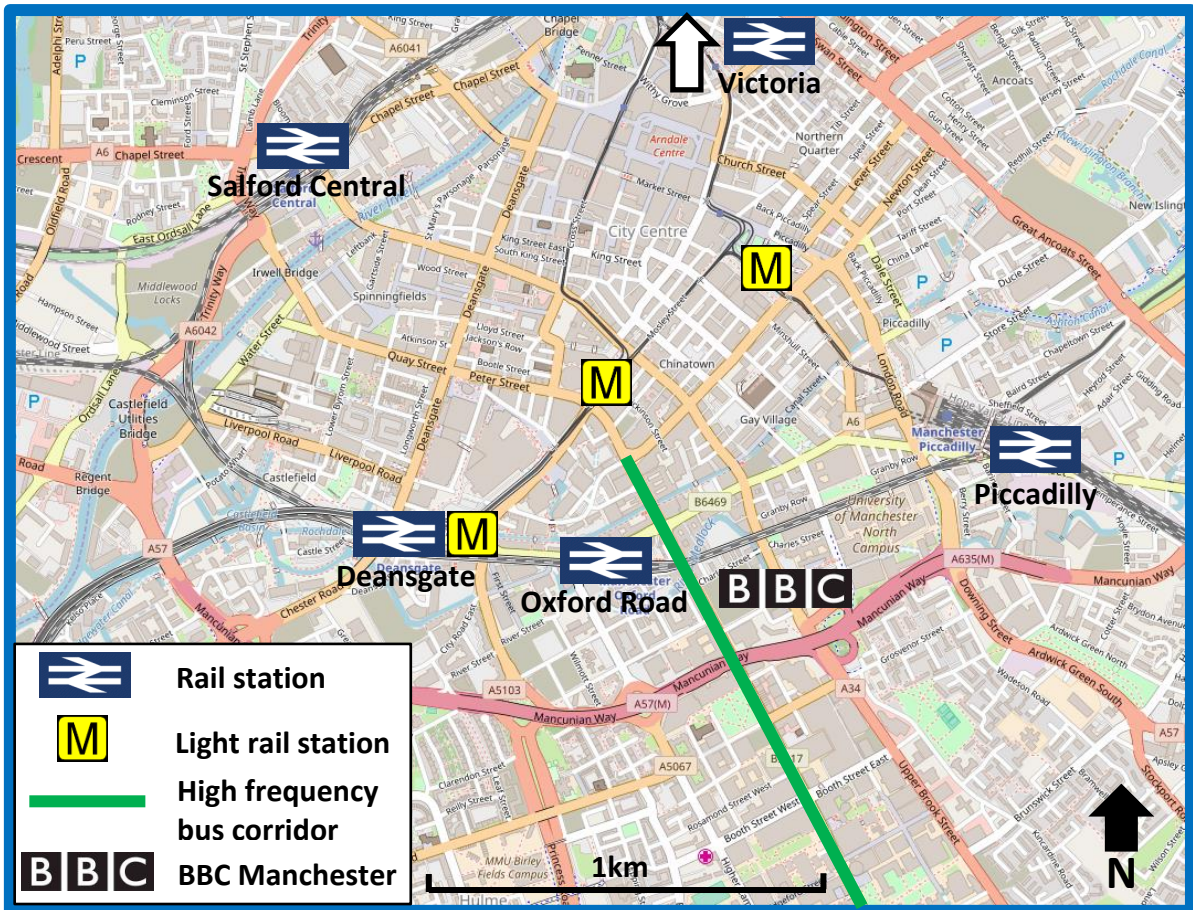


Figure 7.23 – BBC Manchester and the local area (Source: Open Street Map with author’s annotation)

Table 7.4 shows that public transport constitutes the largest modal share at 43.3% with car use (as a driver or in a car share) at 32.2%. The large share for public transport is likely to relate to the location of the site within the regional centre and the range of public transport links. NBH was located on Oxford Road, 200 metres from Manchester Oxford Road railway station and 900 metres from Manchester Piccadilly, the city’s principal station. NBH was also located on one of the busiest bus routes in the country that linked it with suburbs to the south of the city centre. From a light rail perspective, the nearest tram stop was also a short distance away at St. Peter’s Square, approximately 600 metres from the site. In the UK, planning guidance references an acceptable walking distance to reach a railway station as being 800 metres (CIHT, 2015) while wider research found that people will walk up to 1.1 km from a public transport stop to their end destination (Burke & Brown, 2007).

Table 7.4 – Mode share of BBC Manchester and the local area

Mode	Mode share (%)		Difference between the samples			
	BBC M'cr (n=90)	Local area**	Difference p.p.	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	32.2	30.0	2.2	N	0.5	0.6455
Cycle	14.4	1.3	13.1	Y	10.9	0.0000
Public transport	43.3	58.3	-15.0	Y	-2.9	0.0040
<i>Bus</i>	14.4	25.1	-10.7	Y	-2.3	0.0193
<i>Train</i>	18.9	25.6	-6.7	N	-1.5	0.1443
<i>Tram</i>	10.0	7.6	2.4	N	0.9	0.3898
Walk	8.9	10.3	-1.4	N	-0.4	0.6599
Motorcycle/scooter	1.1	0.0	1.1	Y	31.4	0.0000
Sustainable modes	66.6	69.9	+3.3	N	-0.7	0.4965
Non-sustainable modes	33.3	30.0	-3.3	N	0.7	0.4965

*Manchester city centre employee population 2011 (n=89,366), (TfGM, 2016b)

To understand the mode share for BBC Manchester employees in context, mode share data for Manchester city centre workers for 2011 has been utilised as a comparison (2011 was the final year that NBH was open before staff relocated to MediaCityUK).

Comparing the sample with the wider working population of Manchester city centre shows that cycling is statistically significantly higher for the sample group – 14.4% compared to 1.3% (z = 10.9, p = 0). Infrastructure provision for cycling at the site featured a cycle storage location, which although was not seen as ideal, it was utilised and considered safe and convenient:

“In Oxford Road it was just park it underneath the building, so it was safe there and it’s also right under the building so you were right there.” (P17, female, cycle)

The provision of soft measures was also seen as assisting people in travelling by this mode:

“We had the cycle to work scheme so you could get a bike through your salary which I did.” (P17, female, cycle).

In the case of P17, the hard and soft measures delivered on site facilitated cycling despite the hard infrastructure off-site on the main route to the site not being adequate:

“The whole of Oxford Road is much safer as well now, because at the time Oxford Road was a nightmare, I would never have cycled down Oxford Road, I used to come in round the back way, so yeah I suppose safe cycle routes would influence people.” (P17, female, cycle)

The promotion and facilitation of sustainable travel was not felt to be that extensive according to some cases, however, the central location of site meant sustainable options were popular anyway:

“Can’t think of any really, but I suppose I could have cycled, there was like a shuttle bus, I think, from car to a car park, that’s not really that sustainable I suppose? Like a sort of park and ride. Yeah stopping cars coming into the city I guess, but that wasn’t really ever relevant to us, and yeah, I didn’t certainly, there was nothing that was kind of promoted, really. We just kind of did our own thing.” (P12, female, cycle and car share)

“There wasn’t a lot (of sustainable travel promotion) really because they didn’t really need to do a lot because we were so central so everyone know Oxford Road is on major bus routes, there’s the Oxford Road train station as well which you can get too quite easily. Piccadilly is as I say a 10 minute walk away so I don’t particularly remember being targeted for sustainable transport schemes there as most people took advantage of the location.” (P01, female, car)

Apart from cycling, the largest percentage point difference between modes from each sample is bus, which was used by 25.1% of employees within the city centre compared with 14.4% of BBC employees. This represents a statistically significant difference between the two samples ($z = 2.3$, $p = 0.0193$). A potential reason for this is that although NBH is on a high frequency bus corridor, services on the corridor predominantly served destinations to the south of Manchester city centre with few services directly serving the rest of the conurbation.

A similar reason could determine why the rail mode share is lower, although not statistically significantly lower ($z = 1.4$, $p = 0.1443$) than the city centre share at 18.9% compared to 25.6%. When looking at the whole city centre there are five stations – Piccadilly, Victoria, Oxford Road, Deansgate and Salford Central, however, only three of these are within 1km of NBH – Oxford Road, Piccadilly and Deansgate. Services to some destinations in the north of Greater Manchester only call at Victoria and Salford Central within the city centre, both of which are over 1.5km away. It was presented earlier how literature showed that people will walk up to 1.1 km from a public transport stop to their end destination (Burke & Brown, 2007), with UK guidance defining 800 metres as an acceptable walking distance to reach a railway station (CIHT, 2015).

The central location along with the proximity of public transport stations to the site was a key reason for travelling by this mode:

“I used to get the train in everyday, it was much easier [laughs], yeah train into Piccadilly and 10 minute walk.” (P01, female, car)

“Centralised, yeah, near to the station, no problem.” (P01, female, car)

“...public transport was kind of more obvious, so there was... you were right next to Oxford Road train station...it was really easy” (P12, female, cycle and car share)

Despite the central location of the site offering options for sustainable travel connections, the nature of peoples’ job at the site was a key factor in how they travelled:

“So, depending on what shift I was working, cos I work shifts, I would travel by, either, I would walk, which wasn’t far, or because I didn’t want to walk late at night, cos I would finish at 1am. I would sometimes walk in, get a taxi home. The BBC would pay for a taxi. Or, I would drive.” (P12, cycle user)

It was also evident how driving to the site was an option despite being the site being located in the city centre:

“We had a parking space that was free so we—so driving was kind of an option, if you know what I mean.” (P12, female, cycle and car share)

“When it (the weather) wasn’t Ok then I would drive in and we had free parking on Oxford Road as well” (P17, female, cycle)

“If we did drive into Oxford Road, the car park passes were free so if you did use a car park pass it was a free pass.” (P01, female, car).

The option of being able to drive and park for no charge did not result in any of these three cases utilising car as their primary mode. The convenience of public transport due to the central location of the site and traffic congestion were spatial factors that influenced the choice not to drive. There were also attitudinal reasons, such as a preference for cycling. However, the literature did find that the presence of free and available parking is a key factor in determining whether people choose to drive to their place of work (Hess, 2001). With this in mind, section 7.6.2.1 looks at the impact of parking provision post-relocation.

Overall, the share of sustainable modes at BBC Manchester was slightly lower than the wider area, 66.6% compared to 69.9%. However, there was shown to be no significant difference ($z = 0.7$, $p = 0.4965$) between the two populations with regards to sustainable mode share.

7.3.2.3 All previous locations

The rest of the MediaCityUK staff that were not previously based in Manchester or London were previously based in locations around the UK and internationally. The majority were previously employed while a small number were studying at university before relocating

to MediaCityUK. It is worth noting that 14 people (12.7%) previously worked for the BBC in other locations, e.g. Newcastle and Birmingham so their relocation was intra-organisation rather than from an external organisation.

Table 7.5 – Mode share of people based in other locations

Mode	Mode share (%)		Difference between the samples			
	Other locations (n=110)	National (England)*	Difference p.p.	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	31.8	58.6	+26.8	Y	5.7	0.0000
Cycle	8.2	2.9	-5.3	Y	-3.3	0.0009
Public transport	37.2	16.4	-20.8	Y	-5.9	0.0000
<i>Bus</i>	11.8	5.1	-6.7	Y	-3.2	0.0014
<i>Train</i>	14.5	7.3	-7.2	Y	-2.9	0.0037
<i>Tram & underground</i>	10.9	3.9**	-7.0	Y	-3.8	0.0002
Walk	16.4	9.8	-6.6	Y	-2.3	0.0198
Motorcycle/scooter	3.6	0.8	-2.8	Y	-3.3	0.0010
Worked from home	2.7	10.6	+7.9	Y	2.7	0.0071
Sustainable modes	64.5	39.7	-24.8	Y	-5.3	0.0000
Non-sustainable modes	35.5	60.3	+24.8	Y	5.3	0.0000

*Source: Census (2011) ** Census combines light rail and underground

Table 7.5 shows that just under a third of this sub-group travelled to work as a solo car driver, while walking (16.4%) and bus (14.5%) had the next highest mode shares. Comparing this data to the national mode share shows that public transport use was significantly higher than the national average with car use significantly lower. It is also worth noting that there was significant difference between all of the modes when comparing the people who worked at other locations with the national average for England.

7.4 During relocation

7.4.1 Introduction

The period used to determine ‘during relocation’ is from when people knew they would be relocating up to the first 6 months after relocation to MediaCityUK. Regardless of where and when people relocated to MediaCityUK, this period is important because as the literature showed the disruption can trigger people to consider their travel options with

potential to influence them towards sustainable modes (Beige & Axhausen, 2012; Rau & Manton, 2016; Verplanken et al., 2008; Verplanken & Wood, 2006; Walker et al., 2014). There is likely to have been some flux in peoples’ travel behaviour during this period as this could have been a short or long-term period depending on individual circumstances.

This section first looks at peoples’ travel intentions once they knew they were to be relocated before going on to explore peoples’ attitudes towards the measures that were implemented to promote and facilitate sustainable travel. The section also looks at the initial views people had towards travel and accessibility at the site during this period. Data to inform analysis of this period was taken from a BBC Staff Survey in 2012 (see Appendix E). Quotes taken from this survey were not attributed to individuals, so the specific source is unknown. Quotes from this survey are presented as from a ‘BBC staff survey respondent’.

7.4.2 Travel intentions

As presented in section 7.2.5.5 a survey was carried out in 2010 by transport consultants Urban Vision who were developing the MediaCityUK Travel Plan. The survey sought to understand the future mode share at MediaCityUK once it was occupied and to achieve this the survey asked how people intended to travel to the site. Table 7.6 displays the intended mode share that was gained through the survey.

Table 7.6 – Intended mode of travel prior to relocation (n=773)

Mode	Mode share (%)
Car (including car share)	31.7
Car share	6.0
Cycle	19.7
Public transport	35.5
<i>Train</i>	<i>8.5</i>
<i>Tram</i>	<i>22.3</i>
<i>Bus</i>	<i>4.7</i>
Walk	5.7
Taxi	1.4
Sustainable modes	66.9
Non-sustainable modes	33.1

Source: (Urban Vision, 2010)

As Table 7.6 shows, car came out with the largest share with a proportion similar to that of the people who were previously working at BBC Manchester of 32.2% (Table 7.4, page

144). The next highest share was tram, which is the public transport service in closest proximity to the MediaCityUK site.

At this stage in the relocation process, it was evident that many people had questions and concerns about travel to the new site based on the information that was available at the time. This led to questions over the chosen relocation site as a whole as well as the particular transport-related characteristics:

“I was under the impression that the BBC North project was for the whole of the North. The planned move to Salford has left with poorer transportation as compared to New Broadcasting House for anybody living outside of Manchester and Salford.” (BBC staff survey respondent)

“There are lots of unknowns about transport - my main concerns are getting transport directly to Salford from Cheshire (and surrounding countryside) without having to go in to central Manchester which would add a considerable extra time to my journey. Also, driving, I have no idea whether the roads will be able to handle the extra volume of traffic when Salford opens – I am more worried about traffic jams than parking.” (BBC staff survey respondent)

“I fully approve of the BBC wanting to reduce our carbon foot print but there needs to be reasonable alternatives for getting to work. I don't live that far away (8 miles) but there is only one bus and that just goes in to Manchester. Obviously my travel time would rocket! I've heard that Peel intend to charge £15 a day for parking if you're not lucky enough to get a BBC space. As one of the lower paid workers I could not afford this. It seems south Manchester (Didsbury) is going to be well catered for but not the other suburbs of Manchester. Walking or cycling is not an option for me and get rather upset when it's suggested I'm not doing my bit to 'go green'.” (BBC staff survey respondent)

The quote above highlights that this person has an awareness of the need to travel sustainably or 'green' but feels that the relocation would make this difficult without having their journey time extended beyond an acceptable limit.

The complex nature of travelling to work for some BBC employees was highlighted in the surveys where the choice of mode related to the requirements of their role:

“I cycle, use a BBC-provided taxi, drive and use public transport. It depends on the weather, the time of day I start/finish work (either can be anywhere on the 24-hour clock, any day of the week), what I do before/after work, etc. This is not uncommon among those who work on live output, many hundreds of whom will be employed at Media City (5live, Sport, Breakfast television, etc.).” (BBC staff survey respondent)

The mode share of intended modes shows that there was not a planned reliance on using private car to get to MediaCityUK. The majority of people said that they intended to travel

by non-car means with the tram and bicycle being the two most popular modes. This shows an existing base of people who are likely to at least try to travel to the site by sustainable means. It also provides a significant base of sustainable transport users from which there is an opportunity to capitalise on potential for further increases in the sustainable mode share.

As the literature showed, a key element in capitalising on this potential is the implementation of spatial and non-spatial measures to encourage and facilitate sustainable travel use. The following section explores how peoples' attitudes towards how they considered this implementation to have gone during the relocation and any impact this had on their travel behaviour.

7.4.3 Implementation of spatial and non-spatial measures

There were varying attitudes with regards as to how well people felt that sustainable travel options were promoted during relocation. In terms of those who had a more positive outlook on this, they felt that communications were plentiful and encouragement to use sustainable modes was overt:

“There was quite a lot of communications sent out about travel options and there was a lot of discussion when we first—before the move about options for cycling and sustainability and things like that.” (P01, female, car)

“Yeah, so I was made aware of things like lift share schemes and different travel options, so I was made aware of them; they weren't all particularly, what's the word? Practical, but yeah I was made aware of them.” (P08, male, car)

In one case, the interviewee talked about a 'starter pack' that was provided with information on travel:

“Yeah you get as part of your starter pack it tells you all the different ways you can travel by tram, or cycle or anything like.” (P11, male, cycle and public transport)

The quotes above demonstrate that receiving information on travel options resulted in relocating employees contemplating their individual travel choices. This links to what the literature talked about with regards to breaking down the habitual automation that may have inhibited the impact of this type of information in a stable context, e.g. without the relocation (Verplanken et al., 1997).

In terms of the level of information provided to people relocating, the variance in peoples' attitudes to the information and support they received regarding travel generally appears to relate to when they relocated. Those that were in the initial cohort referenced the provision of information more than those who relocated later or relocated as part of getting a new job at the BBC.

"Because I was moving just from Oxford Road we got lots of information, because people were quite worried about it, because a lot of people's circumstances entirely changed in how they would travel in. So we got quite a lot of information about the car park, things like that, we got information about the trams, but it seemed the only two options were car park and tram." (P12, female, cycle and car share).

"They didn't really offer it up, I didn't, I didn't particularly look, I—I did my own research but the BBC didn't, (whispers) maybe they did say...I don't know. I mean there's the tram obviously from Central Manchester, I knew about that, but I didn't know a whole lot more, really, from the BBC." (P13, female, cycle).

Those that relocated after the major initial move who were more negative or neutral towards the level of sustainable travel information provided recalled little promotion taking place but what they did discuss was information on the tram being promoted. The prevalence of the tram in peoples' responses links back to section 7.4.2 where it had the second highest mode share in terms of how people intended to travel once they had relocated. It is evident that this was at the forefront of peoples thinking about options for travel to MediaCityUK and in particular alternatives to the car.

"I don't remember having anything, none other than just the usual spiel of you know Media City has frequent tramline to it" (P14, female, car share)

"I know that Media City website had some things on that, and I can't remember directly being told about it, I think it was possibly a little bit of information in the kind of description about having Metrolink nearby." (P06, male, public transport and cycle)

7.4.4 Views on travel and site access

Public transport access, in particular the tram, was the subject of a large amount of comments in the BBC staff survey, generally of a negative tone. The quotes below highlight how issues with the tram were the main downside to working at the new site:

"The site is excellent all round. The only complaint I have is transport. I know this is not directly a BBC issue, but the trams are truly awful. They are overpriced, unreliable and badly managed. I really wanted to get public transport as I want to be green, but after 5 months of trying I have given up and now drive to work. This

has turned out to be quicker, cheaper and more reliable than the tram.” (BBC staff survey respondent)

“I absolutely love working here at MCKU, it's a fantastic place to work. The only downside is the reliability (or not in many cases) of the trams. They are mainly always late/delayed/cancelled - it's like playing tram roulette! And with only 2 carriages, for each journey for the journey to work and home, they are packed.” (BBC staff survey respondent)

In the case presented below, the issues with the tram had resulted in this person choosing to travel by car as they felt it was a necessity.

“The environment here is excellent. The transport here is not. A car is a necessity which was not the case at Oxford Road so we are now having to run two cars.” (BBC staff survey respondent)

Peoples' comments also referred to the non-central location of the site compared with the regional centre:

“Nice place but in the middle of nowhere, bad commuting to here as well, would have been better closer to the centre of Manchester.” (BBC staff survey respondent)

Comparisons with previous experiences of using transport in London were also made and the perceived better service in London compounded the already negative views towards the tram system serving MediaCityUK:

“Metro (tram) not frequent enough during rush hours (8-10am and 6-8pm). It often breaks down. There aren't good transport alternatives either. Cannot compete with the London transport system. Much shorter distance to work but still takes the same time to get in!” (BBC staff survey respondent)

Views like this comparing experiences of public transport in London with that of getting to MediaCityUK are noteworthy due to the significant number of people who switched from using the London Underground when based there, to using the tram following relocation. Section 7.5.2 and in particular Table 7.8 presents how the tram was the mode that the highest number of previous underground users switched to following relocation.

7.5 Post-relocation

7.5.1 Introduction

The post-relocation period includes the time from the first six months onwards. For the people relocating in the main relocation this would have been in 2011 or 2012 but for other people it could have been in 2013 or 2014.

7.5.2 Mode share changes

This section looks at the mode share of the population post-relocation. The changes in mode share from pre-relocation are explored utilising data from surveys conducted as part of this study.

7.5.2.1 All employees

To assess the impact of the relocation on the primary mode of travel of employees, the 2014 survey asked how they travelled now (post-relocation); this data is then compared to how they stated they travelled pre-relocation, which was presented in section 7.3.

It can be seen from Table 7.7 that the overall share of sustainable modes has reduced post-relocation from 74.2% to 60.6% representing a significant reduction in sustainable mode share ($z = 3.2$, $p = 0.0012$). The share of single occupancy car use increased significantly from 25.3% to 38.2% ($z = 3.1$, $p = 0.0020$) with public transport seeing a 15.7 percentage point reduction from 48.2% to 32.5%, representing a statistically significant difference ($z = 3.6$, $p = 0.0004$).

In terms of active travel modes, cycling increased from 10.0% to 14.9%, building further on a level that was already higher than the national average of 2.9% (Office of National Statistics, 2011a) while walking reduced by 4 percentage points from 11.2% to 7.2%. Although these changes are of note from the perspective of changes to sustainable modes, statistically they are not significant.

Table 7.7 – Pre and post-relocation mode share (all employees, n=249)

Mode	Mode share (%)		Difference between the samples			
	Pre-relocation	Post-relocation	Diff. (p.p.)	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	25.3	38.2	+12.9	Y	3.1	0.0020
Car sharing	3.6	6.0	+2.4	N	-1.3	0.2113
Public transport	48.2	32.5	-15.7	Y	3.6	0.0004
<i>Bus</i>	12.4	4.8	-7.6	Y	3.0	0.0025
<i>Train</i>	16.5	10.0	-6.5	Y	2.1	0.0324
<i>Tram</i>	4.8	17.7	+12.9	Y	-4.6	0.0000
<i>Underground</i>	14.5	n/a	n/a	n/a	n/a	n/a
Cycle	10.0	14.9	+4.9	N	-1.7	0.0970
Walk	11.2	7.2	-4.0	N	1.5	0.1236
Motorcycle/scooter	0.4	0.8	+0.4	N	-0.6	0.5619
Work from home	1.2	0.0	-1.2	N	1.7	0.0836
Taxi/other	0.0	0.4	+0.4	N	-1.0	0.3173
Sustainable modes	74.2	60.6	-13.6	Y	3.2	0.0012
Non-sustainable modes	25.7	39.4	+13.6	Y	-3.3	0.0011

To understand more about the changes in mode use following relocation at a disaggregated level, the pre and post-relocation primary mode for each of the survey respondents is presented as a matrix in Table 7.8. The matrix allows for analysis of how many people maintained or changed modes and if they changed, what modes they changed to following relocation.

Table 7.8 – Changes in primary mode of travel: all previous locations to MediaCityUK

		Primary mode of travel to MediaCityUK											
		Bus	Car on own	Car sharing	Cycle	Motorcycle/scooter	Home working	Taxi	Train	Tram	Underground	Walk	Total
Primary mode of travel to previous place of work or study	Bus	3	11	1	2	1	-	-	2	7	-	4	31
	Car on own	1	46	3	3	-	-	-	4	3	-	3	63
	Car sharing	1	-	5	-	-	-	-	2	-	-	1	9
	Cycle	1	3	-	18	-	-	-	2	-	-	1	25
	Home working	-	2	-	-	-	-	-	-	1	-	-	3
	Motorcycle/scooter	-	-	-	-	1	-	-	-	-	-	-	1
	Taxi	-	-	-	-	-	-	-	-	-	-	-	0
	Train	1	10	2	6	-	-	-	12	7	-	3	41
	Tram	-	1	1	1	-	-	1	-	7	-	1	12
	Underground	3	10	3	2	-	-	-	2	12	-	4	36
	Walk	2	12	-	5	-	-	-	1	7	-	1	28
	Total	12	95	15	37	2	0	1	25	44	0	18	249

The matrix shows that 92 people (37.0%) maintained their previous mode of transport following relocation with the majority, 157 people (63.0%), changing their primary mode.

Cycling and single occupancy car were the two modes that had the highest number of people who maintained the same mode following relocation. 46 car drivers (73.0%) and 18 cycle users (72.0%) continued using the same mode of travel following relocation. Conversely, walking and bus had the lowest retention rate following relocation with only 3

bus users (9.7%) and 1 pedestrian (3.5%) maintaining use of these modes following relocation.

As underground rail is not available at MediaCityUK, it cannot be assessed as an individual mode. However, if all modes are grouped in three modal groups of car (single occupancy and car share), public transport (tram, bus, train, underground) and active travel (cycling and walking) it can then be included in the analysis.

Table 7.9 shows that as a group, public transport (47.5%) and active travel (47.2%) have similar retention rates. Whereas cycling on its own had a 72% retention rate, when combined with walking the rate reduced due to the low retention rate of walking (3.5%). However, for car, the rate is larger (75.0%) when adding car sharers to single occupancy car users. In terms of those who switched modal group, it can be seen that 108 people (44.4%) did so while the majority of 135 people (55.6%) maintained their modal group.

Table 7.9 – Changes in primary mode of travel by modal group

		Primary mode of travel to MediaCityUK					% of people who maintained modal group	% of people who switched modal group
		Public transport	Car	Active travel	Total			
Primary mode of travel to previous place of work/study	Public transport	56	39	23	118		47.5	52.5
	Car	11	54	7	72		75.0	25.0
	Active travel	13	15	25	53		47.2	52.8
	Total	80	108	55	243		55.6	44.4

Looking at the net changes in modal group, Table 7.10 shows that public transport had the largest net loss of users with 38 more people switching away from this group than to it, with the most (73.7%) switching to car use. As such, car (Table 7.11) saw the largest net

increase in users (36 people) while active travel (Table 7.12) remained relatively stable, gaining 2 more users compared to those that switched to other groups.

Table 7.10 – Net change in mode use for public transport

	Car		Active travel	
	Loss	Gain	Loss	Gain
PUBLIC TRANSPORT	-39	+11	-23	+13
Net change (actual)	-28		-10	
	-38			
Net change (proportion)	0.68			

Table 7.11 – Net change in mode use for car

	Public transport		Active travel	
	Loss	Gain	Loss	Gain
CAR	-11	+39	-7	+15
Net change (actual)	+28		+8	
	+36			
Net change (proportion)	1.50			

Table 7.12 – Net change in mode use for active travel

	Car		Public transport	
	Loss	Gain	Loss	Gain
ACTIVE TRAVEL	-15	+7	-13	+23
Net change (actual)	-8		+10	
	+2			
Net change (proportion)	1.04			

A key point from this analysis is that car gained users from both sustainable modal groups, in particular public transport. It is also important to note how a lot of those who switched to active travel did so from public transport, which has a null effect on increasing sustainable mode share. Further exploration of the reasons why people did or did not change modes is included in Sections 7.6 and 7.7.

7.5.2.2 BBC London employees

For the ex-BBC London cohort, the relocation brought about a significant reduction in the proportion of people using public transport at MediaCityUK than previously in London ($z = 4.0$, $p = 0.0001$). There was also a significant increase in the proportion of people driving ($z = -2.6$, $p = 0.0091$). Cycling increased by 10.2 pp., although this was not a significant change at the <0.05 level ($z = -1.6$, $p = 0.1096$). The large mode share of sustainable modes pre-relocation (91.8%) reduced significantly to 71.5% ($z = 2.6$, $p = 0.0093$), however, this proportion is still larger than the sustainable mode share for whole sample (60.6%, see Table 7.7).

Table 7.13 – Pre and post-relocation mode share (BBC London, $n=49$)

Mode	Mode share (%)		Difference between the samples			
	Pre-relocation	Post-relocation	Diff. (p.p.)	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	8.2	28.6	+20.4	Y	-2.6	0.0091
Car sharing	0.0	4.1	+4.1	N	-1.4	0.1527
Public transport	81.6	42.9	-38.7	Y	4.0	0.0001
<i>Bus</i>	4.1	8.2	+4.1	N	-0.9	0.4009
<i>Train</i>	22.4	8.2	-14.2	N	2.0	0.0512
<i>Tram</i>	0.0	26.5	+26.5	Y	-3.9	0.0001
<i>Underground</i>	55.1	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Cycle	6.1	16.3	+10.2	N	-1.6	0.1096
Walk	4.1	8.2	+4.1	N	-0.9	0.4009
Motorcycle/scooter	0.0	0.0	0.0	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Work from home	0.0	0.0	0.0	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Taxi/other	0.0	0.0	0.0	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Sustainable modes	91.8	71.5	-20.3	Y	2.6	0.0093
Non-sustainable modes	8.2	28.6	+20.3	Y	-2.6	0.0091

Table 7.14 displays the mode change matrix for ex-BBC London employees, showing how the changes were distributed. The distribution of people who previously used underground rail is particularly important because they represented 55.1% of the subgroup sample and that mode is not available at MediaCityUK. This means that the majority of the subgroup were forced to use a different mode following relocation. Table 7.14 shows that 14 out of 27 (51.9%) continued to use public transport, with the most (10 out of 14, 71.4%) using tram at MediaCityUK. The remaining share switched to using non-public transport modes, with 9 (69.2%) using car and 4 (30.8%) travelling on foot or by bicycle.

Table 7.14 – Changes in mode share: BBC London to MediaCityUK

		Primary mode of travel to MediaCityUK								
		Bus	Car on own	Car sharing	Cycle	Train	Tram	Underground	Walk	Total
Primary mode of travel to BBC London	Bus	1	-	-	-	-	1	-	-	2
	Car on own	-	4	-	-	-	-	-	-	4
	Car sharing	-	-	-	-	-	-	-	-	0
	Cycle	-	-	-	3	-	-	-	-	3
	Train	-	1	-	3	3	2	-	2	11
	Tram	-	-	-	-	-	-	-	-	0
	Underground	3	7	2	2	1	10	-	2	27
	Walk	-	2	-	-	-	-	-	-	2
	Total	4	14	2	8	4	13	0	4	49

Again, as in section 7.5.2.1 the individual modes have been combined into three groups. Looking at the changes in this context demonstrates that 52.5% of public transport users continued to use this modal group while the remaining 47.5% switched to either car or

active travel (Table 7.15) with an almost even distribution, 9 switched to car and 10 to active travel.

Table 7.15 – Changes in primary mode of travel of ex-BBC London employees by modal group

		Primary mode of travel to MediaCityUK					% of people who maintained modal group	% of people who switched modal group
		Public transport	Car	Active travel	Total			
Primary mode of travel to previous place of work/study	Public transport	21	10	9	40		52.5%	47.5%
	Car	0	4	0	4		100.0%	0.0%
	Active travel	0	2	3	5		60.0%	40.0%
	Total	21	16	12	49		57.1%	42.9%

Looking at where modal groups lost and gained users, Table 7.16 shows that public transport lost almost half of its users while gaining no users from the other modal groups. Conversely, car had four times as many users following relocation as a result of large gains from public transport while losing no users (Table 7.17). Active travel saw some users switch to car but this only slightly offset the gains from the public transport (Table 7.18).

Table 7.16 – Net change in mode use for public transport (BBC London)

	Car		Active travel	
	Loss	Gain	Loss	Gain
PUBLIC TRANSPORT	-10	0	-9	0
Net change (actual)	-10		-9	
	-19			
Net change (proportion)	0.53			

Table 7.17 – Net change in mode use for car (BBC London)

	Public transport		Active travel	
	Loss	Gain	Loss	Gain
CAR	0	+10	0	+2
Net change (actual)	+10		+2	
	+12			
Net change (proportion)	4.00			

Table 7.18 – Net change in mode use for active travel (BBC London)

	Car		Public transport	
	Loss	Gain	Loss	Gain
ACTIVE TRAVEL	-2	0	0	+9
Net change (actual)	-2		+9	
	+7			
Net change (proportion)	2.40			

A key point from the BBC London sample subgroup is the distribution of underground rail users who could no longer use this mode following relocation forcing them to use an alternative. Nearly half of these chose to use a non-public transport mode for travel to MediaCityUK. BBC London employees had a high share of sustainable mode use pre-relocation (91.8%). This has significantly reduced to 71.5%; however, the subgroup still has the highest sustainable mode share out of the three subgroups.

7.5.2.3 BBC Manchester employees

Table 7.19 shows that car use significantly increased following relocation among the BBC Manchester subgroup from 26.7% to 42.2% ($z = -2.4$, $p = 0.0155$). The other significant change was that for public transport which reduced from 43.3% to 25.6% ($z = 2.8$, $p = 0.0058$). The significant reduction in bus and train use was a major factor in the overall share of public transport reducing. The findings are consistent with previous research that workplace relocations from the CBD to less central locations resulted in an increase in car use at the expense of public transport (Aarhus, 2000; Bell, 1990; Cervero & Landis, 1992; Hanssen, 1995; Næss & Sandberg, 1996). Car sharing and cycling saw small increases with walking reducing, however, none of these changes was found to be statistically significant. Overall, there was a significant reduction in the sustainable mode share post-relocation from 72.2% to 54.5% ($z = 2.7$, $p = 0.0065$). The BBC Manchester subgroup had a lower sustainable mode share following relocation than the sample as a whole, 54.5% compared to 60.6%.

Table 7.19 – Pre and post-relocation mode share (BBC Manchester)

Mode	Mode share (%)		Difference between the samples			
	Pre-relocation	Post-relocation	Diff. p.p.	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	26.7	42.2	+15.5	Y	-2.4	0.0155
Car sharing	5.6	7.8	+2.2	N	-0.7	0.5157
Public transport	43.3	25.6	-17.7	Y	2.8	0.0058
<i>Bus</i>	14.4	5.6	-8.8	Y	2.2	0.0293
<i>Train</i>	18.9	8.9	-10.0	Y	2.1	0.0324
<i>Tram</i>	10.0	11.1	+1.1	N	-0.3	0.7872
Cycle	14.4	17.8	+3.4	N	-0.7	0.4902
Walk	8.9	3.3	-5.6	N	1.7	0.0819
Motorcycle/scooter	1.1	2.2	+1.1	N	-0.6	0.5222
Work from home	0.0	0.0	0.0	N	n/a	n/a
Taxi/other	0.0	1.1	+1.1	N	-1.1	0.2713
Sustainable modes	72.2	54.5	-17.7	Y	2.7	0.0065
Non-sustainable modes	27.8	45.5	+17.7	Y	-2.7	0.0065

The mode change matrix for ex-BBC Manchester employees' shows how the mode changes were distributed (Table 7.20). 40 people (44.4%) maintained their mode of travel following

relocation to MediaCityUK. Of the 24 solo car drivers at BBC Manchester, 20 (83.3%) maintained use of this mode following the relocation which was the highest retention rate out of all modes. Cycling had the second highest with 8 out of 13 people (61.5%) continuing to use this mode at MediaCityUK. Walking, train and bus all had low retention rates with the majority of users switching to another mode following relocation. The table shows that the increase in car use came predominantly from switching from train or bus.

Table 7.20 – Change in primary mode of travel: BBC Manchester to MediaCityUK

		Primary mode of travel to MediaCityUK									
		Bus	Car on own	Car sharing	Cycle	Motorcycle/scooter	Taxi	Train	Tram	Walk	Total
Primary mode of travel to BBC Manchester	Bus	1	7	-	2	1	-	-	2	-	13
	Car on own	-	20	1	2	-	-	1	-	-	24
	Car sharing	-	-	3	-	-	-	2	-	-	5
	Cycle	1	1	-	8	-	-	2	-	1	13
	Motorcycle/scooter	-	-	-	-	1	-	-	-	-	1
	Taxi	-	-	-	-	-	-	-	-	-	0
	Train	1	6	2	2	-	-	3	2	1	17
	Tram	-	1	1	1	-	1	-	4	1	9
	Walk	2	3	-	1	-	-	-	2	-	8
	Total	5	38	7	16	2	1	8	10	3	90

Looking at the modal changes by modal group it is evident that car had a strong retention rate among ex-BBC Manchester employees with 82.8% continuing to travel by car or car share post-relocation. For public transport, it is a different story with 38.5% of users

continuing to use public transport but 61.5% switching to another group (Table 7.21). Again, this links back to what the literature found concerning relocations from the CBD to less central areas resulting in reductions in public transport use.

Table 7.21 – Changes in primary mode of travel of ex-BBC Manchester employees by modal group

		Primary mode of travel to MediaCityUK					% of people who maintained modal group	% of people who switched modal group
		Public transport	Car	Active travel	Total			
Primary mode of travel to previous place of work/ study	Public transport	15	17	7	39		38.5	61.5
	Car	3	24	2	29		82.8	17.2
	Active travel	7	4	10	21		47.6	52.4
	Total	25	45	19	89		55.1	44.9

Table 7.22 shows that public transport lost approximately one third of its users with the majority switching to car. Car had net gains in users from both public transport and active travel (Table 7.23) with active travel suffering a slight net loss (Table 7.24).

Table 7.22 – Net change in mode use for public transport (BBC Manchester)

	Car		Active travel	
	Loss	Gain	Loss	Gain
PUBLIC TRANSPORT	-17	+3	-7	+7
Net change (actual)	-14		0	
	-14			
Net change (proportion)	0.64			

Table 7.23 – Net change in mode use for car (BBC Manchester)

	Public transport		Active travel	
	Loss	Gain	Loss	Gain
CAR	-3	+17	-2	+4
Net change (actual)	+14		+2	
	+16			
Net change (proportion)	1.55			

Table 7.24 – Net change in mode use for active travel (BBC Manchester)

	Car		Public transport	
	Loss	Gain	Loss	Gain
ACTIVE TRAVEL	-4	+2	-7	+7
Net change (actual)	-2		0	
	-2			
Net change (proportion)	0.90			

Proportionally, the changes in modal group use are not as large for the BBC Manchester subgroup as they were for BBC London subgroup. The trends are broadly similar however, with car seeing a large increase in users largely at the expense of public transport.

7.5.3 Intended v actual mode of travel

Table 7.6 in section 7.4.2 presented the intended mode share of BBC employees based on data from a survey that was carried out by transport consultants prior to their relocation. Table 7.25 presents this stated intention data alongside the observed data from the travel survey conducted as part of this study.

What can be seen from comparing the two datasets is that the mode shares are similar with no statistically significant differences (apart from motorcycle/scooter but this had 0% share for stated intention). The three modes with the largest intended mode share were car, tram and bicycle. Following relocation, these remained as the three most used modes; however, car increased its share with tram and bicycle shares reducing. As a result the actual sustainable mode share is 6.3 percentage points lower than the intended sustainable mode share.

Table 7.25 – Stated mode share intention compared to observed mode share

Mode	Mode share (%)		Difference between the samples			
	Stated intention	Observed	Diff. p.p.	Significant difference (0.05 significance level)		
				Y/N	Z	p
Car	31.7	38.2	+6.5	N	-1.9	0.0601
Car sharing	6.0	6.0	0.0	N	0	1.0000
Public transport	35.5	32.5	-3.0	N	0.9	0.3898
<i>Bus</i>	4.7	4.8	+0.1	N	-0.1	0.9522
<i>Train</i>	8.5	10.0	+1.5	N	-0.7	0.4715
<i>Tram</i>	22.3	17.7	-4.6	N	1.5	0.1236
Cycle	19.7	14.9	-4.8	N	1.7	0.0910
Walk	5.7	7.2	+1.5	N	-0.9	0.3898
Motorcycle/scooter	0.0	0.8	+0.8	Y	-7.7	0.0000
Work from home	0.0	0.0	0.0	n/a	n/a	n/a
Taxi/other	1.4	0.4	-1.0	N	1.3	0.2005
Sustainable modes	66.9	60.6	-6.3	N	1.8	0.0719
Non-sustainable modes	33.1	39.4	+6.3	N	-1.8	0.0719

* Source: (Urban Vision, 2010)

The largest percentage point difference was for car where a higher proportion of people were observed using this mode compared how they intended to travel. In terms of public transport, 32.5% were observed using bus, train or tram compared to 35.5% who stated they would use these modes. Looking at the individual public transport modes it is evident that a lot of this difference can be attributed to tram where there was a 4.6 percentage point difference in intended and actual usage. Looking at active travel modes, a higher share was observed than intended as walking to work while cycling had a lower proportion compared to how people said they intended to travel.

Although the top three intended and observed modes were the same in terms of their order, this comparison leads to further questioning as to why the mode share of car became larger while that of public transport and bicycle is reduced when comparing the pre-relocation intended mode use against the observed mode use following relocation.

Reasons people gave relating to their intention to use public transport included to avoid travelling by car, enjoyment of using public transport, fitting in exercise and environmental concerns:

“I started thinking that I would continue getting the train in because it was convenient and easier than sitting in traffic, less stressful and all of those things.” (P01, female, car)

“So my intention was...I do try and travel as environmentally friendly as I can, so my intention was to travel by train into Piccadilly and then to get the tram, again because it gives me a little bit of exercise.” (P09, female, car)

“I wondered if (by using public transport) I could do it without a car, because a car’s pretty quick, but prefer not to if I can.” (P11, male, cycle and public transport)

“Kind of a bit of geeky answer, but I loved trams and trains, if I get the opportunity to use a tram everyday then that was just amazing.” (P14, female, car share)

However, in all of these cases the intention to use public transport was ultimately not matched in their actual mode of travel. Public transport unreliability, having to interchange between services or modes, the cost of multimode tickets and slower comparable journey times were cited as reasons why the observed post-relocation travel did not match the pre-relocation intention.

“So for the first 3 months I attempted to continue travelling by train and getting the tram out from Piccadilly to here but it was taking me so long in terms of travel time and the trams weren’t particularly reliable.” (P01, female, car)

“The daily tickets are quite expensive and there are not a lot of good weekly or monthly options.” (P11, male, cycle and public transport)

“If trams are delayed obviously that (delay) increases, whereas the whole driving to work, parking up, because we park over the other side of the river, so utilise the free parking and the on-street parking over there, and then walking across the river, it still takes less time than even the Cornbrook to Media City tram would take.” (P14, female, car share)

The quote below from P09 links to what Kollmuss and Agyeman (2002) explored regarding the differences in attitude and actual behaviours with regards to pro-environmental behaviour. P09 has intentions to travel in a way that matches their environmental principles, however, the actual circumstances of travel mean they decide to behave differently.

“I do try and travel as environmentally friendly as I can, so my intention was to travel by train into Piccadilly and then to get the tram...I realised that not only was the journey very expensive on the train and the tram, so it's nearly £900 for a train ticket, £560 for a Metro (tram) ticket per year. So not only was it reasonably expensive but it was taking was just too long, so I abandoned my green principles for convenience and did it by car a couple of times, and it shaved about 20 minutes of each journey, which I decided could be time well spent elsewhere. So I didn't renew my train ticket, cashed in my Metro ticket and now I drive.” (P09, female, car)

Views from the 2012 BBC staff survey (see section 7.2.5.5 for survey details) provide further indications as to why the actual post-relocation sustainable travel mode share was less than the intended sustainable travel mode share. Respondents discuss issues with the tram, the need for further bus and cycle infrastructure and how this can result in the view that a car is necessary to travel to the site.

“They (the trams) are overpriced, unreliable and badly managed. I really wanted to get public transport as I want to be green, but after 5 months of trying, I have given up and now drive to work. This has turned out to be quicker, cheaper and more reliable than the tram.” (BBC survey respondent)

“Better cycle and bus links to Manchester are needed.” (BBC survey respondent)

“Easier to drive than to access via public transport.” (BBC survey respondent)

“The environment here is excellent. The transport here is not. A car is a necessity which was not the case at Oxford Road, so we are now having to run two cars.” (BBC survey respondent)

In terms of bicycle use, the data is less clear as all interviewees who stated they intended to travel by bicycle did so following relocation. Indeed, there were several cases of people who intended to use public transport but instead travelled by bicycle following relocation:

“So I tried the tram and I didn’t like it because you had to change at Cornbrook then, so it wasn’t as easy, so I tended to drive and then when it got round to kind of the spring and summer, I started cycling.” (P12, female, cycle and car share)

“So I suppose when I had done the six months trial and I had found what an easy cycle ride it was from the friends I was staying with, that’s when I changed my plan from being in the countryside (and travelling by public transport) to actually, I’d like this cycle to work.” (P13, female, cycle)

This links to how in section 7.5.2.1 and in particular Table 7.10 there was a shift away from public transport following relocation with people switching to car use; however, there was also a shift from public transport to cycling.

Previous research of intended and actual mode shares during a workplace relocation is limited but Yang et al. (2017) found the actual sustainable mode share was lower than the intended mode share following a relocation to a less central area. Further in-depth analysis on the influences on travel behaviour post-relocation is presented in sections 7.6 and 7.7.

7.5.4 Longitudinal mode share analysis

The post relocation mode of travel is shown at four snapshots in time between November 2012 and October 2016 in Table 7.26. As well as providing longitudinal data, the results of the surveys conducted outside of this research give confidence to the results of the surveys undertaken for this study due to the similarities in mode shares.

Looking at the mode share at different points since the relocation reveals some interesting trends. The results show that the mode share of car use (as a single occupancy driver) has fluctuated since 2012 but with the overall trend showing an increase in mode share. This is also the case for cycling and walking, both of which have larger mode shares than the first dataset in 2012. Public transport and car sharing have seen a trend of diminishing mode shares over this period.

The sample size of the October 2016 survey is lower than the other surveys which results in a larger confidence interval around the data. If this survey was excluded and the October 2014 data was used as the end point, it changes the analysis slightly. The trend of an increasing mode share for car and cycling is still evident; however, the share for walking is

reducing by October 2014. Meanwhile, the public transport mode share is increasing slightly.

Table 7.26 – Post-relocation primary mode of travel

Mode	Mode share (%)			
	Nov 2012* (n=724)	Jun 2014 (n=249)	Oct 2014* (n=437)	Oct 2016 (n=96)
Car	33.0	38.2	35.9	42.7
Car sharing	8.0	6.0	5.9	3.1
Public transport	40.0	32.5	33.7	26.0
<i>Bus</i>	4.0	4.8	0.0	3.1
<i>Train</i>	13.0	10.0	14.2	8.3
<i>Tram</i>	23.0	17.7	19.5	14.6
Cycle	14.0	14.9	18.5	17.7
Walk	3.0	7.2	4.1	10.4
Motorcycle/scooter	1.0	0.8	1.1	0.0
Taxi/other	2.0	0.4	0.7	0.0
Sustainable modes	65.0	60.6	62.2	57.2
Non-sustainable modes	35.0	39.4	37.8	42.8

*Source: MediaCityUK travel survey conducted by Peel and TfGM

The findings in Table 7.26 are given further depth by data from the 2016 survey that showed that 51% of respondents had changed their primary mode since they started working at the site. The majority of people who had changed said that they had done so due to issues with public transport. Their comments also indicate that they switched to either car or cycle following their negative experiences of using public transport:

“Bike is quicker than tram from City to MCUK (walking was quicker than tram sometimes!), tram is far too expensive for distance travelled.” (BBC staff survey respondent)

“Car is quicker and cheaper and too many delays on the train - also it's not a very pleasant journey being crammed on both tram and train at rush hour times.” (BBC staff survey respondent)

“Tram took too long. Often 45+ minutes, whereas the cycle can be as little as 15 minutes. Also cycling is healthier.” (BBC staff survey respondent)

“Unreliable trams, line closures, huge wait times at Cornbrook for transfers, infrequency of MediaCity trams, overcrowding on mornings and evening, expense.” (BBC staff survey respondent)

“A couple of reasons - the trams are horribly busy at rush hour and were making me feel ill. I have also worked out that driving and parking at MediaCity is cheaper than travelling by tram.” (BBC staff survey respondent)

A residential relocation was also cited by several people as a reason why they changed their mode of travel, with positive, negative and neutral connotations for sustainable travel mode share:

“Used to live in Manchester city centre, public transport times were too long for how short the distance was. Chose to live closer and walk instead.” (BBC staff survey respondent)

“Moved house and there is no tram line where I live now.” (BBC staff survey respondent)

“Moved from Cycling/Tram distance to outside Greater Manchester.” (BBC staff survey respondent)

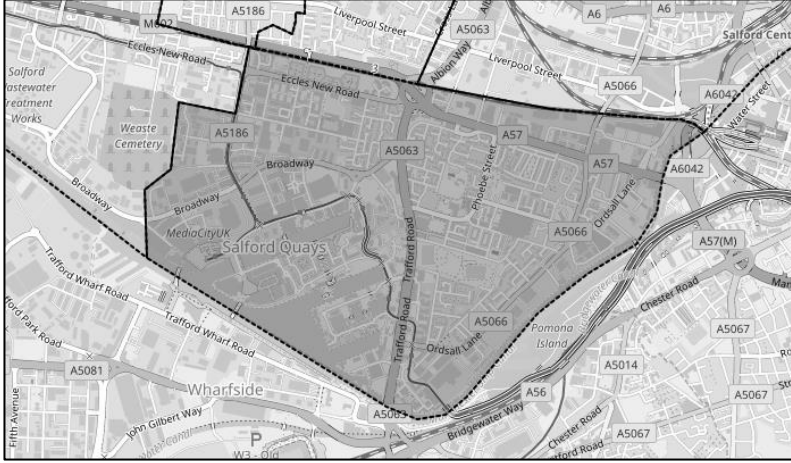
During the period between the first and last sources of data, November 2012 and October 2016, there were numerous changes to transport provision at and around MediaCityUK. For example, the Cycle Hub opened in 2015 and the light rail network expanded with lines to East Manchester (2013) and Manchester Airport (2014). Section 7.2.3 provides full information on the timeline of transport infrastructure and interventions at MediaCityUK

7.5.5 Geographical mode share comparisons

To put the mode share for MediaCityUK in context, data from wider geographies has been utilised and these are detailed in Table 7.27.

Table 7.27 – Wider geographies for mode share comparison

Wider geography	Details
Local area	The wider Salford Quays area within which MediaCityUK is located. A Census Middle Layer Super Output Area (MSOA) has been utilised to gain data for this area. The MSOA for MediaCityUK and the immediate surrounding area is shown below and represents approximately 18,000 people in employment who travelled into this area when the Census was completed in 2011.

	 <p>Figure 7.24 – MSOA E02001184: Salford 028 (Source: 2011 Census)</p>
Regional CBD	The regional CBD is Manchester city centre where approximately 90,000 people are employed.
Wider region	The wider region of Greater Manchester with a population of approximately 2.8 million.
Country	England

The post-relocation mode share for MediaCityUK was presented in Table 7.7 in section 7.5.2. Table 7.28 presents this data alongside data from wider geographies to allow for comparison.

Table 7.28 – Mode share comparison with wider geographies

Mode	Mode share (%)				
	MediaCityUK	Local area*	Regional CBD**	Wider region*	Country*
Car	38.2	72.9	26.8	57.8	57.0
Car sharing	6.0	n/a	n/a	5.7	5.0
Public transport	32.5	16.1	60.8	14.3	16.9
<i>Bus</i>	4.8	7.9	23.9	10.5	7.5
<i>Train</i>	10.0	2.5	25.8	2.5	5.3
<i>Tram</i>	17.7	5.7	11.1	1.3	4.1
Cycle	14.9	2.3	1.7	2.1	3.0
Walk	7.2	7.4	10.7	9.9	10.7
Motorcycle/scooter	0.8	0.5	0.0	0.5	0.8
Work from home	0.0	0.0	0.0	8.5	5.4
Taxi/other	0.4	0.6	0.0	1.2	1.1
Sustainable modes	60.6	25.8	73.2	40.5	36.0
Non-sustainable modes	39.4	74.2	26.8	59.5	64.0

* Source: 2011 Census, ** Source: (TfGM, 2016b)

7.5.5.1 Local area

Only the mode shares of bus and walking are not statistically significantly different between the two samples. The mode share of car is dominant within this wider area around MediaCityUK, which although not a part of CBD is also not a great distance from the CBD either. The eastern boundary of the MSOA borders the edge of Manchester city centre and the main CBD.

To explore reasons for the disparity in mode share between MediaCityUK and the wider area it is necessary to look at some of the spatial features of the area. The employment sites within the MSOA are typically low density, self-contained light industrial, office and retail premises with many having their own car parking facilities. Figure 7.25 displays a 2.4km² excerpt of the area to the north of MediaCityUK showing the array of light industrial units along with some office buildings (top middle of figure) all with private, off highway car parking spaces.

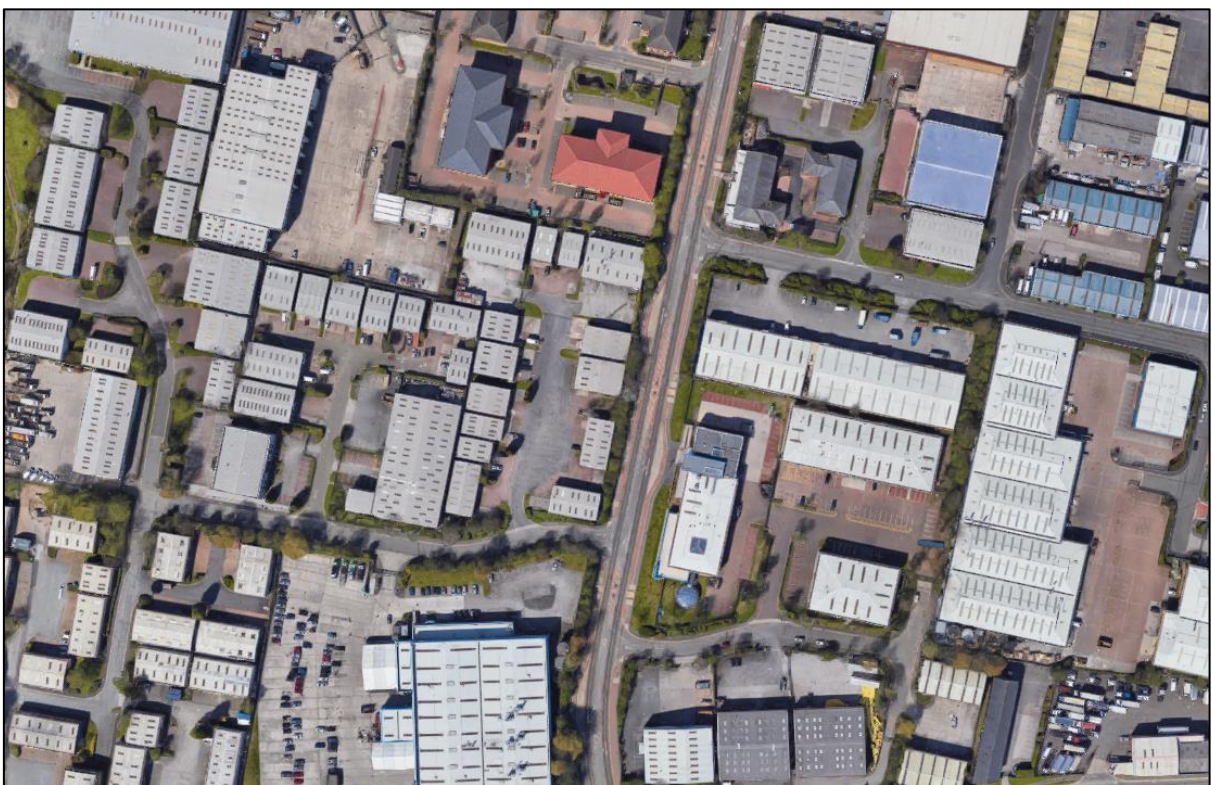


Figure 7.25 – Land use in the local area to MediaCityUK (Source: Open Street Map)

Previous research has shown how the availability of parking along with good access to the principal highway network are likely to be key factors in the dominance of car for journeys

to work in this area (Hess, 2001). The low levels of density in the area is also a reason why the mode share for journeys to this area is high (Cervero, 2002).

Although the wider area is served by public transport in the form of the tram network, this was developed after the area was established rather than an integral part of the design as at MediaCityUK. As such, walking access to and from the tram stops in the wider area is restricted in some locations due to the constraints of the highway network and low levels of permeability due to large blocks of private land. Figure 7.26 displays the same 2.4km² area to the north of MediaCityUK and it can be seen that there are several links from the main road through the area that are dead-ends and only serving the units contained within. This results in elongated routes needing to be made to reach certain parts of the area from the bus stops (shown on the figure) and the light rail stops located just off the figure at either end.

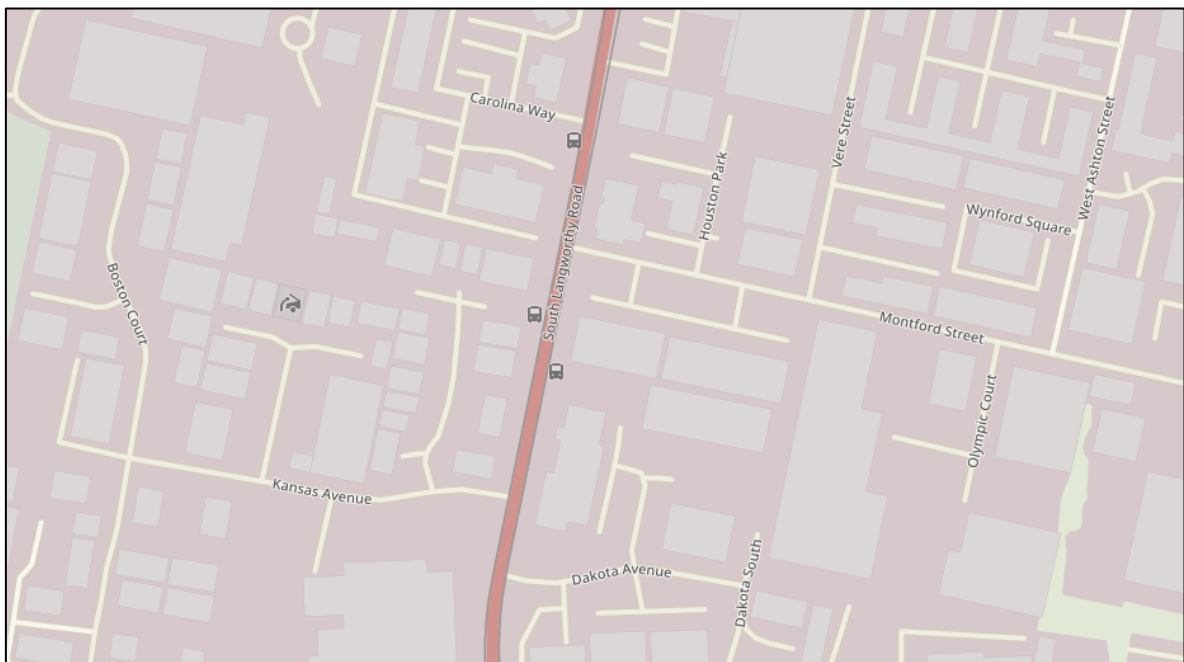


Figure 7.26 – Lack of permeability in local area to MediaCityUK (Source: Open Street Map)

The MediaCityUK site differs from the wider area in terms of how it was designed as a high-density employment site with elements of Transit Oriented Development and New Urbanism included in the design to facilitate sustainable accessibility. The MediaCityUK tram stop is central to the site and high levels of permeability across the site meaning walking distances are minimised and closer to desire lines.

7.5.5.2 Regional CBD

Comparing the mode share of the survey sample to the mode share of Manchester city centre employees shows that car use (solo and car share) is over 17 percentage points higher (44.2% to 26.8%) which is a statistically significant difference in sample proportions ($z = 6.20$, $p = <0.0001$). Potential explanations for this include the greater availability of car parking provision on site or on nearby streets or other private parking locations near to MediaCityUK. It could also be linked to less choice of other modes, in particular public transport. Like many large urban areas, the public transport network of Greater Manchester is predominantly radial with services travelling into/out of the regional centre. Connections to less central locations, such as MediaCityUK, often require interchange, which the literature showed, was a barrier to usage.

Looking at the public transport shares both rail and bus at MediaCityUK have shares statistically significantly lower than that of Manchester city centre (rail: $z = 5.70$, $p = <0.0001$, bus: $z = 7.1$, $p = <0.0001$, see Table 7.28). This links to the point in the previous paragraph that there is no rail station near enough to allow for direct access and only a few bus services call near to the site. Tram on the other hand has a share higher than the city centre, which may relate to the tram network directly serving the site.

The mode share of walking to MediaCityUK is slightly lower than that of Manchester city centre (7.2% compared to 10.7%, see Table 7.28) but statistically there is not a significant difference between the two proportions ($z = 1.80$, $p = 0.0743$). The mode share of cycling at MediaCityUK is of particular note with it accounting for 14.9% of mode share. This is statistically significantly higher than Manchester city centre where it accounts for only 1.7% of mode share ($z = 15.9$, $p = 0$, see Table 7.28).

7.5.5.3 Wider region and nation

Bicycle, train and tram use are higher with bus and walking lower than the regional and national figures. The mode shares are obviously subject to a range of caveats, most prominently the fact that tram services are not available at all locations across the region and the country. These comparisons do however provide an indication that travel to work at MediaCityUK is more sustainably oriented than travel to work within the wider region and across the country.

7.5.6 Spatial distribution

From analysing the home postcode data of the survey recipients (Figure 7.27), it is observed that there are large clusters of BBC employees living in the following areas:

- Salford Quays and Ordsall (<1km from MediaCityUK);
- Manchester city centre (3km);
- Chorlton (3.5km); and
- Sale (5.5km).

Looking at the spatial distribution of employees by primary mode of travel (Figure 7.28), it is evident that a large proportion of the 14.9% that cycle to MediaCityUK reside in the Chorlton area. The tram users are generally located near to the light rail network, such as along the Altrincham and Chorlton but particularly within Manchester city centre. As would be expected, there is a cluster of people who walk living within 1km of the site but there are also employees walking approximately 3km from the city centre along with the Eccles and Chorlton areas.

Rail users are observed travelling from the peripheries of Greater Manchester, such as from the Oldham area in the east (Mossley and Greenfield). Other employees are travelling by rail from outside of Greater Manchester, residing in Derbyshire and Lancashire.

Car users are distributed across Greater Manchester and out to wider locations, including those not shown on the map, such as West Yorkshire and Merseyside. There are notable car users that reside within three or five kilometres of MediaCityUK in Salford and south Manchester. Given their proximity to MediaCityUK and to employees that are travelling by sustainable modes it is important to understand more about why they are not utilising sustainable modes. Previous sections in this chapter have begun to identify reasons why this is the case, this chapter continues to explore those reasons further in the following sections.

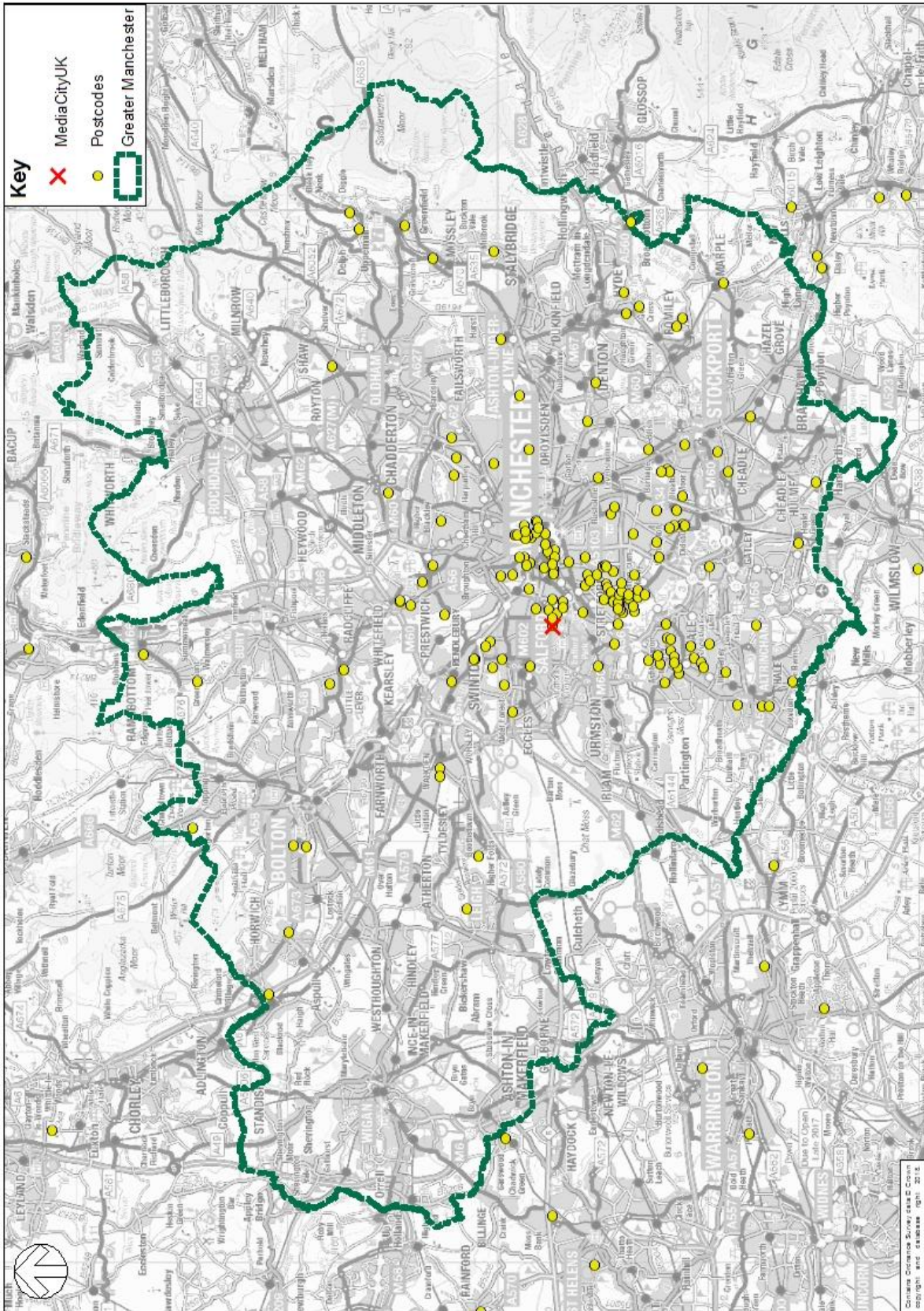


Figure 7.27 – Spatial distribution of BBC employees

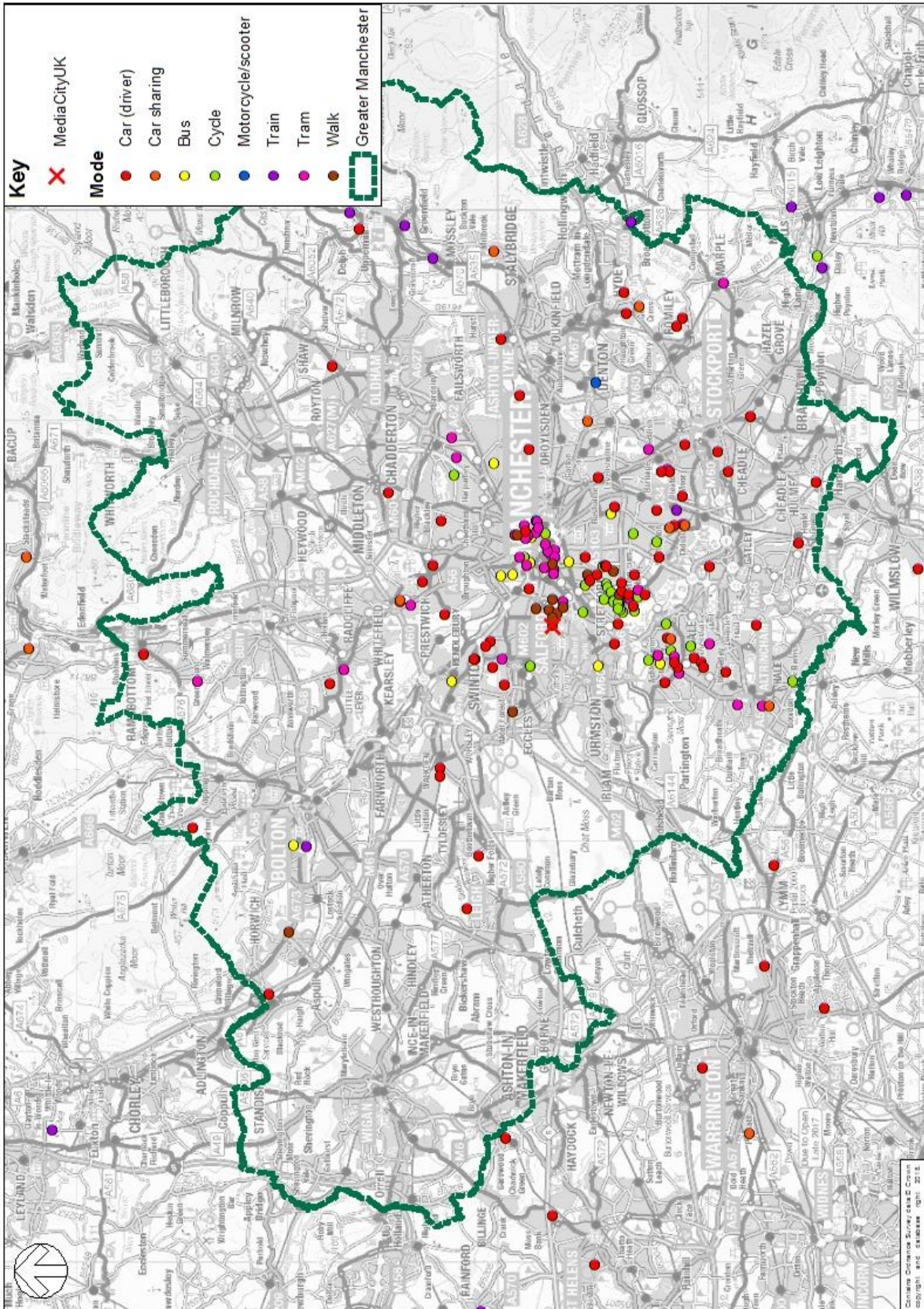


Figure 7.28 – Spatial distribution of BBC employees and primary mode of travel

7.5.7 Summary

Post-relocation, there has been a reduction in the mode share of sustainable modes compared to how people travelled to their previous place of work or study. More people changed modes than continued using the same mode following relocation with 63% of people switching. This demonstrates that workplace relocations have potential to induce significant changes in travel behaviour. As individual modes, car and bicycle had the highest retention rate following relocation, while public transport and walking retained the lowest share of users following relocation.

Despite the sustainable mode share of MediaCityUK being lower than the regional CBD, it was also found that the sustainable mode share is significantly larger than that of the surrounding non-central area, 60.6% compared to 25.8%. Therefore, despite the sustainable mode share being lower than the CBD it is a lot higher than the area in which it is situated.

7.6 Spatial influences on travel behaviour

7.6.1 Introduction

This section looks at the spatial influences on travel behaviour during the relocation. Building on the previous sections which looked at the 'what', 'where' and 'when' questions, it aims to explore the 'how' and 'why' questions related to the observed data collected during the study. The section is based around the data that emerged as the study took place and what was found in the literature to have an impact on travel behaviour.

7.6.2 Transport provision

This section looks at the impact of the transport provision on travel behaviour at MediaCityUK, some of which were direct hard measures implemented as part of the planning of the site. An overview of transport provision at MediaCityUK was provided in section 7.2.3 and this section will refer to that information, however, some information is restated and added to where significant.

7.6.2.1 Motor vehicles

Motor vehicle access to the site was provided with new junctions of existing highway links but most significantly through a new highway link to connect the site to the strategic

highway network. Motor vehicle parking was provided through the construction of a multi-storey car park on site.

7.6.2.1.1 Car parking

Car parking provision at MediaCityUK is made up of two main types:

- Chargeable off-street parking in the MediaCityUK multi-storey car park or nearby outlet mall multi-storey car park; and
- Free on-street parking on nearby streets with no parking restrictions.

Parking in the MediaCityUK or outlet mall car parks car park costs £12 per day while there is no charge for using the on-street capacity. When the MediaCityUK car park first opened, BBC employees did not have to pay for parking with the spaces fully subsidised. In April 2013, a part-subsidised rate came into place with BBC employees having to pay £3.50 per day to park in the in the MediaCityUK car park (BBC, 2012).

The availability of free car parking was shown to be an influence on people driving to the site. In the case of P05, the discovery of free car parking was stated as being key to not travelling by bus or cycle:

“Colleagues told me about free parking in the Trafford Park area, that’s when I discovered that if I drove up to there then walked in it’s cheaper than the bus in terms of petrol.” (P05, male, car)

“Well after I bought my bike, it was about the same time I found about the free parking (laughs) and then sort of laziness kicked in so, driving was the more convenient option than cycling.” (P05, male, car)

This was also the case for P14, who discussed how despite the free parking not being on site, it was not a deterrent to using it due to the comparable journey time by public transport:

“Whereas the whole driving to work, parking up—we park over the other side of the river, so utilise the free parking and the on street parking over there, and then walking across the river, it still takes less time than even the Cornbrook to Media City tram would take.” (P14, female, car share)

P07 discussed how the free on-street parking capacity had reduced as more organisations had relocated to the site:

“I’ve always parked (on-street) in the Trafford Park business park area, but gradually had to park further and further away as more and more people have

obviously started on site, and more and more people are parking” (P07, female, car).

Exploring the journey time factor with regards to the off-site free parking becoming further away from the site, it was evident that this could be a reason for re-consideration of travel behaviour:

“Possibly and it will be, because at the moment it takes about 15 minutes to drive and 15 minutes to walk. There is quite, it is quite a big area out at Trafford Park because it’s a business park and there’s all the free on street parking, so I think it would take quite a lot of, quite a lot more cars to have used up all the parking, but certainly if that changed massively I’d have to re-think.” (P07, female, car)

This supports what the literature found in terms of when the distance to a parking place increases, the likelihood of people driving decreases (Christiansen et al., 2017).

The provision of free on-street parking was not a factor in all cases in terms of deciding to drive to work. For P01, attitudes towards convenience and personal safety and security meant that the availability of free off-site parking was not an influence in driving to work:

“I know people who do, for the sake of not paying £3.50 park on local streets and walk in but I wouldn’t feel confident doing that around here, simply because I don’t feel particularly safe off campus and I don’t know the area well enough to be confident that I’m parking in a safe area.” (P01, female, car)

Indeed, P01 did not drive to the site from the outset and utilised public transport while also considering other alternatives. However, the negative experiences of using public transport to access the site (see Section 7.6.2.2.1) were key in P01 rethinking their options. Despite parking not being completely free as at the previous BBC Manchester site, the subsidised parking was a factor in driving as it allowed for parking on-site, which was seen as important by P01:

“I wouldn’t be able to manage without that (subsidised parking) so even though I think we all moaned like hell when we had to pay it to start with because we’d not been used to paying, we had free parking, if we did drive into Oxford Road (Manchester), the car park passes were free so if you did use a car park pass it was a free pass. People who went from free to paying were cross but I wouldn’t be able to manage without a car park pass even though it is £3.50 a day here.” (P01, female, car)

It was also evident how the £3.50 charge resulted in driving being cheaper than public transport and therefore having an impact on mode choice. P09 had travelled to their

previous place of work by public transport and had initially used public transport for travelling to MediaCityUK:

“Now I pay petrol and I have like a BBC parking pass that’s £3.50 a day which still, you know, it sounds a lot, it adds up to a lot, but it’s much cheaper than the train and the tram ticket.” (P09, female, car)

The cost of the parking provision had played a key role in making car use cheaper than public transport, with cost stated as being the most important factor in terms of choice of travel mode for P09.

The 2010 travel survey that was conducted prior to relocation (see section 7.2.5.5) found that when asked whether a £5 parking charge would influence the decision to drive 40.4% of Manchester staff and 64.3% of London staff answered ‘Yes’. This indicates that the cost of parking could have an impact on the decision to drive to a certain extent. It was also found that the current parking charges were perceived to be sufficient to deter car use:

“Absolutely I think it’s a good thing that parking is expensive here because otherwise I’d be more tempted, so if they introduce free parking, then I know when I am running (late) that then I would just jump in the car.” (P20, female, cycle and public transport)

It was highlighted in the literature review that access to free parking is a key determinant of people choosing to drive to their place of work (Hess, 2001). The evidence from the cases discussed in this section aligns with the literature with examples of people driving because of the availability of free parking, despite it not being located directly on site. It was also evident how subsidised parking was influential in people driving, particularly because the subsidised parking provision is conveniently located on site. The free or subsidised parking makes the cost of driving cheaper compared to public transport, which combined with negative experiences of using public transport modes (see Section 7.6.2.1.2 and 7.6.2.2.1) is shown to be important in terms of people driving to the site.

7.6.2.1.2 Other motor vehicle measures

Measures to reduce the need to use a private vehicle and to use lower emissions vehicles were implemented at the site in the form of car club vehicles and electric vehicle charging points.

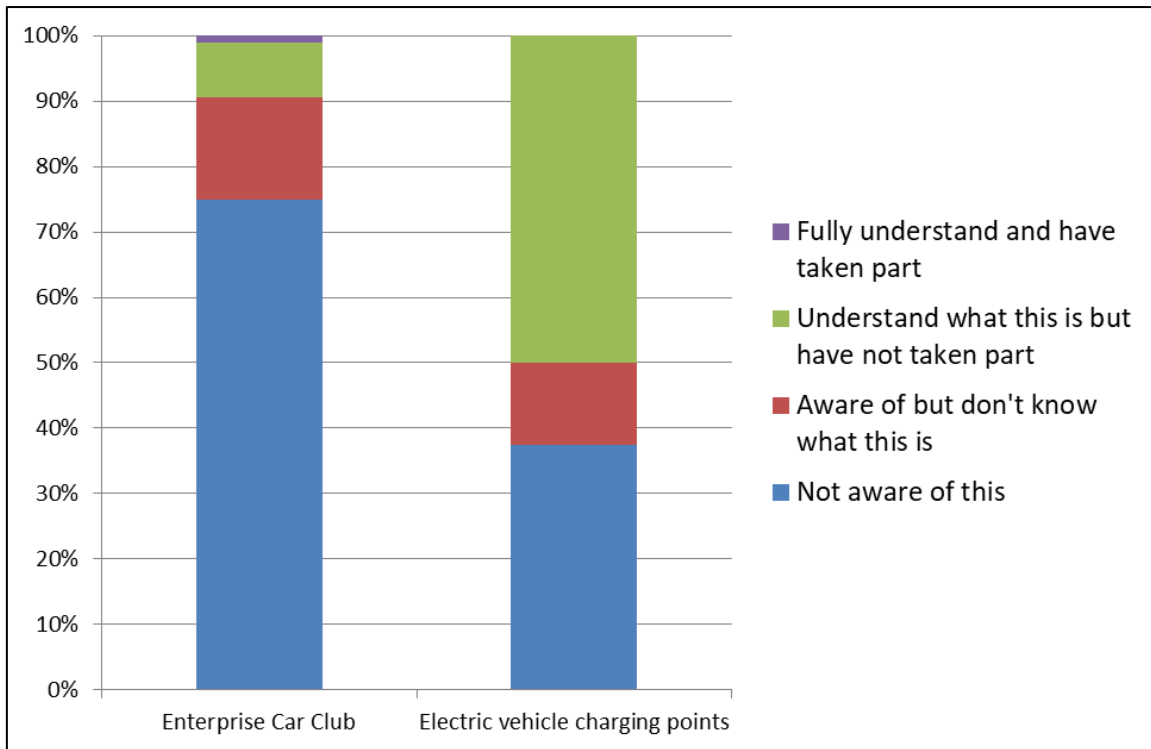


Figure 7.29 – Awareness of motor vehicle infrastructure measures

Figure 7.29 presents the levels of awareness of these measures among the BBC employees. Use of these measures is low with no-one stating they had used the electric vehicle charging points and one person saying they had used the car club. Awareness of the electric vehicle charging points is higher than the car club with 62.5% of people being aware that they were in place compared to 25.0% of people being aware of the car club.

Although usage of the charging points was reported as low during the survey, MediaCityUK was one of the first sites in Greater Manchester to install the charging points as part of Transport for Greater Manchester’s strategy. Since the initial installation of charging points in 2013/14, usage has increased across the region (Green Growth, 2016) and it is likely that awareness and use of the charging points at MediaCityUK will have increased.

7.6.2.2 Public transport

Public transport accessibility to MediaCityUK is principally provided by light rail services that serve the site directly through the MediaCityUK spur or call at nearby stops at Harbour City or Broadway (Figure 7.30). Light rail services to/from the MediaCityUK stop operate every 12 minutes meaning low average waiting times for travelling to/from the site. Combined with the services operating on a 12 minute frequency that stop at Harbour City

and Broadway (on the Eccles line) there is a service every six minutes from the vicinity of MediaCityUK to Manchester city centre. The 17.7% mode share for light rail shows that the provision is having an impact on travel behaviour despite some of the issues picked up through this study.

Bus is having less of an impact on mode share with 4.8% of people using it as their primary mode; however, this is relative to the provision of bus services to the site. Bus services to MediaCityUK are limited with the 50 service providing the only high frequency service that calls at MediaCityUK with six services per hour during the day. The 50 service connects MediaCityUK with Manchester city centre and south Manchester via Salford Shopping Centre and Salford Crescent railway station. This offers the opportunity of reaching a number of locations; however, it affects the journey time of the service compared to a more direct route between Manchester city centre and MediaCityUK. Further afield, the X50 and 250 services stop approximately 1km from MediaCityUK on Wharfside Way to the south of the site (Figure 7.32).



Figure 7.30 – Light rail stations near to MediaCityUK (Source: Google Maps with authors annotation)



Figure 7.31 – Metrolink tram at MediaCityUK

The X50 used to stop closer to MediaCityUK on Trafford Wharf Road near the Imperial War Museum, approximately 300 metres from the site, however, it was re-routed in 2017 (TfGM Committee, 2017). These services provided a combined high frequency link between Manchester city centre and the Trafford Centre retail mall. The X50 is a limited stop service and provides a quicker connection to Manchester city centre. However, the 1km walking distance from the site may be too far for many people as it exceeds the 400 metres used in UK planning as an acceptable walking distance to a bus stop (CIHT, 2015).

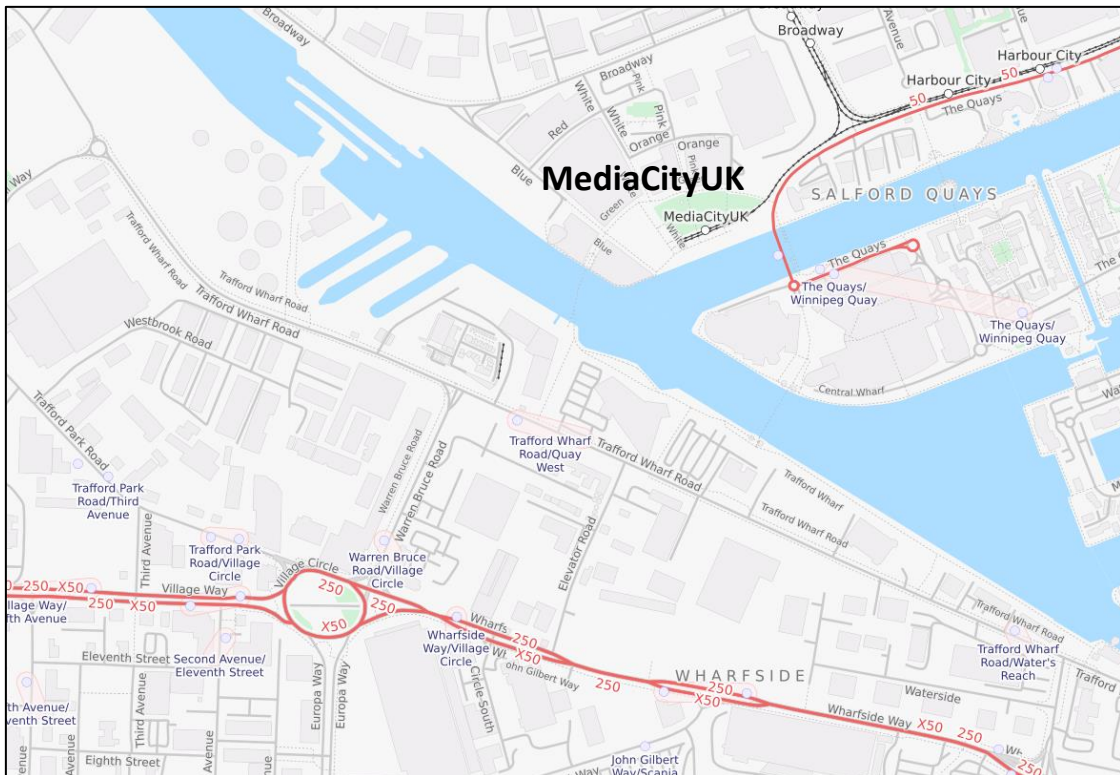


Figure 7.32 – Bus services near to MediaCityUK (Source: Author's annotation on Open Street Map)

There are no direct rail services to MediaCityUK with interchange required between light rail at Eccles, Deansgate-Castlefield or Manchester Piccadilly or between bus at Salford Crescent or Manchester city centre. The 10.0% mode share for rail as a primary mode indicates that it is still a key mode with the majority of rail users (44.0%) connecting to MediaCityUK through light rail services (Table 7.29).

Table 7.29 – Arrival mode at MediaCityUK for rail users

Mode	%
Tram	44.0
Bus	8.0
Cycle	36.0
Walk	8.0

Bus is not well used as an onward connection to MediaCityUK with cycling being the second most used mode by rail users.

7.6.2.2.1 Public transport provision to MediaCityUK

The literature highlighted that public transport travel to less central locations resulted in a greater ‘interchange penalty’ compared with travel to central locations (Hanssen, 1995; Palmer et al., 2011; Sprumont et al., 2014). Interchange penalty was identified as a key factor in deterring people from using public transport to travel to MediaCityUK. The interchange between tram and train or between tram services was discussed by several interviewees:

“I don’t want to spend 2 hours messing around on trams and trains and connecting with the tram to my particular area...You get a tram that doesn’t run followed by a train that doesn’t run and you’re stuck and I think I—I can’t be doing with that now.” (P01, female, car)

“It’s mainly convenience because if I could get a direct tram from where I live, but it’s the fact that I have to go to Cornbrook and change and then come from Cornbrook, means it takes, if I drive and walk from where I park it takes half an hour, but if I get the tram it takes an hour.” (P07, female, car)

Those residing outside of Greater Manchester, as in the case of P08, the interchange penalty can extend the journey time enough that it impacts on the choice of mode:

“I’ve kind of used the combination of the train and the tram which is painful, primarily just because how long it takes and how much of a faff it is, so I’ll get on the train near me on the Wirral which is Mersey Travel so that will take about 20 minutes to get over to Liverpool Lime street and then I’ll get on a train from

Liverpool Lime street which will take me to Manchester Piccadilly and that takes normally about 50 minutes thereabouts and then I'll get the tram from Manchester Piccadilly to Media City which is you know what, 20-25 minutes. So it kind of adds up to, when you have a little bit of waiting time in between, each of those things, it's anything between an hour and a half and two hours full journey time." (P08, male, car)

For P02 it was evident that driving had come about due to having tried to use public transport initially having not been a car user prior to relocation:

"So it was a slow "moving to driving" more. It's a long drive when you are new to it, so I probably did the train and the tram for about a month at the start but the train and the tram takes about two hours, two and a half hours, whereas a drive is about an hour tops." (P02, female, car share)

The non-central location of MediaCityUK and the resulting public transport interchange penalty meant the journey was less competitive in terms of time compared to the car than the journey to the regional centre.

The interchange in Manchester city centre or at Cornbrook was most frequently referred to by the interviewees as the quotes above highlight. In the city centre, interchange between rail and tram is available at Piccadilly and Deansgate stations from which direct trams to MediaCityUK can be boarded. Cornbrook, just outside the city centre, is an interchange station where passengers who have travelled from destinations to the south and west of the city centre can change for trams to MediaCityUK (Figure 7.33).

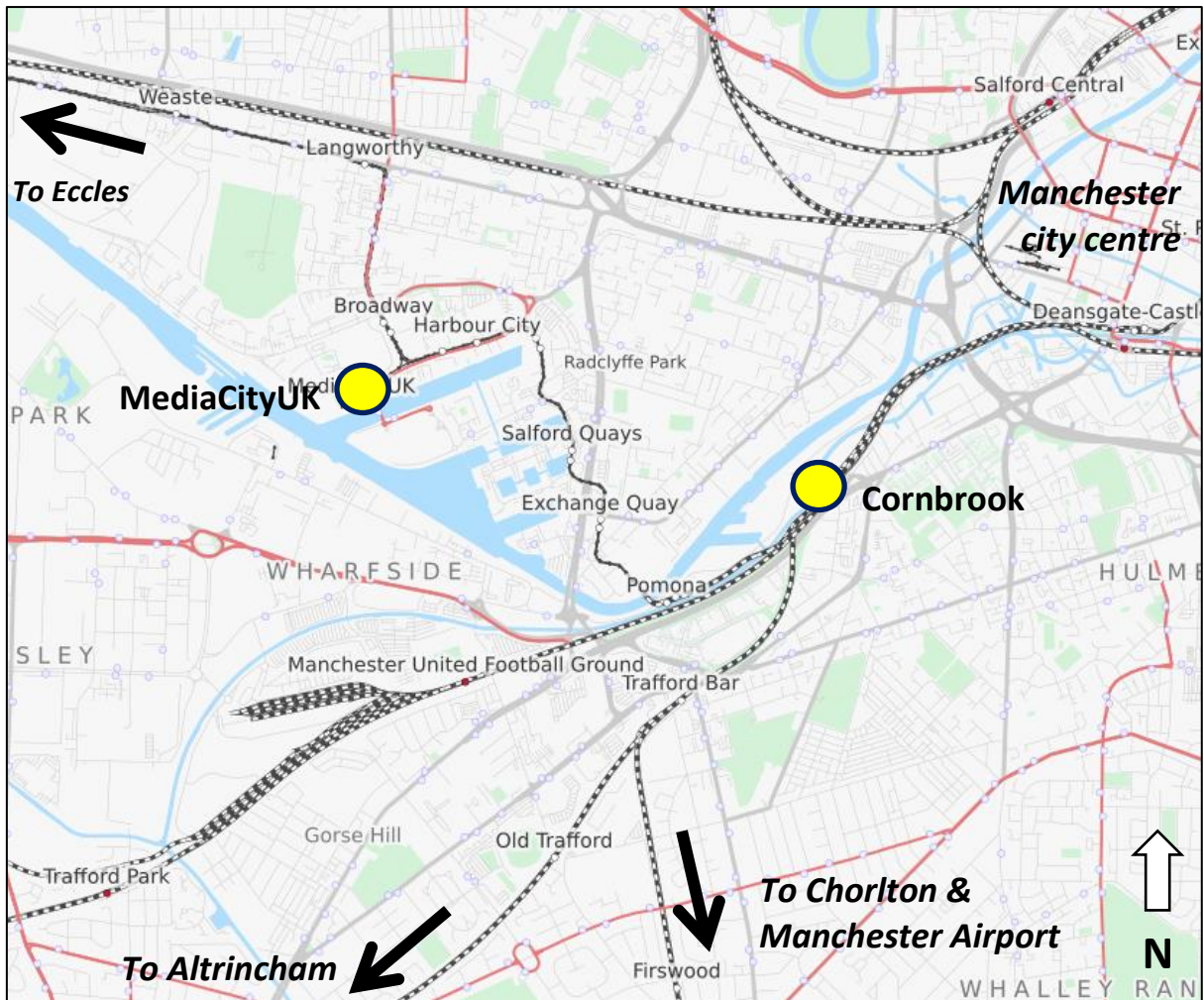


Figure 7.33 – Location of Cornbrook light rail interchange (Source: author's annotation on Open Street Map)

Data from TfGM shows that large numbers of people travelling to MediaCityUK are doing so from stations requiring interchange. It can be seen that 9 of the top 20 origin stations for journeys to MediaCityUK are from stations along the Altrincham and East Didsbury lines and require interchange at Cornbrook (Table 7.30).

Table 7.30 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, journeys stations in bold require interchange* (Source: TfGM)

Origin station	Number of journeys to MediaCityUK
Piccadilly	17,949
Piccadilly Gardens	14,124
Deansgate–Castlefield	7,446
St Peter's Square	6,533
Eccles	4,449
Chorlton	2,603
Cornbrook	2,375
Ladywell	1,786
East Didsbury	1,531
Victoria	1,497
Exchange Quay	1,476
Burton Road	1,447
Altrincham	1,320
Weaste	1,125
Salford Quays	1,093
Brooklands	1,025
New Islington	1,002
Sale	992
Stretford	990
Didsbury Village	989

*= Data is for all users, not just BBC employees

Figure 7.34 displays the trip origins spatially across Greater Manchester showing how many of the origin stations with the highest flows to MediaCityUK are in the south of the conurbation and require interchange at Cornbrook. Figure 7.35 focuses on Manchester city centre and Salford Quays, where the stations with the largest flows to MediaCityUK are displayed.

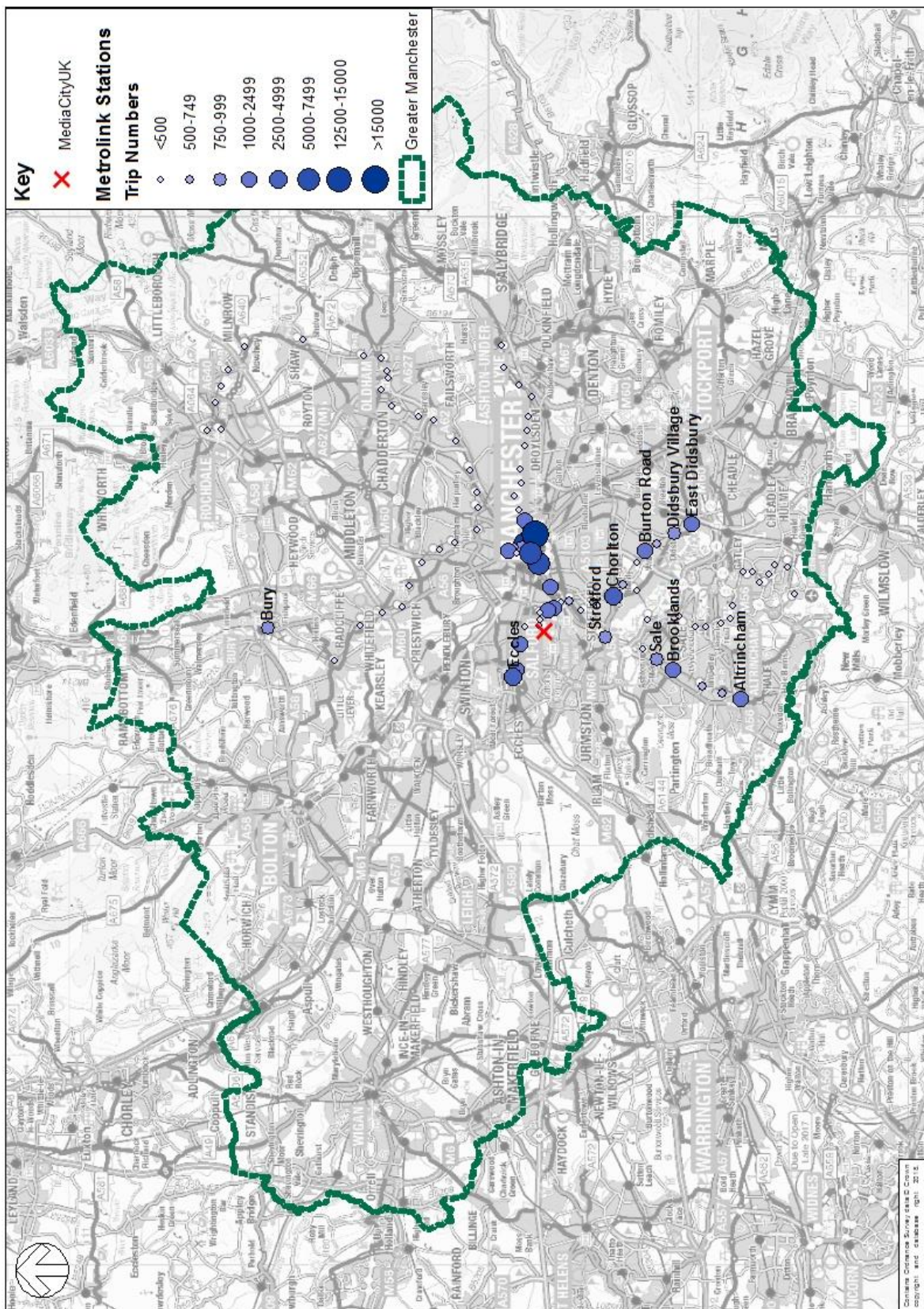


Figure 7.34 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, Greater Manchester area* (Source: TfGM)

Note – only station names of large trip origins are displayed.

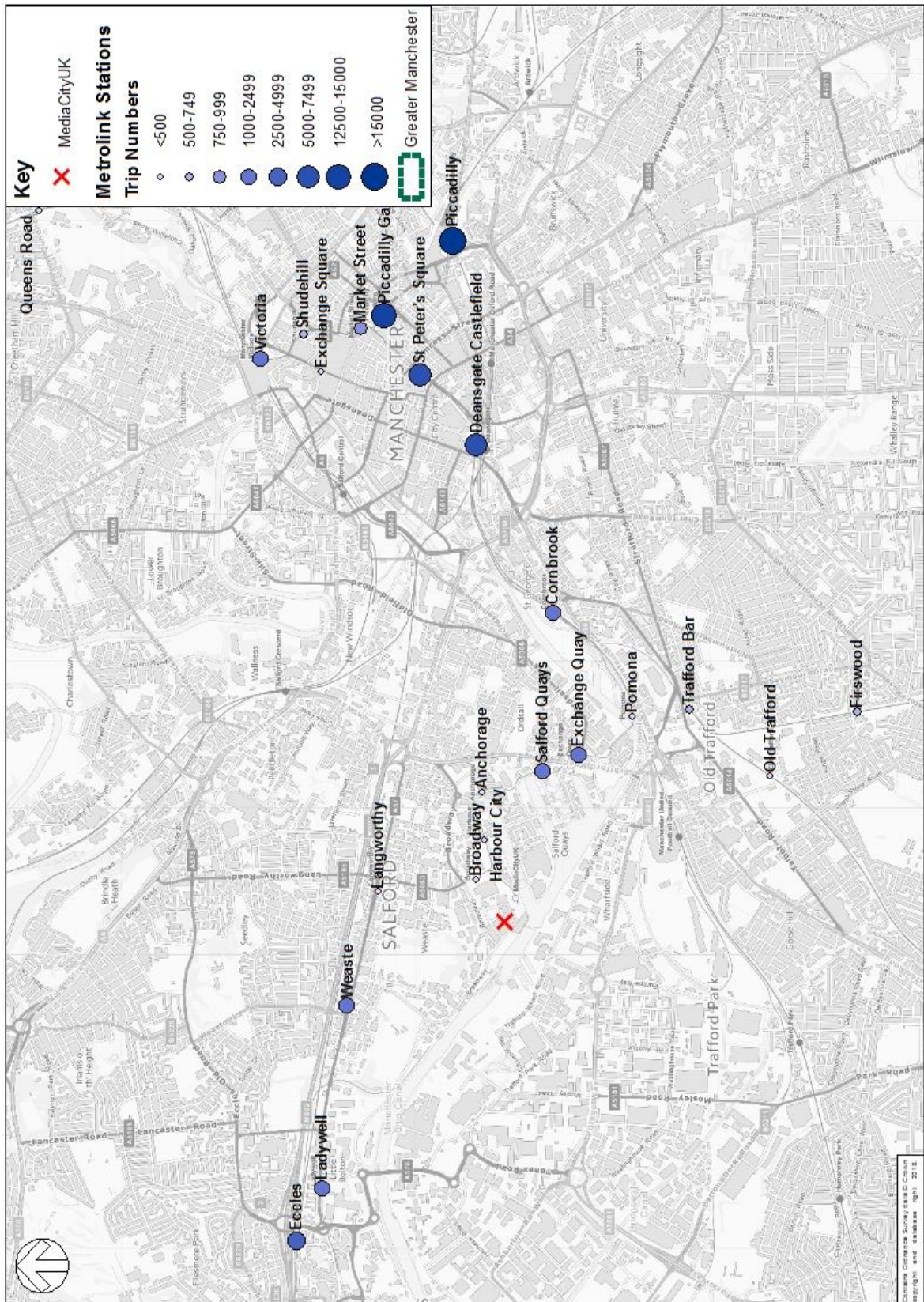


Figure 7.35 – Origin of tram trips to MediaCityUK, Sep–Nov 2016, focus on Manchester city centre and Salford Quays* (Source: TfGM)

The top four origin stations are within Manchester city centre, showing a significant flow of people making the journey from the city centre to MediaCityUK. Piccadilly station is the main origin of trips and we understand from the data from this study that many people are interchanging from local and national rail services to tram to reach MediaCityUK. Even though these stations show a high number of trip origins, this only refers to the tram part of the trip, with many peoples' trips originating at a railway station inside or outside of Greater Manchester.

For people residing to the south and west of the city centre, the interchange requirement at Cornbrook means that they almost travel past MediaCityUK to get another service to take them to it (Figure 7.33). Areas where large numbers of BBC employees live such as Chorlton (Figure 7.28, section 7.5.6), are not far from MediaCityUK. However, the interchange requirement to travel there by tram reduces the attractiveness of this mode. However, it was also noted that cycle and walking rates from locations on the Chorlton line are high (Figure 7.28, section 7.5.6) so people are choosing other sustainable modes to access the site.

An interchange possibility was also created at Salford Crescent, the nearest railway station to MediaCityUK, allowing for interchange from rail services onto a bus service to connect to MediaCityUK (see section 7.2.3.2). However, the interchange arrangement between rail and bus at Salford Crescent is not optimal as the bus stops are not located directly outside of the station and require people to cross the A6 road at which point there are no crossing facilities. As discussed by P06, the route between Salford Crescent and MediaCityUK diverts via Salford Shopping Centre rather than taking a more direct route to MediaCityUK.

“I have tried the bus from Salford Crescent... but that's kind of a quite roundabout route in the middle of Salford.” (P06, male, public transport and cycle)

In the 2010 MediaCityUK Travel Plan survey conducted by Urban Vision, (see section 7.2.5.5) only 9.5% of BBC Manchester staff and 10% of BBC London staff said that they were very likely to use the bus service from Salford Crescent to MediaCityUK. From reviewing the data collected as part of this project, the actual percentage of people who use it would appear to be less. Out of the people who stated rail as their primary mode of travel and therefore had to have used another mode to reach MediaCityUK, 8% stated they arrived at the site by bus, compared to 48% by tram and 44% by walking or cycling.

Monthly patronage data supplied by Stagecoach (operator of the 50 service) shows that approximately 20% of the patronage on the 50 service is trips between Salford Crescent and MediaCityUK (B. Jarvis, personal communication, April 28, 2017); however, this study showed it was not a particularly popular method of connecting to the site. Assuming all 8% of BBC employees interchanging from rail to bus use the 50 service, once per day in each direction for every working day of the month means that 25% of the trips between Salford Crescent and MediaCityUK are by BBC employees. The other 75% is likely to relate to students at the University of Salford having free travel on this section of the route in order for them to study at the University's MediaCityUK campus (University of Salford, nd).

The quotes above provide examples of where the interchange required to reach MediaCityUK was a barrier to them using public transport to reach the site. It was also evident that although the interchange was affecting public transport use, in some cases it was not affecting sustainable travel mode share overall as P12 discusses:

“I know quite a lot of people who get the tram, like from Altrincham to Trafford Bar and walk from there because it just makes loads more sense, because they just feel like they are on the go.” (P12, female, cycle and car share)

The Trafford Bar stop is the one before Cornbrook when coming from either the Chorlton or Altrincham lines and is located approximately 2.3km away from MediaCityUK. Despite this distance, it is apparent that people are walking this leg of the journey rather than waiting for the onward connection at Cornbrook.

Considering the level of public transport accessibility to MediaCityUK within the context of what we understand about urban form (section 2.3.1), it is evident that MediaCityUK is more accessible from certain areas. The transport system enables direct connection to the site from certain areas (e.g. Manchester city centre) and indirect connection from other areas on the rail and light rail network. The reliability of the network has come in for much criticism, as this study has highlighted, but the opportunity is present to reach the site from across the wider conurbation. This was facilitated by transport measures introduced directly to serve MediaCityUK – the tram station and services and the Quayslink then 50 bus service.

7.6.2.2.2 Public transport provision at MediaCityUK

The need to interchange to reach MediaCityUK along with reliability issues was identified in the previous sections as barriers to public transport use. In terms of enablers of public transport use, the proximity of the public transport network to MediaCityUK was seen positively:

P03 talked about how having the tram serve the site directly helped keep his public transport journey time acceptable:

“Yes, definitely, yeah it takes a couple of minutes to change over at Manchester Piccadilly, only have to wait for a tram but then its right next to the buildings at Media City. Two minutes’ walk.” (P03, male, public transport)

P05 also discussed how having the MediaCityUK tram stop made it easy to travel to the site using public transport:

“With the Metrolink stop being right by Media City that made it quite easy to just do train and tram...Yeah, I think the Metrolink stop was a pretty good idea.” (P05, male, car)

In terms of bus services, there were mixed findings regarding what people thought about bus services to the site. Some felt that MediaCityUK was difficult to reach by bus due to limited services or the length of the bus route:

“Bus routes—I don’t think they’ve ever really sorted that out.” (P01, female, car)

“I’ve got the Bus from Manchester to Burnley which was near to where I live once, but in terms of buses (to MediaCityUK) it’s near impossible.” (P02, female, car share)

“So I have tried the bus but that’s kind of quite a roundabout route in the middle of Salford.” (P06, male, public transport and cycle)

Other people were not aware of the services and highlighted how, unlike the tram, which has visible fixed infrastructure, bus services are less obvious and therefore people are less aware of them:

“Whereas with the buses, it’s...obviously the bus stop is over the other side by the Lowry...there is none of that constant reminder that the buses exist, because when, again, when the tram line was closed, I think about three or four days into it, somebody said ‘Oh I got the bus to work this morning’, they were all like ‘There’s buses down here?!’ and then it was just a like a quick reminder that maybe ‘Oh yeah, Media City is served by buses’.” (P14, female, car share)

“I would get a bus, I like buses, I would get a bus if there was one, but I don’t think there is one.” (P12, female, cycle and car share)

The quotes from P12 and P14 above highlight how soft measures around the promotion of the bus services could be improved to increase awareness. Particularly in the case of the P12 who displays a positive attitude towards bus travel and stated they would use a service if there was one that met their travel needs. It is not known if the existing services would meet the requirements of P12; however, this is an example that could be typical of other employees who may be unaware of services that they could potentially utilise. P14 discusses how during the closure of the tramline in 2016 (see section 7.6.2.2.3) awareness of the bus services increased and required people to re-evaluate their travel. While the general promotion of bus services is a key soft measure, during a disruption to other public transport services it is even more important in order to ensure people do not switch to non-sustainable modes in the short or longer term.

It was also found that bus services to the site were well considered with P05 being knowledgeable about the two main services that serve the site.

“(MediaCityUK is) fairly well serviced by buses, you have got the number 50, although it would be better if there was an express one. The X50 of course, which I used to catch, some people may not realise that it’s actually quite close to Media City, drops you off by the Imperial War Museum.” (P05, male, car)

It was noted in section 7.6.2.1.2 that the X50 no longer stops at the Imperial War Museum (approximately 300 metres from MediaCityUK), the nearest stop now is approximately 1km from the site. This increase in walking distance is likely to have impacted on the use of this service as it is beyond the recommended 400 metre acceptable walking distance between a bus stop and trip origin or destination. However, as the changes took place after the data collection, it is unknown if this impact has occurred.

In general, buses appear to play a less significant role than light rail in terms of public transport access to MediaCityUK.

7.6.2.2.3 Public transport reliability issues

The previous section showed how the direct tram network connection to MediaCityUK was seen as positive by employees. However, despite the proximity of the tram stop and connection to the wider tram network, there was significant negativity towards the service. This was highlighted through the comments featured in section 7.5.3 where people

discussed how their actual mode of travel was different to their intended mode due to issues with reliability of the tram network.

As well as general day-to-day delays and issues that occur on any major public transport network, since the relocation to MediaCityUK there have been two significant periods of disruption due to planned construction and maintenance:

- During the main relocation period for BBC staff (2010–12) the Metrolink network was being expanded with Phases 3a and 3b including the construction of lines to Manchester Airport, Didsbury and Ashton and the conversion of Rochdale via Oldham railway line to Metrolink usage (TfGM, 2016a). During the expansion, there were changes to tram routing along with service disruptions due to the implementation of new signalling and points control systems. In addition, the original fleet of trams that had been in operation since the network opened in 1992 were suffering reliability issues and breaking down (Manchester Evening News, 2013).
- In 2016, the Eccles Metrolink line that serves MediaCityUK was closed temporarily for six weeks in order for essential repair work to take place on sections of the track (Peel MediaCityUK, 2016). During this period (planned to coincide with summer holidays) no trams operated on the line to MediaCityUK with a bus replacement service operating instead.

P07 recalls reliability of the tram system during the initial period at MediaCityUK following relocation:

“I remember at the start the trams were really terrible and that’s improved an awful lot, but they were really bad and I felt bad for the people that were relying on them actually to get home.” (P07, female, car)

When the BBC conducted a staff survey in 2012 (see section 7.2.5.5) most comments related to travel concerned the tram system and issues with reliability.

“The site is excellent all round. The only complaint I have is transport. I know this is not directly a BBC issue, but the trams are truly awful.” (BBC survey respondent)

“I love the site and the atmosphere but access to the site by public transport is difficult because of the sheer unpredictability on a day-to-day basis of the tram system.” (BBC survey respondent)

“Travel to the site is not always very easy, with...the trams sometimes slow and unreliable.” (BBC survey respondent)

A common theme through the comments above is how the issues with the tram system appear to be the main downside of working at the site, with people having overall positive views on working at MediaCityUK.

The reliability issues on the tram network affected the confidence people have of using this mode to connect to MediaCityUK. P16 discusses the period issues with tram reliability and how once these occur, the option to use an alternative mode is restricted:

“I prefer not to (use the tram), just because of the number of people who get on it and also because, periodically there would be problems and delays and there was nothing you could do about that and you wouldn’t know how long it was going to take and you would just be sat there for ages.” (P16, male, cycle)

P14 planned to use public transport to travel to site and demonstrated a preference for using tram and train in particular:

“Mostly the tram, kind of a bit of geeky answer, but I love trams and trains, if I get the opportunity to use a tram everyday then that was just amazing. The novelty soon wore off though...having experienced Manchester before moving here, I know the trams very frequently go down and sometimes it’s actually easier and quicker to walk than take the tram in Manchester.”

However, it is evident that the reliability issues affected this preference and they have opted to car share as their main method of travel.

The issue of reliability is exacerbated when people have to interchange to reach MediaCityUK, which as presented in section 7.6.2.2.1 was a concern for people:

“As I say they weren’t frequent enough, they’re too slow and you know they weren’t reliable...you get a tram that doesn’t run followed by a train that doesn’t run and you’re stuck and I think I—I can’t be doing with that now.” (P01, female, car)

For P19 the 2016 disruption added stress to their journey to work due to the increased journey time:

“I found it a bit of a drain; it took quite a long time. There was some upheaval on the tram network as well shortly after I started, which meant I had to get a replacement bus, which I found a bit stressful.” (P19, female, public transport)

The daily journey time unreliability due to the tram disruption, along with the need to interchange, created doubts about working in a non-central location such as MediaCityUK:

“Yeah I kind of started doubting whether I should be working in the location, when I kind of experienced the reality of the daily commute. Yeah it just took a long time. If there is a problem on either the tram or the train then had such a knock on effect that it could kind of ruin my morning or evening.” (P19, female, public transport)

P19 persevered with using public transport but also referred to the possibility of relocating their home in order to have a more favourable journey to work:

“I get the train then the tram, some days its good some days its bad. I have thought about moving because of it, because it’s taking so much time out of my day.” (P19, female, public transport)

7.6.2.3 Cycling

Cycle access to the site is provided by a mixture of on and off-highway cycle routes connecting MediaCityUK with key destinations such as Manchester city centre. New routes, such as along Broadway, were implemented directly because of MediaCityUK being developed and identified as a key strategic employment location.

On site bicycle provision consists of cycle access directly to the main entrance of all buildings on quiet and mostly traffic free roads. Internal and external cycle storage facilities are available with shower facilities also available in the Cycle Hub and in the buildings where BBC employees are based.

7.6.2.3.1 On-site cycle provision

Figure 7.36 displays the level of awareness and uptake of hard measures related to cycling. Previous research has identified how site-level measures such as cycle parking and storage is related to higher levels of cycle use (Bartle et al., 2016).

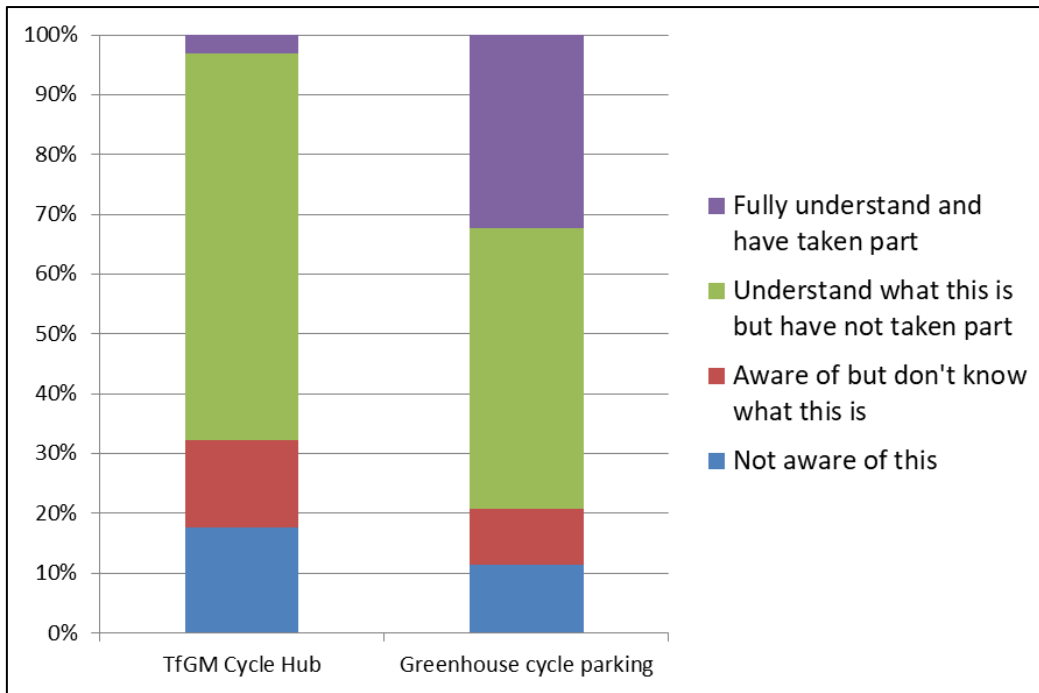


Figure 7.36 – Awareness and uptake of cycle infrastructure measures

The cycling related measures are widely known with between 80%–90% of people being aware of the cycle storage infrastructure. The survey also found that 38.6% of cycle users stated storage and 40.9% stated showers as reasons for cycling to the site. The high level of awareness was demonstrated through the interviewees, with the clear majority discussing the different cycle infrastructure available at the site.

“Yeah, I think there’s a lot of places to put your bike. You can either pay and put it indoors, sort of in an official place, or you can lock it up outside the building and there is always space.” (P10, male, public transport and cycle)

“So they have got, I just chain my bike at the back bridge house, so I don’t use the “greenhouse” thing, maybe I should, but it’s a little bit further to go and I don’t feel like I need to, and they have showers and lockers and stuff on every floor in the BBC, so it’s really good setup.” (P11, male, cycle and public transport)

“And then there’s the—we have a place to lock up our bikes indoors, so that’s obviously encouraging, we use that. There’s showers in the office, about a year and a half ago, they introduced a drying room so you can put your sopping wet clothes in to dry so that’s encouraged, so cycling’s encouraged as much as I can think of really.” (P13, female, cycle)

“There’s a good amount of infrastructure for the cycling, so there’s bike racks pretty much everywhere, there’s also the cycle hub I believe it’s called, that you get passes for at work.” (P15, male, cycle)

“I think they are great, so I use the Hub or whatever it’s called, which I have never had any problems with I think it is excellent. There’s lots of bike racks around but

I don't use them any more since my mates bike got stolen, so I always use the hub." (P18, male, public transport and cycle)

Those that were cycle users understandably talked about the facilities in more detail but there was a level of awareness across users of different modes also. The comments above generally show people are positive about the cycle infrastructure at the site and indeed, more people were positive than negative across all of the interviews. Those that had negative views focused on concerns about security:

"Well the bike parking is absolutely awful. I park my bike now then round – there, but I don't think it is very secure, but there is some kind of indoor parking, but I find, I don't want to go in there, I find that a bit scary." (P12, female, cycle and car share)

"But, initially we didn't have a cycle park here, they were suggesting bikes were left on the racks in the Piazza and it took a while to persuade them that they needed proper closed off parking for bikes if you like." (P01, female, car)

There were also concerns about the number of bicycle parking spaces being insufficient, particularly straight after the relocation:

"I think there was a lot of issues with where you could park bikes and the capacity of bike parking spaces and that sort of thing." (P07, female, car)

There was also evidence of where people had a lack of awareness about the range of cycle infrastructure that was available. P09 discusses how the closure of the Greenhouse cycle park meant that colleagues who cycled in had to use the open cycle stands on the Piazza as they are unaware of the TfGM operated Cycle Hub that replaced the Greenhouse facility:

"But I think, I think the biggest loss in terms of sustainable transport is the cycle hub that I understand is not available anymore. So I know that my colleagues are chaining their bikes up on railing and wherever which obviously is more of a risk and that's not ideal, so I think if, I am surprised that the BBC hasn't thought about that or sorted out some alternative." (P09, car user)

"Well I had heard about the "greenhouse" bike shed thing with secure parking, so I assumed I'd be able to use that and I don't really know how you do it and I haven't used it, so I just park up and lock up outside." (P20, cycle user, pedestrian and public transport user)

"So we have got the greenhouse in Media City where you can lock up your bike which was quite convenient..." (P05, car user)

The lack of awareness of the infrastructure may link to where more is needed from the soft measures in terms of promoting the hard measures available at the site.

7.6.2.3.2 Off-site cycle provision

In terms of off-site cycle provision 15.9% of cycle users (n=37) stated that this was a reason they cycled to MediaCityUK, a lower proportion compared to the on-site infrastructure. Of the non-cycle users (n=212), 11.8% stated that a lack of appropriate infrastructure was a reason they did not cycle along with 13.7% stating safety concerns were a barrier. If cycle infrastructure to the site was improved to make those who considered it an issue switch to cycling it could increase the mode share of cycling significantly. Even if only half of those that stated lack of infrastructure and safety as concerns switched to cycling it would increase the mode share from 14.9% to around 20%. The lack of infrastructure considered safe is an identified issue across the wider conurbation with 77% of people saying safety for cycling needs to be improved and 65% stating that physically segregated cycle infrastructure is needed for them to start cycling or cycle more (Sustrans, 2017).

The view of non-cycle users at MediaCityUK reflects the wider public views on this matter:

“I know one person who does (cycle) that but she’s considerable braver than I am because I wouldn’t cycle on these roads to be honest.” (P01, female, car)

“Since I have become a driver I am not happy about cycling on the roads, which has been, like, getting on for thirty years—over 25 years, and yeah I just don’t feel safe basically.” (P07, female, car)

“I know Manchester are trying to improve cycle routes, I don’t think that would influence me personally, but as I say the cycle routes were just a bit of green paint on the road, there wasn’t any dedicated cycle path, so that may help others.” (P05, male, car)

The literature review highlighted how increasing the destination accessibility of a site through bicycle network provision was important in increasing bicycle use (Beenackers et al., 2012; Monsere et al., 2014; Santos et al., 2013). The findings of this study highlight how a bicycle network with key characteristics such as safe, segregated provision (Hull & O’Holleran, 2014) could increase the destination accessibility by bicycle and potentially increase cycle mode share.

7.6.2.4 Walking

As presented in section 7.2.3.5, pedestrian movement within the MediaCityUK site is given high priority with wide pedestrian routes throughout the site converging on the central Piazza where the tram station is located. A new footbridge was constructed in 2011 to provide access across the Manchester Ship Canal to Trafford Wharf, meeting a key desire

line to the south of the site. The design of the site's urban form aligns with previous research regarding what facilitates walking through reducing the psychological and physiological barriers to walking (Handy et al., 2002).

77.8% of people who walk to MediaCityUK (n=18) stated they did so because they 'live within reasonable walking distance'. The home postcode analysis (Figure 7.28, section 7.5.6) showed that there is a cluster of people who walked to work that resided within the Salford Quays and Ordsall area, within 1km of MediaCityUK. Many of these respondents stated how they live too close to work to consider using other modes, some living within the MediaCityUK site. These findings highlight how the proximity of residential properties within the local area facilitates people walking to the site. The findings link to what has been previously observed in areas with high land use diversity with people more likely to walk (Cervero & Duncan, 2003; Clark et al., 2016; Ewing & Cervero, 2010) while reducing the amount of car use (Chatman, 2003).

7.6.3 Residential location

A significant factor in the relocation of staff to MediaCityUK was that many people were relocating their job from other parts of the country, in particular London. This also meant that their residential location was changing as well as their place of work.

The people who switched to cycling post-relocation all lived within 3km of the site while all those who had switched to walking lived within 1km. This demonstrates the link between residential proximity and mode of travel used following relocation. It was evident that travel to work was a key factor in people's decisions about their residential location following the relocation. Cycle route provision was considered by P06 and the availability of a route from their preferred residential area was key to choosing to live there and cycle to work:

“When I first started working here I lived not too far away in Chorlton and so there was quite not too bad cycle route off main roads between here and there. I originally thought I would live more towards the Oxford Road area of the City Centre, so probably get the tram, but then when I saw this flat in Chorlton and I looked into it and thought it was quite a good cycle route.” (P06, male, public transport and cycle)

A preference to cycle was also stated by P15 with regards to considering future residential relocations based on their experiences of where they currently live and their journey to work:

“I would prefer a place that I would still be able to walk to cycle, that would be most important. Yeah, that’s the main reason, like, if I just move house, I would like a place where I could walk and cycle in, because it’s a good bit of exercise, a lot better than sitting on a bus for however long.” (P15, male, cycle)

The importance of matching residential location to the preferred mode of cycling was particularly evident for P12 who stated how their travel preferences were very high in terms of influencing residential location:

“I’d say, like, pretty high in the top five things we would think about. Yeah, just because of our experience in London and, also, we only have one car, we don’t really want to have any more, and things like that we are quite—it’s not really environmental, it’s just more kind of for our own sort of sanity, it’s quite good to cycle and we realised that and wanted—we sort of built our life around that a little bit.” (P12, female, cycle and car share)

It is evident that this decision was partly based on previous experience of travel, in this case in London, which is looked at in more depth in section 7.7.2.4 on page 210. P12’s requirements concerning cycling extended beyond just the location of the residence to the specifications, emphasising the importance placed on travel to work when choosing where to reside:

“We found a house, where we could store our bikes, you know we kind of really thought about it that much, so yeah it (travel to work) was a big part I would say.” (P12, female, cycle and car share)

The location and accessibility of the public transport network was discussed as being important in terms of where people wanted to live:

“I was specifically looking for a flat close enough to a tram stop that I wouldn’t have to walk miles to get to the nearest tram stop.” (P04, female, public transport and walk)

“Yeah I think that (travelling to work) was key, from Marple where I live, there’s a train 25 minutes into Manchester, 25 minutes on the tram, so about an hour, so door to door travelling.” (P03, male, public transport)

For P18, the choice of residential area was already decided; however, the specific location of their residence was influenced by the importance of wanting to travel using public transport:

“In terms of ‘was I going to live in Whaley Bridge?’, it (travel to work) didn’t influence my choice of house, but you know I can remember having a spread sheet with all the different houses or places that we might potentially live and having a spread sheet with distance to railway station, time from railway station to Piccadilly on there, so it was very important.” (P18, male, public transport and cycle)

It was also evident that for some people, the relationship between travel behaviour and residential location was the other way around with people’s travel influenced by where they chose to live. For P02 the choice of residence was more influenced by the desire to live in a more rural location with the acceptance that this would require motor vehicle travel to get to work. As such, a home located near to the motorway network was a key requirement:

“The house that we bought was near a motorway so that was factored in because we knew that we would likely travel to Salford a lot...so we chose a town which while quite far away unfortunately, in terms of getting on the motorway and gaining access to that speedily that was a big factor in why we chose where we chose to live.” (P02, female, car share)

Sections 7.5.3 and 7.5.4 looked at the differences in intended and actual mode of travel as well as changes over time since the initial relocation to MediaCityUK. It was evident that attitudes towards where people chose to live changed following relocation. For P13 there was an initial preference to reside in a countryside location based on their previous experiences of living in this type of environment. However, the non-central location of MediaCityUK meant that their public transport journey was longer than they hoped and this affected their plans to live in such a place:

“Well I was planning to move to a similar place that I had been living, which would be the countryside. I was hoping for another train commute for a bit to be a lot shorter, but because of where Media City is located, i.e. not Central Manchester, that extra half hour on the tram made the commute look actually longer than I’d really hoped it to be.” (P13, female, cycle)

Their search for a suitable residential location was influenced by the desire for a shorter public transport journey but they felt the public transport network was limited and this was potentially going to result in them driving:

“I’d considered looking, I had looked at places North of Media City, which would take me to in the Bolton direction, so I’d looked at that, but, the train connection didn’t look quite so good, so I was considering like would I drive in? I was surprised actually that the train network was not quite so good and lots of people drive and I was surprised because I didn’t want to be driving.” (P13, female, cycle)

With their preferred residential location not resulting in a suitable journey to work, P13 reviewed their options and ended up living within the conurbation and opting to cycle to work:

“When I had done the six months trial and I had found what an easy cycle ride it was from the friends I was staying with, that’s when I changed my plan from being in the countryside to actually, I’d like this cycle to work.” (P13, female, cycle)

“So the combination of property being a lot cheaper in Manchester and you get a lot more space for your money combined with not wanting to commute, was why I ended up living in South Manchester actually and not living out in the countryside, so that was a massive influence on now a 20 minute cycle ride.” (P13, female, cycle)

Their negative experiences of travel using their planned mode (public transport) following relocation resulted in a re-evaluation of travel as a key factor in residential choice.

“That was a big change from what I had anticipated, so I think the quality of life around the time spent commuting was practically a number one, number two priority.” (P13, female, cycle)

“That (travel to work) was pretty high to be honest because I think if it wasn’t as high as it was we would be living in the countryside right now.” (P13, female, cycle)

The relocation had also changed the outlook on travel options. For P14 this meant being able to consider living further away than they initially thought because they felt MediaCityUK was well connected to public transport:

It’s definitely given me more options that’s for sure, because I have worked in various cities across the country and I have always looked at houses near the workplace, within like, I would say about a 45 minute maximum walking distance, but because I had already had experience with Manchester and the tram system before moving here, I could start looking a bit further out because I knew there was an almost reliable mode of transport to and from work.” (P14, female, car share)

There was evidence how the relocation to MediaCityUK and their residential location had changed views towards travel rather than them changing travel to match their attitude:

“I think I’ve probably changed my views in that sense in that I’m kind of one of these long-distance commuters now you know, so I think it just changes your mind set as to how close or how far you are from your work and how that determines what transport you do basically.” (P08, male, car)

P08 identified themselves as a long-distance commuter (living 40 miles from MediaCityUK) and used car as their primary mode of travel. They had looked at public transport options

for the journey but not wanting to relocate residentially, they had adapted their method of travel around their residential-work travel.

Factors outside of personal preferences for places to live or ways to travel were also identified as being key to residential location. The work location of other family members was discussed:

“My wife has job in Sheffield, so that’s why we have ended up staying in Sheffield for now, and she has had that job for 10 years, so, for the time being we decided we would stay in Sheffield.” (P10, male, public transport and cycle)

7.6.4 Summary

The findings of this study highlighted how the MediaCityUK benefits from having a high frequency public transport service directly serving the site. The light rail network provides connectivity across the Greater Manchester region and links the site with the regional and national rail network.

However, two types of public transport interchange are resulting in negative attitudes towards the provision. Light rail-to-light rail interchange is required to reach the site from several areas of Greater Manchester, in particular, areas to the south and west of the conurbation where a high proportion of BBC employees reside. The interchange penalty is resulting in negative attitudes towards the light rail service and was resulting in people driving rather than incurring waiting time because of the interchange. The second type of interchange is rail-to-light rail, predominantly taking place in Manchester city centre where people alight rail services and board the tram to MediaCityUK. The interchange penalty again acts as a barrier to further use of public transport to MediaCityUK. It was noted that the issue is particularly heightened for those previously based in Manchester city centre as their previous travel to work may have only consisted of a rail or light rail journey without interchange as the city centre is the regional transport hub. Since relocating to MediaCityUK, they now have to incur a further public transport leg to their journey, adding further time and uncertainty due to the need to interchange and potentially extra costs.

In addition to interchange penalty encountered accessing the site for many employees, there were also long periods of disruption on the light rail network following relocation. The expansion of the tram network, signalling issues and a complete closure of the line to MediaCityUK for maintenance all had negative impacts on people’s attitudes towards

public transport. The issues with the tram services were identified as a principal concern among employees when they were asked about working at the site shortly after relocation. The issues had resulted in people reconsidering their travel behaviour to the site, with some switching to private motor vehicle use after initially intended to travel by public transport. The various issues with the tram network during and post-relocation hindered the planned sustainable transport intervention (tram extension and MediaCityUK stop) from achieving its full potential. However, it must be noted that the mode share of 17.7% is significantly higher than the local area (5.7%) and above that of the regional centre (11.1%) so the tram network is playing a key role in the sustainable mode share for journey to MediaCityUK.

While people were switching away from public transport following the relocation, not all of the mode shift was towards private motor vehicles. Employees were observed travelling by bicycle that had travelled by public transport to their previous place of employment. It was also found that people who had using public transport initially after relocation had also switched to cycling, in some cases for reasons due to reliability and journey time.

It was evident the on-site cycle infrastructure, such as storage and shower facilities, was positively viewed by employees and facilitated travel to the site by bicycle from the outset. The off-site infrastructure, in terms of cycle routes to the site, was supporting a high level of cycle use (14.9%), significantly higher than regional (1.7%) and national (3.0%) averages for cycle mode share. However, it is also identified that cycle infrastructure across the local area needs investment in order for cycling to realise its full potential, particularly for journeys of up to 5km. The fact that cycling had a high retention rate following relocation and increased its mode share from 10.0% to 14.9% indicates that the infrastructure planning for cycling was effective. The existing base of cycle use provides an excellent foundation from which to increase the share of this mode further should the wider cycle network be enhanced. If the cycle network improvements are achieved then cycling can provide a competitive option for people currently driving to the site, particularly those who live within 5km. The positive attributes of cycling, such as it being low cost, having reliable journey times and being supported at MediaCityUK in terms of infrastructure offer considerable potential should the principal barrier to utility cycling of perceived and actual safety be removed.

7.7 Non-spatial influences on travel behaviour

7.7.1 Introduction

Following on from the previous section that looked at the spatial or hard influences on travel behaviour, this section focuses on the non-spatial or soft influences that emerged from the data.

7.7.2 Attitudes and preferences

The attitudes that people had towards different factors related to travel had an influence on their travel behaviour. This section analyses the factors that emerged from the data as having an impact in the present but also how previous experiences has resonance with current behaviour.

7.7.2.1 Cost

The main cost-related influence on travel behaviour was that of public transport ticketing and fares, which were repeatedly stated as reasons why people switched to car or bicycle. For P09, the cost of purchasing a ticket for both train and tram was prohibitive to using the mode and they were now opting to use the car as their primary mode:

“I realised that not only was the journey very expensive on the train and the tram, so it’s nearly £900 for a train ticket, £560 for a Metro ticket per year.” (P09, female, car)

“I have also worked out that driving and parking at MediaCity is cheaper than travelling by tram.” (BBC survey respondent)

“Train/tram journey unreliable, expensive and took on average 1hr 45 mins, as opposed to 45 mins in car.” (BBC survey respondent)

“Bike is quicker than tram from City to MCKU (walking was quicker than tram sometimes!), tram is far too expensive for distance travelled.” (BBC survey respondent)

P06 also discussed how when using public transport the lack of flexible or integrated ticketing means that they have to pay for individual journeys:

“I suppose the buses in the Huddersfield end are pretty good, pretty frequent, the main problem around that is ticketing, because I don’t use the same mode all the time I end up paying for lots of singles which is not—it just adds up...It’s just trying to work out what the cheapest option is when you have got a few different modes of transport to use can be a bit complicated.” (P06, male, public transport and cycle)

The quotes above show that the issues with the cost of public transport relates to the issue of interchange. Due to the nature of public transport operations in Greater Manchester, there is currently no collective ticket for using bus, train and tram. Indeed, in the case of bus, separate tickets are required when using the same mode as there are multiple operators in the region.

It was also highlighted that even when using the bus on its own the cost of travel was higher than London where P12 was drawing from previous travel experiences:

“The bus in London was a quid, but it’s not here, but yeah, if the buses here were like the buses in London, I think we would use then all the time.” (P12, female, cycle and car share)

Cost as a reason for using a particular mode was most significant with cycling where 73.0% (n=37) of cycle users stated that cycling cost less than other modes with 70.3% stating costs associated with parking and vehicle operation as the main reason for not using a car.

7.7.2.2 Journey time reliability

The issues around public transport interchange and reliability have been well established in previous sections. It was evident that for many people having a reliable journey time was an influencing factor on their travel behaviour and as previously highlighted, it has resulted in people switching away from public transport. It is also evident that people are not travelling by car for similar reasons, with bicycle use being identified as a way of having more reliable journey times:

“It's sometimes quicker to cycle and also because parking charges are high.” (Anonymous survey respondent)

“The tram was taking a long time, costing a lot and was unreliable.” (Anonymous survey respondent)

“(Cycling has) more predictable travel times than trams.” (Anonymous survey respondent)

The reliable journey times experienced while cycling are an identified strength of this mode as it is not hindered by traffic or wider network issues that can disrupt private motor vehicle or public transport journeys.

For some people, the bicycle journey was not only more reliable, it was quicker than using other modes.

“Bike is quicker than tram from City to MCUK (walking was quicker than tram sometimes!).” (Anonymous survey respondent)

“Tram took too long. Often 45+ minutes, whereas the cycle can be as little as 15 minutes.” (Anonymous survey respondent)

The spatial analysis in section 7.5.6 showed how a cluster of people lived 3-5 km away in places such as Chorlton; however, they had to interchange to reach the site by light rail. Again, as previously highlighted, the interchange penalty was having a considerable impact on attitudes towards public transport. The quote above highlights the difference that the interchange causes to public transport journey times compared to a direct route.

7.7.2.3 Health and environment

The active modes of walking and cycling offer the significant benefits to the user in terms of health (Garrard, et al., 2012; Martin et al., 2014) and to the wider environment (Lindsay et al., 2011; Woodcock et al., 2007). 68% (n=37) of cycle users and 38.9% (n=18) of people who walked stated that health benefits were a reason for doing so. While cost and journey time were the main reasons for cycling and distance to home the main reason for walking, attitudes toward health and the environment were also supporting factors.

“I’d much prefer to do that (cycle), it’s better for the environment...It’s nice to get some exercise every day. So if you cycle along the Mersey, along the Bridgewater Canal, it’s just like being out in the countryside, so it’s really nice.” (P11, male, cycle and public transport)

“I like to cycle, it's better for the environment and for my fitness.” (Anonymous survey respondent)

“Car or tram are no quicker than cycling, so I'd rather take the cheaper healthy option.” (Anonymous survey respondent)

It was also identified that environmental concerns were a particular attitudinal factor in some cases, with P18 demonstrating a high level of awareness of environmental impacts of cycling compared to car use.

“I cycle past all these people sitting in cars, there is one person in a car, bumper to bumper, nitrogen dioxide coming out and sulphur coming out the back of their....and that makes me feel very, very sad, and I just think there’s got to be a better way.” (P18, male, public transport and cycle)

7.7.2.4 Previous travel behaviour and experiences

The literature review found that previous travel behaviour was found to be an indicator of current travel behaviour (Dargay & Hanly, 2007; Thøgersen, 2006) how behaviours learnt

in the past may have a strong influence on current behaviours following a relocation (Clark et al., 2016).

This research sought to understand whether the differing experience of travel among BBC employees to their previous place of work had an influence on the attitudes and preferences they had about their current travel behaviour. As such, the research looked at the influence of previous travel behaviour at an aggregate and individual level. As presented in the Research Design chapter and the introduction to this chapter, the aggregate data was gained using a survey and was followed up with semi-structured interviews of a smaller sample.

As previously highlighted, the MediaCityUK survey sample can be divided into sub-sectors based on where people were previously employed. When the initial relocation was complete circa 2012, the BBC workforce could be roughly divided into thirds based on previous workplace: BBC London, BBC Manchester and everywhere else. Table 7.31 presents the pre and post-relocation mode share from the 2014 survey conducted for this research for each of the sample sub-sectors.

Table 7.31 – Pre and post relocation mode share by sub-group

Mode	Mode share (%)								
	BBC London (n=49)			BBC Manchester (n=90)			Elsewhere (n=110)		
	Pre	Post	Diff	Pre	Post	Diff	Pre	Post	Diff
Bus	4.1	8.2	+4.1	14.4	5.6	-8.8	14.5	2.7	-11.8
Car	8.2	28.6	+20.4	26.7	42.2	+15.5	31.8	39.1	+7.3
Car sharing	0.0	4.1	+4.1	5.6	7.8	+2.2	3.6	5.5	+1.9
Cycle	6.1	16.3	+10.2	14.4	17.8	+3.4	8.2	11.8	+3.6
Train	22.4	8.2	-14.2	18.9	8.9	-10.0	11.8	11.8	0.0
Tram	n/a	26.5	n/a	10.0	11.1	+1.1	2.7	19.1	+16.4
Underground	55.1	n/a	n/a	n/a	n/a	n/a	8.2	n/a	n/a
Walk	4.1	8.2	+4.1	8.9	3.3	-5.6	16.4	10.0	-6.4
Motorcycle/scooter	0.0	0.0	0.0	1.1	2.2	+1.1	0.0	0.0	0.0
Taxi/other	0.0	0.0	0.0	0.0	1.1	+1.1	0.0	0.0	0.0
Worked at home	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	-2.7

Section 7.5.2 looked at whether there was a significant difference between the pre and post-relocation mode share for each of the sub-groups. The findings showed that there

was significant difference in the pre and post-relocation modes shares for some modes and for the sustainable mode share overall.

In order to explore if the previous place of work had an influence on the current mode of travel, a cross tabulation test was conducted to see if employees' previous place of work and their primary mode of travel to MediaCityUK were independent of each other or not. In other words, did previously working in London, Manchester or elsewhere relate to the mode used to travel to MediaCityUK?

Table 7.32 shows that with a chi-square (χ^2) value of 5.27 with an associated p-value of 0.2605 there is no relationship between previous place of work and current mode of travel.

Table 7.32 – Cross tabulation of previous workplace with primary mode of travel to MediaCityUK (smaller frequencies have been combined)

		Primary mode of travel to MediaCityUK				Total
		Public transport	Cycle or walk	Car (as driver or passenger)		
Previous place of work or study	BBC - based in London	Count	21	12	16	49
		Expected	16.1	11.0	22.0	49.0
	BBC - based in Manchester	Count	23	19	45	87
		Expected	28.7	19.5	39.0	87.0
	Other	Count	37	24	49	110
		Expected	36.2	24.6	49.2	110.0
Total		Count	37	55	110	246
		Expected	37.0	55.0	110.0	246.0

$\chi^2=5.27, p=.2605$

Despite there being differences in the urban form and transport accessibility at the different places people worked prior to relocation, these quantitative findings surmise that regardless of where people previously worked, at an aggregate level there is no significant relationship to mode choice to the current workplace.

However, when looking at the qualitative data from the individual cases within this study, there is evidence of people talking about how their previous experiences still resonate with current travel behaviour. The two examples below discuss how experiences of cycling in London, both positive and negative, have influenced their current mode use:

“I used to live in London and I cycled about the place then, so I kind of have always been used to cycling as a method of commuting.” (P13, female, cycle)

“I would never have cycled in a million years in London, I’d have been absolutely petrified, and then even in the City Centre it’s not that pleasant, so it has changed in the sense of I now use a mode of transport I never would have thought I would and it’s saved me a lot of money actually doing that and it would be much more of a consideration in future if we moved somewhere else I’d say.” (P12, female, cycle and car share)

The expectations of the public transport network at the new location were related to experiences of using public transport modes when travelling to the previous place of work. The high frequencies of services within urban centres like central London and Manchester being notably different from what is available on the light rail network at MediaCityUK was discussed by P12.

“And even then I’m ‘argh, just missed one’, that 12 minutes, which feels like quite a long time. You know in London, you like, four minutes, three minutes and you think like “Oh that’s ages” and so, here you kind of have to be a bit more relaxed but even then you think, if you knew, like on Oxford Road (Manchester), if you stood there and knew a bus was coming (due to high frequencies) and you could just jump on it, you would.”

It was found in section 7.5.2.2 that 71.4% of underground rail users in London used tram as following relocation. The comments of P12 pick up on the differences between the mass transit systems in London and Greater Manchester that would have been experienced by people relocating from London.

Although a key destination station within the light rail network, the MediaCityUK stop is not located on a section of the network with multiple services so the overall frequency is lower. This links to the non-central location of that station, compared to those within the city centre zone, which have frequencies comparable with what the interviewee talks about in London.

The non-central location of the site had affected what P19 was thinking in relation to an acceptable journey time for travelling to work. When considering their expectations of the public transport trip to work, their previous experiences had shaped their thinking in terms of an acceptable travel time.

“So I think when I last looked at changing jobs, commuting for an hour seems fine, now that I am actually doing that I am realising that a lot of the time because of the unreliability of the transport it actually takes more than hour, so that’s actually

more physically draining than you expect it to be even though you have sat on public transport. I think I would try and reduce my commute drastically next time, if I was still living in the same location I would be looking to work in the City Centre rather than getting two modes of transport, because it's just the connecting up can cause so many problems." (P19, female, public transport)

The quote shows that the reality of the journey does not meet the expectations due to how the interchange penalty adds unreliability to a journey that had planned to take an hour. The need to change modes to reach MediaCityUK is prolonging this journey sufficiently for them to state they would only consider working in the city centre should they move jobs. The quote links to the literature in terms of what Milakis et al. (2015) defined as people having an 'acceptable travel time', beyond which the total utility of travel decays and they become dissatisfied with their travel to work. A 60 minute duration for the public transport trip is seen as acceptable for P19, aligning with literature on acceptable public transport travel times (Milakis & van Wee, 2018). The quote from P19 gives an example of where expectations of the journey to work, linked to previous experiences, are not being matched by reality due to the non-central location of the new workplace.

The excerpts from the interviews demonstrate cases of where peoples' previous experience of travel, both positive and negative, is influencing their current travel behaviour. There is also evidence of how the reality of the post-relocation travel situation does not meet the expectations or the previous experiences in some cases.

7.7.3 Socio-demographics

Of the influences on travel behaviour identified through the literature review, socio-demographics are an element that a large-scale workforce relocation cannot change but which provide a context within which people make their travel choices. It is, however, important to understand how socio-demographics affect travel behaviour in order to develop measures that may be targeted towards certain demographics during a relocation.

7.7.3.1 Gender

Table 7.33 displays the mode share by gender and overall a higher share of males travel by sustainable modes than females (68.3% to 56.0%). Males are more likely to travel by public transport, in particular rail where 19.4% use this mode compared with 4.0% of females. More males also travel by bicycle (20.4%) than females (11.3%). However, as highlighted in section 7.5.5, the bicycle mode share at MediaCityUK is above average so the mode

share of females, while lower than males, is considerably larger than the local or national average.

Further to the descriptive analysis, Table 7.34 presents a chi square test for the independence of gender and primary mode of travel to determine any statistical relationship between the two variables. Cycling and walking have been grouped for this test, as have all public transport modes, to combine small numbers in some of the cells.

Table 7.33 – Mode share by gender

Mode	Mode share (%)		Significant difference (0.05 significance level)		
	Males	Females	Y/N	Z	p
Car	29.6	44.0	Y	-3.3	0.0009
Car sharing	2.0	8.7	Y	-3.3	0.0009
Public transport	40.8	27.3	Y	3.2	0.0015
<i>Bus</i>	<i>4.1</i>	<i>5.3</i>	<i>N</i>	<i>-0.6</i>	<i>0.5287</i>
<i>Train</i>	<i>19.4</i>	<i>4.0</i>	<i>Y</i>	<i>5.4</i>	<i>0.0000</i>
<i>Tram</i>	<i>17.3</i>	<i>18.0</i>	<i>N</i>	<i>-0.2</i>	<i>0.8415</i>
Cycle	20.4	11.3	Y	2.8	0.0054
Walk	5.1	8.7	N	-1.6	0.1141
Motorcycle/scooter	2.0	0.0	Y	2.2	0.0251
Sustainable modes	68.3	56.0	Y	2.8	0.0047
Non-sustainable modes	31.6	44.0	Y	-2.9	0.0044

Table 7.34 – Cross tabulation of gender and primary mode

		Primary mode of travel			Total
		Cycle or walk	Public transport	Car (as driver or passenger)	
Male	Count	25	40	31	96
	Expected	21.5	31.6	43.0	96.0
Female	Count	30	41	79	150
	Expected	33.5	49.4	67.1	150.0
Total	Count	55	81	110	246
	Expected	55.0	81.0	110.0	246.0

$$\chi^2=10.04, p=.0066$$

The result of the test shows that there is a relationship between gender and mode of travel ($\chi^2=10.04$, $p = 0.0066$). Using the interview to explore the themes as to why there is a gender difference in relation to mode choice, references to concerns over safety were noted by females when using non-car modes for part or all of a journey:

“I don’t feel particularly safe off campus and I don’t know the area well enough to be confident that I’m parking in a safe area.” (P01, female, car)

In the case of P13, concerns over travelling alone influence route choice rather than to travel by bicycle:

“In the winter when it’s dark, it’s might not feel safe” (to be cycling alone on certain routes) (P13, female, cycle).

The same issues were not discussed by any of the male interview participants indicating that they are not affected by them or are less forthcoming about discussing them as reasons for not using active modes.

The findings of this study align with some of the literature on gender and mode choice, for example how gender can be a determinant of mode of travel with females more likely to travel to work by car than males due to concerns over safety when travelling alone (Dickinson et al., 2003). However, other literature found how the majority of consistent users of sustainable modes were female (Prillwitz & Barr, 2011).

Despite this current research finding that a higher proportion of females used non-sustainable modes following relocation compared to males, the literature also revealed how females have a greater acceptance of the measures to reduce car use (Polk, 2003). This indicates that the gender where greater modal shift is required is also the gender that will be more receptive to measures aimed to encourage and facilitate sustainable travel. This offers a potential opportunity in terms of targeting this particular group for specific measures during a relocation.

7.7.3.2 Age

The modal group proportions for each age group are displayed in Figure 7.37.

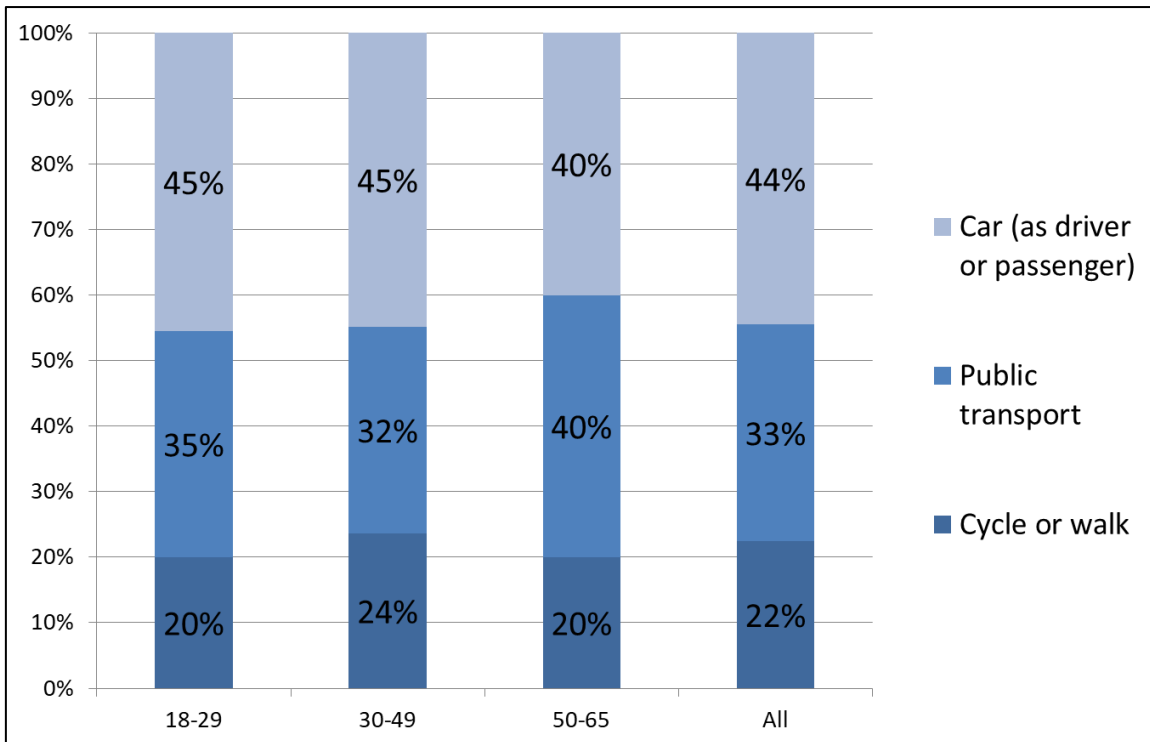


Figure 7.37 – Age and primary mode of travel

Cycling and walking were slightly higher in the 30-49 age group while the highest share of public transport use was among the 50-65 age group. The 18-29 and 30-49 age groups had shares for car that were closer to the sample mode share of 44.2% than the 50-65 age group.

To explore if there was a statistical relationship between age and primary mode, a chi square test was undertaken. Again, the active travel modes and public transport modes have been grouped and car driver and car share have been combined.

Table 7.35 – Cross tabulation of age and primary mode

		Primary mode of travel			Total
		Cycle or walk	Public transport	Car (as driver or passenger)	
18-29	Count	11	19	25	55
	Expected	12.4	18.2	24.5	55.0
30-49	Count	39	52	74	165
	Expected	37.0	54.6	73.4	165.0
50-65	Count	5	10	10	25
	Expected	5.6	8.3	11.1	25.0
Total	Count	55	81	109	245
	Expected	55.0	81.0	109.0	245.0

$$\chi^2=0.97, p=.9148$$

With a p-value of 0.9148, age and primary mode are independent of each other with no relationship present in the sample. These findings differ from what was found in the literature where persistent and frequent car users were most represented in middle-age groups (Jan Prillwitz & Barr, 2011). Within the sample utilised for this current research there is no clear representation in any of the age groups.

7.7.3.3 Household type

The literature found that households with children had a positive association with car use and a negative association with public transport for the journey to work (Chen et al., 2008; Dargay & Hanly, 2007; Ryley, 2005). The need to pick up and drop off children on the way to and from work was an important reason behind higher car use in households with children (Castellani et al., 2016).

29.5% (n=95) of car users (as drivers) stated that needing to drop off/pick up children as a reason why they drove to work. The need to pick up a child as a reason for using car to travel to work was discussed by P01 and that the convenience of having a car to perform this task is more important than having to pay the daily parking charge:

“So for convenience, for the fact that I’m usually rushing when I leave work to pick up my son or get somewhere to meet him somewhere I’m not—convenience is more important than money at that point.” (P01, female, car)

With approximately one-third of car users needing to fulfil this task as part of their journey it potentially limits the proportion of car users who may be facilitated to use sustainable modes, should they have a desire to. In terms of the journey to MediaCityUK, it may not

the sustainable travel infrastructure or services that are limiting their sustainable travel use, it could be the infrastructure and services to/from their children's school.

It was also observed that despite having to manage childcare logistics when travelling to and from work, it was not always resulting in people driving. P06 discussed how the journey to work involved dropping a child off before travelling on a multi-mode journey by public transport and bicycle.

“Now our son has a child-minder that live nearby where we moved to first, so I usually do the same sort of thing, but the chances of me missing my normal train are a lot higher so if that happens I sometimes go to Piccadilly, or Oxford Road and cycle from town out, or sometimes get the Metrolink.” (P06, male, public transport and cycle)

Through further discussion, it was found that P06 was undertaking these arrangements within the context of a wider plan around the relocation of not just their job but also their spouse's job. Their residential location was chosen based on both of their journeys to work taking into consideration that they only wanted to maintain one car in the household. P06 did not have access to the car for travelling to work but this was a conscious decision related to attitudes about experience of driving to the new workplace:

“I definitely didn't want to be driving down the M62 every day.” (P06, male, public transport and cycle)

The decision was also based on an outlook established at the previous location in terms of only maintaining one car in the household:

“Not having to run another car.” (P06, male, public transport and cycle)

P18 was another case where they were managing the drop off of children without using a car for their journey to work. Like with P06, P18 displayed a negative attitude towards the use of a car for travelling to work alongside positive attitudes towards sustainable modes, in their case a multimodal trip of bicycle and public transport.

“I know that I can cycle just as quick as I can get on the tram, and for me, it's cheaper, it's healthier, and it's lower carbon, so it's a no brainer. Have never driven to work once and I never will, I haven't got a car, I have no intention of driving, it's just not a smart way to travel, as far as I am concerned.” (P18, male, public transport and cycle)

7.7.4 Job requirements

7.7.4.1 Working hours

The nature of the BBC as a 24-hour organisation makes job requirements related to start and finish times a key factor in influencing peoples travel behaviour. 29.5% of car users stated that they drove due to having to start or finish early/late. Meanwhile, it was evident that identifying a typical primary mode was difficult for some employees due to the varying nature of their working pattern. An example work and travel pattern of an employee based in news operations highlights the impact of working patterns on mode use:

“Early shift - either drive each way, or cab in and a lift home from the Mrs. Day shift - either drive each way or cycle (weather dependent. Late shift - drive each way or lift/cab. I also know colleagues who get a cab in for an early with the bike in the back for the return journey.” (BBC News Production employee, personal communication, June 12, 2014)

Starting or finishing outside of daytime hours does not affect cycling or walking in the same way as public transport because these modes are not dictated by timetables. However, people were not using these modes when working early or late due to safety concerns of travelling in darkness with little other traffic around. P12 discusses how depending on working hours, their mode choice was different with late finishes resulting in car use:

“(I) sort of settled into a routine of driving if I was finishing late and cycling if I was on a sensible daytime pattern, or walking in and taxi home.” (P12, female, cycle and car share)

This links to what was found from previous research about the impact of travel outside of core working hours and bicycle use (Gatersleben & Appleton, 2007; Heinen et al., 2013). P12 also discussed how a taxi home was provided if required when people were finishing late. This use of a car mode for the return trip helped facilitate use of walking for the trip to work because P12 knows they have an option to get home without needing to drive in unnecessarily.

7.7.4.2 Working location

As well as requirements around start and finish times having an impact on travel behaviour, the option to have flexible patterns also influenced travel behaviour. 79.0% of employees stated that they travelled to MediaCityUK five or more days per week (Table 7.36), representing a significant majority of people travelling to the site every day of a typical five-day working week.

Table 7.36 – Days travelled to MediaCityUK per week

Days travelled to MediaCityUK per week	%
1	0.4
2	2.4
3	4.4
4	13.7
5	79.0

22.1% of people stated that they worked off-site or at home during a typical week with the majority 67.3% of those working away from MediaCityUK one day per week.

Table 7.37 – Days working at home or off-site per week

Days working at home or off-site per week	%
1	67.3
2	20.0
3	9.1
4	1.8
5	1.8

P18 discussed how the option to work from home reduced the amount of travel they were required to do related to getting to work:

“Typically I am in here two days a week, sometimes three, sometimes four, sometimes none, but typically I would say I am in here two and half days a week and then yesterday I was in London, tomorrow I am going to be working from home, so every week is slightly different.” (P18, male, public transport and cycle)

The opportunity to work from home is supported in some areas but is perhaps not occurring as much as it could be and is dependent on arrangements within individual teams:

“Well within my team, it’s (teleworking) completely encouraged, you know, it’s more effective for the BBC, it’s, I believe, it’s more productive, it’s lower carbon if it ultimately leads to smaller buildings, improves work life balance which will increase productivity, so for me it’s a complete “no brainer”. In general I would say in theory it’s widely supported in practice, you see very little reference to it.” (P18, male, public transport and cycle)

“They do allow you to work from home if there is any sort of emergencies or anything like that then there’s no qualms at all...otherwise there was one senior manager who wanted to see people in the offices for four days a week, that’s one

day working from home, but we have had a change of management, they don't mind now so long as the work's done." (P03, male, public transport)

"People just choose, there are some people who decide because they live far away, for me it's because for example, I have Doctors appointment or something like that." (P04, female, public transport and walk)

The flexibility and autonomy discussed by P18, P03 and P04 contrasts with other respondents where it is identified that the option to work from home differs depending on the views of line managers:

"I get to work from home one day a month. Which I'd do more but we only have the one day." (P02, female, car share)

"Yeah I think it kind of varies from Manager to Manager and I suppose in our department it's varied as well as to how much they are keen on it. I think at first it sounds like they were quite keen on it when new to Media City, but since then they have gone a bit lukewarm on it" (P06, male, public transport and cycle)

P02 states how this is something they would prefer to do more often but the local arrangement where they work prevents this. The lack of acquiescence by line managers concerning homeworking could be restricting reductions in the need to travel which would have particular benefits if it meant less car trips were being undertaken.

7.7.5 Soft measures

As presented in section 7.2.3.6 a Travel Plan for the MediaCityUK was a statutory condition of the site gaining planning approval. The Travel Plan featured a range of soft measures to encourage and facilitate sustainable mode use. Figure 7.38 displays the levels of awareness and uptake for a range of non-spatial measures that have been implemented or are currently still in place at the site.

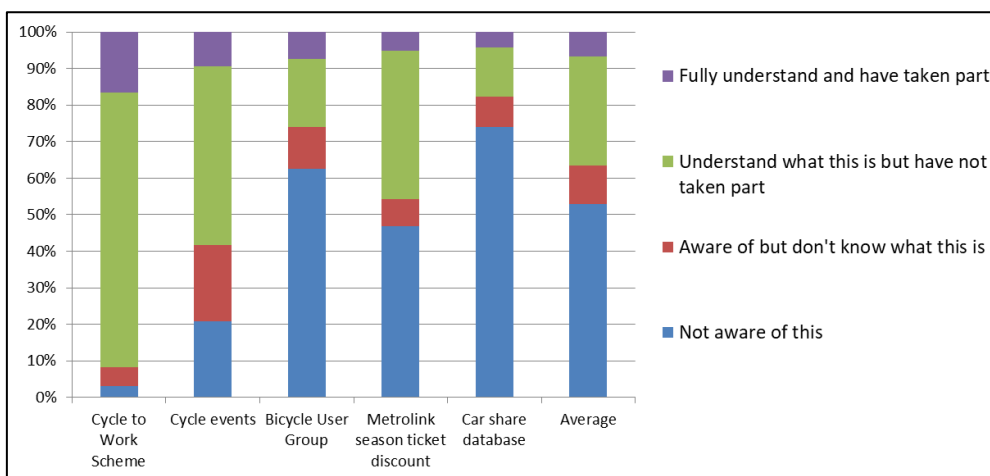


Figure 7.38 – Awareness and uptake of soft/non-spatial measures

7.7.5.1 Travel Plan

As presented in section 7.2.3.6, a Travel Plan was conditioned as part of MediaCityUK gaining planning approval. Awareness levels of the Travel Plan were similar to that of the travel information website with 81.3% of people being unaware that Travel Plan was in place. The Travel Plan also had the smallest proportion of people who said they understand what it is and have taken part (4.2%).

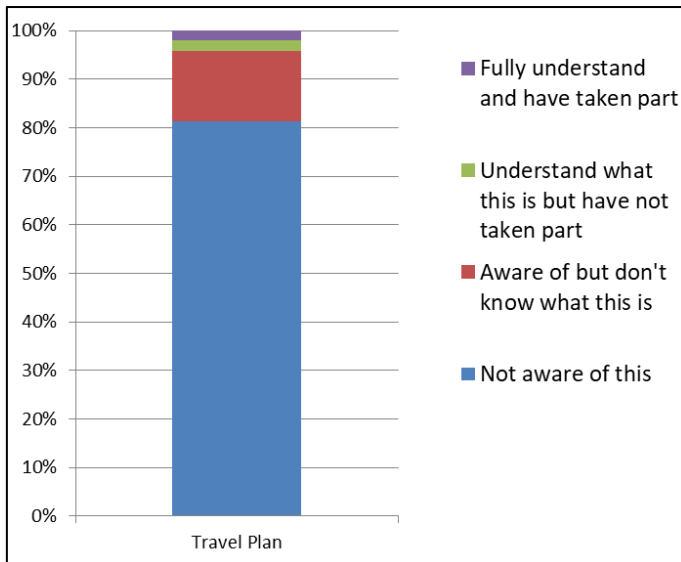


Figure 7.39 – Awareness of the Travel Plan

Compared to the other non-spatial measures discussed above the awareness of the Travel Plan is considerably lower. However, this is not unexpected, as rather than being a measure itself, the Travel Plan is the delivery mechanism by which the other measures are delivered (Enoch, 2012). The Travel Plan is not intended to be a public-facing measure for the general MediaCityUK workforce to engage with, as is the case with the cycle events or the bicycle user group. As presented in section 7.2.3.6 the MediaCityUK Travel Plan is operated by Peel (who is responsible through the planning process for its delivery) and is jointly delivered through collaboration with the MediaCityUK tenants, such as the BBC, ITV and the University of Salford. Within the MediaCityUK Travel Plan is an action plan that includes the joint responsibility of Peel and the tenants to deliver the range of measures discussed in the previous sections.

7.7.5.1.1 Travel Plan progress

As the Travel Plan was established, further support was offered by Transport for Greater Manchester through their Government funded Local Sustainable Transport Fund project

(TfGM, 2011). Through the 'Travel Choices' work stream of the LSTF project, support was provided to the TSG by the project officer for the Salford area. This assisted in the setting up of measures such as Bike Week events and first-hand information on how the MediaCityUK Travel Plan could link in with the wider regional sustainable transport programme. TfGM also provided support in operating and analysing the 2014 travel survey, which was conducted to monitor changes in travel patterns compared to the 2012 baseline survey. TfGM were keen to champion the MediaCityUK Travel Plan as it was a Travel Plan that they had not had to establish through the LSTF programme as it was already being delivered privately through the landowner-tenant partnership of the TSG (TfGM, 2013).

The reasons for taking part in the TSG and the Travel Plan differed between the organisations involved. From the University of Salford's perspective, the key reasons for being part of the TSG were to support the wider University Travel Plan and as part of multi-faceted partnership working with organisations across the site. For the BBC, they were keen to make the relocation to MediaCityUK work as best as possible for their employees and they understood the importance of travel to the site. As part of this the BBC had established an internal Transport User Group (TUG) where issues could be raised by employees and information relayed back from the BBC to their employees (BBC Head of Campus Operations, personal communication, February 2, 2018).

7.7.5.1.2 Stages of change comparison

The Stages of Change model is a behavioural continuum within the context of an identified need to alter behaviour towards a more positive outcome (DiClemente & Prochaska, 1982). Rye (2002) utilised the theory to help predict what Travel Plans can achieve at certain points in their development. From what is understood about the MediaCityUK Travel Plan (as discussed in section 7.7.5.1.1), it is evident that the model has relevance for this case. Table 7.38 links the stages of the Travel Plan with the Stages of Change model within the context of the MediaCityUK Travel Plan.

Table 7.38 – Travel Plan and Stages of Change comparison

Travel Plan stages	Stages of Change stages
Initiation	Preparation
Baseline	
Developing measures	
Implementing	Action
Monitoring and reporting	
Reviewing and updating	Maintenance

Once the Travel Plan is mandated through the planning process then Preparation stage begins as the relevant actors prepare to take action concerning sustainable travel. The Action stage began when the TPC was appointed by Peel to begin the delivery of the Travel Plan. The Action stage continued for approximately 12-18 months as the Travel Plan measures were established and implemented. Beyond this period, the Maintenance stage was in effect, as the Travel Plan was now established and the actors were involved in maintaining it, delivering the measures and aiming to achieve the targets established. The TPC for MediaCityUK left their role in February 2015 with the TPC responsibility being taken up by another Peel employee as part of their wider role (BBC Head of Campus Operations, personal communication, April 2, 2015). As the TPC played a key role in co-ordinating all the Travel Plan actors, the loss of this dedicated role was a risk to the Travel Plan continuing in its Maintenance stage. There is, however, evidence that the Travel Plan measures are still being delivered with the national Bike Week being promoted at the site in June 2018 (Figure 7.40) along with a newly launched Bicycle User Group website that went live in August 2018 (MediaCityUK & TfGM, 2018).

Made2Move4Macmillan

Friday 15th June 2018
8am to 3pm

The Piazza, Media City UK
112 Broadway,
Manchester, M50 2EQ

ON YER BIKE

WE ARE MACMILLAN. CANCER SUPPORT.

An event to promote cycling in all its forms to give our community the confidence to ride safely on the streets of Manchester. Enjoy the health benefits of getting ON YER BIKE & supporting Macmillan

Roll down to Media City for a cycling fiesta!

Supporting Chris Boardman's Made to Move campaign, the plan to make everyday cycling (and walking) easier and safer for everyone in Greater Manchester.

- Bike checks by Evans Cycles
- Security bike marking by GMP
- Bike racing with Rollapaluza
- Test ride a Raleigh electric bike
- Test out kids seats and trailers with Bambino Biking
- Help and advice for new cyclists
- Commuting advice and tips
- Great cycling raffle prizes

EVANS CYCLES

bambino biking
the rules of seats to ride.

RALEIGH

ROLLAPALUZA

Rollapaluza cycling events

BRITISH CYCLING

we are cycling UK

Salford City Council

Greater Manchester Cycling Campaign

GREATER MANCHESTER POLICE

Transport for Greater Manchester

sustrans

Peel HOLDINGS

Figure 7.40 – Cycling promotion event at MediaCityUK, June 2018

If the Travel Plan were to fall out of the Maintenance stage, it would enter the relapse phase. This could be a voluntary action because when a Travel Plan has been in place (and in the Maintenance stage) for long period (e.g. 2-3 years) there is a need to review progress. The review of a Travel Plan is phase 6 of the process as presented in section 4.3.1.2. Once a Travel Plan has undergone this review and updating stage, it should then return to phase 6 to begin the development of measures, this represents the Preparation stage on the stages of change model. From this, it should then move back to the Action stage, which represents phase 4 of the Travel plan process.

However, the Travel Plan could also fall into the relapse stage for non-voluntary reasons, for example if any of the key success factors are removed or constrained, such as those identified as being success factors in section 4.3.1.5:

- Car park management;

- Suitably skilled TPC with time dedicated to TP;
- Senior management buy-in; and
- Appropriate measures.

A particular risk is if this relapse happens because of the TPCs time being restricted, or in the worst case, the TPC role is unfilled or removed. If this happens, there is likely to be no person with the time and ability to bring the Travel Plan back to the preparation and action stages. Over time, the danger is that the organisation then does not see sustainable accessibility as a priority and they move all the way back to the pre-Contemplation stage where they are not aware of the importance of promoting and facilitating sustainable travel.

7.7.5.2 Cycling

As an average across all measures, just under half were at least aware of soft measures even though they may not have taken part or be fully aware of what the measure is. Cycling related measures had higher levels of awareness with close to all survey respondents aware of the cycle to work scheme despite only 17% having taken part. Interviewees who travelled by other modes referenced their awareness of the cycle to work scheme:

“I know there is a cycle to work scheme.” (P02, female, car share)

“It’s all well-advertised, make sure you use the cycle to work scheme, that’s well promoted through the websites they have...” (P03, male, public transport)

A cycle user also expressed how cycling promotion and soft measures were promoted more than where they previously worked for the BBC:

“I think it is definitely promoted more, definitely cycling, there’s lots of cycle to work scheme promotion and bike doctor and stuff like that, so I think cycling is definitely a lot more encouraged here than it was when I worked in Leeds previously.” (P10, male, cycle)

Events to promote cycling were also well known with nearly 80% of people aware of them taking place even though they may not have taken part or fully understand what was happening. These events generally take place on the piazza at MediaCityUK outside the BBC buildings and therefore have a high profile while they are going on.

The BBC bicycle user group at MediaCityUK was established to engage directly with existing and prospective cycle users. The group is administered by the BBC but the actions are

driven by the members who provide support and advice to each other while allowing for collective feedback on facilities to be given to site management.

P18 discusses how they interact with the bicycle user group:

“I am not an active part of the cycling community, I am a part of the community because I am a cyclist at Media City, but I am not an active part in it, but I am on, there’s an email group I think it is called “NBUG” and I see their emails and they don’t happen every day, but most weeks you’d get some kind of emails about then, saying either “what’s the best route for this” or “can I borrow a bike lock” and things like that.” (P18, male, public transport and cycle)

As Figure 7.38 shows, 7.3% of people said they had participated in the bicycle user group, which is around half of the number of people who said their primary mode of travel to the site was bicycle. This demonstrates that there is scope from further participation in this group from existing users. P16 provides background as to why more cycle users are not involved in the group:

“There was a poster on the wall when you come out the lifts that said about “NBUG” I thought “what the hell’s NBUG?”, “North Bicycle User Group, contact this guy” so I contacted that guy and said can you sign me up to this, and he was like “Yeah. How did you find out about me?” I’m like “You name’s on a poster” “Is it? I didn’t know that” and I had never seen it advertised anywhere else, and all of my colleagues, on my floor, who I know cycle, I have been—“Oh there’s this mailing list” and a lot of them have gone: “Oh that’s kind of useful, I should sign up for that” and some of them have, but it’s not publicised very well, there is that one poster that I am aware of and I have not seen anything else about it really.” (P16, male, cycle)

It is understood that the BBC bicycle user group now links to the site-wide bicycle user group highlighted in section 7.7.5.1.1.

7.7.5.3 Public transport

For soft measures that are not cycling related the season ticket discount on public transport was the measure that had the largest level of awareness, with over half of people at least aware of the measure.

“The company actually, would actually provide you with a subsidised loan for rail travel. I didn’t take it up because I had actually bought my season ticket already by the time I came to the company, but, have since taken up the err, when I renewed by season ticket to have the interest free loan and so on, on the rail travel.” (P03, male, public transport)

“Although I know now there is an annual Metrolink ticket with a discount I think, but, or you can pay it monthly rather than all at once.” (P06, male, public transport and cycle)

7.7.5.4 Car sharing

Nearly three-quarters of survey respondents were not aware of a car share scheme being in place. Car sharing was mentioned by many interview respondents as a potential for increasing sustainable mode use but the awareness of a scheme at the site was mixed.

Some interviewees had no awareness of the MediaCityUK car sharing scheme:

“They are quite good about mentioning you’ve got different options and I know some people car share but I don’t know if they are any schemes to promote it.” (P11, male, cycle and public transport)

“As for car sharing, this is the first I have ever had access to a car really to get to work, I am not aware of any car sharing (scheme) or anything.” (P14, female, car share)

Other respondents demonstrated awareness, with P09 referencing how the official car-sharing scheme was being promoted at the site.

“I have looked at the lift share sites so the ones outside of Media City, because I know there’s one endorsed by Media City now and I have looked at that and I have looked at others...I think it’s promoted well for example, in the car parks, there is posters in the car park now for lift share, which is great.” (P09, female, car)

It is unclear from P08 how they came about lift sharing but it is evident that their awareness of this measure had encouraged and/or facilitated them to start lift sharing where previously they were only a single-occupancy car user.

“Just kind of similar to what I had been told before I started really, kind of been made aware of lift shares and stuff, I have started doing a bit of lift sharing, but only quite recently.” (P08, male, car)

The survey only provides snapshot information on peoples’ awareness levels when the survey took place in October 2016. However, during the interviews, some people reflected on their awareness of soft measures at different points in time:

“When I first started working here, which I think must have been October 2011, obviously there was a lot less stuff on site, and I think there was information about, there was information on trams and where you could park bikes and stuff, but I don’t remember anything, any particular initiatives to get you to use public transport.” (P07, female, car)

7.7.5.5 Travel information website

In 2013, a travel information website was created to provide dedicated travel information for the MediaCityUK development. The 'Travel Choices' website was created with support from Transport for Greater Manchester and features information and links for accessing the site by all modes.

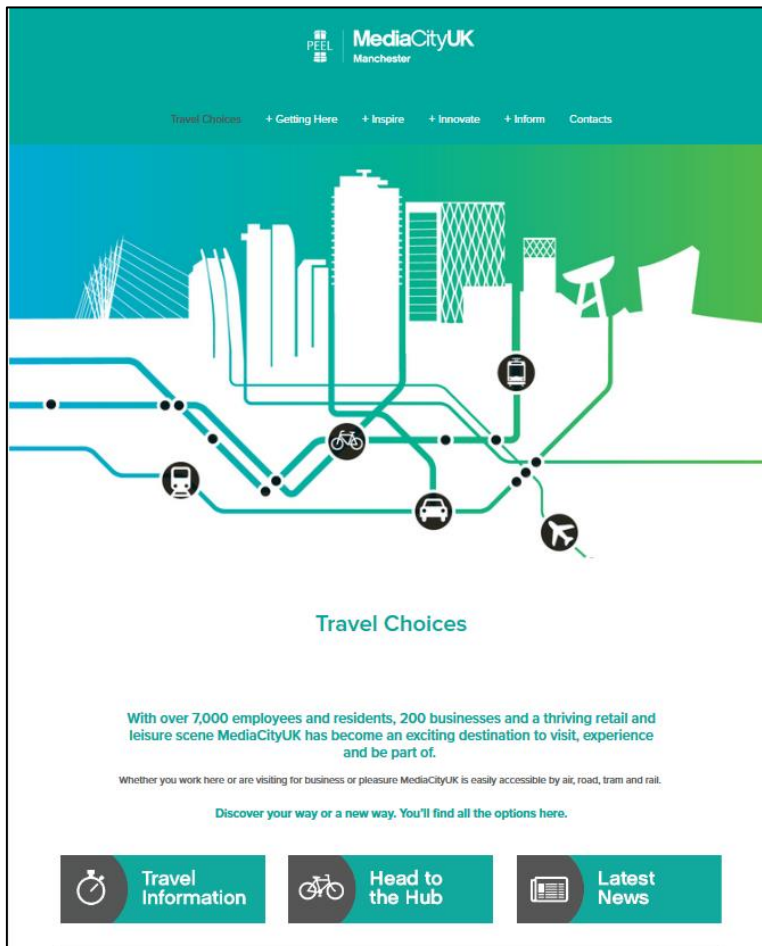


Figure 7.41 – Travel Choices website

Compared to the awareness levels of the other non-spatial measures the awareness of the website is low with 82.3% of people being unaware of it.

7.7.5.6 Informal knowledge sharing

A key theme to emerge from the interviews was how the sharing of travel information and knowledge among colleagues was an important way (and in some cases the only way) that people found out about travel options to MediaCityUK. P20 discusses how a colleague's information on parking at MediaCityUK charges resulted in them assessing alternative modes:

“I knew a colleague working here so it was more of due to our friendship that I asked her about does she get to work. I think she drives and so she was saying where the car parking is really expensive but you can do this kind of subsidised thing which would still work out really expensive so prior to starting here I did a test run and walked on site to see how long it would take.” (P20, female, cycle and public transport)

Cycling in particular was a focus of the information sharing among colleagues with people helping others with information on routes and facilities:

“So some of my friends and some of my team members are very experienced cyclists so when it came to like, where is the best place to park your bike and lock it during work? There was lots of experience on hand to help out with that. It was the things I was a bit anxious about when I decided to go the whole cycling route, but having that (support) on hand was quite reassuring.” (P14, female, car share)

“So it was talking to people who live in similar areas to me that I found out about good ways to cycle.” (P11, male, cycle and public transport)

“Yeah, so I found that out and that access to the cycle store didn’t cost anything extra and I knew from speaking to the same people that there were showers so I could come in and there would be somewhere for me to put my stuff.” (P16, male, cycle)

The comments from P12 below reflect what we understand about the cycle mode share to MediaCityUK being significantly above the local and national average as presented in section 7.5. A large number of people cycling to the site using the same peer-approved routes means that people feel safe when travelling by this mode, potentially attracting more users.

“I looked on line at what was suggested as routes and lots of people of put, you know like on “Mapmyrun” things they had used. So they put cycle rides up on there so they have put it as a suggested route and then just from talking to other people, it’s, everyone just kind of using the same route now, so that’s kind of become an established route, which is also good. It’s a bit of safety in numbers type thing, you feel, if I cycle in at a normal time, like half eight, then I tend to always be with a group of about five people.” (P12, female, cycle and car share)

It was also evident that the extent of help provided by colleagues extends beyond the provision of information. P18 discusses how a colleague showed them a recommended cycle route directly:

“The first time I did it, I had I suppose I had – buddy is not the right phrase because it sounds too formal – but I had a friend who lived in the same town as me, she worked at Media City and she showed me the way, so I followed her and remember thinking “Oh my God this is miles I am never going to remember this”

but I did remember it and now it just seems like second nature.” (P18, male, public transport and cycle)

As presented in section 7.7.5.1, the BBC bicycle user group facilitates knowledge sharing among cycle users. P18, whose reference to the bicycle user group was included in that section, goes on to talk about how they feel there is a community aspect around people who cycle to MediaCityUK:

“I am not an active part of the cycling community, I am a part of the community because I am a cyclist at Media City, but I am not an active part in it...So there is a community there and certainly whenever you go to the hub. I have never met somebody who is not prepared to open a door for you or say hello and in that respect I think cycling brings out the best in people.” (P18, male, public transport and cycle)

The sharing of information among colleagues is clearly something that is taking place frequently and people are open about assisting each other. Although the sharing of information is not a specific measure that was implemented at the site, it is evident that it can have an impact in terms of people using modes of travel, in particular sustainable modes.

7.8 Summary

This chapter has presented the findings of this study which were obtained using travel surveys, travel diaries and interviews conducted among the large relocated workforce at the BBC MediaCityUK site. It is evident that the large-scale workforce relocation had a significant impact on travel behaviour and that the share of sustainable modes, while reducing post-relocation, remains high for a non-central site.

While some analysis was included in this chapter, the following chapter provide an in-depth interpretation and discussion of the findings in relation to the research objectives of this study.

8 Discussion

8.1 Introduction

The previous chapter presented findings in relation to the effect that a large-scale workforce relocation can have on travel behaviour. The impact of hard (spatial) and soft (non-spatial) measures during a relocation were also reported on.

This chapter is shaped around the fifth and sixth objectives of this research:

1. To critically review travel behaviour literature and analyse the influences on travel behaviour.
2. To determine the opportunity that large-scale workforce relocations provide to positively influence travel behaviour and appraise their potential to this end.
3. To define, illustrate and evaluate the measures that can be utilised to influence travel behaviour towards sustainable patterns during a large-scale workforce relocation.
4. To formulate and implement an appropriate research design methodology to investigate the opportunity to influence travel behaviour during a large-scale workforce relocation.
5. **To analyse the effect of a large-scale workforce relocation on travel behaviour.**
6. **To interpret the role of hard and soft measures in encouraging and facilitating sustainable travel during a large-scale workforce relocation and identify how the measures can be better utilised.**

Firstly, the chapter focuses on the effect of the large-scale workforce relocation on travel behaviour found through the case study featured in this research. Following this is a discussion on the role of hard and soft measures during relocation which includes identifying how the measures can be better utilised to facilitate sustainable travel. The final part of the discussion reflects on how Social Practice Theory could offer an alternative means of understanding and influencing travel behaviour beyond the approach more individual-focused commonly taken in practice.

8.2 The effect of a large-scale workforce relocation on travel behaviour

8.2.1 Considerable change occurred

A key finding of this study is that a large-scale workforce relocation can bring significant change to travel behaviour with the majority of people (63%) changing their primary mode of travel following relocation. This high propensity for modal change supports what was found from previous studies in terms of large-scale workforce relocations being a 'disruption' to normal or habitual travel behaviour that necessitates people to revisit decisions about how they travel in order to manage their new context or norm (Verplanken et al., 2008; Verplanken & Wood, 2006; Walker et al., 2014; Whitmarsh, 2012). The existing understanding of the weakening of travel habit combined with the data from this study showing a high level of modal change emphasises how large-scale workforce relocations can generate changes in mode use.

The important point to take from this is that due to the high level of modal change noted, large-scale workforce relocations offer potential for influencing people towards sustainable modes that does not exist within a 'steady state' situation. Therefore, it is evident that a large-scale workforce relocation offers an opportunity for a targeted approach to encouraging and facilitating sustainable travel among a population that have been identified as having a high propensity for modal change.

Previous work has identified biographical events or 'mobility milestones' as offering potential for increasing sustainable travel (Beige & Axhausen, 2012; Rau & Manton, 2016). These biographical events include those that relate to household or family changes, employment status and residential moves (Scheiner & Holz-Rau, 2013) and can weaken the strength of habit people have with regards to their travel behaviour (Walker et al., 2014).

This study has added further findings to this existing body of research by adding depth to the understanding of a specific type of mobility milestone and disruption – workplace relocation and for some people, residential relocation as well. By analysing a population who have recently gone through a large-scale workforce relocation, this study was able to gain insights from a specific case that can be used to inform future policy and practice more generally.

The understanding of large-scale workforce relocations in this context is important because they offer the opportunity to influence the travel behaviour of a large number of people within a known and focused period. It was also highlighted in Chapter 3 how large-scale workforce relocations are a relevant and current theme but were not well understood from a travel perspective within the UK context (Vale, 2013).

This study showed that although a large proportion of people were recorded as changing modes following relocation, the overall mode share of sustainable modes reduced from 74.2% to 60.6%, indicating the changes were not all positive in terms of sustainable mode share. When looking at the changes by modal group, (Table 7.9, section 7.5.2) only 25% of car users (single occupancy or car share) changed to either the active travel (cycle or walk) or public transport (train, tram or bus) groups. This compares with 53% of both public transport and active travel users switching modal groups, demonstrating a lower level of user retention. This indicates that despite the majority of people changing modes, those that are least likely to change are people that travel by car, representing a problem in terms of increasing sustainable travel mode share. However, the 25% that did change modal group does indicate that change towards sustainable mode groups can happen but more needs to be understood as to why car users did or did not switch modes.

8.2.2 Implications for sustainable travel

The following sections discuss the reasons for car use and reasons for switching away from car use and the implications for future decision making.

8.2.2.1 Reasons for car use

The provision and cost of parking on and close to the site was shown to be a factor in people choosing to drive to work. The parking charges in the on-site car park was a reason for not driving for some people, despite the subsidy for BBC employees (see Section 8.2.2.2). However, for others it was a deterrent for parking on-site, rather than a deterrent for driving to work. This was due to the availability of free off-site parking on nearby streets, from which people could walk into the site. These findings align what Hess (2001) found regarding access to free parking being a key determinant of people choosing to drive to their place of work. If a policy decision was made to increase the cost of on-site parking (for example, by removing the subsidy) to increase sustainable mode use, the impact would be limited by the availability of the free off-street parking. In order for the cost of the on-

site parking to have an impact on the mode share of car use, the free off-site parking would need to be restricted.

Restriction of the off-site free parking availability would require the local authorities to implement parking restrictions in the neighbouring areas that people are using to park and access the site. There are issues with this procedure in that it may be opposed by businesses and residents who use the on-street parking spaces if they are close to their properties. Parking restrictions must also be looked at strategically and on an area-wide basis as extending parking restrictions can merely move the issue to another location (Marsden, 2006). The findings from this study identified that if the distance of the free parking was increased, it would result in reconsideration of travel options. The findings link to what Christiansen et al. (2017) found concerning an increase in distance to parking resulting in a decrease in the likelihood of driving. These findings imply that when looking to reduce car use and increase sustainable mode use during large-scale workforce relocations, restrictions to the supply of free parking should form part of the approach if practicable.

If the post-relocation site is designed to be transit oriented with good public transport connectivity (Goetz, 2013; Knowles, 2012) or new urbanism with high densities and priority for active modes (De Vos & Witlox, 2013; Ellis, 2002) then parking restrictions can be particularly effective due to availability of alternative modes (Christiansen et al., 2017). The MediaCityUK site was designed around transit and includes elements of new urbanism, such as density, diversity and active mode priority. As such, the site has potential for parking restrictions to be effective because there are other methods for people to reach the site. However, as was found in this study there are factors relating to alternative modes (such as journey time, frequency and reliability) that are constraining these other modes in offering alternative ways to travel to the site.

8.2.2.2 Reasons for switching away from car

While it is interesting and important to understand the reasons for sustainable mode use generally, it is of particular importance to understand the reasons why people who formerly drove switched to sustainable modes. These reasons can help build on the existing body of research that is looking at ways to facilitate and encourage an increase in sustainable travel use, particularly where it creates modal shift from car use.

Traffic congestion and cost were shown to be factors in people not using a car in some cases. Traffic congestion affects most major urban areas, however, Manchester has been shown to be the second most congested large urban area in the UK behind London (Ames, 2017). A key effect of congestion on individuals relates to how congestion causes an increase in journey times. The knowledge gained from this study about congestion being a key factor for switching modes means that a targeted approach to modal shift could focus on the journey time benefits of sustainable modes. This could be addressed through site design by prioritising the directness of cycle routes over that of motor vehicles through 'filtered permeability', for example, where cycling (and walking) is separated from motor traffic and given greater levels of permeability through areas provides advantages in terms of speed, distance and access (Melia, 2012). Focusing on the journey time benefits could also be promoted using soft measures that focus on raising awareness of the comparative journey time benefits of cycling and potential other sustainable modes depending on individual travel patterns.

For users of both public transport and active modes the lower journey times of these modes compared to car were, in some cases, the reasons why they had switched modes. The people who had switched to cycling all lived within 3km of the site while all those who had switched to walking lived within 1km of the site. The postcode mapping of employees' residential locations shows car users who live within these distances demonstrating potential for further mode shift. There are, many other urban form, attitudinal and socio-demographic factors that ultimately influence mode choice that were covered in the literature review. However, to provide a focus for targeting measures to those with most potential for switching, this study has shown how those living close and with short journey times have chosen sustainable modes following relocation.

It was discussed in the previous section that the cost of on-site car parking was resulting in people parking in free on-street locations near to the site. However, it was also identified that the cost of car parking was a reason for people not driving to work. Additionally, the costs of operating a vehicle were also observed to be a key factor in people not driving. The combined parking and vehicle operating costs were factors that users of both public transport and active modes stated as being reasons for them not using a car for travelling to work. This understanding is important again from the perspective of identifying the

important factors that have led to people not using a car post-relocation as a way of focusing measures to facilitate sustainable travel.

8.2.2.3 Cycling was a key mode

One of the reasons MediaCityUK differs in terms of a non-central location and travel behaviour is what was found out about cycle use. Cycling mode share increased from 10.0% to 14.9% following relocation representing a share considerably higher than the regional CBD (1.7%) and national (3.0%) average. Cycling also had a post-relocation retention rate of 72.0%, only slightly lower than that of car at 73.0%. Relating these findings to safe cycle infrastructure provision, one of the most important facilitators of bicycle use (Hull & O'Holleran, 2014; Pooley et al., 2011; Pucher & Buehler, 2007), cycle links in the immediate area around the site are largely segregated from motor vehicle traffic, helping to make the site attractive for people to cycle within. There are also segregated or off-highway routes to the Salford Quays area from some directions, some of which were improved since the relocation. However, there are still significant barriers to cycle movements from some directions due to large junctions and lack of suitable provision on busy highway routes.

The findings of this research showed that as well as people switching from public transport to car, people were switching from public transport to cycle as well. Whereas the previous literature had established that relocations to less central areas would see a shift from public transport to car use, the same trend had not been established for cycling. Burke et al. (2010) modelled an increase in bicycle use of 3% following an employment decentralisation but there is a lack of empirical evidence in this area representing a knowledge gap that this study has added to. These findings demonstrate that cycling can play a key role in the sustainable accessibility of non-central locations by offering a sustainable alternative to public transport where the post-relocation public transport services are not available or result in time penalties to the user compared to pre-relocation. While a shift away from public transport to cycling does not change the overall share of sustainable modes, there are positive implications of more people choosing to travel by bicycle, for both the individual and wider society. For the user cycling has been shown to improve both physical and mental health (Garrard et al., 2012; Martin et al., 2014) and reduce mortality rates (Andersen et al., 2000; Deenihan & Caulfield, 2014). Meanwhile, increases in cycle use can benefit wider society through reduction in traffic congestion

(Krizek, 2007; Litman, 2018), improvements in air quality (Lindsay et al., 2011; Woodcock et al., 2007) and by boosting the economy (Blondiau et al., 2016; NYCDOT, nd).

Coming back to the switching of public transport trips to bicycle, there is potential to support an increase in cycling through integration with public transport that would be mutually beneficial for both modes. It would allow people to travel further than may have considered by cycle alone as well as extending the catchment area of public transport stops (Brons et al., 2009; Pucher & Buehler, 2012b). Both of these outcomes offer potential for reaching more car users in terms of them shifting towards cycle or bus travel. Better integration would also give people more flexibility if they have to change public transport service in the city centre, which was identified as a key reason why people were not satisfied with or had switched away from public transport. Rather than having to wait for a connecting service, they could make the next leg of their journey by cycle.

The public transport-bicycle combination was being undertaken by a small (3.6%) number of people to reach MediaCityUK and was being considered by others, such as P02 but there were issues with being able to transport a bicycle on busy public transport services:

“I thought about cycling to the station or cycle to my local station then cycle from Victoria, but my train isn’t one that you can get a bike on. So it’s, like no one wants to be the guy on the train with a huge bike and, it’s one of those trains that on the last few stops, there’s people like pushing to get on and things, so having a bike on there is just not do-able.” (P02, female, car share)

There is an option to leave the bike at the railway station; however, P02 highlighted the constraints of this option:

“I was initially going say like a bike locker at Victoria where I could leave the bike, but then you don’t have access to that at the weekends, so that doesn’t work.” (P02, female, car share)

The constraints identified by P02 link to what Bachand-Marleau et al. (2011) identified in terms taking the bicycle on to public transport being the preferred method of bicycle-public transport integration. The opportunity for bicycle-light rail integration is hindered across the region by the policy of only permitting fully folded and covered bicycles on trams (TfGM, 2018b). As only 4% of bicycles sold in the UK in 2016 were folding bicycles (Bike Europe, 2017), this somewhat limits the potential for integration with light rail through taking a bicycle on board. The low numbers of people identified as integrating a bicycle and

public transport journey reveals this as an area that could be addressed to increase sustainable mode share.

Even though the proportion of people combining public transport and cycling in their journey was only 3.6%, it was found that 36.0% of people that used rail as their primary mode to MediaCityUK interchanged from rail to bicycle to complete their journey. This was the second highest connecting mode for rail users behind the tram (44.0%). It was highlighted earlier by P02 that there are barriers to people using cycling at the origin end of their journey due to not being able to take a bicycle on public transport or storing it at public transport stations. However, the significant proportion of people currently using cycling to connect to MediaCityUK from rail services demonstrates that there is potential for cycling to play a key role at the destination end of rail journeys.

A way of facilitating this would be through bike share systems which have been shown as being effective at public transport-cycle integration (Tang et al., 2011). The possibility for integration of this type emerged in Greater Manchester after the data collection stage of this research was undertaken. The introduction of the 'Mobike' bike share system in June 2017 provided potential for utilising the short-term hire bikes to connect short distances to or from public transport (Mobike, 2017). MediaCityUK was identified as one of several key hubs where Mobike's would be provided in larger numbers (MediaCityUK, 2017). However, in 2018 Mobike withdrew from the Greater Manchester area. A request was sent to Mobike for data on trips to MediaCityUK; however, they would not provide any information. It is therefore unknown how many people were using the bike share system to connect with MediaCityUK following a rail journey.

Regardless of the improvements made to facilitate bicycle-public transport integration at the public transport stop and the trip origin/end, the uptake is still likely to be hindered by route infrastructure (Martens, 2007). As such, the implications for increasing public transport and cycle shares at non-central locations through integration of these modes would be to focus on the routes between the key public transport hubs and the site.

8.2.3 Complexities of travel behaviour

Chapter 2 discussed the influences on travel behaviour and how urban form (spatial) along with socio-demographics and psycho-social factors (non-spatial) have been identified

empirically as key influences on individual travel behaviour (section 1). The chapter also identified how individual travel behaviour influenced by these factors must also be considered within the social and spatial environment that the individual is within and how the Ecological Model can be used to explain the complexity of travel behaviour (section 2.5).

Using the ecological model to understand and explain individual travel behaviour links back to what was set out in the Research Design chapter of this study. Section 6.5.4 presented a conceptual example of what the study anticipated as being the contextual influences on individual travel behaviour based on the literature review and is shown in Figure 8.1.

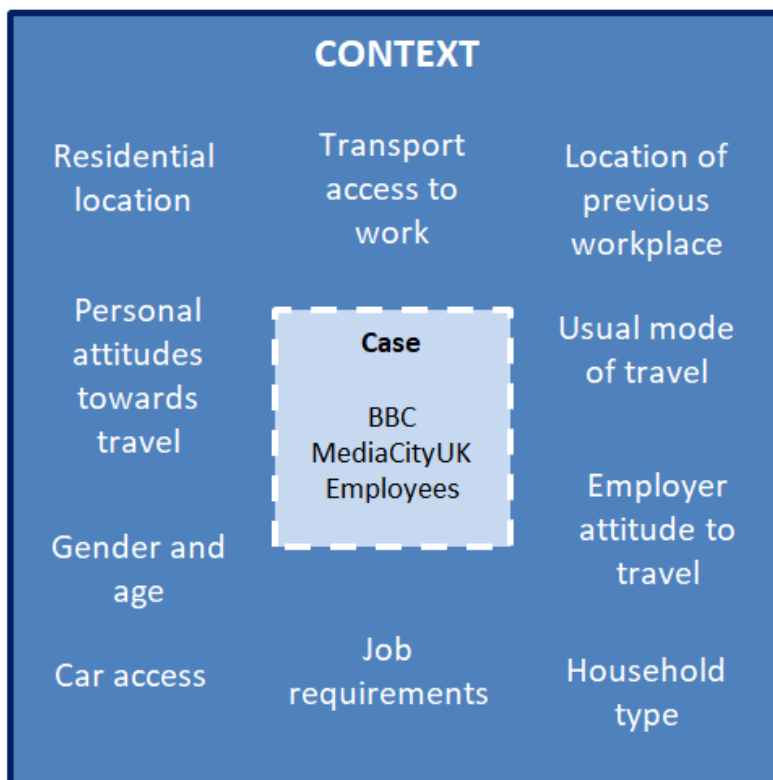


Figure 8.1 – Case and context conceptualisation from Chapter 7: Research Design

When the ecological model has been applied to active travel behaviour research the variables used have included individual (intrapersonal), social (interpersonal), organisational, physical environment and policy (Christensen et al., 2012; Handy et al., 2010). By taking this approach to using the ecological model, this initial conceptualisation of the influences on travel behaviour as shown in Figure 8.1 can be further structured around the five levels of influence, as presented in Figure 8.2.

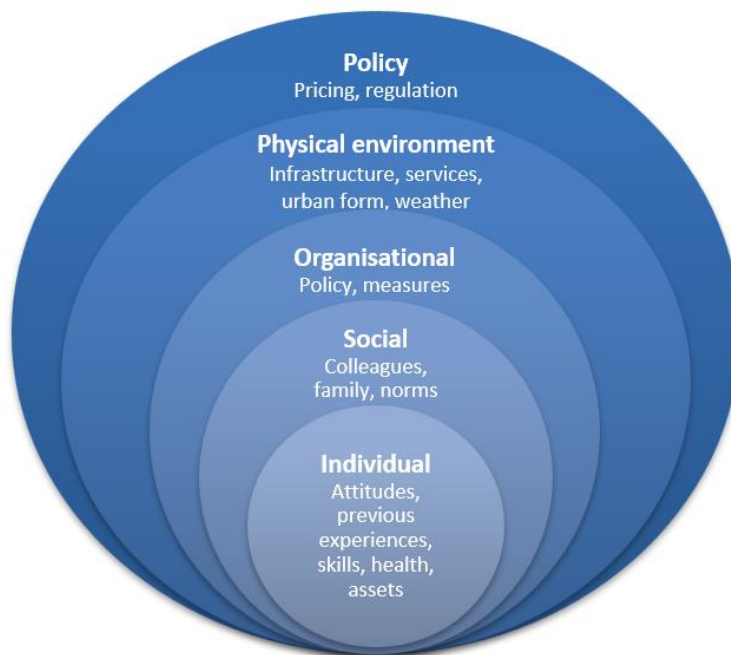


Figure 8.2 – Ecological model

To discuss the findings of this study concerning the complexities of travel choices as a result of a large-scale workforce relocation, the levels of the ecological model provide the framework for the discussion in the following sections.

8.2.3.1 Individual

An individual's previous travel behaviour can be used as an indicator of current travel behaviour (Dargay & Hanly, 2007; Thøgersen, 2006) but only if circumstances remain relatively stable (Bamberg et al., 2003). A large-scale workforce relocation is an example of a change in circumstances, however, it was also found that despite the change brought about by relocation that past behaviours may still have a strong influence on current behaviours in the new location (Clark et al., 2016).

In this study, the experiences of travel that people had at their previous workplace were shown to have an impact on the travel choices following relocation, such as how having been used to cycling previously meant they had continued it post-relocation. However, the relationship was not always predictable as the characteristics of travelling to MediaCityUK are different from that of their previous workplace and this was particularly evident in relation to public transport. Lower service frequencies and the interchange penalty meant

that public transport services were not as frequent or direct as what people had been used to when travelling to their previous workplace location in large urban centres, such as London or Manchester.

The implication for sustainable travel during large-scale workforce relocations is that the experiences of using sustainable modes at the new location must be comparable or better to what people had experienced previously. As this study found, there is a risk that people will switch away from a sustainable mode (in this case public transport) to car use if their expectations are not met. Therefore, the choice of new location must be looked at carefully from a transport perspective in that sustainable transport provision needs to be comparatively the same or better than the previous location. However, this is not always going to be possible in practice, as other decisions will play a key role, such as the availability of land and the commercial viability of developing a site.

Another implication is that the provision of sustainable travel infrastructure and services needs to be in place before people relocate. Therefore, the infrastructure is there to be used from the outset and may prevent people from switching to car use as was found through this study. Having key sustainable travel infrastructure in place before people relocate, or at least before the majority relocate, will assist in delivery of the soft measures also. At MediaCityUK, the cycle hub was not in place until 2015, four years after the relocation of the BBC workforce began. Some of the cycle route improvements had been completed by the time of the relocation; however, others were completed afterwards and safe cycle routes to wider destinations are yet to be developed. The light rail connection to MediaCityUK was opened ahead of the relocation, however, the on-going operational issues continued post-relocation and there is still only a limited bus service to Salford Quays. Conversely, all highway and car parking infrastructure were in place upon occupation, facilitating car use from the outset.

Intrapersonal factors relating to attitudes and preferences were shown to be important in relation to people using sustainable modes. Positive attitudes towards cycling are significant in terms of increasing cycle use for journeys to work (Heinen et al., 2010). However, it has also been found that people who have never contemplated cycling had the least positive attitude towards cycling (Gatersleben & Appleton, 2007). Utilising the stages of change model developed and implemented by DiClemente & Prochaska (1982),

Gatersleben & Appleton (2007) highlighted how in order for people to have a positive attitude about cycling they needed to be in the contemplation stage. Therefore, triggers are required to move people from the pre-contemplation stage to the contemplation stage and then potentially into preparation and ultimately taking action to begin travelling by bicycle.

As discussed in section 3.4 a large-scale workforce relocation is a disruption and mobility milestone for the people involved. Understanding their considerations about travel is fundamental to being able to capitalise on future relocations in terms of encouraging and facilitating sustainable mode use. It is evident that travel to the new place of work was a key consideration for people within the wider context of the relocation. For those relocating from further afield, such as those that previously worked in London, the considerations are further reaching than those relocating from existing locations within the Manchester Travel to Work Area (TTWA) (Office of National Statistics, 2011). The main difference between those relocating from further afield was that they had prepared for the parallel disruption of a workplace and residential relocation. As such, concerns about travelling to MediaCityUK (in relation to the non-central location) were not as heightened when compared with those relocating from within the TTWA and the wider North West region. Part of this difference is that those relocating both home and workplace have the opportunity to select their new residence based upon a perceived desirable journey to MediaCityUK.

Those who are relocating from locations within the region, in particular BBC Manchester were in the most cases not considering a residential relocation as part of the workplace relocation. The major change in relation to travel to work was that compared to their previous place of work in central Manchester, MediaCityUK was non-central and did not have the same level of public transport accessibility.

Therefore, from a travel perspective, those that are experiencing the most disruption (home and workplace relocations) are potentially less affected by the location of the new workplace because they can take the opportunity to choose a residential location that meets their travel needs. This is understood as the concept of 'residential self-selection' (Cao, 2014; Cao et al., 2009; Handy et al., 2005; Schwanen & Mokhtarian, 2005) which surmises that people select a neighbourhood to match their travel preferences. Residential

self-selection has been the focus of recent research in terms of determining if travel behaviour is a function of people's preferences or the built environment around them (Næss, 2014; van Wee & Handy, 2016). There are many other factors that will ultimately influence the residential location such as cost, amenities and availability (Gutierrez & Garcia-Palomares, 2007), however, the matching of travel preferences is within this wider mix as demonstrated by P18 who based their exact residential location on their preference to travel to work by public transport.

“In terms of ‘was I going to live in Whaley Bridge?’, it (travel to work) didn't influence my choice of house, but you know I can remember having a spread sheet with all the different houses or places that we might potentially live and having a spread sheet with distance to railway station, time from railway station to Piccadilly on there, so it was very important.” (P18, male, public transport and cycle)

The urban form of where they reside (including the home-work spatial relationship) was not obvious in influencing their travel behaviour (for the journey to work), rather they matched their travel preferences with a neighbourhood that provided that accessibility, alluding to self-selection. In this case the non-central location of MediaCityUK (as a trip end) was not the sole factor for determining travel behaviour because they had the opportunity to plan a public transport (as their preferred mode) route to the site due to their trip origin flexibility.

8.2.3.2 Social

However, further investigation highlights that the relationship is not that simple with other factors also being important. P14 relocated their residence two years after the initial relocation and now lives further away from MediaCityUK. They still reside on the public transport network; however, the opportunity to car share arose as their partner also works at MediaCityUK. As such, the decision to live near the public transport network to travel by public transport has been surpassed as a new travel option has become available. This aligns with what Jones and Ogilvie (2012) found with regards to there being constant negotiation and reassessment of travel behaviour following relocation rather than a simplistic process of deciding how they prefer to travel, relocating and then travelling the expected way. Decisions made about travelling to work can also adapt or be forced to

adapt over short periods (different days of the week) or longer periods (different times of the year) (Castellani et al., 2016) due to both individual and household factors.

For P18, travel by public transport was important, however, they went onto discuss how being close to relatives along with their spouses travel to work requirements were also factors in the choice of residential location. This aligns with what Næss (2014) found with regards to other factors relating to family or leisure travel influencing travel behaviour and preventing people from utilising their preferred method of travel. It did not prevent P18 from using public transport; however, it meant further consideration was required to reach that travel goal. The findings confirm how individual travel choices cannot be looked at solely from the context of the individual as in many cases they are influenced by a group decision making process within a household (Timmermans & Zhang, 2009). In the context of a relocation, it is important to take into account that people with other family members in their household will be taking travel decisions around the requirements of those other household members. The other members of the household will have also experienced relocation of their home and place of work/education. Depending on the context, this may constrain efforts to increase sustainable mobility. For example, those that have children in the household may have to trip-chain as part of their journey to work which Castellani et al. (2016) found to be an important reason for using a car.

This study has shown that existing levels of cycling at MediaCityUK is significantly higher than local (2.3%) and national averages (3.0%) with mode shares of between 14.0% and 18.5%, as recorded by surveys undertaken as part of this study and those conducted external to this work. What is understood from the Section 8.2.3.1 is that attitudes and preferences are key factors in decisions to travel by bicycle and that non cycle-users need to be positive about cycling in order to contemplate traveling by this method. It is also understood from previous research that the prevalence of cycle users is a catalyst for further growth in usage, partly due to how it increases the safety of the mode (Jacobsen, 2003) Given that approximately 1 in 6 people travel to MediaCityUK by bike as their primary mode, there is an existing base of cycle users that could have a positive impact on changing attitudes towards cycling. Willis et al. (2015) identified how social factors, such as subjective norms and social acceptance of cycling as a mode of transport, clearly impacted on decisions to travel to work by bicycle. The implications of this is that there is potential

for the significant number of existing cycle users to have further influence in making non-cycle users positive towards cycling as a mode of transport.

Previous research has demonstrated that 'word of mouth' information sharing is significant in the decision-making process relating to tourism and consumerism however, less is known about the impact of information sharing in relation to day-to-day utility travel (Bartle et al., 2013; Bieger & Laesser, 2004). What is understood is that among cycle users, information sharing inspired greater trust than information from 'official' sources due to how it came about from actual experiences of travelling by bicycle (Bartle et al., 2013). Looking specifically at workplaces, it is understood that encouragement, including information sharing, by colleagues was key to people taking up cycling to work (Sherwin et al., 2014) and there is a consensus that social factors have a clear effect on the decision to travel to work by bicycle (Willis et al., 2015).

Knowledge sharing and word of mouth information that leads to sustainable travel use is not unique to the relocation context as the studies referenced above demonstrate. However, this study showed that unlike in a stable context, people during a large-scale workforce relocation are enquiring with colleagues about travelling to work. Combining this with what is understood about there being a 'window of opportunity' for change during a relocation (Walker et al., 2014) means that this information sharing could be most transformative within the relocation context. The sharing of travel knowledge by word of mouth could assist a Travel Plan in having long-term sustainability outside of the formal delivery process. People sharing positive experiences of using sustainable modes become deliverers of the Travel Plan and the findings of this study and Bartle et al., (2013) demonstrate that people have confidence in the information being provided by their colleagues.

The implications of these findings are that the informal information sharing should be supported by the relocating organisation. This study found there was a discrepancy in how much people knew about travel options in certain parts of the organisation compared to others. The effective communication of information relating to sustainable travel options needs to be undertaken within the subgroups or departments of a large organisation.

By assisting colleagues to share knowledge with each other (in particular new starters) on an informal basis removes some of the burden to the organisation in terms of having to centrally disseminate information to a large workforce.

8.2.3.3 Organisational

Of those people that drove to work post-relocation, 29.5% stated that a reason for this was the times that they started and finished work. Being a 24-hour broadcaster it would be expected to find a significant proportion of people who will be working non-standard hours; that is they start or finish outside of 0800 to 1800 hrs, Monday to Friday.

Compared to trips for other purposes, such as leisure or retail, the time of the journey to work trip is dictated by the required start and finish times of peoples' roles. This study has shown how these start and finish times have an impact on mode choice.

Public transport timetables generally serve the core working hours well but very early mornings (pre-0600 hrs), evenings (post-1900 hrs) and weekends (particularly Sundays) feature lower service frequencies and no services at all in some cases. The lack of services outside of the core working hours restrict use of public transport services for people who are starting or finishing early or late in the day, particularly at weekends.

The organisational policy of providing a taxi home when finishing late was found to be utilised by employees as a way of being able to travel in by a sustainable mode. The policy is likely to have been developed to assist people working unsociable hours, however, it did, in this case help, facilitate use of sustainable modes for accessing the site. This is not referenced as a formal measure in the Travel Plan but perhaps should be recognised as one. It also demonstrates how sustainable travel objectives can be successfully embedded within an organisations' core business objectives, which Roby (2010a) identified as a key way Travel Plans can have long-term sustainability.

In summary, the requirement to start and finish work early or late hinders the potential for sustainable mode use to some extent. For some people, start and finish times may not affect their ultimate decision to drive as other factors may have already influenced their decision to drive to work. However, for others it may hinder their choice of a sustainable mode, which they would utilise if they travelled to work during daytime hours. The impact of working hours may not have a totally negative impact on sustainable travel use as

peoples schedules fluctuate, allowing them to travel by sustainable modes when feasible, as the examples in section 7.7.4.1 demonstrate.

As well as organisational requirements affecting travel behaviour through start and finish times, the organisation can influence travel behaviour through policies relating to working arrangements. Although many roles require people to travel to site to work (such as those in broadcasting discussed above), there are many roles that are primarily desk and office based. As such, a way in which the impact of travel to work can be reduced is through facilitating people to work remotely, for example, from their home, known as teleworking or homeworking (Crosbie & Moore, 2004). Teleworking means that overall demand for travel is reduced, as employees are not required to travel to and from work and has been shown to reduce vehicle miles travelled if the journeys not taken would have been by car (Choo et al., 2005).

Depending on the nature of people's roles and the requirements for face-to-face collaboration, teleworking could offer opportunities to reduce overall travel demand and thus reducing trips to the site by private motor vehicle. Although the majority of employees travel to the site five days per week, some employees have different requirements through the week relating to their job that means travel to the site is not an everyday occurrence.

This study has identified how some people are travelling considerable distances from outside of the Greater Manchester conurbation to reach the site every day. It is understood that not all of these people could work remotely due to role requirements. It is also understood how people value the space-time transition between home and work (Vale, 2013) and place value on their travel to work time (Jain & Lyons, 2008) and may not want to work from home for this reason. However, further understanding of individual role requirements and individual preferences may uncover further potential for teleworking where it is currently suppressed.

8.2.3.4 Physical environment

The new location of the employment site is a significant factor in influencing the travel behaviour of employees. The previous section highlighted the importance of the post-relocation site being equal or better in terms of sustainable accessibility or there is a risk people will switch away from sustainable modes. Key themes coming from previous work

on site location and travel behaviour were how less central sites had higher levels of car use when compared to central sites and relocations from central to less central areas result in increases in car use (Aarhus, 2000; Bell, 1990; Cervero & Landis, 1992; Hanssen, 1995).

These findings on the sustainability impacts of non-central locations have particular resonance for the MediaCityUK case study due to how the site was developed on a brownfield site in a non-central location approximately 3.5 km from the regional CBD. The findings of this study show that MediaCityUK aligns with the studies referenced above as the site has a sustainable mode share of 60.6% compared to 73.2% for the regional CBD, representing a significant difference.

Looking at the reasons for lower levels of sustainable travel to less central sites it was found from previous studies that more car parking availability (Aarhus, 2000; Hess, 2001), a less congested highway network (Cervero & Landis, 1992), lower levels of public transport accessibility (Hanssen, 1995; Næss & Sandberg, 1996; Sprumont et al., 2014) and an increase in the distance from home to work (Chatterjee et al., 2014; Vale, 2013) were key factors. This study found that the switch away from sustainable travel was linked to three of these reasons, car parking availability, lower level of public transport accessibility and increase in the distance from home to work. There was a less clear picture with regards to congestion on the highway network with some people discussing it negatively while others not discussing it as an issue.

As discussed in section 7.6.2.2.1 the public transport interchange penalty is related to the non-central location of the MediaCityUK site. The non-central location of the site affects how people can access it through the transport network. Urban public transport networks are generally arranged around trips being made from the outer conurbation into the urban centre. When the destination of a trip is outside of the centre of the network, interchange between public transport modes or services may be required. Previous research has identified how interchange penalty is related to fewer people using public transport to reach non-central locations (Hanssen, 1995; Palmer et al., 2011; Sprumont et al., 2014).

To reach MediaCityUK by public transport, interchange is required from many locations. The interchange includes light rail interchange at Cornbrook, light rail-rail interchange in Manchester city centre and rail-bus interchange at Salford Crescent. This study found that the need to interchange to reach MediaCityUK from many locations was a key factor in

reducing the attractiveness of public transport or meaning people travelled by other modes. A large number of people switched from public transport to car use and the interchange penalty emerged as a key factor in this change:

“I don’t want to spend 2 hours messing around on trams and trains and connecting with the tram to my particular area.” (P01, female, car)

“It’s mainly convenience because if I could get a direct tram from where I live, but it’s the fact that I have to go to Cornbrook and change and then come from Cornbrook, means it takes, if I drive and walk from where I park it takes half an hour, but if I get the tram it takes an hour.” (P07, female, car)

Despite the sustainable mode share of MediaCityUK (60.6%) being lower than the regional CBD (73.2%), it was also found that the sustainable mode share is significantly larger than that of the surrounding non-central area. This has implications for policy and practice because the site demonstrates the possibilities of developing non-central locations in a way that supports sustainable travel. This is in contrast with the trend of developing non-central locations in a manner that facilitated access primarily by car during the twentieth century (Banister, 2012; Goetz, 2013).

To achieve the levels of sustainable travel recorded at the non-central site there were significant costs involved, for example, the £20 million required to extend the light rail system to the site and procure new trams. If the site had been located within the CBD, infrastructure improvements would have been required; however, they are unlikely to have been to this level due to existing provision. The costs for the soft measures are less clear, however, they will have been relatively low in comparison to infrastructural measures (Roby, 2010a). However, there are opportunities for these costs to be borne or shared by the private sector through the planning process. For example, the design of the site can be made to favour sustainable modes, such as the spatial layout favouring walking and cycling over cars and the on-site infrastructure including cycle storage facilities. Some of the factors that can be influential in encouraging and facilitating sustainable travel have no specific costs associated with them, such as parking policies (Cairns et al., 2010) or flexible working arrangements (Shabanpour et al., 2018). It was evident from this study that people had been influenced, both positively and negatively, with regards to sustainable travel by parking and flexible working policies at the site.

The implications for future non-central developments of this nature with a large relocated workforce are that the hard and soft measures must be considered thoroughly to ensure they will facilitate sustainable accessibility. The following Section 8.3 goes on to discuss how this could be achieved.

8.2.3.5 Policy

The site-level policy context in which travel to MediaCityUK is conducted is influenced by what was discussed in Chapters 5 and 7 regarding the conditions of the planning application for the development of the site. The planning condition specified a 45% non-car modal split for trips to the site in the AM and PM peak hours (Urban Vision, 2011). To support this target a range of hard and soft measures were implemented (see section 7.2.3). This site-level policy is what can be utilised during a large-scale workforce relocation to influence travel towards more sustainable patterns. However, people's travel behaviour is influenced by far wider policy that could potentially negate the local and site-level policies. This context relates to what was discussed in section 1.2.1.1 about how twentieth century urban form has been designed around people travelling by motor vehicles (Banister, 2012), resulting in increases in private motor vehicle use and the reduction of all other modes (DfT, 2017e). This study has highlighted how policies that promote and facilitate sustainable travel for travel to work journeys can have an impact for this specific trip purpose. However, the wider current and historic policy context that people are operating has the potential to outweigh site-level efforts to increase sustainable travel.

8.3 The role of hard and soft measures in facilitating sustainable travel during a relocation

The sixth objective of this study was to understand how to utilise hard and soft measures during a large-scale workforce relocation to facilitate sustainable travel. The MediaCityUK case study provided a unique opportunity to achieve this objective due to the range of hard and soft measures that were implemented (see section 7.2.3 for full details of the interventions).

To provide public transport connectivity to MediaCityUK and instigate Transit Oriented Development (TOD) around a public transport hub, a spur line from the existing light rail network and a MediaCityUK station were opened in 2010. The investment in light rail to serve MediaCityUK was substantial compared to investment in a bus connection, however,

light rail has been shown to be perceived more positively compared to bus travel, providing more potential to attract users (Beirão & Cabral, 2007). The light rail connection is seen positively in terms of ease of access to the transport network and short walking distance to the MediaCityUK buildings:

“With the Metrolink stop being right by Media City that made it quite easy to just do train and tram...Yeah, I think the Metrolink stop was a pretty good idea.” (P05, male, car)

From an infrastructure perspective, the spur and station are a key factor in demonstrating the importance of the site in terms of being connected to the wider region. However, their effectiveness is hindered by the services that operate on the infrastructure. The interchange penalty is a fixed issue for people travelling to the site from parts of the conurbation, particularly those areas where many employees were travelling from (e.g. south Manchester and Trafford). The interchange location for services from the south of the conurbation is a Cornbrook, which features elevated platforms without shelters, providing a hostile environment in the colder months. The frequency of five services per hour to/from MediaCityUK is low compared with frequencies of services in London, particularly underground services, where, for example, there are 24 services per hour on the Northern Line (TfL, nd). This is particularly salient due to how public transport frequency is understood to be a key factor in user satisfaction (Hensher et al., 2003). The low frequency of services on the light rail network is further exacerbated by network reliability issues. Periods of disruption due to network expansion and maintenance have occurred post-relocation, adding to issues experienced more generally. There is a never a good time to close or reduce services on a public transport network but the significant disruptions that took place in the years following the relocation resulted in particularly negative attitudes towards the service from those that had relocated to the site. As highlighted in section 7.6.2.2.3, this was identified as a possible factor in the mode share of public transport (and tram in particular) reducing between 2012 and 2016. The quotes below encompass the key issues with light rail access to the site:

“I love the site and the atmosphere but access to the site by public transport is difficult because of the sheer unpredictability on a day-to-day basis of the tram system.” (BBC staff survey respondent)

“I prefer not to (use the tram), just because of the number of people who get on it and also because, periodically there would be problems and delays and there

was nothing you could do about that and you wouldn't know how long it was going to take and you would just be sat there for ages." (P16, male, cycle)

"Unreliable trams, line closures, huge wait times at Cornbrook for transfers, infrequency of MediaCity trams..." (BBC staff survey respondent)

In terms of other public transport modes that serve the site, the bus services to the site are limited which has resulted in them being a less used mode compared with before relocation with a share of 4.8% down from 12.4%. The 50 bus service that connects MediaCityUK with Salford Crescent station and Manchester city centre is frequent with six services per hour; however, it is not a direct service, which affects the journey time compared to if it was direct. The 50 service was extended from Manchester city centre to connect Salford Crescent railway station with MediaCityUK, replacing a direct shuttle service that connected the two locations previously (see section 7.2.3.2 for full details). This study showed it was not a particularly popular method of connecting to the site with respondents referring to the indirect nature of the route as being a key issue.

"I have tried the bus from Salford Crescent... but that's kind of a quite roundabout route in the middle of Salford." (P06, male, public transport and cycle)

The interchange between rail and bus at Salford Crescent is also hindered by the MediaCityUK-bound bus stop being located on the opposite side of the A6 with no crossing facilities on or near to the desire line.

It is worth highlighting that despite the on-going issues with the light rail service, the lack of direct rail services and a low number of bus services; public transport mode share to MediaCityUK (32.5%) is still higher than the regional average of 14.3%. This demonstrates effectiveness of the measures to promote and facilitate public transport access but also alludes to further potential should these public transport accessibility issues be addressed.

For cycling, the Cycle Hub not being open upon relocation was not addressed as a key concern by BBC employees most likely due to the arrangement that was facilitated for them through the Greenhouse cycle store. They also had access to showers and changing areas within their buildings upon occupation if required. However, the Greenhouse facility was only available to BBC employees and not to other users of the site. A female cycle user also expressed concern about the Greenhouse facility that highlighted its inadequacy for appealing to all potential users:

“I never liked the greenhouse thing, like you would go in there and you would be on your own, and like the door would close and I’d be like “Oh my God”, you know, anyone could follow you in and you know. I think it’s a bit different for blokes, but I sort of feel you a bit vulnerable if it was dark outside, whatever, so I just never went in there really.” (P12, female, cycle and car share)

The ad-hoc nature of the Greenhouse facility and the lack of a high quality, high capacity cycle storage facility on occupation undermines the strategic sustainable transport objectives of the site. Particularly when considering that the large multi-storey car park was open on occupation.

The spatial barriers for further cycling to the site relate to the offsite provision of routes to the site. Although some infrastructure in the immediate vicinity to the site is of a good standard, the wider urban area lacks a consistent and coherent cycle network that is likely to be suppressing further usage.

The soft measures at the site were delivered through a site-wide Travel Plan that was conditioned through the planning process. 81.3% of people were unaware that Travel Plan was in place at MediaCityUK; however, this was expected, as the Travel Plan itself is not intended to be an outward facing measure. It is the mechanism through which other outward facing measures e.g. car sharing scheme or cycle promotions, are delivered. The success of a Travel Plan is determined by the measures that are included within it and how they are delivered (Cairns et al., 2010; Enoch, 2012; Roby, 2010b). The findings demonstrated that awareness and uptake of several Travel Plan measures, such as cycling promotions and incentives, was higher than awareness of the Travel Plan itself.

The co-ordination of Travel Plan delivery through collaboration of multiple stakeholders was a key factor in the Travel Plan reaching the large population at the site. The delivery model of this nature was recognised by the local transport authority TfGM as a case study example they wish to follow (TfGM, 2013).

8.3.1 How can hard and soft measures be utilised to facilitate sustainable travel during a large-scale workforce relocation?

What we have learned from this study is that the hard and soft measures are going some way towards facilitating sustainable travel. This research has shown that the case study site is performing better in terms of sustainable mode share when compared to adjacent sites in the local area and the regional and national average. It is behind the regional centre but

that has a greater supply of sustainable travel connectivity. However, this study has also revealed insights for where there are opportunities in to increase the effectiveness of hard and soft measures that are implemented in future large-scale workforce relocations. This section discusses these insights about how hard and soft measures can be used to facilitate sustainable travel during a large-scale workforce relocation.

The previous sections have discussed how changes in travel behaviour occurred during the relocation and the positive and negative implications for sustainable travel. It was also discussed how the complexities around travel behaviour mean that there are other factors (e.g. individual, social etc.) that may ultimately influence travel choices that are not related to the hard and soft measures implemented through the relocation.

However, this study has identified that there were two key aspects related to the hard and soft measures that were implemented as part of the relocation that can have an influence should other factors not be as influential. It has been identified how having the infrastructure to facilitate sustainable travel in place and operating sufficiently is important in supporting sustainable mode use from the outset. This supports what Walker et al. (2014) found concerning how spatial factors were important post-disruption, regardless of the attitudes of the people relocated. This research has also recognised the importance of providing people with the appropriate information on the sustainable travel options that are available in order to increase awareness when people are considering their travel plans. These two aspects represent the hard and soft sides of Transport Demand Management (TDM) about which we also understand the importance of implementing a combined package of hard and soft measures to enable sustainable travel use (Cairns et al., 2004; Enoch, 2012).

At MediaCityUK, both hard and soft measures were implemented with a range of hard measures implemented as the site was planned and developed, such as the light rail extension, pedestrian and cycle footbridge and link road with cycle provision (see section 7.2.3 for full details). These hard measures are referenced in the Travel Plan where the focus was designated as 'promoting these new developments (hard measures) to employees, residents and visitors to MediaCityUK to encourage them to take advantage of these' (Urban Vision, 2011). The Travel Plan also included a range of soft measures that were implemented when the Travel Plan delivery commenced in 2012.

8.3.1.1 Implementation timescales

The method enacted at MediaCityUK is typical of the approach for delivering hard and soft measures at a site where planning permission is required (see section 4.3). The hard measures are planned and delivered as part of the wider development and construction of the site while the soft measures are implemented post-occupation through the Travel Plan mechanism.

While this represents a combined approach to delivering hard and soft measures, there is a temporal disconnect between the two types of measures that mean their full potential may not be being realised. With the Travel Plan only reaching the delivery stage following occupation means that it is only active during the post-relocation stage of the relocation process. This study has presented how people are considering, planning and making decisions about how they will travel post-relocation throughout both the pre-relocation and during relocation stages of the process. In the case of MediaCityUK, the Travel Plan did not start to be delivered until 2012 when the post of TPC was filled, which was over a year after the initial occupation by the BBC, representing a further delay.

Due to the temporal separation between the planning and delivery of hard and soft measures and the lack of delivery until post-relocation, an expansion of the scope of Travel Plans may be appropriate to further their objectives. The scope of the current Travel Plan requirement being too narrow in terms of timescales links to what Enoch (2012) discusses with regards to relocation being, in theory, an opportunity for Travel Plans that, in practice, is limited. Enoch describes Travel Plans as not being “pro-active” in this context and merely a “sticking plaster” attempting to make the most of a sub-optimal situation (Enoch, 2012). Enoch discusses going further than the Travel Plan being active from the interim/framework stage (Table 4.4, section 4.3.1.3.2) as discussed above because at this stage key decisions over the site location have already been made. As such, Enoch proposes that to be more effective, Travel Plans should be incorporated into the relocation process to positively influence relocations decisions towards sustainable ends (Enoch, 2012). Lack of space, least costs and the condition of properties were found to be the priorities for relocating organisations, with accessibility not typically featuring as a key priority (Elgar & Miller, 2010). Having the Travel Plan requirement in place at this early stage may ensure organisations put accessibility on a par with those other internal issues. This would give the

Travel Plan, as a mechanism for facilitating sustainable travel, a much wider and strategic remit that is linked to the planning of the new site. This remit would encompass the decisions made about on site infrastructure as well as those about offsite infrastructure, such as public transport connections and cycle routes.

The difficulty in implementing this through the planning process, which is the only current way of mandating Travel Plans, is that these internal discussions over relocation are likely to have taken place before the organisation has chosen a site and then begun the planning approval process. Therefore, for Travel Plans to be involved at this stage they would have to be mandated more wholly as in other countries (e.g. France) where organisations over a certain size must have a Travel Plan in place regardless of whether they are seeking planning approval (Dill, 1998; Enoch, 2012).

If the Travel Plan delivery was to begin earlier at the framework/interim stage then delivery of soft measures could be enacted consistently among all employees who it is known will be relocating to the site. Having a Travel Plan Co-ordinator (TPC) in place to influence decisions at this stage would allow for the longer term, on-going soft measures to be explicitly linked to and supporting of the hard measures that are delivered as part of the development. This longer-term approach would allow for effective integration of hard and soft measures rather than the existing approach of having to attempt to integrate the soft measures with hard measures that may not be wholly appropriate or practical for many people.

In the case of MediaCityUK, incorporating the Travel Plan into the relocation process has particular relevance because the chosen site was among a shortlist of four sites, with the other three sites being within the CBD (Gibson, 2005; Knowles & Binder, 2017). Therefore, from an accessibility perspective the other three sites were in an area with existing sustainable transport links. It could be argued that locating MediaCityUK in the CBD would have increased the possibility for higher levels of sustainable mode share, for example, on a par with the CBD rate of 73.2% (TfGM, 2016b). It could be further argued that the 73.2% could be surpassed by a completely new development that could be designed to reduce the attractiveness of car use while facilitating sustainable travel. For example, utilising the hard measures that were discussed in section 0 in relation to Transit Oriented Development (TOD) and new urbanism. These hard measures combined with the soft

measures within a Travel Plan could have further boosted the sustainable travel mode share for the development through the provision of long-term framework to facilitate sustainable travel.

As presented in section 4.3.1.2., Stage 4 of the Travel Plan process is 'implementation' and this is where the Travel Plan moves from being a document to an active delivery mechanism. The TPC that was appointed by Peel, as the organisation responsible for the Travel Plan, took the action plan within the Travel Plan and converted the measures into active delivery streams. The fact that MediaCityUK is a large multi-organisation development and how the majority of the several thousand employees based at the site worked for organisations other than Peel meant that the Travel Plan needed to be delivered collaboratively with the tenant organisations. The tenant organisations are under no direct mandate to deliver the Travel Plan. Peel, as site developer, are the organisation that the Local Planning Authority (Salford City Council) have conditioned through the planning process to implement a Travel Plan at the site. Unless participation in the Travel Plan was included in a tenancy agreement (which to the author's knowledge it was not) then the basis for involvement is purely voluntary. This makes the way the MediaCityUK Travel Plan was collaboratively developed of note as the tenant organisations all contributed towards achieving the condition that was set for the developer and landowner Peel. The fact that the Travel Plan is not only being delivered but being delivered at a large site with complex interactions involving a number of actors means the MediaCityUK Travel Plan particularly stands out. Especially when considering how nearly half of Local Planning Authorities stated there were Travel Plans not being delivered (Rye et al., 2011).

8.3.1.2 Spatial focus

In terms of focusing on people that have spatial propensity for sustainable travel, this study found that the sustainable mode share of MediaCityUK is 60.6%, higher than the local (25.8%), regional (40.5%) and national (36.0%) average. The mode share also means that the site is achieving its Travel Plan target of at least 45% of trips to the site by non-car modes. As a considerable number of people are already using sustainable modes then a focus on replacing public transport trips with cycle trips could be appropriate due to the additional benefits cycling would bring compared to public transport use (see Section 8.2.2.3 for details of the benefits). This approach is being taken in London where busy parts

of the bus and underground network are being targeted for mode shift towards cycling (Greater London Authority, 2013). However, increasing the share of one sustainable mode at the expense of another is not the usual approach of Travel Plans, which are aimed at reducing single occupancy vehicle mode share (DfT, 2009a).

To achieve this aim, a more focused travel planning approach would be applicable, such as the use of Personalised Travel Planning (PTP) where people receive sustainable travel information tailored to their individual requirements (Bonsall, 2009). This could be applied by targeting those existing public transport users that are within an acceptable cycling distance of MediaCityUK or those that have to interchange as part of the journey. An acceptable cycle distance is not standardised in the UK but it is acknowledged that 80% of cycle trips are less than 8km and 40% less than 3.2km (Gallagher & Parkin, 2014). A focus on employees within those catchments would be an efficient way of allocating resources to where there is a higher propensity for mode shift based on the detailed understanding of the factors that result in people cycling (discussed in Section 8.2.2.3). In terms of hard measures to support this focused approach, improving cycle provision to/from public transport interchanges could then be prioritised. An understanding of this at an earlier stage would allow the cycle provision secured through the planning process to be delivered in a targeted manner.

8.3.1.3 Focus on underrepresented groups

Another way in which a Travel Plan could begin the process of influencing travel behaviour towards sustainable modes earlier in the relocation process is through focusing on groups of the employee population that are underrepresented in terms of sustainable mode share. This study found an example of this with regards to cycling where females were less represented than males (11.3% to 20.4%) corresponding with previous research into the differences in cycling in relation to gender (Heesch et al., 2012; Krizek et al., 2005).

It was discussed in Section 8.2.3.1 that positive attitudes towards cycling are significant in terms of increasing cycle use for journeys to work (Heinen et al., 2010) but people who have never contemplated cycling had the least positive attitude towards cycling (Gatersleben & Appleton, 2007). As such, support provided to female cycle users in sharing their positive experiences of cycling to work would be a targeted way of increasing cycle mode share. Female employees who may not have a positive outlook about cycling in

general but more specifically for transport purposes may start considering cycling as an option for travelling to the site. An example case that can be drawn upon from this study highlights the impact of the large cycle mode share and how, to a non-cycle user, the visibility of cycling means they are in the contemplation stage:

“...you can’t walk across the Plaza without almost being run down by at least two cyclists, so there’s always people cycling around, so again another constant reminder that’s a thing that exists...I think also it (cycling promotions) helps keep cycling in people’s minds, like ‘Oh yeah that is an option’.” (P14, female)

Converting this state of contemplation into preparation and beyond may require other constraints to be subjugated, such as those related to cycle infrastructure on highway routes (Heinen et al., 2015; Hull & O’Holleran, 2014). A way of focusing an approach to removing constraints from part of a population targeted for increasing cycling would be to utilise the Theory of Constraints (TOC) (Goldratt, 1990). TOC has been largely applied in management sciences to study the constraints that limit a system from achieving its objectives, however, it has also been applied to bicycle policy where the following steps are taken:

1. What is the goal of the bicycle policy? (increase numbers of female users)
2. What is the first most important constraint? (negative attitudes towards cycling as transport)
3. How can the constraint be lifted? (existing female cycle users creating positive representations of cycling as transport) (Zuidgeest et al., 2009).

Once the most important constraint has been lifted the process can revert to step 1 to look at the next most important constraint (Goldratt, 1990). A relevant application of TOC to a large-scale workforce relocation, where an objective is to increase cycling by females (as an underrepresented group), could involve the use of focus groups. Focus groups allow for a clearly defined topic to be explored with a group of people from which insights can be gained to influence further research or implemented measures (Saunders et al., 2009).

By understanding more about groups of the relocating population earlier in the relocation process would allow the measures delivered to be targeted towards those groups. The implementation of focus groups to identify constraints to cycle use among females would be a key part of this earlier approach to encouraging and facilitating sustainable travel. Engagement with existing female cycle users and non-cycle users would allow for the TOC

method to be applied with a view to removing as many constraints as possible. This approach could be transferred to other objectives if constraints are understood among the relocating population at an earlier stage.

8.3.1.4 Focus on the practice

An alternative way of understanding how to influence travel behaviour towards more sustainable patterns during a large-scale workforce relocation is to think beyond travel to work as 'a behaviour' with the individual as the sole focus for promoting sustainable travel. The government's recent approach to changing behaviour and increasing sustainable travel has been through the provision of information, increased choice and incentives to change behaviour. This 'psychology-led' approach underpinned the Local Sustainable Transport Fund (LSTF) programme, aimed at increasing sustainable transport use by influencing individual travel behaviour (Williams, 2014). The government approach of increasing individual choice and incentivising the desired change in behaviour rather than restricting the undesirable behaviour in a transport context is consistent with wider government policy. Targeting the individual with 'nudges' within the environment of choice-making, highlighting better choices without restricting freedom of choice has become known as 'libertarian paternalism' (Jones et al., 2011). It was highlighted in section 4.3.1.3.1 how the approach is popular with policy makers across government departments due to how it avoids the controversy of restricting individual choice (Avineri, 2012).

While popular with the government due to political acceptability, an approach to changing travel behaviour and the conceptualisation of travel to work as 'a behaviour', rather than a more complex set of beliefs, values and activities, could limit understanding and therefore application of measures aimed at increasing sustainable travel (Guell et al., 2012). Barr and Prillwitz (2014) describe existing solutions for sustainable mobility as being framed through a narrow political lens that fails to address the potential social transformations needed to tackle climate change. As such, a focus on changing behaviours amongst individuals needs to be seen within the wider context of the different influences on travel behaviour (Barr & Prillwitz, 2014).

In relation to this study, on reflection, considering travel behaviour solely at a psychological level from the perspective of the individual and their attitudes and preferences limits the insights that can be gained within the context of a large-scale workforce relocation. Looking at this problem from a sociological perspective offers potential for further understanding and ultimately opportunities to inform the delivery of effective policy. A theory that allows this problem to be assessed through a different lens is Social Practice Theory (SPT), which conceptualises the individual as a carrier of practices that comprise of material, meanings and competencies:

- Materials: including things, technologies, tangible physical entities, and the stuff of which objects are made;
- Meanings: symbolic meanings, ideas and aspirations; and
- Competences: which encompass skill, know-how, and technique (Shove et al., 2012).

SPT focuses on the practice being undertaken by the individual rather than looking at the psychological context of the individual undertaking the practice (Shove et al., 2012). SPT theorises that individuals draw meanings from a practice being implemented, for example, the construction of a new highway designed predominantly for private motor vehicles is likely to generate meaning of how people should travel, with driving seen as acceptable. Conversely, if the new infrastructure primarily catered for sustainable modes, this provides a different message and meaning in terms of how the government expects people to travel (Williams, 2015). The study of SPT within a transport context is emerging, with recent research investigating its use in understanding and influencing travel behaviour (Barr & Prillwitz, 2014; Shove et al., 2015; Spotswood et al., 2015; Williams et al., 2019).

Within the context of utilising a large-scale workforce relocation as an opportunity to influence travel, SPT offers a method that goes beyond focusing on the individual during the period of the relocation. SPT argues that interventions to influence travel behaviour must take into account the many factors that influence why a practice has been performed in particular manner (Shove et al., 2012). The findings of this research highlight the importance of understanding travel behaviour for journeys to work at the level of the practice. This is due to how complex interactions are involved in the practice of this type of journey, for example, trip chaining (Hensher & Reyes, 2000) and how interventions to

influence travel behaviour must take into account the many factors that influence why a practice has been performed in particular manner (Shove et al., 2012). While recent research has looked at SPT in the context of transport and travel behaviour this has not transferred into practice. Recent government policy has focused on psychology-led approaches discussed above when attempting to influence travel behaviour towards sustainable patterns, focusing on the individual and their environment. As such, measures targeted at the individual rather than the practice that the individual is undertaking could therefore be limited in their impact due to how the act of travelling to work is a complex practice. SPT allows the individual to be removed as the focus when addressing the issues of increasing levels of sustainable travel during a large-scale workforce relocation. Rather the practice of travelling to work can become the principal unit of enquiry (Spotswood et al., 2015).

By thinking about the practice as a combination of elements that are complexly linked will assist in which aspects would need to be altered for the practice to be changed towards the desired aim of increased sustainable travel use (Spotswood et al., 2015). Spotswood et al. (2015) argue that the limited uptake of practice theory within the policy arena could be explained by the abstract nature of the theory or the dominant focus on individual choices, such as soft measures (e.g. through the LSTF), as highlighted by Cairns et al. (2014). The utilisation of SPT in practice is a challenging undertaking, as it requires collaboration across a diverse group of stakeholders that relate to the practice of travelling to work, such as the employer, government, local authority, transport authority and transport operators. However, during a large-scale workforce relocation a more holistic and long-term implementation of a Travel Plan (as discussed in section 8.3.1.1) provides the prospect for collaboration between these stakeholders to focus on the practice of travelling to work. The opportunity is unique as it is an occasion where the influential stakeholders that could have a positive impact on travel to the site are brought together to address access for a large number of people. Barr and Prillwitz (2014) highlighted how the practices of (un)sustainable mobility are related to the structure and organisation of physical environments, the nature of which changes significantly during a large-scale workforce relocation. The findings of this research support these findings and emphasise the need for

further research into the possible opportunities to influence travel behaviour towards sustainable patterns through understanding travel behaviour at the level of the practice.

9 Conclusions

9.1 Implications

The implications of this study are relevant for a number of stakeholders that are involved in land use and transport planning in the context of a large-scale workforce relocation. This chapter presents the implications of this study in relation to these key stakeholders with the aim of informing future decision-making.

9.1.1 Government

9.1.1.1 Large-scale workforce relocations offer opportunities for significant changes in travel behaviour

The level of modal change observed due to a large-scale workforce relocation was significant and this emphasises the rationale for researching large-scale workforce relocations within the context of the mobility biographies and disruption streams. Large-scale workforce relocations should be considered as key opportunities to understand and influence how people travel for work in order to develop measures to increase sustainable travel. An important reason behind this is how large-scale workforce relocations provide an opportunity to understand and influence travel across a large population of people that are being affected by a disruption to their normal patterns of behaviour all at the same time. It would be a lot harder and resource intensive to identify a large population (for example, based on residential relocation) going through a similar disruption at the same time for the purpose of understanding and influencing travel behaviour.

The UK Government has previously recognised the major opportunity that workplace relocations provide concerning ‘bringing about comprehensive changes in travel conditions’ (DfT, 2005). This study demonstrates that the Government should continue to recognise workplace relocations as opportunities for changing travel behaviour, in particular those involving large numbers of people. Indeed, given what is understood about Government policy for relocating Government departments and the economic and political context triggering further organisational relocations, increased focus from central Government is warranted. Advice and guidance publications, similar to those that have been previously produced by the government to advise different audiences on how to effectively implement policy (see (DfT, 2008; DfT & Transport Energy, 2005) offer

opportunities to disseminate what is understood about the opportunities to positively influence travel during a large-scale workforce relocation. Jointly produced by government departments that have an interest in workplace relocations, such as the Department for Transport and Ministry of Housing, Communities and Local Government, the documents can be tailored towards the relevant stakeholders, such as local authorities, developers and organisations. Highlighting the mutual benefits to all stakeholders will be an important element of the productions, as will use of relevant case study evidence, such as that originating from this research.

9.1.1.2 Cycling is a key mode of travel

Cycling as a mode of transport, while still having a low mode share in many locations, has seen increased recognition in this context in recent years. In the UK, Government strategy includes an ambition for cycling becoming a natural choice for shorter journeys or as part of a longer journey (DfT, 2017b).

In this case study cycle use for the journey to work prior to the relocation was higher than local and national averages. Following the relocation increases in the overall mode share of cycling was observed along with considerable switching from public transport to cycling. It became apparent that due to issues with public transport, people were looking for alternatives and cycling became that natural choice, rather than the shift being solely towards car use that had been observed in previous studies.

This research emphasises how cycling should continue to be considered a key mode of travel within national transport strategy. The Government identifies that to achieve more widespread use of cycling as a mode of transport requires sustained investment in infrastructure (DfT, 2017b). This study adds further evidence to this case with findings demonstrating where infrastructure has facilitated cycle use and where the lack of it is acting as a barrier to usage.

9.1.2 Local Authorities

9.1.2.1 Further potential for hard and soft measures

The high level of modal change observed through the case study is of relevance to local authorities in terms of how there are opportunities to support policies related to facilitating sustainable travel. While an on-going policy of supporting organisations within

their area in the development of TDM measures should be continued, this research supports additional emphasis being placed on TDM implementation when large-scale workforce relocations take place. When large-scale workforce relocations involve the planning process, as in this case study, it provides local authorities with a direct means of influencing TDM implementation through negotiation with the developer and mechanisms within planning policy, such as Section 106 agreements. These opportunities should be capitalised on by local authorities due to what this study has demonstrated regarding the disruption in normal travel behaviour they can bring and the opportunities to positively influence travel behaviour towards sustainable patterns.

As such, implementation of national government planning policy that consents local authorities to mandate hard and soft TDM measures should be strengthened within the context of large-scale workforce relocations. Hard and soft measures support each other in facilitating sustainable travel; however, the current approach of implementing hard and soft measures means that they may not be focused in a way that would achieve the most potential for sustainable mode use. The Travel Plan and the soft measures that were delivered through the Travel Plan were all implemented in the final stage of the three-stage relocation process – post-relocation. Indeed, there was a further delay of approximately a year from the first occupation of the site until the Travel Plan implementation commenced following the appointment of Travel Plan co-ordinator.

This implementation timescale misses what is understood as a crucial period in the relocation for influencing people's travel to work. The underpinning aim of Travel Plan is to encourage and facilitate sustainable travel, however, its role is passive until after the main relocation and planning decisions have taken place. The opportunity to influence travel behaviour through a large-scale workforce relocation in theory is therefore limited by the soft measures having to respond to the already established environment. This limits how the Travel Plan can encourage and facilitate sustainable travel by public transport and active transport because the implementation context has already been established. This context is related to both the physical environment and infrastructure changes at the new site and the governance arrangements within organisations responsible for Travel Plan implementation. In order to extend the reach of Travel Plans and soft measures within the large-scale workforce relocation context they need to be active at an earlier stage in the

relocation process. Local planning policy could be adapted to reflect this requirement, promoting a collaborative approach between the key actors to achieve a more holistic delivery of the Travel Plan measures.

9.1.2.2 Strategic planning of sustainable transport networks

When large-scale workforce relocations involve the planning process, there is a likelihood that the planning application will be locally significant (as in the case study in this research) due to the development or redevelopment resulting in considerable changes in travel demand locally and regionally. To facilitate sustainable mode use this change in demand has to be factored into decisions about the sustainable transport network. The tram network was particularly focused on during the large-scale workforce relocation investigated through this study. However, it is important to consider all sustainable modes in the same strategic manner by planning for the change in demand and facilitate an increase in usage in the future.

An example of where this thinking is emerging in UK policy relates to the development of bicycle networks, through Local Cycling & Walking Infrastructure Plans (LCWIPs) (DfT, 2017d). LCWIPs are based around identifying key desire lines between significant trip origins and destinations. An important part of the LCWIP process is considering the impact of future development and land use changes on travel demand and where that demand could be met by cycling (and walking) trips. This research adds further weight to this strategic approach to developing sustainable travel networks due to how understanding where significant changes in trip patterns are going to occur allows the network to be planned appropriately.

9.1.3 Developers

9.1.3.1 Relocations to non-central sites can have considerable sustainable mode shares

This study has demonstrated how non-central sites can achieve sustainable mode shares above the rate observed in existing non-central sites nearby. For this to be replicated, a similar integrated approach to planning the development around access to sustainable modes is required. The approach could also go further in supporting the incentive to use sustainable modes by providing further restrictions on using private motor vehicles. The

availability of free or subsidised car parking near to the development is hindering it from realising further increases in sustainable mode share due to how people are not disincentivised to drive to the site. From a developer perspective, providing car-parking capacity has two main financial impacts. First, there is the cost associated with constructing the car park and associated access and connections to the highway network. Second, the space dedicated to car parking could be developed for other types of land use, such as residential or commercial, that are more profitable for the developer. As such, the wider strategy of facilitating sustainable access to the site can offer commercial benefits to the developer by reducing the burden in relation to car parking provision.

9.1.4 Relocating organisations

9.1.4.1 Focus on high propensity groups

The findings of this study have informed ways in which efforts to promote and facilitate sustainable travel could be focused in order to generate further sustainable travel use in future similar relocations. Part of this focus requires an integration of hard and soft measures at an earlier stage in order to maximise their potential. Another key element is focusing on people who may have a higher propensity for sustainable travel use due to their proximity to the new site and levels of accessibility. The approach is also based on targeting groups that are under-represented in terms of their sustainable mode share. This targeted approach would support the more general implementation of soft and hard measures that was shown through this study to be sufficient for some people to utilise sustainable modes.

9.1.4.2 Peer-to-peer knowledge sharing should be recognised

The above average number of existing cycle users prior to relocation had an influence on the addition of new cycle users following relocation. The visibility of cycling at MediaCityUK along with information and advice being openly shared by colleagues established cycling as a real option for travelling to the site. The number of cycle users and in particular those sharing information helped remove some of the established barriers to cycling that include knowledge of routes and also technical barriers relating to operating and maintaining a bicycle. The combination of soft measures aimed at increasing cycling and the information sharing and support from colleagues resulted in people having self-efficacy to travel to work by bicycle.

In order to capitalise on what is understood about the impact of knowledge sharing among colleagues, it could be included within the Travel Plan as a measure. Travel Plans can often include the measure of identifying 'champions' within an organisation that may be enthusiastic about promoting the benefits of sustainable travel to their colleagues. However, on this occasion, the experience at MediaCityUK appeared to go beyond the use of solitary champions due to the more common use of cycling, with 1 in 6 people utilising the mode compared to 1 in 50 of the general population. As such, across the organisation there were people providing useful information that assisted people in travelling by bicycle. If the facilitation of information sharing became a Travel Plan measure, it could create a risk of it losing its appeal, a key part of which was that it was personalised and provided by colleagues with their own personal experience of using that mode of travel. Whilst information provided through the Travel Plan was still being referred to, information delivered through colleagues inspired greater trust than information from official sources. To capitalise on the opportunity provided by knowledge sharing there needs to be a considered understanding of sustainable mode users and what inspires them to share useful information. The practice could be incentivised by the organisation or efforts made to ensure people are further equipped with sufficient information for sharing, such as relevant external sources. In a large-scale workforce relocation, the knowledge sharing was particularly useful for those who relocated after an initial cohort had been at the site for a while. The information passed onto people was therefore a product of the actual experiences of those relocated early in the process. For future relocations, this is where the focus on encouraging and incentivising informal knowledge sharing could focus. This would overlap with ensuring the long-term sustainability of the Travel Plan because the people relocating to the site after the initial relocation may be doing so beyond the period where the Travel Plan was being implemented at its peak. As long as the sustainable travel information being shared by colleagues is positive then hard and soft Travel Plan measures implemented at the outset will continue to be promoted without the same level of resource burden on the organisation.

9.1.4.3 Previous experiences are influential

Previous experiences of travel and the practices people develop and carry with them around travel influence how they will travel following relocation. Those that travelled

sustainably pre-relocation developed expectations about the provision of sustainable transport that they carried with them to the new location. These expectations were particularly evident in the case of public transport. This links to how the availability and functionality of sustainable travel options at the new location needs to be comparable or better than the previous location to maintain mode share and create the possibility of mode shift from car use. Issues around public transport connectivity and reliability caused expectations not to be met resulting in a notable shift away from public transport. A workplace relocation that involves a move from a CBD to a non-central area is highly likely to involve a significant reduction in levels of public transport accessibility and use. Organisations should consider this when planning where to relocate as employees may have negative views towards the relocation if their expectations around travel are not met.

9.1.5 Summary

Table 9.1 summarises the opportunity that has been identified through this research to facilitate sustainable travel during a large-scale workforce relocation. The table is structured around the different stakeholders involved in a relocation and what the outputs of this study do to inform future high-level approaches. High-level actions are listed that can assist each of the stakeholders with their own agendas while contributing towards facilitating sustainable travel during a large-scale workforce relocation.

Table 9.1 – Implications summary

Stakeholder	Key implications
Government	<ul style="list-style-type: none"> • Produce guidance for all stakeholders involved (LAs, developers etc.) on how to maximise large-scale workforce relocations to influence sustainable travel. • Link the opportunity to influence travel behaviour during these opportunities with wider strategic agenda (e.g. sustainability).
Local authorities & transport authorities	<ul style="list-style-type: none"> • Review and update strategic planning for sustainable modes around changes in travel demand due to large-scale workforce relocations. • Instigate TDM measure planning earlier in the planning process, engaging with relevant stakeholders.
Developers	<ul style="list-style-type: none"> • Reduce costs by providing less or no car parking. Cost can be then focused on land use that will provide greater returns (e.g. commercial, retail or residential space). • Cost could also be focused on transport infrastructure that has most value from a sustainable transport perspective (e.g. public transport, cycle infrastructure).
Relocating organisations	<ul style="list-style-type: none"> • Understand the relocating employees in further depth in order to focus TDM measures on those with greater propensity for sustainable travel. • Understanding the workforce and catering to their travel needs will assist with wider employee satisfaction strategies.

9.1.6 Originality and contribution

Future large-scale workforce relocations will present further opportunities to influence travel behaviour towards sustainable modes. Although this research focused on one case study location, it has drawn contrasts between people relocating from three different settings (London, Manchester and elsewhere) to a wholly new site developed outside of the regional centre and CBD. As such, the large relocated population had experienced different levels of transport provision prior to relocating and had different expectations about travel to MediaCityUK that would in some cases influence their travel behaviour.

The research has provided an in-depth understanding of the complexities of relocation process for individual employees and how these complexities need to be understood and responded to. The study has also highlighted the impact of methods to facilitate sustainable travel and how they can be further augmented to capitalise on the opportunity that the large-scale workforce relocation provides.

This research has provided a valuable insight into the issues and opportunities for increasing sustainable travel during a large-scale workforce relocation. Although research into the transport impacts of relocations has been taking place over the last few decades, there has been less of a focus on workplace relocations. Additionally, within a UK context the number of studies is very limited and given the current relevance means that this research could be valuable in forming the public and private sectors in decisions regarding relocation and travel patterns. This study has further significance in the fact that it has investigated a large-scale workforce relocation to a new development from locations within the local sub-region and another region.

This study has demonstrated that a substantial sustainable mode share can be achieved following a large-scale workforce relocation to a non-central area, which was not typical of previous research. The research has also highlighted the key reasons behind peoples travel choices and how hard and soft measures can be utilised to influence travel behaviour towards more sustainable patterns, particularly in a non-central location. Along with the identified opportunities, the study has also provided an analysis of the issues that can constrain efforts to generate sustainable travel during a large-scale workforce relocation.

The lack of integration between actors involved in the relocation (developer, tenant organisation, transport authority, local planning authority and transport operator) meant that hard and soft measures were not all in place when people began relocating. An increased focus on access to significant new or redeveloped sites is required at an earlier stage to ensure travel patterns are understood but also responded to with appropriate hard and soft measures. Otherwise, the approach becomes more reactive and limits the opportunity presented. This was particularly evident when disruption to public transport operations occurred as wider network improvements took place in the years following relocation during which new employees were still relocating from other organisations. The delays and disruption resulted in the sustainable mode share, in particular that of public

transport, being negatively impacted on. Planned disruptions to the public transport network that are known to have particular impact on a site that is reliant on public transport for a large part of its sustainable mode share can be mitigated. The implementation of hard and soft measures facilitating use of other sustainable modes, such as walking, cycling and car sharing, could be focused around the planned disruptions to ensure sustainable mode users are not lost to private car temporarily or permanently.

9.2 Limitations

The primary research that this study is focused on is based on the case of one large-scale workforce relocation to a new site in a non-central area. To gain further insights into travel behaviour around large-scale workforce relocations, the methodology could be replicated across several examples of a large-scale workforce relocation. When this research was being planned and scoped out, no other comparable relocations were identified that would have allowed the research to take in multiple sites. There were also issues around the scale and practicality of conducting in depth research at multiple locations through a part-time PhD programme. If the methodology utilised in this study were to be taken forward as part of a research programme with multiple researchers involved then there would be opportunities to involve a larger number of case study relocations. An overarching issue regardless of resources is having the similar case studies taking place within a particular timeframe, which may not be feasible. The challenge of identifying cases to study workplace relocations relates to why research on this topic is limited.

As such, it can be considered that this research has been exploratory in that it has identified specific areas within relocation research for further study. Future study of similar cases would allow for greater generalisation of the findings of this research with larger quantitative and qualitative datasets providing a basis for application in wider context, not solely for decentralised relocations.

9.3 Dissemination

The intention is to disseminate the findings of this research through at least two academic journal papers. The papers will focus on the main themes emerging from this research:

- The effect of a large-scale workforce relocation on travel behaviour; and

- The role of hard and soft measures in facilitating sustainable travel during a large-scale workforce relocation.

The journals to which the papers will potentially be submitted include:

- Journal of Transport Geography;
- Transport Policy;
- Transport Behaviour and Society; and
- Transportation Research Part A: Policy & Practice.

To date the research has been disseminated through conference papers and a book article, the details of which are presented below.

Conference papers

Binder, A., Knowles, R. D. (2017) *Spatial and non-spatial influences on travel behaviour during a large-scale workforce relocation*. Paper presented at the Royal Geographical Society (with the Institute of British Geographers) Annual International Conference 2017, London, UK. <http://conference.rgs.org/AC2017/317>

Binder, A., Knowles, R. D. (2014) *MediaCityUK, Salford – travel behaviour, modal choice and achieving travel plan targets*. Paper presented at the Royal Geographical Society (with the Institute of British Geographers) Annual International Conference 2014, London, UK. <http://conference.rgs.org/AC2014/198>

Binder, A., Knowles, R. D. (2013) *Transport choice, accessibility and modal shift – constraints on achieving a travel plan target at MediaCityUK, Salford*. Paper presented at the Royal Geographical Society (with the Institute of British Geographers) Annual International Conference 2013, London, UK. <http://conference.rgs.org/AC2013/203>

Book chapter

Knowles R. D. and Binder A., (2017) *MediaCityUK: A Sustainable Transit-Oriented Development*, Chapter 1, 3-12 in Theakstone W (ed) *Manchester Geographies*, Manchester Geographical; Society, Manchester, UK

References

- Aarhus, K. (2000). Office location decisions, modal split and the environment: the ineffectiveness of Norwegian land use policy. *Journal of Transport Geography*, 8(4), 287–294.
- Aditjandra, P. T., Cao, X., & Mulley, C. (2016). Exploring changes in public transport use and walking following residential relocation: a British case study. *Journal of Transport and Land Use*, 9(3), 77–95.
- AECOM. (2013). *Birley Fields and All Saints Travel Plan*. Retrieved from http://www.mmu.ac.uk/staff/travel/birley_fields_tp_04-03-2013.pdf
- Aguilera, A., Wenglenski, S., & Proulhac, L. (2009). Employment suburbanisation, reverse commuting and travel behaviour by residents of the central city in the Paris metropolitan area. *Transportation Research Part A: Policy and Practice*, 43(7), 685–691.
- Albalade, D., & Bel, G. (2012). High-speed rail: Lessons for policy makers from experiences abroad. *Public Administration Review*, 72(3), 336–349.
- Ames, C. (2017). Most congested cities revealed. Retrieved from <https://www.transport-network.co.uk/Most-congested-cities-revealed/13826>
- Anable, J. (2005). 'Complacent Car Addicts' or 'Aspiring Environmentalists'? Identifying travel behaviour segments using attitude theory. *Transport Policy*, 12(1), 65–78.
- Andersen, L., Schnohr, P., Schroll, M., & Hein, H. (2000). All-cause mortality associated with physical activity during leisure time, work, sports, and cycling to work. *Archives of Internal Medicine*, 160(11), 1621–1628. <https://doi.org/10.1001/archinte.160.11.1621>
- Arup. (2006). *Dock 9 Travel Plan Framework*. Manchester: Ove Arup & Partners Ltd.
- Avineri, E. (2012). The use and potential of behavioural economics from the perspective of transport and climate change. *Journal of Transport Geography*, 24, 512–521.
- Axhausen, K. W., & Polak, J. W. (1991). Choice of parking: stated preference approach. *Transportation*, 18(1), 59–81.
- Bachand-Marleau, J., Larsen, J., & El-Geneidy, A. (2011). Much-anticipated marriage of cycling and transit: how will it work? *Transportation Research Record: Journal of the Transportation Research Board*, 2247, 109–117.
- Bagley, M., & Mokhtarian, P. L. (2002). The impact of residential neighbourhood type on travel behaviour: A structural equations modelling approach. *The Annals of Regional Science*, 36(2), 279–297.

- Bamberg, S. (2006). Is a residential relocation a good opportunity to change people's travel behavior? Results from a theory-driven intervention study. *Environment and Behavior*, 38(6), 820–840.
- Bamberg, S., Ajzen, I., & Schmidt, P. (2003). Choice of travel mode in the theory of planned behavior: The roles of past behavior, habit, and reasoned action. *Basic and Applied Social Psychology*, 25(3), 175–187.
- Bamberg, S., Fujii, S., Friman, M., & Gärling, T. (2011). Behaviour theory and soft transport policy measures. *Transport Policy*, 18(1), 228–235.
- Banister, D. (2012). Assessing the reality - Transport and land use planning to achieve sustainability. *The Journal of Transport and Land Use*, 5, 1–14.
- Barker, T. (2008). The Economics of Avoiding Dangerous Climate Change. *Climatic Change*, 89(3–4), 173–194. <https://doi.org/10.1007/s10584-008-9433-x>
- Barnes, G. (2005). The importance of trip destination in determining transit share. *Journal of Public Transportation*, 8(2), 1.
- Barr, S., & Prillwitz, J. (2014). A smarter choice? Exploring the behaviour change agenda for environmentally sustainable mobility. *Environment and Planning C: Government and Policy*, 32(1), 1–19.
- Bartle, C., Avineri, E., & Chatterjee, K. (2013). Online information-sharing: A qualitative analysis of community, trust and social influence amongst commuter cyclists in the UK. *Transportation Research Part F: Traffic Psychology and Behaviour*, 16, 60–72.
- Bartle, C., Calvert, T., Clark, B., Huing, H., Jain, J., Melia, S., ... Streng, M. (2016). *The Economic Benefits of Sustainable Urban Mobility Measures: Independent Review of Evidence: Reviews*. Brussels: European Commission, Directorate General for Mobility and Transport.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544–559.
- BBC. (2009). BBC Buildings: New Developments. Retrieved from https://web.archive.org/web/20090424153241/http://www.bbc.co.uk/info/buildings/new_dev/move_north.shtml
- BBC. (2012). Staff will pay to park at White City. Retrieved from <http://www.bbc.co.uk/ariel/20260042>
- BBC News. (2015). Darlington DfE office officially opens. Retrieved from <https://www.bbc.co.uk/news/uk-england-tees-31972276>
- BBC News Devon. (2002). Met Office prepares for big switch. Retrieved from http://www.bbc.co.uk/devon/news_features/2002/met_office.shtml

- Beatty, C., & Haywood, R. (1997). Changes in travel behaviour in English Passenger Transport Executives' areas 1981-1991. *Journal of Transport Geography*, 5, 61–72.
- Beenackers, M. A., Foster, S., Kamphuis, C. B. M., Titze, S., Divitini, M., Knuiman, M., ... Giles-Corti, B. (2012). Taking up cycling after residential relocation: built environment factors. *American Journal of Preventive Medicine*, 42(6), 610–615.
- Beige, S., & Axhausen, K. W. (2012). Interdependencies between turning points in life and long-term mobility decisions. *Transportation*, 39(4), 857–872.
- Beirão, G., & Cabral, J. A. S. (2007). Understanding attitudes towards public transport and private car: A qualitative study. *Transport Policy*, 14(6), 478–489.
- Bell, D. (1990). Travel impacts arising from office relocation from city to suburbs. *Australasian Transport Research Forum*, 15, 145–162.
- Bendix, A. (2019). Amazon just cancelled its New York City HQ2 plans. Here's what the development was supposed to look like. *Business Insider*. Retrieved from <https://www.businessinsider.com/amazon-hq2-what-we-know-long-island-city-queens-2018-11?r=US&IR=T>
- Berman, W., & Radow, L. (1997). Travel demand management in the USA: context, lessons learned and future directions. *Energy Policy*, 25, 1213–1215.
- Bieger, T., & Laesser, C. (2004). Information sources for travel decisions: Toward a source process model. *Journal of Travel Research*, 42(4), 357–371.
- Bike Europe. (2017). *UK Bicycle Market*. Doetinchem, Netherlands: Bike Europe.
- Black, C., & Schreffler, E. (2009). Understanding TDM and its Role in the Delivery of Sustainable Urban Transport. *Transportation Research Record*, 2163.
- Blondiau, T., Van Zeebroeck, B., & Haubold, H. (2016). Economic benefits of increased cycling. *Transportation Research Procedia*, 14, 2306–2313.
- Blythe, P. T. (2004). Improving public transport ticketing through smart cards. *Proceedings of the Institute of Civil Engineers: Municipal Engineer*, 157, 47–54.
- Boarnet, M. G., & Crane, R. (2001). *Travel by design: The influence of urban form on travel*. Oxford: Oxford University Press.
- Bonsall, P. (2009). Do we know whether personal travel planning really works? *Transport Policy*, 16(6), 306–314.
- Booz and Company. (2009). *The Benefits of Simplified and Integrated Ticketing in Public Transport*. Retrieved from Passenger Transport Executive Group website: <http://www.urbantransportgroup.org/resources/types/reports/benefits-simplified-and-integrated-ticketing-public-transport>

- Boucher, P. (2009). Relocation: moving with the times. *Personnel Today*. Retrieved from <https://www.personneltoday.com/hr/relocation-moving-with-the-times/>
- Brewer, A. M. (1998). Work design, flexible work arrangements and travel behaviour: policy implications. *Transport Policy*, 5(2), 93–101.
- Bristow, A., Pridmore, A., Tight, M., May, T., Berkhout, F., & Harris, M. (2004). *How can we reduce carbon emissions from transport?* Manchester: Tyndall Centre for Climate Change Research.
- Brons, M., Givoni, M., & Rietveld, P. (2009). Access to railway stations and its potential in increasing rail use. *Transportation Research Part A: Policy and Practice*, 43(2), 136–149.
- Brooke, S. (2017). Now London is competing for business with the North. Retrieved 11 April 2019, from Reconteur website: <https://www.raconteur.net/business-innovation/now-london-is-competing-for-business-with-the-north>
- Brouwer, A. E., Mariotti, I., & Van Ommeren, J. N. (2004). The firm relocation decision: An empirical investigation. *The Annals of Regional Science*, 38(2), 335–347.
- Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done? *Qualitative Research*, 6(1), 97–113.
- Bryman, A. (2012). *Social Research Methods* (4th ed.). Oxford: Oxford University Press.
- Buchanan, C., Cooper, G. H. C., MacEwen, A., Crompton, D. H., Crow, G., Michell, G., ... Burton, D. (1963). *Traffic in Towns*. London: HMSO.
- Burke, M., & Brown, A. L. (2007). Distances people walk for transport. *Road & Transport Research: A Journal of Australian and New Zealand Research and Practice*, 16(3), 16.
- Burke, M., Li, T., & Dodson, J. (2010). *The transport impacts of employment decentralisation in Brisbane*. Presented at the Australasian Transport Research Forum.
- Burns, R. (2000). *Introduction to Research Methods, 4th Edition*. London: Sage.
- Butcher, R., & Eldridge, J. (1990). The use of travel diaries in data collection. *The Statistician*, 25–41.
- Cabinet Office. (2014). *Government's Estate Strategy*. Retrieved from HMSO website: <https://www.gov.uk/government/publications/governments-estate-strategy-2014>
- Cairns, S., & Newson, C. (2006). Making School Travel Plans Work: Effects, Benefits and Success Factors at English Schools. *Wasted Miles, Wasted Money: A Less Congested, More Energy Efficient Future*, CICC Publications.
- Cairns, S., Newson, C., & Davis, A. (2010). Understanding successful workplace travel plan initiatives in the UK. *Transportation Research Part A*, 44, 473–494.

- Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., & Goodwin, P. (2004). *Smarter Choices - Changing the Way We Travel*. London: DfT.
- Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., & Goodwin, P. (2008). Smarter choices: assessing the potential to achieve traffic reduction using 'soft measures'. *Transport Reviews*, 28(5), 593–618.
- Cameron, R. (2009). A sequential mixed model research design: Design, analytical and display issues. *International Journal of Multiple Research Approaches*, 3(2), 140–152.
- Cao, X. (2014). Residential self-selection in the relationships between the built environment and travel behaviour: Introduction to the special issue. *The Journal of Transport and Land Use*, 7(3), 1–3.
- Cao, X., Mokhtarian, P., & Handy, S. (2009). Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings. *Transport Reviews*, 29(3), 359–395.
- Carlton, I. (2009). Histories of transit-oriented development: perspectives on the development of the TOD concept (working paper). *Institute of Urban & Regional Development*.
- Castellani, S., Colombino, T., Grasso, A., & Mazzega, M. (2016). *Understanding commuting to accompany work organisations' and employees' behaviour change*. 1–6. IEEE.
- Cervero, R. (2002). Built environments and mode choice: toward a normative framework. *Transportation Research Part D*, 7, 265–284.
- Cervero, R. (2004). *Transit-oriented development in the United States: Experiences, challenges, and prospects* (Vol. 102). Transportation Research Board.
- Cervero, R., & Duncan, M. (2003). Walking, bicycling, and urban landscapes: evidence from the San Francisco Bay Area. *American Journal of Public Health*, 93(9), 1478–1483.
- Cervero, R., & Kockelman, K. (1997). Travel demand and the 3Ds: density, diversity, and design. *Transportation Research Part D: Transport and Environment*, 2(3), 199–219.
- Cervero, R., & Landis, J. (1992). Suburbanization of jobs and the journey to work: a submarket analysis of commuting in the San Francisco Bay Area. *Journal of Advanced Transportation*, 26(3), 275–297.
- Cervero, R., Sarmiento, O. L., Jacoby, E., Fernando Gomez, L., & Neiman, A. (2009). Influences of Built Environments on Walking and Cycling: Lessons from Bogota. *International Journal of Sustainable Transportation*, 3(4), 203–226. <https://doi.org/10.1080/15568310802178314>
- Cervero, R., & Wu, K.-L. (1998). Sub-centring and commuting: evidence from the San Francisco Bay area, 1980–90. *Urban Studies*, 35(7), 1059–1076.

- Chatman, D. (2003). How density and mixed uses at the workplace affect personal commercial travel and commute mode choice. *Transportation Research Record, 1831*, 193–201.
- Chatterjee, K., Clark, B., Davis, A., Toher, D., & Martin, A. (2014). *Evidence Summary 2 - Drivers of change to commuting mode*. Retrieved from https://travelbehaviour.files.wordpress.com/2014/06/lttb_cmbriefingnote_16-june.pdf
- Chen, C., Gong, H., & Paaswell, R. (2008). Role of the built environment on mode choice decisions: additional evidence on the impact of density. *Transportation, 35*, 285–299.
- Choo, S., Mokhtarian, P. L., & Salomon, I. (2005). Does telecommuting reduce vehicle-miles traveled? An aggregate time series analysis for the US. *Transportation, 32*(1), 37–64.
- Choppin, E. (2009). Reed Smith's London HQ by Gensler. *On Office Magazine*. Retrieved from <https://www.onofficemagazine.com/interiors/item/736-reed-smith-s-london-hq-by-gensler>
- Christensen, J., Chatterjee, K., Marsh, S., Sherwin, H., & Jain, J. (2012). *Evaluation of the cycling city and towns programme: qualitative research with residents*. London: Department for Transport.
- Christiansen, P., Engebretsen, Ø., Fearnley, N., & Hanssen, J. U. (2017). Parking facilities and the built environment: Impacts on travel behaviour. *Transportation Research Part A: Policy and Practice, 95*, 198–206.
- Christiansen, P., & Julsrud, T. (2014). *Effekter av Gjensidiges omløslisering fra Lysaker til Bjørvika*. Oslo: Institute of Transport Economics.
- CIHT. (2015). *Planning for Walking*. London.
- Clark, B., Chatterjee, K., & Melia, S. (2015). Changes in level of household car ownership: The role of life events and spatial context. *Transportation, 1*–35.
- Clark, B., Chatterjee, K., & Melia, S. (2016). Changes to commute mode: The role of life events, spatial context and environmental attitude. *Transportation Research Part A: Policy and Practice, 89*, 89–105.
- Clifton, K., & Handy, S. (2001). *Qualitative methods in travel behaviour research*. Presented at the International Conference on Transport Survey Quality and Innovation.
- Coleman, C. (2000). Green commuter plans and the small employer: an investigation into the attitudes and policy of the small employer towards staff travel and green commuter plans. *Transport Policy, 7*, pp 139-148.

- Copsey, S. (2012). *The development and implementation processes of a travel plan within the context of a large organisation: Using an embedded case study approach* (PhD Thesis). University of Hertfordshire.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Sage publications.
- Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and Conducting Mixed Methods Research* (2nd ed.). Thousands Oaks, CA: Sage.
- Crosbie, T., & Moore, J. (2004). Work–life balance and working from home. *Social Policy and Society*, 3(3), 223–233.
- Cullingworth, J., & Nadin, V. (2006). *Town and Country Planning in the UK* (14th Edition). London: Routledge.
- Curtis, C., & Perkins, T. (2006). *Travel behaviour: A review of recent literature, Impacts of Transit Led Development in a New Rail Corridor, Perth*. Perth: Department of Urban and Regional Planning, Curtin University.
- Dargay, J., & Hanly, M. (2007). Volatility of car ownership, commuting mode and time in the UK. *Transportation Research Part A*, 41(10), 934-948 doi: <http://doi.dx.org/10.1016/j.jtrangeo.2007.05.003>.
- Davidson, D. (1994). *Corporate Amenities, Trip Chaining and Transportation Demand Management*. Federal Transit Administration, Office of Technical Assistance and Safety.
- Davis, H. (2018). Work relocation: Taking the pain out of an office move. *The Guardian*. Retrieved from <https://www.theguardian.com/money/2010/sep/18/office-relocation>
- Davison, L., & Knowles, R. (2006). Bus quality partnerships, modal shift and traffic congestion. *Journal of Transport Geography*, 14, 177–194.
- DCLG. (2001). *PPG13: Transport*. London: HMSO.
- DCLG. (2011). *Localism Act*. Retrieved from HMSO website: <http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted>
- DCLG. (2012). *National Planning Policy Framework*. London: HMSO.
- DCLG. (2014). *Planning Practice Guidance*. Retrieved from <http://planningguidance.communities.gov.uk/blog/guidance/making-an-application/types-of-application/>
- DCLG. (2015). *Plain English guide to the Planning System*. Retrieved from DCLG website: <https://www.gov.uk/government/publications/plain-english-guide-to-the-planning-system>

- de Bok, M., & van Oort, F. (2011). Agglomeration economies, accessibility and the spatial choice behavior of relocating firms. *Journal of Transport and Land Use*, 4(1), 5–24.
- De Gruyter, C., Rose, G., & Currie, G. (2015). Enhancing the impact of travel plans for new residential developments: Insights from implementation theory. *Transport Policy*, 40, 24–35.
- De Vos, J., Van Acker, V., & Witlox, F. (2014). The influence of attitudes on Transit-Oriented Development: An explorative analysis. *Transport Policy*, 35, 326–329.
- De Vos, J., & Witlox, F. (2013). Transportation policy as spatial planning tool; reducing urban sprawl by increasing travel costs and clustering infrastructure and public transportation. *Journal of Transport Geography*, 33, 117–125. <https://doi.org/10.1016/j.jtrangeo.2013.09.014>
- DECC. (2008). *Climate Change Act*. London: HMSO.
- Deenihan, G., & Caulfield, B. (2014). Estimating the health economic benefits of cycling. *Journal of Transport & Health*, 1(2), 141–149.
- DETR. (1998). *A New Deal for Transport: Better for Everyone*. London: HMSO.
- DfBEIS. (2018). *2016 UK greenhouse gas emissions: final figures - statistical summary*. Retrieved from HMSO website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/679334/2016_Final_Emissions_Statistics_one_page_summary.pdf
- DfT. (2000). *Ten Year Transport Plan*. London: HMSO.
- DfT. (2001). *Take up and effectiveness of travel plans and travel awareness campaigns*. London.
- DfT. (2002). *Using the Planning Process to Secure Travel Plans*. London: HMSO.
- DfT. (2004). *Feasibility of road pricing in the UK - Full report*. Retrieved from https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/DfT%20road%20pricing%20feasibility%20study.pdf
- DfT. (2005). *Making Travel Plans work*. London: HMSO.
- DfT. (2008). *The Essential Guide to Travel Planning*. London: HMSO.
- DfT. (2009a). *Delivering Travel Plans through the Planning Process*. London: HMSO.
- DfT. (2009b). *Guidance on Local Transport Plans*. London: HMSO.
- DfT. (2009c). *Kickstart Bus Funding Competition 2009*. London: HMSO.

- DfT. (2013a). *Door to Door: A Strategy for Improving Sustainable Transport Integration*. London: HMSO.
- DfT. (2013b). *National Travel Survey statistics*. Retrieved from HMSO website: <http://www.gov.uk/government/collections/national-travel-survey-statistics>
- DfT. (2014). Cycle City Ambition Grants extension: ongoing funding guidelines. Retrieved from <https://www.gov.uk/government/publications/cycle-city-ambition-grants-extension-ongoing-funding-guidelines>
- DfT. (2017a). *Commuting trends in England 1988-2015*. Retrieved from HMSO website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657839/commuting-in-england-1988-2015.pdf
- DfT. (2017b). *Cycling and Walking Investment Strategy*. Retrieved from HMSO website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/603527/cycling-walking-investment-strategy.pdf
- DfT. (2017c). *High Speed Two: From Concept to Reality*. London: DfT.
- DfT. (2017d). *Local Cycling and Walking Infrastructure Plans: Technical Guidance for Local Authorities*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/607016/cycling-walking-infrastructure-technical-guidance.pdf
- DfT. (2017e). *Transport Statistics Great Britain*. Retrieved from HMSO website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664323/tsgb-2017-print-ready-version.pdf
- DfT. (2018). *Transport Statistics Great Britain*. Retrieved from DfT website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/762011/tsgb-2018-report-summaries.pdf
- DfT, & Transport Energy. (2005). *A guide on Travel Plans for developers*. Retrieved from DfT website: <http://webarchive.nationalarchives.gov.uk/20101213165134/http://www.dft.gov.uk/pgr/sustainable/travelplans/work/deontravelplansfordevelopers.pdf>
- Dickinson, J. E., Kingham, S., Copesey, S., & Pearlman Hougie, D. J. (2003). Employer travel plans, cycling and gender: will travel plan measures improve the outlook for cycling to work in the UK? *Transportation Research Part D*, 8, 53–67.
- DiClemente, C. C., & Prochaska, J. O. (1982). Self-change and therapy change of smoking behavior: A comparison of processes of change in cessation and maintenance. *Addictive Behaviors*, 7(2), 133–142.
- Dill, J. (1998). Mandatory employer-based trip reduction: What happened? *Transportation Research Record: Journal of the Transportation Research Board*, (1618), 103–110.

- Dill, J., & Wardell, E. (2007). Factors affecting worksite mode choice: Findings from Portland, Oregon. *Transportation Research Record: Journal of the Transportation Research Board*, (1994), 51–57.
- Elgar, I., & Miller, E. J. (2010). How office firms conduct their location search process: An analysis of a survey from the greater Toronto area. *International Regional Science Review*, 33(1), 60–85.
- Ellis, C. (2002). The new urbanism: Critiques and rebuttals. *Journal of Urban Design*, 7(3), 261–291.
- Enoch, M. (2012). *Sustainable transport, mobility management and travel plans*. Farnham: Ashgate.
- Enoch, M., & Ison, S. (2010). *An Expert Perspective on the Future of Travel Plans: Lessons from the UK*. Presented at the Transportation Research Board 89th Annual Meeting (No. 10-0127).
- Enoch, M., & Potter, S. (2002). Encouraging the commercial sector to help employees to change their travel behaviour. *Transport Policy*, 10(1), 51–58.
- Ernst & Young. (2018). EY Financial Services Brexit Tracker: Firms forge ahead with contingency plans despite transition agreement. Retrieved 28 February 2019, from <https://www.ey.com/uk/en/newsroom/news-releases/18-06-25-ey-financial-services-brexit-tracker---firms-forge-ahead-with-contingency-plans-despite-transition-agreement>
- Ettema, D., Friman, M., Gärling, T., Olsson, L. E., & Fujii, S. (2012). How in-vehicle activities affect work commuters' satisfaction with public transport. *Journal of Transport Geography*, 24, 215–222. <https://doi.org/10.1016/j.jtrangeo.2012.02.007>
- European Medicines Agency. (2019, January 23). EMA relocation updates. Retrieved 22 March 2019, from European Medicines Agency website: <https://www.ema.europa.eu/en/news/ema-relocation-updates>
- Ewing, R. (1997). Is Los Angeles-style sprawl desirable? *Journal of the American Planning Association*, 63(1), 107–126.
- Ewing, R., & Cervero, R. (2001). Travel and the built environment: a synthesis. *Transportation Research Record*, 1780(1), 87–114.
- Ewing, R., & Cervero, R. (2010). Travel and the built environment. *Journal of the American Planning Association*, 76(3), 265–294.
- Felton, R. (2017). Toyota Loses 25 Percent Of Its American Workforce In HQ Move. *Jalopnik*. Retrieved from <https://jalopnik.com/toyota-loses-25-percent-of-its-american-workforce-in-hq-1796713649>

- Fishburn, R. (2012). Reaching the target audience: how can we encourage increased mode shift if our travel surveys are biased towards those already using smarter modes? *Bursary Paper for Transport Planning Society*.
- Flick, U. (2009). *An Introduction to Qualitative Research* (4th ed.). London: Sage.
- Forsyth, P. (2011). Environmental and financial sustainability of air transport: Are they incompatible. *Journal of Air Transport Management*, 17, 27–32.
- Foth, N., Manaugh, K., & El-Geneidy, A. M. (2014). Determinants of mode share over time: how changing transport system affects transit use in Toronto, Ontario, Canada. *Transportation Research Record*, 2417(1), 67–77.
- Fujii, S., & Garling, T. (2003). Development of script-based travel mode choice after forced change. *Transportation Research F: Traffic Psychology and Behavior*, 6(2), 117–124.
- Fujii, Satoshi, Gärling, T., & Kitamura, R. (2001). Changes in drivers' perceptions and use of public transport during a freeway closure: Effects of temporary structural change on cooperation in a real-life social dilemma. *Environment and Behavior*, 33(6), 796–808.
- Gallagher, R., & Parkin, J. (2014). *Planning for cycling*. London: CIHT.
- Gärling, T., & Schuitema, G. (2007). Travel demand management targeting reduced private car use: effectiveness, public acceptability and political feasibility. *Journal of Social Issues*, 63(1), 139–153.
- Garrard, J., Handy, S., & Dill, J. (2012). Women and Cycling. In J. Pucher, R. Buehler, & R. Buehler (Eds.), *City Cycling* (pp. 211–234). Cambridge, MA: MIT Press.
- Garrard, J., Rissel, C., & Bauman, A. (2012). *Health Benefits of Cycling* (J. Pucher, R. Buehler, & R. Buehler, Eds.). Cambridge, MA: MIT Press.
- Gatersleben, B., & Appleton, K. M. (2007). Contemplating cycling to work: Attitudes and perceptions in different stages of change. *Transportation Research Part A: Policy and Practice*, 41(4), 302–312.
- Gehl, J. (2010). *Cities for people*. Washington, DC: Island Press.
- Geurs, K. T., & Van Wee, B. (2004). Accessibility evaluation of land-use and transport strategies: review and research directions. *Journal of Transport Geography*, 12(2), 127–140.
- Gibson, O. (2005). BBC a step closer to Manchester move. *The Guardian*. Retrieved from <https://www.theguardian.com/media/2005/oct/22/broadcasting.bbc?INTCMP=SRCH>
- Giles-Corti, B., Bull, F., Knuiiman, M., McCormack, G., Van Niel, K., Timperio, A., ... Boruff, B. (2013). The influence of urban design on neighbourhood walking following

- residential relocation: Longitudinal results from the RESIDE study. *Social Science & Medicine*, 77, 20–30.
- Glaeser, E. L. (2010). Introduction to "Agglomeration Economics". In E. L. Glaeser (Ed.), *Agglomeration Economics* (pp. 1–14). University of Chicago Press.
- Glaister, S. (2002). UK Transport Policy 1997–2001. *Oxford Review of Economic Policy*, 18(2), 154–186.
- Glaister, S., Burnham, J., Stevens, H., & Travers, T. (2006). *Transport Policy in Britain, 2nd Edition*. Basingstoke: Palgrave Macmillan.
- Goetz, A. (2013). Suburban sprawl or urban centres: Tensions and contradictions of smart growth approaches in Denver, Colorado. *Urban Studies*, 50(11), 2178–2195.
- Golden, T. D., & Veiga, J. F. (2005). The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings. *Journal of Management*, 31(2), 301–318.
- Goldratt, E. (1990). *Theory of Constraints*. Great Barrington, MA: North River Press.
- Goodwin, P. (2004). Solving Congestion. In F. Terry (Series Ed.), *Turning the Corner?* Oxford: Blackwell.
- Goodwin, P., Hallett, S., Kenny, F., & Stokes, G. (1991). *Transport: A New Realism*. Oxford: Transport Studies Unit, University of Oxford.
- Greater London Authority. (2013). *The mayor's vision for cycling in London: an olympic legacy for all Londoners*. Retrieved from https://www.london.gov.uk/sites/default/files/cycling_vision_gla_template_final.pdf
- Greenwald, M., & Boarnet, M. (2001). Built environment as determinant of walking behavior: Analyzing nonwork pedestrian travel in Portland, Oregon. *Transportation Research Record: Journal of the Transportation Research Board*, (1780), 33–41.
- Gross, R., Heptonstall, P., Anable, J., & Greenacre, P. (2009). *What policies are effective at reducing carbon emissions from surface passenger transport?* London: UK Energy Research Centre.
- Guell, C., Panter, J., Jones, N. R., & Ogilvie, D. (2012). Towards a differentiated understanding of active travel behaviour: using social theory to explore everyday commuting. *Social Science & Medicine*, 75(1), 233–239.
- Guiliano, G., & Narayan, D. (2003). Another look at travel patterns and urban form: The US and Great Britain. *Urban Studies*, 40(11), 2295–2312.
- Gutierrez, J., & Garcia-Palomares, J. C. (2007). New spatial patterns of mobility within the metropolitan area of Madrid: Towards more complex and dispersed flow networks. *Journal of Transport Geography*, 15, 18–30.

- Handy, S. (2005). Critical assessment of the literature on the relationships among transportation, land use, and physical activity. *Transportation Research Board and the Institute of Medicine Committee on Physical Activity, Health, Transportation, and Land Use. Resource Paper for TRB Special Report, 282.*
- Handy, S., Boarnet, M. G., Ewing, R., & Killingsworth, R. E. (2002). How the built environment affects physical activity: views from urban planning. *American Journal of Preventive Medicine, 23*(2), 64–73.
- Handy, S., Cao, X., & Mokhtarian, P. (2005). Correlation of causality between the built environment and travel behaviour? Evidence from Northern California. *Transportation Research Part D, 10*, 427–444.
- Handy, S., & Clifton, K. (2001). Evaluating neighborhood accessibility: Possibilities and practicalities. *Journal of Transportation and Statistics, 4*(2/3), 67–78.
- Handy, S., Xing, Y., & Buehler, T. J. (2010). Factors associated with bicycle ownership and use: a study of six small US cities. *Transportation, 37*(6), 967–985.
- Hanssen, J. (1995). Transportation impacts of office relocation. *Journal of Transport Geography, 3*(4), 247-256 doi: [http://dx.doi.org/10.1016/0966-6923\(95\)00024-0](http://dx.doi.org/10.1016/0966-6923(95)00024-0).
- Headicar, P. (2015). *Traffic and Towns: The next 50 years (ITC Occasional Paper Number 6)* [ITC Occasional Paper Number 6]. London: Independent Transport Commission.
- Heath, G. W., Brownson, R. C., Kruger, J., Miles, R., Powell, K. E., & Ramsey, L. T. (2006). The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. *Journal of Physical Activity and Health, 3*(s1), S55–S76.
- Hebes, P., Menge, J., & Lenz, B. (2013). Service-related traffic: An analysis of the influence of firms on travel behaviour. *Transport Policy, 26*, 43–53.
- Heesch, K. C., Sahlqvist, S., & Garrard, J. (2012). Gender differences in recreational and transport cycling: a cross-sectional mixed-methods comparison of cycling patterns, motivators, and constraints. *International Journal of Behavioral Nutrition and Physical Activity, 9*(1), 106.
- Heinen, E., Maat, K., & van Wee, B. (2013). The effect of work-related factors on the bicycle commute mode choice in the Netherlands. *Transportation, 40*, 23–43.
- Heinen, E., Panter, J., Mackett, R., & Ogilvie, D. (2015). Changes in mode of travel to work: a natural experimental study of new transport infrastructure. *International Journal of Behavioral Nutrition and Physical Activity, 12*(1), 81.
- Heinen, E., Van Wee, B., & Maat, K. (2010). Commuting by bicycle: an overview of the literature. *Transport Reviews, 30*(1), 59–96.

- Hendricks, S. (2008). Four challenges to incorporating transportation demand management into the land development process. *Transportation Research Record: Journal of the Transportation Research Board*, 2046(1), 30–36. <https://doi.org/10.3141/2046-04>
- Hensher, D. A., & Reyes, A. J. (2000). Trip chaining as a barrier to the propensity to use public transport. *Transportation*, 27(4), 341–361.
- Hensher, D. A., Stopher, P., & Bullock, P. (2003). Service quality—developing a service quality index in the provision of commercial bus contracts. *Transportation Research Part A: Policy and Practice*, 37(6), 499–517.
- Hess, D. (2001). Effect of free parking on commuter mode choice: Evidence from travel diary data. *Transportation Research Record: Journal of the Transportation Research Board*, 1753, 35–42.
- HMG. (1999). *Greater London Authority Act*. Retrieved from HMG website: <http://www.legislation.gov.uk/ukpga/1999/29/section/295>
- Hull, A. (2005). Integrated transport planning in the UK: from concept to reality. *Journal of Transport Geography*, 13(4), 318–328.
- Hull, A. (2008). Policy integration: What will it take to achieve more sustainable transport solutions in cities? *Transport Policy*, 15(2), 94–103.
- Hull, A., & O'Holleran, C. (2014). Bicycle infrastructure: can good design encourage cycling? *Urban, Planning and Transport Research*, 2(1), 369–406.
- Jacobsen, P. L. (2003). Safety in numbers: more walkers and bicyclists, safer walking and bicycling. *Injury Prevention*, 9(3), 205–209.
- Jain, J., & Lyons, G. (2008). The gift of travel time. *Journal of Transport Geography*, 16(2), 81–89. <https://doi.org/10.1016/j.jtrangeo.2007.05.001>
- Jones, C., & Ogilvie, D. (2012). Motivations for active commuting: a qualitative investigation of the period of home or work relocation. *International Journal of Behavioral Nutrition and Physical Activity*, 9(109), <http://www.ijbnpa.org/content/9/1/109>.
- Jones, R. (1992). In J. Whitelegg (Series Ed.), *Traffic Congestion: is there a way out?* Hawes: Leading Edge.
- Jones, R., Pykett, J., & Whitehead, M. (2011). Governing temptation: changing behaviour in an age of libertarian paternalism. *Progress in Human Geography*, 35(4), 483–501.
- Kingham, S., Dickinson, J., & Copsey, S. (2001). Travelling to work: will people move out of their cars. *Transport Policy*, 8(2), 151–160.
- Kitamura, R. (2009). A dynamic model system of household car ownership, trip generation and modal split: model development and simulation experiment. *Transportation*, 36(6), 711–732.

- Kitchin, R., & Tate, N. (2000). *Conducting research into human geography: theory, methodology and practice*. Harlow: Pearson Education.
- Klier, T., & Testa, W. (2002). Location trends of large company headquarters during the 1990s. *Economic Perspectives-Federal Reserve Bank of Chicago*, 26(2), 12–26.
- Knaap, G., & Talen, E. (2005). New urbanism and smart growth: a few words from the academy. *International Regional Science Review*, 28(2), 107–118.
- Knowles, R. (2012). Transit Oriented Development in Copenhagen, Denmark: from the Finger Plan to Orestad. *Journal of Transport Geography*, 22, 251–261. <https://doi.org/10.1016/j.jtrangeo2012.02.010>
- Knowles, R., & Binder, A. (2017). MediaCityUK at Salford Quays: A sustainable, transit oriented development. In W. Theakstone (Ed.), *Manchester Geographies* (pp. 3–12). Retrieved from https://www.mangeogsoc.org.uk/pdfs/manchestergeographies/Manchester_Geographies_1_Knowles&Binder.pdf
- Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260.
- Krizek, K. (2003). Residential relocation and changes in urban travel: Does neighborhood-scale urban form matter? *Journal of the American Planning Association*, 69(3), 265–281.
- Krizek, K. (2007). Estimating the economic benefits of bicycling and bicycle facilities: An interpretive review and proposed methods. In V. Inglada (Series Ed.), *Essays on Transport Economics* (pp. 219–248). Physica-Verlag HD.
- Krizek, K., Barnes, G., & Thompson, K. (2009). Analyzing the effect of bicycle facilities on commute mode share over time. *Journal of Urban Planning and Development*, 135(2), 66–73.
- Krizek, K., Johnson, P. J., & Tilahun, N. (2005). Gender differences in bicycling behavior and facility preferences. *Research on Women's Issues in Transportation*, 2, 31–40.
- Kwoka, G. J., Boschmann, E. E., & Goetz, A. R. (2015). The impact of transit station areas on the travel behaviors of workers in Denver, Colorado. *Transportation Research Part A: Policy and Practice*, 80, 277–287.
- Lanzendorf, M. (2003). *Mobility biographies. A new perspective for understanding travel behaviour*. Presented at the 10th International Conference on Travel Behaviour Research (IATBR).
- Lee, B., Gordon, P., Moore, J. E., & Richardson, H. W. (2011). The attributes of residence/workplace areas and transit commuting. *Journal of Transport and Land Use*, 4(3), 43–63.

- Lee, C., & Moudon, A. V. (2008). Neighbourhood design and physical activity. *Building Research & Information*, 36(5), 395–411.
- Lindholm, A.-L., Gibler, K., & Leväinen, K. (2006). Modeling the value-adding attributes of real estate to the wealth maximization of the firm. *Journal of Real Estate Research*, 28(4), 445–476.
- Lindsay, G., Macmillan, A., & Woodward, A. (2011). Moving urban trips from cars to bicycles: impact on health and emissions. *Australian and New Zealand Journal of Public Health*, 35(1), 54–60.
- Litman, T. (2003). The Online TDM Encyclopedia: mobility management information gateway. *Transport Policy*, 10, 245–249.
- Litman, T. (2008). *Evaluating accessibility for transportation planning*. Victoria, Canada.
- Litman, T. (2017). *Land use impacts on transport: How land use factors affect travel behavior*. Victoria, Canada.
- Litman, T. (2018). *Evaluating active transport benefits and costs*. Retrieved from <http://vtpi.org/nmt-tdm.pdf>
- Lucas, K. (2004). *Transport, social exclusion and environmental justice*. Bristol: Policy Press.
- Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105–113.
- Macmillan, A. K., Hosking, J., Connor, J. L., Bullen, C., & Ameratunga, S. (2013). A Cochrane systematic review of the effectiveness of organisational travel plans: Improving the evidence base for transport decisions. *Transport Policy*, 29, 249–256.
- Manchester Evening News. (2013). Metrolink chiefs review plans to replace ‘unreliable’ older trams after four break down in a fortnight. *Manchester Evening News*. Retrieved from <https://www.manchestereveningnews.co.uk/news/greater-manchester-news/metrolink-chiefs-review-plans-to-replace-680455>
- Martens, K. (2007). Promoting bike-and-ride: The Dutch experience. *Transportation Research Part A: Policy and Practice*, 41(4), 326–338.
- Martin, A., Goryakin, Y., & Suhrcke, M. (2014). Does active commuting improve psychological wellbeing? Longitudinal evidence from eighteen waves of the British Household Panel Survey. *Preventive Medicine*, 69, 296–303.
- Maxwell, J. (2009). Designing a qualitative study. In L. Bickman & D. J. Rog (Eds.), *The SAGE handbook of applied social research methods* (2nd ed., pp. 214–253). Thousand Oaks, California: SAGE Publications, Inc. SAGE Knowledge.
- MediaCityUK. (2016). *MediaCityUK set to double in the next 10 years*. Retrieved from <http://www.mediacityuk.co.uk/newsroom/mediacityuk-set-to-double-in-the-next-10-years/>

- MediaCityUK. (2017). MediaCityUK welcomes Mobike. Retrieved from <http://travel.mediacityuk.co.uk/news/2017/6/29/mediacityuk-welcomes-mobike-everything-you-need-to-know-about-the-new-mobike-service>
- MediaCityUK. (2018). Key occupiers. Retrieved from <http://mediacityuk.co.uk/whos-here/key-occupiers/>
- MediaCityUK, & TfGM. (2018). MediaCityUK Bicycle User Group (BUG). Retrieved 9 October 2018, from <https://www.mediacityukbug.co.uk/>
- Meland, S. (2012). *Arbeidsreisen - reisevaner og utvikling*. Trondheim: SINTEF.
- Melia, S. (2012). Filtered and unfiltered permeability: The European and Anglo-Saxon approaches. *Project, 4*, 6–9.
- Melia, S., Chatterjee, K., & Stokes, G. (2018). Is the urbanisation of young adults reducing their driving? *Ransportation Research Part A: Policy, 118*, 444–456.
- Melia, S., & Clark, B. (2017). *What happens to travel behaviour when parking is removed?* Presented at the University Transport Study Group Conference.
- MHCLG. (2018). Use of planning conditions. Retrieved from <https://www.gov.uk/guidance/use-of-planning-conditions>
- Milakis, D., Cervero, R., Van Wee, B., & Maat, K. (2015). Do people consider an acceptable travel time? Evidence from Berkeley, CA. *Journal of Transport Geography, 44*, 76–86.
- Milakis, D., & van Wee, B. (2018). “For me it is always like half an hour”: Exploring the acceptable travel time concept in the US and European contexts. *Transport Policy, 64*. <https://doi.org/10.1016/j.tranpol.2018.02.001>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. London: Sage.
- Mobike. (2017). Mobike for Manchester December 2017 Update. Retrieved from <https://mobike.com/uk/blog/post/mobike-for-manchester-december-2017>
- Mokhtarian, P. L., & Salomon, I. (2001). How derived is the demand for travel? Some conceptual and measurement considerations. *Transportation Research Part A: Policy and Practice, 35*(8), 695–719. [https://doi.org/10.1016/S0965-8564\(00\)00013-6](https://doi.org/10.1016/S0965-8564(00)00013-6)
- Monsere, C., Dill, J., McNeil, N., Clifton, K., Foster, N., Goddard, T., ... Parks, J. (2014). *Lessons from the Green Lanes: Evaluating protected bike lanes in the U.S.* Portland, OR: National Institute for Transportation and Communities.
- Morby, A. (2016). MediaCityUK set to double in size with £1bn expansion. *Construction Enquirer*. Retrieved from

<http://www.constructionenquirer.com/2016/09/02/mediacityuk-set-to-double-in-size-with-1bn-expansion/>

- Möser, G., & Bamberg, S. (2008). The effectiveness of soft transport policy measures: A critical assessment and meta-analysis of empirical evidence. *Journal of Environmental Psychology, 28*(1), 10–26.
- Moudon, A., Lee, C., Cheadle, A., Collier, C., Johnson, D., Schmid, T., & Weather, R. (2005). Cycling and the built environment, a US perspective. *Transportation Research Part D: Transport and Environment, 10*(3), 245–261.
- Næss, P. (2003). Urban Structures and Travel Behavior: Experiences from Empirical Research in Norway and Denmark. *European Journal of Transport Infrastructure Research, 3*(2), 155–178.
- Næss, P. (2005). Residential location affects travel behaviour-but how and why? The case of Copenhagen metropolitan area. *Progress in Planning, 63*(2), 167–257.
- Næss, P. (2009). Residential self-selection and appropriate control variables in land use: Travel studies. *Transport Reviews, 29*(3), 293–324.
- Næss, P. (2014). Tempest in a teapot: The exaggerated problem of transport-related residential self-selection as a source of error in empirical studies. *The Journal of Transport and Land Use, 7*(3), 57–79.
- Næss, P., & Sandberg, S. L. (1996). Workplace location, modal split and energy use for commuting trips. *Urban Studies, 33*(3), 557–580.
- National Audit Office. (2013). *The BBC's move to Salford*. London: National Audit Office.
- Neate, R. (2017). HSBC cash sweetener aims to entice staff to new Birmingham HQ. *The Guardian*. Retrieved from <https://www.theguardian.com/business/2017/jun/04/hsbc-cash-sweetener-aims-to-entice-staff-to-new-birmingham-hq>
- Newman, & Kenworthy, J. (1996). The land use—transport connection: An overview. *Land Use Policy, 13*(1), 1–22.
- Newman, & Kenworthy, J. (1999). *Sustainability and cities: overcoming automobile dependence*. Washington, DC: Island press.
- Newman, P., & Kenworthy, J. R. (1989). *Cities and automobile dependence: An international sourcebook*. Brookfield, VT: Gower.
- NYCDOT. *The Economic Benefits of Sustainable Streets*. Retrieved from NYCDOT website: <http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf>

- Oakil, A. T. M., Ettema, D., Arentze, T., & Timmermans, T. (2014). Changing household car ownership and life cycle events: an action in anticipation or an action on occurrence. *Transportation*, 41(4), 889–904.
- Oates, B. J. (2006). *Researching Information Systems and Computing*. London: Sage.
- O’Carroll, L. (2001). BBC staff fight for free car parking. Retrieved 28 April 2018, from <https://www.theguardian.com/media/2001/apr/20/broadcasting.bbc>
- Office of National Statistics. (2011). Commuting to work, Changes to Travel to Work Areas: 2001 to 2011. Retrieved from <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/commutingtoworkchangestotraveltoworkareas/2001to2011>
- O’Mara, M. (1999). Strategic drivers of location decisions for information-age companies. *Journal of Real Estate Research*, 17(3), 365–386.
- Palmer, D., Jones, M., & James, C. (2011). *Door to Door Journeys: Project Report*. Wokingham.
- Parkhurst, G., & Dudley, G. (2008). In J. Shaw (Ed.), *Traffic Jam: Ten years of ‘sustainable’ transport in the UK*. Bristol: Policy Press.
- Parkin, J., Ryley, T., & Jones, T. (2007). Barriers to cycling: an exploration of quantitative analyses. *Cycling and Society*, 67–82.
- PAS. (2015). Section 106 agreements. Retrieved from <http://www.pas.gov.uk/s106>
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Thousand Oaks, CA: SAGE Publications, inc.
- Paulley, N., Balcombe, R., Mackett, R., Titheridge, H., Preston, J., Wardman, M., ... White, P. (2006). The demand for public transport: The effects of fares, quality of service, income and car ownership. *Transport Policy*, 13(4), 295–306.
- Paulsen, K., Kvidal, M., & Strømme, K. (2008). *Endringer i reisevaner etter samlokalisering av kommunal administrasjon i midtbyen*. Trondheim: Trondheim Kommune.
- Peel MediaCityUK. (2016). Eccles Metrolink line to close for major summer repair work. Retrieved from <http://travel.mediacityuk.co.uk/news/2016/6/3/eccles-metrolink-line-to-close-for-major-summer-repair-work>
- Petrunoff, N., Wen, L. M., & Rissel, C. (2016). Effects of a workplace travel plan intervention encouraging active travel to work: outcomes from a three-year time-series study. *Public Health*, 135, 38–47.
- Polk, M. (2003). Are women potentially more accommodating than men to a sustainable transportation system in Sweden? *Transportation Research Part D: Transport and Environment*, 8(2), 75–95.

- Pooley, C., Jones, T., Tight, M., Horton, D., Scheldeman, G., Mullen, C., ... Strano, E. (2013). *Promoting Walking and Cycling: New perspectives on sustainable travel*. Bristol: Policy Press.
- Pooley, C., Tight, M., Jones, T., Horton, D., Scheldeman, G., Jopson, A., ... Constantine, S. (2011). *Understanding walking and cycling: Summary of key findings and recommendations*.
- Poticha, S. (2000). Smart Growth and New Urbanism: What's the difference? Retrieved from New Urban News website: <http://bettercities.net/article/smart-growth-and-new-urbanism-what%E2%80%99s-difference>
- Prillwitz, J., & Barr, S. (2011). Moving towards sustainability? Mobility styles, attitudes and individual travel behaviour. *Journal of Transport Geography*, 19(6), 1590–1600.
- Prillwitz, J., Harms, S., & Lanzendorf, M. (2007). Interactions Between Residential Relocations, Life Course Events, and Daily Commute Distances. *Transportation Research Record*, 2021, 64–69.
- Pritchard, R., & Frøyen, Y. (2019). Location, location, relocation: how the relocation of offices from suburbs to the inner city impacts commuting on foot and by bike. *European Transport Research Review*, 11(1), 14.
- Pucher, John, & Buehler, R. (2007). At the frontiers of cycling: policy innovations in the Netherlands, Denmark, and Germany. *World Transport Policy and Practice*, 13(3), 8–57.
- Pucher, John, & Buehler, R. (2012a). *City Cycling*. Cambridge, MA: MIT Press.
- Pucher, John, & Buehler, R. (2012b). Integration of cycling with public transportation. In J Pucher, R. Buehler, & R. Buehler (Eds.), *City Cycling* (pp. 157–181). Cambridge, MA: MIT Press.
- Rau, H., & Manton, R. (2016). Life events and mobility milestones: Advances in mobility biography theory and research. *Journal of Transport Geography*, 52, 51–60.
- Reaves, C. (1992). *Qualitative Research for the Behavioural Sciences*. New York: Wiley.
- Redmond, L. S., & Mokhtarian, P. L. (2001). The positive utility of the commute: modeling ideal commute time and relative desired commute amount. *Transportation*, 28(2), 179–205.
- Rey, B. (2019). Companies moving out as Brexit looms. Retrieved 22 March 2019, from Phys.org website: <https://phys.org/news/2019-02-companies-brexit-looms.html>
- Rhodes, C. (2018). *Business Statistics Briefing Paper*. London: House of Commons Library.
- Richter, J., Friman, M., & Gärling, T. (2009). *Soft transport policy measures 1: Results of implementations*. Karlstad: Karlstads universitet.

- Roby, H. (2009). *The Development of Workplace Travel Plans*. Presented at the University Transport Studies Group Annual Conference.
- Roby, H. (2010a). *Using innovation and business models to analyse the organisational embedding of travel plans* (PhD Thesis). Open University, Milton Keynes.
- Roby, H. (2010b). Workplace travel plans: past, present and future. *Journal of Transport Geography*, 18(1), 23–30.
- Rodrigue, J., Comtois, C., & Slack, B. (2013). *The Geography of Transport Systems*. Abingdon: Routledge.
- Rye, T. (1999). Employer transport plans—a case for regulation? *Transport Reviews*, 19(1), 13–31.
- Rye, T. (2002). Travel plans: do they work? *Transport Policy*, 9(4), 287–298.
- Rye, T., Green, C., Young, E., & Ison, S. (2011). Using the land-use planning process to secure travel plans: an assessment of progress in England to date. *Journal of Transport Geography*, 19(2), 235–243.
- Ryley, T. (2006). Use of non-motorised modes and life stage in Edinburgh. *Journal of Transport Geography*, 14(5), 367–375.
- Sallis, J. F., Owen, N., & Fisher, E. (2015). Ecological models of health behavior. *Health Behavior: Theory, Research, and Practice*, 5, 43–64.
- Santos, G., Maoh, H., Potoglou, D., & von Brunn, T. (2013). Factors influencing modal split of commuting journeys in medium-size European cities. *Journal of Transport Geography*, 30, 127–137.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students* (5th ed.). In *Always Learning* (5th ed.). Retrieved from <https://books.google.co.uk/books?id=u-txtfaCFiEC>
- Savills. (2016). *Relocation, relocation?* Retrieved from <http://www.savills.co.uk/insight-and-opinion/savills-news/198330-0/relocation--relocation--most-companies-in-greater-london-and-the-south-east-move-just-800-metres>
- Scheiner, J. (2014). Residential self-selection in travel behaviour: Towards an integration into mobility biographies. *The Journal of Transport and Land Use*, 7(3), 15–29.
- Scheiner, J. (2018). Why is there change in travel behaviour? In search of a theoretical framework for mobility biographies. *Erdkunde*, 72(1), 41–62.
- Scheiner, J., & Holz-Rau, C. (2007). Travel mode choice: affected by objective or subjective determinants? *Transportation*, 34(4), 487–511.
- Scheiner, J., & Holz-Rau, C. (2013). Changes in travel mode use after residential relocation: A contribution to mobility biographies. *Transportation*, 40(2), 431–458.

- Schwanen, T. (2002). Urban form and commuting behaviour: a cross-European perspective. *Tijdschrift Voor Economische En Sociale Geografie*, 93, 336–343.
- Schwanen, T., Banister, D., & Anable, J. (2012). Rethinking habits and their role in behaviour change: the case of low-carbon mobility. *Journal of Transport Geography*, 24, 522–532.
- Schwanen, T., & Mokhtarian, P. (2005). What affects commute mode choice: neighbourhood physical structure or preferences toward neighbourhoods? *Journal of Transport Geography*, 13, 83–99.
- Shabanpour, R., Golshani, N., Tayarani, M., Auld, J., & Mohammadian, A. K. (2018). Analysis of telecommuting behavior and impacts on travel demand and the environment. *Transportation Research Part D: Transport and Environment*, 62, 563–576.
- Shaw, J., & Docherty, I. (2014). *The Transport Debate*. Bristol: Policy Press.
- Sherwin, H., Chatterjee, K., & Jain, J. (2014). An exploration of the importance of social influence in the decision to start bicycling in England. *Transportation Research Part A: Policy and Practice*, 68, 32–45.
- Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*. London: Sage.
- Shove, E., Watson, M., & Spurling, N. (2015). Conceptualizing connections: Energy demand, infrastructures and social practices. *European Journal of Social Theory*, 18(3), 274–287.
- Sim, L. L., Malone-Lee, L. C., & Chin, K. H. L. (2001). Integrating land use and transport planning to reduce work-related travel: a case study of Tampines Regional Centre in Singapore. *Habitat International*, 25(3), 399–414.
- Simons, D., Clarys, P., De Bourdeaudhuij, I., de Geus, B., Vandelanotte, C., & Deforche, B. (2014). Why do young adults choose different transport modes? A focus group study. *Transport Policy*, 36, 151–159.
- Sloman, L., Cairns, S., Newson, C., Anable, J., Pridmore, A., & Goodwin, P. (2010). *The effects of smarter choice programmes in the sustainable travel towns: summary report*.
- Smith, H., & Raemaekers, J. (1998). Land use pattern and transport in Curitiba. *Land Use Policy*, 15(3), 233–251.
- Spotswood, F., Chatterton, T., Tapp, A., & Williams, D. (2015). Analysing cycling as a social practice: An empirical grounding for behaviour change. *Transportation Research Part F*, 29, 22–33.
- Sprumont, F., Viti, F., Caruso, G., & Konig, A. (2014). Workplace relocation and mobility changes in a transnational metropolitan area: The case of the University of Luxembourg. *Transportation Research Procedia*, 4, 286–299.

- Stanbridge, K., & Lyons, G. (2006). *Travel behaviour and considerations during the process of residential relocation*. Presented at the 11th International Conference on Travel Behaviour Research.
- Stern, N. (2006). *The Economics of Climate Change*. London: HMSO.
- Sturcke, J. (2008). Manchester says no to congestion charging. *The Guardian*. Retrieved from <https://www.theguardian.com/politics/2008/dec/12/congestioncharging-transport>
- Susilo, Y. O., Williams, K., Lindsay, M., & Dair, C. (2012). The influence of individuals' environmental attitudes and urban design features on their travel patterns in sustainable neighborhoods in the UK. *Transportation Research Part D*, 17(3), 190–200.
- Sustrans. (2017). *Bike Life Report for Greater Manchester*. Retrieved from https://www.sustrans.org.uk/sites/default/files/file_content_type/bike-life-greater-manchester-2017-report.pdf
- Sweney, M. (2015). BBC3 to move half of its operations to hub in Birmingham by 2018. *The Guardian*. Retrieved from <https://www.theguardian.com/media/2016/may/11/bbc3-birmingham-move-youth-team-bbc-news>
- Swinney, P., & Piazza, G. (2018). Should we move public sector jobs out of London? *Centre for Cities*. Retrieved from <http://www.centreforcities.org/reader/move-public-sector-jobs-london/>
- Tang, Y., Pan, H., & Shen, Q. (2011). *Bike-sharing systems in Beijing, Shanghai, and Hangzhou and their impact on travel behavior*. Presented at the Transportation Research Board 90th Annual Meeting.
- Taniguchi, A., Suzuki, H., & Fujii, S. (2007). Mobility management in Japan: Its development and meta-analysis of travel feedback programs. *Transportation Research Record: Journal of the Transportation Research Board*, (2021), 100–109.
- TAPESTRY. (2003). *Travel Awareness Publicity and Education Supporting a Sustainable Transport Strategy in Europe - Final Report*.
- Taylor, I., Elliot, J., Sloman, L., & Matson, L. (2006). *Beyond Transport Infrastructure: Lessons for the future from recent road projects, supplementary report*. Machynlleth.
- Teddle, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. London: Sage Publications Inc.
- TfGM. (2011). Local Sustainable Transport Fund. Retrieved from <http://archive.tfgm.com/ltp3/Pages/Local-Sustainable-Transport-Fund.aspx>

- TfGM. (2013). *Working with a large site to promote sustainable travel choices*. Retrieved from http://archive.tfgm.com/journey_planning/LTP3/Documents/LSTF-MediaCityUK.pdf
- TfGM. (2016a). *Metrolink Phase 3 Evaluation - early findings*. Retrieved from Transport for Greater Manchester website: https://www.greatermanchester-ca.gov.uk/download/meetings/id/1004/22_metrolink_evaluation_report
- TfGM. (2016b). *Transport Statistics Greater Manchester 2016 Key Centres Section*.
- TfGM. (2018a). Trafford Park Line. Retrieved from <https://tfgm.com/trafford-park-line>
- TfGM. (2018b). Travelling with a bike or pushchair on Metrolink. Retrieved from <https://tfgm.com/public-transport/tram/bikes-and-pushchairs>
- TfGM Committee. (2017). *Bus Networks and TfGM Services sub committee report*. Manchester: TfGMC.
- TfL. (2011). *Travel in London, Supplementary Report: London Travel Demand Survey (LTDS)*. London: TfL.
- TfL. (2013). Enforcing travel plan targets. Retrieved from <https://tfl.gov.uk/info-for/urban-planning-and-construction/travel-plans/enforcing-travel-plan-targets#on-this-page-0>
- TfL. (2014). Public and stakeholder consultation on a Variation Order to modify the Congestion Charging scheme - Impact Assessment. Retrieved from https://consultations.tfl.gov.uk/roads/cc-changes-march-2014/user_uploads/cc-impact-assessment.pdf
- TfL. (2017). Congestion Charge. Retrieved from <https://tfl.gov.uk/modes/driving/congestion-charge>
- TfL. (2018). What is Oyster? Retrieved from <https://tfl.gov.uk/fares-and-payments/oyster/what-is-oyster>
- Thøgersen, J. (2006). Understanding repetitive travel mode choices in a stable context: A panel study approach. *Transportation Research Part A: Policy and Practice*, 40(8), 621–638.
- Thomas, G., Poortinga, W., & Sautkina, E. (2016). Habit discontinuity, self-activation, and the diminishing influence of context change: evidence from the UK understanding society survey. *PloS One*, 11(4).
- Thomas, G., Walker, I., & Musselwhite, C. (2014). Grounded Theory analysis of commuters discussing a workplace carbon-reduction target: Autonomy, satisfaction, and willingness to change behaviour in drivers, pedestrians, bicyclists, motorcyclists, and bus users. *Transportation Research Part F*, 26, 72–81.

- Timmermans, H. J. P., & Zhang, J. (2009). Modeling household activity travel behavior: Examples of state of the art modeling approaches and research agenda. *Transportation Research Part B: Methodological*, 43(2), 187–190.
- Tonkiss, F. (2014). *Cities by design: the social life of urban form*. John Wiley & Sons.
- UNWCED. (1987). *Our Common Future (Brundtland Report)*. Oxford: Oxford University Press.
- Urban Vision. (2011). *MediaCityUK Final Travel Plan*. Salford.
- Vale, D. (2013). Does commuting time tolerance impede sustainable urban mobility? Analysing the impacts of commuting behaviour as a result of workplace relocation to a mixed-use centre in Lisbon. *Journal of Transport Geography*, 32, 38–48.
- Valentine, G. (2005). Tell me about...using interviews as a research methodology. In R. Flowerdew & D. Martin (Eds.), *Methods in Human Geography: A Guide for Students Doing a Research Project, second edition*. (pp. 110–127). Abingdon: Routledge.
- Van Acker, V., Van Wee, B., & Witlox, F. (2010). When Transport Geography Meets Social Psychology: Toward a Conceptual Model of Travel Behaviour. *Transport Reviews: A Transnational Transdisciplinary Journal*, 30(2), 219–240.
- Van Acker, V., & Witlox, F. (2005). *Exploring the relationship between land-use system and travel behaviour-some first findings*. Presented at the 45th Congress of the European Regional Science Association.
- Van Acker, V., & Witlox, F. (2007). *Explaining travel behavior: Towards a new conceptual framework and modeling technique*.
- Van Malderen, L., Jourquin, B., Pecheux, C., Thomas, I., Van De Vijver, E., Vanoutrive, T., ... Witlox, F. (2013). Exploring the profession of mobility manager in Belgium and their impact on commuting. *Transportation Research Part A: Policy and Practice*, 55, 46–55.
- Van Wee, B. (2002). Land use and transport: research and policy challenges. *Journal of Transport Geography*, 10(4), 259–271.
- van Wee, B. (2011). Evaluating the impact of land use on travel behaviour: the environment versus accessibility. *Journal of Transport Geography*, 19(6), 1530–1533.
- van Wee, B., Bakker, T., & Van der Hoorn, T. (1997). Office suites suit the railways: the effects of office locations to public transport nodal points on passenger transport. *PTRC European Transport Forum, Annual Meeting, Proceedings of Seminar E: Transportation Planning Methods*, 1.
- van Wee, B., & Handy, S. (2016). Key research themes on urban space, scale and sustainable urban mobility. *International Journal of Sustainable Transportation*, 10(1), 18–24.

- Verhetsel, A., & Vanelslander, T. (2010). What location policy can bring to sustainable commuting: an empirical study in Brussels and Flanders, Belgium. *Journal of Transport Geography*, 18(6), 691–701.
- Verplanken, B., Aarts, H., & van Knippenberg, A. (1997). Habit, information acquisition, and the process of making travel mode choices. *European Journal of Social Psychology*, 27(1–2), 539–560.
- Verplanken, B., Walker, I., Davis, A., & Jurasek, M. (2008). Context change and travel mode choice: Combining the habit discontinuity and self-activation hypotheses. *Journal of Environmental Psychology*, 28(2), 121–127.
- Verplanken, B., & Wood, W. (2006). Interventions to break and create consumer habits. *Journal of Public Policy & Marketing*, 25(1), 90–103.
- Vigar, G., & Stead, D. (2003). In J. Shaw (Ed.), *A New Deal for Transport?* Oxford: Blackwell.
- Wachs, M., Taylor, B. D., Levine, N., & Ong, P. (1993). The changing commute: A case-study of the jobs-housing relationship over time. *Urban Studies*, 30(10), 1711–1729.
- Walker, I., Thomas, G. O., & Verplanken, B. (2014). Old habits die hard: Travel habit formation and decay during an office relocation. *Environment and Behavior*, 47(10), 1089–1106.
- Wardman, M., & Hine, J. (2000). *Costs of Interchange: A Review of the Literature*.
- Wardman, M., Tight, M., & Page, M. (2007). Factors influencing the propensity to cycle to work. *Transportation Research Part A: Policy and Practice*, 41(4), 339–350.
- Weinberger, R., & Goetzke, F. (2010). Unpacking preference: How previous experience affects auto ownership in the United States. *Urban Studies*, 47(10), 2111–2128.
- Whitmarsh, L. (2012). How useful is the Multi-Level Perspective for transport and sustainability research? *Journal of Transport Geography*, 24, 483–487.
- Wiggins, K. (2017). How to make a job move to the UK's north. *Financial Times*. Retrieved from <https://www.ft.com/content/20b15744-3be1-11e7-ac89-b01cc67cfeec>
- Williams, C. (2017). These Companies Are Relocating Headquarters In Search Of Young, Qualified Talent. *Bisnow*. Retrieved from <https://www.bisnow.com/national/news/office/8-companies-that-have-relocated-expanded-offices-in-pursuit-of-young-talent-70823>
- Williams, D. (2014). *Social practice theory and sustainable mobility: An analysis of the English local transport planning as a system of provision*.
- Williams, D. G., Spotswood, F., Parkhurst, G., & Chatterton, T. (2019). Practice ecology of sustainable travel: The importance of institutional policy-making processes beyond the traveller. *Transportation Research Part F: Traffic Psychology and Behaviour*, 62, 740–756.

- Willis, D. P., Manaugh, K., & El-Geneidy, A. (2015). Cycling under influence: summarizing the influence of perceptions, attitudes, habits, and social environments on cycling for transportation. *International Journal of Sustainable Transportation*, 9(8), 565–579.
- Woodcock, J., Banister, D., Edwards, P., & Andrew, M. (2007). Energy and Health 3: Energy and Transport. *Lancet*, 370(9592), 1078–1088.
- Yang, X., Day, J. E., Langford, B. C., Cherry, C. R., Jones, L. R., Han, S. S., & Sun, J. (2017). Commute responses to employment decentralization: Anticipated versus actual mode choice behaviors of new town employees in Kunming, China. *Transportation Research Part D: Transport and Environment*, 52, 454–470.
- Yeates, S., & Enoch, M. (2013). Travel plans from the developer perspective. *Proceedings of the Institute of Civil Engineers: Urban Design & Planning*, 166(5), 262–273.
- Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). London: Sage Publications.
- Zuidgeest, M., Rouwette, A., de Jong, H., Godefrooij, T., & Sagaris, L. (2009). *Identifying bicycle networks for better cities: Cycling-inclusive policy development: a handbook*. (pp. 66–75). Utrecht.

Appendix A – Travel survey forms

Survey 1 (2014)

Employee travel patterns and modal choice at MediaCityUK - PhD travel survey

Hello, my name is Andy Binder and I am a PhD transport geography research student at the University of Salford. This survey forms a key part of my PhD study looking into how employees travel to MediaCityUK and should take no more than 5 minutes to complete. I am very grateful for your participation in the survey, the information that you provide will be highly valuable to my study.

All respondents who leave their contact details will be entered into a prize draw for up to £50 of Debenhams vouchers, more details are available at the end of the survey.

The survey will ask why you use your chosen mode and why you don't use other modes available. If you use more than one mode e.g. train and tram or tram and walk, the survey will allow you to record this also.

Please try to consider a 'typical' day. If this is not straightforward please fill it in based on your most recent journey to MediaCityUK.

* Required



Untitled Section

Why MediaCityUK and why the BBC?

MediaCityUK provides an excellent case study for several reasons:

- It is a new development on post-industrial brownfield site on the edge of the regional centre;
- Featured decentralisation of resources by the BBC from London and associated changes in employee residence and/or travel choices and availability;
- There is a large concentration of workforce;
- The development was set a target of at least 45% of journeys by non-car modes in the peak periods as part of being granted planning permission;
- Some high cost transport infrastructure interventions have taken place, such as new Metrolink spur and

The BBC has circa 2,300 people employed on site, by far the largest population of any of the organisations at MediaCityUK.

Taking part

Participation in this survey is optional and you can withdraw at any time. However, the success of the research depends on a good response to the survey so your support is highly valued.

What am I going to be asked?

The survey is in three parts:

- 1) Questions about travel to your previous place of work/education before you were based at MediaCityUK
- 2) Questions about travel to MediaCityUK including why you travel by certain modes and why you don't travel by other modes
- 3) Demographic information

Consent

By clicking continue, you have agreed that you have read the participation information above and agreed to take part in the study.

Confidentiality

All data collected for this study will be treated confidentially and stored securely. The research approach has been approved by the Research Ethics Panel at the University of Salford.

Part 1 - BEFORE you worked at MediaCityUK

1. Before you worked at MediaCityUK, where were you employed (or studying)? *

If selecting 'Other' please include organisation name and location if possible e.g. 'ITV, London', or just the location e.g. 'London'.

Mark only one oval.

- BBC - based in London
- BBC - based in Manchester (New Broadcasting House)
- Other: _____

Travel to your previous place of employment (or education)?

Please consider which modes of travel you used on a typical journey to your previous place of employment (or education).

2. What was your primary mode of travel to your previous place of employment (or education)? *

(The primary mode is the one you used for the longest leg of your journey in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Tube
- DLR
- Cycle
- Walk
- Motorcycle/scooter
- Taxi
- Other: _____

3. What was your secondary mode of travel to your previous place of employment (or education)? *

(The mode you used for the 2nd longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Tube
- DLR
- Cycle
- Walk (only select if walk was over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Only used one mode *Skip to question 8.*
- Other: _____

4. Did you use more than 2 modes of transport in your journey to your previous place of employment (or education)? *

Mark only one oval.

- Yes
- No *Skip to question 8.*

5. What was your tertiary mode of travel to your previous place of employment (or education)? *

(The mode you use for the 3rd longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Tube
- DLR
- Cycle
- Walk (only select if walk was over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Only used one mode
- Other: _____

6. Did you use more than 3 modes of transport in your journey to your previous place of employment (or education)? *

Mark only one oval.

- Yes
- No *Skip to question 8.*

7. What was your quaternary mode of travel to your previous place of employment (or education)? *

(The mode you use for the 4th longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Tube
- DLR
- Cycle
- Walk (only select if walk was over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Only used one mode
- Other: _____

Frequency of travel to your previous place of employment (or education)

8. How many days per week did you travel to your previous place of employment (or education) for work (or study)? *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Working (or studying) off-site or at home

9. Did you regularly work (or study) off site or at home at your previous place of employment?

(Regular is at least once a week)

Mark only one oval.

- Yes
- No Skip to question 11.

Working (or studying) off-site or at home

10. How many days per week did you work (or study) off-site or at home? *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Part 2 - Journey to MediaCityUK

Now consider which modes of travel you use in a typical journey to MediaCityUK



11. What is the primary mode of travel you use to travel to MediaCityUK? *

(The primary mode is the one you use for the longest leg of your journey in terms of time)

Mark only one oval.

- Car (driver) Skip to question 21.
- Car sharing (as driver) Skip to question 26.
- Car sharing (as passenger) Skip to question 26.
- Bus Skip to question 36.
- Train Skip to question 36.
- Tram Skip to question 36.
- Cycle Skip to question 40.
- Walk Skip to question 44.
- Motorcycle/scooter Skip to question 31.
- Taxi Skip to question 48.
- Other: _____

Journey to MediaCityUK

12. What is your secondary mode of travel to MediaCityUK? *

(The mode you use for the 2nd longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk (only select if walk is over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Only use one mode Skip to question 18.
- Other: _____

Journey to MediaCityUK

13. Do you use more than 2 modes of transport in your journey to MediaCityUK? *

Mark only one oval.

- Yes
- No Skip to question 17.

Journey to MediaCityUK

14. What is your tertiary mode of travel to MediaCityUK? *

(The mode you use for the 3rd longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk (only select if walk is over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Other: _____

Journey to MediaCityUK

15. Do you use more than 3 modes of transport in your journey to MediaCityUK? *

Mark only one oval.

- Yes
- No *Skip to question 17.*

Journey to MediaCityUK

16. What is your quaternary mode of travel to MediaCityUK? *

(The mode you use for the 4th longest leg in terms of time)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk (only select if walk is over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Other: _____

Arrival at MediaCityUK

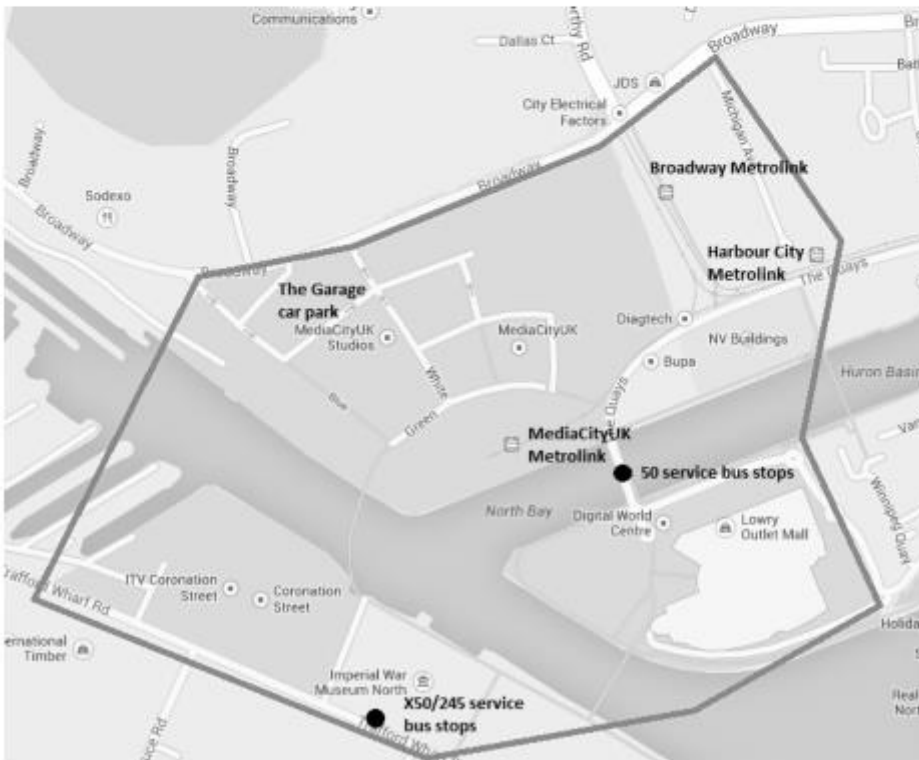
17. By what mode of travel do you arrive at MediaCityUK? *

The MediaCityUK arrival zone is defined as within the green polygon on the map below. Please select the mode that you use to arrive within this zone. Please discount any journeys once within this zone e.g. walking to your building from the tram stop.

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk
- Motorcycle/scooter
- Taxi
- Other: _____

MediaCityUK arrival zone



Frequency of travel to MediaCityUK

18. How many days per week do you travel to MediaCityUK? *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Working away from MediaCityUK

19. Do you regularly work off site or at home?

(Regular is at least once a week)

Mark only one oval.

- Yes
 No Skip to question 53.

Working away from MediaCityUK

20. How many days per week do you work off-site or at home? *

Mark only one oval.

- 1
 2
 3
 4
 5
 6
 7

Skip to question 53.

Car users

21. What are the reasons that you drive to MediaCityUK as your primary mode of travel? *

Please tick all that are applicable

Check all that apply.

- It is the quickest way of traveling
 Disability
 Use car for business trips
 Convenient parking space available
 Start/finish work early or late or work out of hours
 Personal security
 Transport large items on a regular basis
 Costs less than other modes (including parking charges)
 Drop off/pick up children on way to/from work
 Other: _____

What are the reasons you do not use the following modes as your primary mode?

Please tick all that are applicable

22. Public transport

Check all that apply.

- Journey time is too long
 Not a direct journey, requires interchange
 Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
 Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
 Concerns about reliability and punctuality
 Overcrowding
 Other: _____

23. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

24. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

25. Car sharing

Check all that apply.

- Do not know anyone to car share with
- Prefer to travel on my own
- Do not have any space in my car (e.g. due to other passengers or items)
- Other: _____

Skip to question 12.

Car sharers as driver or as driver and passenger (e.g. alternate roles with sharer)

26. When you car share, are you:

Mark only one oval.

- Predominantly the driver
- Predominantly the passenger
- Equally a driver and passenger

27. What are the reasons that you car share to MediaCityUK as your primary mode of travel?

Please tick all that are applicable

Check all that apply.

- Know someone from my office/floor/department to car share with
- Save money on costs of parking and running a car
- To share driving
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

28. Public transport

Check all that apply.

- Journey time is too long
- Not a direct journey, requires interchange
- Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
- Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
- Concerns about reliability and punctuality
- Overcrowding
- Other: _____

29. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

30. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

Skip to question 12.

Motorcycle/scooter users

31. What are the reasons that you use a motorcycle/scooter as your primary mode of travel to MediaCityUK? *

Please tick all that are applicable

Check all that apply.

- It is the quickest way of traveling
- Use motorcycle/scooter for business trips
- Convenient parking space available
- Start/finish work early or late or work out of hours
- Costs less than other modes (including parking charges)
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

32. Car

Check all that apply.

- Do not have access to a car
- Traffic congestion
- High running costs (petrol, insurance, tax, maintenance etc)
- High parking charges
- Low availability of parking
- Concerns about environmental sustainability
- Other: _____

33. Public transport

Check all that apply.

- Journey time is too long
- Not a direct journey, requires interchange
- Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
- Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
- Concerns about reliability and punctuality
- Overcrowding
- Other: _____

34. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

35. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

Skip to question 12.

Public transport users

36. What are the reasons that you use public transport as your primary mode of travel to MediaCityUK?

Please tick all that are applicable

Check all that apply.

- It is the quickest way of travelling
- Live within 400 metres of a public transport service (train/tram station, bus stop)
- Utilise travel time for other purposes (e.g. reading, working)
- Reliable and punctual service
- Timetable suits my requirements for travelling to work
- More sustainable than car use
- Costs less than driving
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

37. Car

Check all that apply.

- Do not have access to a car
- Traffic congestion
- High running costs (petrol, insurance, tax, maintenance etc)
- High parking charges
- Low availability of parking
- Concerns about environmental sustainability
- Other: _____

38. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

39. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

Skip to question 12.

Cycle users

40. What are the reasons that you cycle to MediaCityUK as your primary mode of travel?

Please tick all that are applicable

Check all that apply.

- It is the quickest way of travelling
- Live within a reasonable cycling distance
- Have to make stops on the way to/from work (for leisure, retail or other reasons)
- Use my bicycle for business trips
- More sustainable than car use
- Offers door-to-door transport
- Health and fitness benefits
- Costs less than other modes
- Availability of cycle storage at MediaCityUK
- Availability of facilities such as shower and changing areas at MediaCityUK
- Availability of cycle infrastructure on route from where I live (e.g. segregated or non-segregated cycle lanes, off-road cycle routes)
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

41. Car

Check all that apply.

- Do not have access to a car
- Traffic congestion
- High running costs (petrol, insurance, tax, maintenance etc)
- High parking charges
- Low availability of parking
- Concerns about environmental sustainability
- Other: _____

42. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

43. Public transport

Check all that apply.

- Journey time is too long
- Not a direct journey, requires interchange
- Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
- Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
- Concerns about reliability and punctuality
- Overcrowding
- Other: _____

Skip to question 12.

Pedestrians

44. What are the reasons that you walk to MediaCityUK as your primary mode of travel?

Please tick all that are applicable

Check all that apply.

- Live within reasonable walking distance
- Health and fitness
- Route has good pedestrian infrastructure (e.g. on/off-street footpaths, well lit, good surfaces)
- More sustainable than other modes
- Costs less than other modes
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

45. Car

Check all that apply.

- Do not have access to a car
- Traffic congestion
- High running costs (petrol, insurance, tax, maintenance etc)
- High parking charges
- Low availability of parking
- Concerns about environmental sustainability
- Other: _____

46. Public transport

Check all that apply.

- Journey time is too long
- Not a direct journey, requires interchange
- Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
- Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
- Concerns about reliability and punctuality
- Overcrowding
- Other: _____

47. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

Skip to question 12.

Taxi users

48. What are the reasons that you use a taxi as your primary mode of travel to MediaCityUK?

Please tick all that are applicable

Check all that apply.

- Disability
- Quickest way of travelling
- Transport large items
- Other: _____

What are the reasons you do not use the following modes as your primary mode of travel?

Please tick all that are applicable

49. Car

Check all that apply.

- Do not have access to a car
- Traffic congestion
- High running costs (petrol, insurance, tax, maintenance etc)
- High parking charges
- Low availability of parking
- Concerns about environmental sustainability
- Other: _____

50. Public transport

Check all that apply.

- Journey time is too long
- Not a direct journey, requires interchange
- Do not live within 400 metres of a public transport service (train station, bus stop, tram stop)
- Lack of flexible or smart ticketing (e.g. don't travel enough to buy a season ticket but travel more than once a week)
- Concerns about reliability and punctuality
- Overcrowding
- Other: _____

51. Walking

Check all that apply.

- Lack of pedestrian facilities on walking route (e.g. footways, crossings)
- Have to cross or walk along busy roads with associated negative effects (noise, air pollution, congestion)
- Concerns about safety
- Live too far to walk
- Other: _____

52. Bicycle

Check all that apply.

- Don't have access to a bike
- Lack of cycle infrastructure on route from where I live (e.g. segregated/non-segregated cycle lanes, off-road cycle routes)
- Not confident enough to cycle
- Concerns about safety
- Live too far to cycle
- Lack of adequate cycle storage at MediaCityUK
- Lack of supporting facilities at MediaCityUK, such as shower and changing areas
- Lack of knowledge on bicycle maintenance
- Other: _____

...and finally

53. What is your gender? *

Mark only one oval.

- Male
 Female

54. What area of the BBC do you work in? *

Mark only one oval.

- Presenting
 Production crew
 Pre-production
 Post-production
 Research & Development
 Software design and engineering
 Website management and design
 Finance
 Administration and secretarial
 Human Resources
 Legal
 Operations & facilities
 Senior management
 Other: _____

55. What is your age? *

Mark only one oval.

- 19 or under
 20-29
 30-39
 40-49
 50-59
 60 or over

56. What is your home postcode?

Please provide the full postcode if possible (e.g. M15 4NY)

Thank you for your time, would you be able to assist my studies further? Voucher prizes available!

Survey 2 (2016)

BBC MediaCityUK travel to work survey (for PhD research)

Hello, my name is Andy Binder and I am a PhD transport geography research student at the University of Salford.

This survey forms a key part of my PhD study looking into travel behaviour among relocated personnel at new developments.

The survey should take no more than 10 minutes to complete. I am very grateful for your participation in the survey, the information that you provide will be highly valuable to my study.

(The survey is a follow up to the 2014 survey that you may have completed.)

* Required



Participant information

Taking part

Participation in this survey is optional and you can withdraw at any time.

What am I going to be asked?

The survey is in 4 parts:

- 1) Questions about where you worked/studied before starting at MediaCityUK and how you travelled to work/study
- 2) Questions about your travel to MediaCityUK
- 3) Questions about changes in travel and awareness of sustainable travel measures
- 4) Demographic information

Confidentiality

All data collected for this study will be treated confidentially and stored securely. The research approach has been approved by the Research Ethics Panel at the University of Salford.

Consent

By clicking 'Next', you have agreed that you have read the participation information above and agreed to take part in the study.

Part 1 - Before you worked at MediaCityUK

1. Before you worked at MediaCityUK, where were you employed (or studying)? *

If selecting 'Other' please include organisation name and location, e.g. 'ITV London'

Mark only one oval.

- BBC - based in London
- BBC - based in Manchester (New Broadcasting House)
- Other: _____

2. What was your usual mode of travel to your previous place of work or study? *

(Please try to consider a 'typical' day.)

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Underground rail
- Tram
- Cycle
- Walk
- Motorcycle/scooter
- Taxi
- Other: _____

Part 2 - Travel to MediaCityUK

Now consider which modes of travel you use in a typical journey to MediaCityUK



3. When did you start working at BBC MediaCityUK? *

(Month, year)

4. What is the primary mode of travel you use to travel to MediaCityUK? *

The primary mode is the one you use for the longest leg of your journey in terms of time, for example: Train 25 mins (primary), Tram 15 mins (secondary). Please consider a typical day or if this is not straightforward, please provide information based on your most recent journey to work.

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk
- Motorcycle/scooter
- Taxi
- Other: _____

5. What is your secondary mode of travel to MediaCityUK? *

(The mode you use for the 2nd longest leg in terms of time)

Mark only one oval.

- Only use one mode *Skip to question 7.*
- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Train
- Tram
- Cycle
- Walk (only select if walk is over 5 minutes long)
- Motorcycle/scooter
- Taxi
- Other: _____

Part 2 - Travel to MediaCityUK

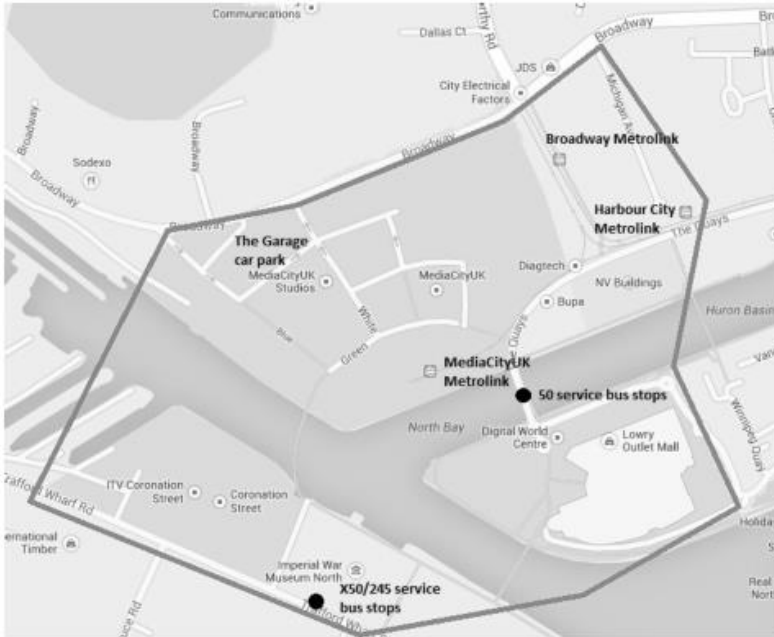
6. By what mode of travel do you arrive at MediaCityUK? *

The MediaCityUK arrival zone is defined as within the green polygon on the map below. Please select the mode that you use to arrive within this zone. Please discount any journeys once within this zone e.g. walking to your building from the tram stop.

Mark only one oval.

- Car (driver)
- Car sharing (as driver)
- Car sharing (as passenger)
- Bus
- Tram
- Cycle
- Walk
- Motorcycle/scooter
- Taxi

MediaCityUK arrival zone



Part 2 - Travel to MediaCityUK

7. On average, how many days per week do you travel to MediaCityUK? *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Part 2 - Travel to MediaCityUK

8. Do you regularly work off site or at home? *

(Regular is at least once a week)

Mark only one oval.

- Yes
- No Skip to question 10.

9. On average, how many days per week do you work off-site or at home? *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Part 3 - Changes in mode of travel since starting at MediaCityUK

10. Have you changed your primary mode of travel since starting at MediaCityUK? *

Mark only one oval.

- Yes, I used to travel by a different mode
- No, I travel the same way as when I first started Skip to question 13.

Part 3 - Reasons for change in mode

11. What other mode(s) of travel have you used since starting at MediaCityUK? *

Check all that apply.

- Car (as driver)
- Car share (as driver)
- Car share (as passenger)
- Bus
- Tram
- Train
- Cycle
- Walk
- Taxi
- Other: _____

12. What are the reasons that you have changed mode since starting at MediaCityUK? *

e.g. why you have switched from tram to cycle.

Part 3 - Awareness of sustainable travel measures & options

A MediaCityUK Travel Plan is in place that aims to increase the use of sustainable modes of travel (e.g. walking, cycling, public transport, car sharing) for journeys to and from MediaCityUK. Over the last few years a range of measures have been implemented as part of the Travel Plan.

	Not aware of this	Aware of but don't know what this is	Understand what this is but have not taken part	Fully understand and have taken part
MediaCityUK Travel Plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel Choices website (travel.mediacityuk.co.uk)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cycle to Work scheme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TIGM Cycle Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cycle parking in the Greenhouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cycle events (e.g. Bike Week, Cycle to Work day, Dr. Bike)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle User Group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discount on Metrolink season tickets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enterprise Car Club	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electric vehicle charging points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Car Share database (CarShareGM)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Skip to question 14.

...and finally

14. What is your gender? *

Mark only one oval.

- Male
- Female

15. What area of the BBC do you work in? *

Mark only one oval.

- Presenting
- Production crew
- Pre-production
- Post-production
- Research & Development
- Software design and engineering
- Website management and design
- Finance
- Administration and secretarial
- Human Resources
- Legal
- Operations & facilities
- Senior management
- Other

16. What is your age? *

Mark only one oval.

- 19 or under
- 20-29
- 30-39
- 40-49
- 50-59
- 60 or over

17. What is your home postcode?

Please provide the full postcode if possible (e.g. M15 4NY). If you have more than one residence, for example, a residence in the north west when working at MediaCityUK and an additional permanent residence elsewhere, please provide details below.

Thank you for your time, would you be able to assist my studies further?

Thank you very much for taking the time to participate in this survey. I am very grateful for the data you have provided to assist me with my PhD studies.

For the next stage of my research I would like to understand more about your travel to MediaCityUK as I'm aware that there is no 'typical day' for a lot of people.

I would like volunteers to complete a 1-week travel diary for all work related journeys. This will allow me to build a more accurate picture of travel to MediaCityUK beyond the limitations of this survey.

I appreciate how busy you are (in and out of work) so please be reassured that participation in the next stage will not require a large commitment of time, however, it will be very important to my studies and I would be most grateful.

If you are interested in assisting during the next stage, please leave a contact name and email below. (Please note - Your name will not be linked to the answers you have provided in this survey nor any of the information that you provide should you take part in the next stage)

Many thanks, if you have any queries at all, please contact me on the email address below.

Andy Binder
a.binder1@edu.salford.ac.uk

18. Name

19. Email

Appendix B – Travel Diary Form



University of
Salford
MANCHESTER

1967 - 2017 50 YEARS

BBC MediaCityUK 7-day travel diary

Introduction

Hello, my name is Andy Binder and I am a PhD transport geography research student at the University of Salford.

Thank you for completing the online travel survey and for agreeing to participate in the 2nd stage of my research into travel behaviour of employees at the BBC MediaCityUK site. Your contribution is invaluable to a study.

Please read the PARTICIPATION INFORMATION SHEET and sign the CONSENT FORM before starting your diary. These provide details of how information you provide will be treated confidentially in line with the local Approval Guidance of the University of Salford.

Please refer to the TRAVEL DIARY GUIDANCE opposite to assist completing the diary. An EXAMPLE travel diary has been completed on the following page to provide additional assistance.

Please complete the BLANK TRAVEL DIARY and add any ADDITIONAL FORMATION on the next page. On the final page, please provide some information about you that will help understand the context of your travel decisions.

If you have any questions at any point please contact me on abinder1@edu.salford.ac.uk

Guidance

Please enter the date of the Monday of the week your diary was recorded.

For each day you travel to MediaCityUK for work, please complete the appropriate row.

Please complete for the both the journey TO MediaCityUK from home and the journey FROM MediaCityUK to home.

If you are working somewhere other than MediaCityUK, please record this also adding the alternative destination into the boxes (*see Friday of the Example*)

Please try to complete the diary on a daily basis so that the information is fresh in your mind.

If you use more than one mode of transport e.g. train and tram as part of your journey to/from MediaCityUK, please state all methods.

Please provide as much information about the public transport you use e.g. 'tram from xx to MediaCityUK' or 'train from xx to Manchester Oxford Road and then 50 bus to MediaCityUK'

In the Additional Information, please add information relating to the following: Disruption or problems with the journey to/from MediaCityUK e.g. traffic issues, late running services, route obstructions, cycle parking availability.

Monday, November 28	TRAVEL TO MEDIACITYUK FROM HOME			TRAVEL FROM MEDIACITYUK TO HOME			Additional information (Please continue over leaf if necessary)		
	Method(s) of travel	Time of departure	Time of arrival	Additional stops between home and MediaCityUK	Method(s) of travel	Time of departure		Time of arrival	Additional stops between MediaCityUK and home
Monday	Car on own for whole journey	08:20	09:05	Yes, dropped children off at school.	Car on own	17:30	18:00	No	On Monday's I usually drop the children off at school as my spouse has to start work earlier.
Tuesday	Car on own for whole journey	07:45	08:25	No	Car on own	16:50	18:30	Yes, stopped at Sainsbury's Salford for food shopping.	I would've got the tram today if I didn't have to go food shopping this evening.
Wednesday	Worked from home all day	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Thursday	Car to East Didsbury tram stop and then tram to MediaCityUK	07:30	08:20	No	Tram from MediaCityUK to East Didsbury and then car to home	12:15	12:50	No	I worked from home this afternoon.
Friday	Car to Stockport station, train to London, tube to destination	07:00	09:30	No	Tube to Euston, train to Stockport and car to home	16:00	19:00	No	
Saturday	Car with colleague	05:00	05:40	Yes, stopped to pick colleague up on the way	Car on own	14:30	15:30	Yes, stopped at DIY store to pick up pre-ordered goods.	Due to the early start I have to drive as no public transport but pick a colleague up who doesn't have a car.
Sunday	Day off	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

Enter date on the Monday of the week	TRAVEL TO MEDIACITYUK FROM HOME				TRAVEL FROM MEDIACITYUK TO HOME				Additional Information (Please continue over leaf if necessary)
	Method(s) of travel	Time of departure	Time of arrival	Additional stops between home and MediacityUK	Method(s) of travel	Time of departure	Time of arrival	Additional stops between MediacityUK and home	
Monday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Tuesday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Wednesday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Thursday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Friday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Saturday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.
Sunday	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.	Enter time	Enter time	Click here to enter text.	Click here to enter text.

Additional information

Please continue to add any additional information regarding your journeys to work that you could not fit in the table.

Click here to enter text.

Some information about you

Are you: Male or female?

What age range are you in? Please select from the list

What is your home postcode? Please enter your postcode

Do you have access to a car for travelling to work? Please select

What is your household structure? Please select from the list

If you selected Other household structure, please provide details here

Appendix C – Interview Guide

Interview guide

Prompts are in italics.

Pre-relocation

- 1 **Where did you work prior to relocating to MediaCityUK?**
 - *Organisation name, location, postcode*
- 2 **Were you based at one location?**
 - *Did it involve working in multiple locations?*
- 3 **Where did you reside?**
 - *Location, postcode*
- 4 **Tell me about how you usually travelled to work prior to relocation and why you travelled that way...**

<i>Job requirements (e.g. hours, flexibility, multiple workplace locations, working from home)</i>	<i>Characteristics of facilities at previous workplace (e.g. cycle parking, showers, proximity to tram, bus, rail, underground services)</i>
<i>Location of residence</i>	<i>Health and fitness</i>
<i>Location of previous workplace</i>	<i>Cost</i>
<i>Travel options to previous workplace (e.g. rail, bus, tram, underground services, cycle routes)</i>	<i>Other responsibilities (e.g. transporting children)</i>

- 5 **What sustainable travel measures were promoted by your previous workplace?**
 - *How did they impact on your travel choices?*
- 6 **In terms of travel to work and travel for work, how much did the BBC inform you about travel options to MediaCityUK?**
- 7 **Can you tell me about how you planned you would travel to MediaCityUK prior to relocation...**
- 8 **Why did you think you would travel that way?**
 - *Did it influence where you chose to reside once relocated? Why?*
 - *What information on travel options were you given?*
 - *What incentives or compensation were available?*
 - *Did you know your travel plans fully prior to relocation?*

Post-relocation (first 6 months)

- 9 **When did you start working at MediaCityUK?**
 - *Month, year*
- 10 **Where were you residing?**
 - *Location, address*
 - *Did you have more than one residence?*
 - *Did you move straightaway? E.g. before starting work or after starting?*
- 11 **Tell me about how you travelled to MediaCityUK during that initial 6 months after relocation...**

- Was it the same or different than you had planned? Why?
- Was it the same or different each day? Why?
- Where your expectations of travel the same as prior to relocation?
- Were you given any information or support for planning your travel?

Present

12 Where do you live now?

- Is it the same as in previous section?
- If not, what were the reasons behind the move?

13 Tell me about how you travel to MediaCityUK now...

- Is it the same every day?
- Why has/hasn't the mode changed?
- What influences how you travel now?

<i>Job requirements (e.g. hours, flexibility, multiple workplace locations, working from home)</i>	<i>Characteristics of facilities at MediaCityUK (e.g. cycle parking, showers, proximity to tram, bus, rail, underground services)</i>
<i>Location of residence</i>	<i>Health and fitness</i>
<i>Location of previous workplace</i>	<i>Cost</i>
<i>Travel options to MediaCityUK (e.g. public transport services, cycle routes)</i>	<i>Other responsibilities (e.g. transporting children)</i>

- What other factors shape your travel plans?
 - **Mode of travel to previous workplace?**
- Are your travel plans rigid or fluid based on changing work or non-work circumstances?

14 Tell me about any travel you do during working hours...

15 CAR USERS ONLY – Tell me why using the car is your preferred mode of travel...

16 Tell me your experiences of using other modes of travel e.g. the train, tram, bus, walking, cycling...

- Only ask the about the modes they have not stated as their usual mode
- How did you know about the alternative mode you used?
- Was information on alternatives easy to access?

17 What would need to change to encourage you to use these modes at all, or more frequently?

- Public transport services to MediaCityUK
- Not having to change between services or modes
- Distance (e.g. for cycling or walking)
- Job requirements (e.g. hours, flexibility, multiple workplace locations)
- Personal mobility
- Cost incentives
- Facilities at MediaCityUK
- Knowledge of available travel options

18 Tell me about how you feel sustainable travel (e.g. cycling, walking, public transport) is promoted and supported at MediaCityUK...

- Flexible/homeworking
- Cycle facilities
- Cycle to work scheme
- Season tickets for public transport
- Are you aware of the MediaCityUK travel plan?

Appendix D – Ethical Approval

Academic Audit and Governance Committee

College of Science and Technology Research Ethics Panel
(CST)

University of
Salford
MANCHESTER

To Andrew Binder (and Ralph Henson)
cc: Prof Sunil Vadera, Head of School of CSE
From Nathalie Audren Howarth, College Research Support Officer
Date 21/07/2014

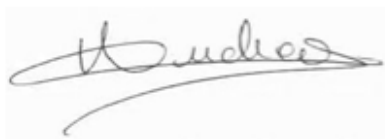
MEMORANDUM

Subject: Approval of your Project by CST
Project Title: Travel behaviour and modal choice at MediaCity UK, Salford.
REP Reference: CST 14/16

Following your responses to the Panel's queries, based on the information you provided, I can confirm that they have no objections on ethical grounds to your project.

If there are any changes to the project and/or its methodology, please inform the Panel as soon as possible.

Regards,



Nathalie Audren Howarth
College Research Support Officer

5 October 2016

Dear Andy,

RE: ETHICS APPLICATION ST16/116 – Travel behaviour at BBC MediaCityUK, Salford

Based on the information you provided, I am pleased to inform you that your application ST16-116 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,



Prof Mohammed Arif
Chair of the Science & Technology Research Ethics Panel
Professor of Sustainability and Process Management,
School of Built Environment
University of Salford
Maxwell Building, The Crescent
Greater Manchester, UK M5 4WT
Phone: + 44 161 295 6829
Email: m.arif@salford.ac.uk

Appendix E – Secondary Data

MediaCityUK Travel Plan Survey no.1 (2010)	
Details	Between August and October 2010, a survey was carried out by transport consultants Urban Vision appointed to develop the full Travel Plan for MediaCityUK. The survey was issued to the BBC staff in London and Manchester who were scheduled to relocate to MediaCityUK over the next few years. A key aim of the survey was to establish how people intended to travel to the site to inform the development of the Travel Plan and influence the measures included.
Study usage	Data from the survey has been used to provide information on intended travel (section 7.4.2).
UK Census (2011)	
Details	Data from the 2011 UK Census of the population was utilised to provide local, regional and national travel to work data to allow for comparisons with the data specific to the case study. The 2011 Census was conducted on March 27, 2011.
Study usage	Census data has been to provide information travel behaviour in the wider area around MediaCityUK (section 7.5.5) and the former location in London (section 7.3.2.1).
BBC Staff Survey (2012)	
Details	The BBC carried out a staff survey to gather the views of MediaCityUK employees following their relocation to the site. The survey covered a range of topics, such as on-site facilities and the general working environment. Transport and access to the site was also covered in the survey and considerable amounts of comments were received relating to this area. The data from this survey provides perspectives from during the relocation period.
Study usage	Data from the survey has been used to help understand staff attitudes towards travel at MediaCityUK during and post-relocation (sections 7.4 and 7.5).
MediaCityUK Travel Plan Survey no.2 (2012)	
Details	Peel conducted a site-wide travel survey in November 2012 to monitor how the site was performing against the Travel Plan mode share targets agreed through the planning process.
Study usage	Data from the survey was used to analyse longitudinal changes to travel behaviour (section 7.5.4).
MediaCityUK Travel Plan Survey no.3 (2014)	

Details	TfGM, in conjunction with site owners Peel, implemented a site-wide travel survey at MediaCityUK in October 2014. The primary purpose of the survey was to monitor how the site was performing against the Travel Plan mode share targets agreed through the planning process. The survey also helped inform sustainable travel initiatives being delivered by TfGM through their Local Sustainable Transport Fund (LSTF) programme (TfGM, 2011).
Study usage	Data from the survey was used to analyse longitudinal changes to travel behaviour (section 7.5.4).
Transport Statistics Greater Manchester (2016)	
Details	TfGM compile annual statistics on travel and transport across the conurbation that is freely available via their website (TfGM, 2016b).
Study usage	The 2016 dataset was used to provide information on travel behaviour within Manchester, where one of the former BBC sites was located (section 7.3.2.2).
Metrolink Passenger Data (2016)	
Details	TfGM monitor patronage data across the Greater Manchester tram (Metrolink) network. Passenger usage data was provided by TfGM for the study.
Study usage	The data has been used to understand patterns of usage and demand on Metrolink network in relation to travel to MediaCityUK (section 7.6.2.2).