

Local Sustainable Transport Fund
Case Study Evaluation
Strategic Employment Sites and Business Parks
West of England Final Report

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Executive Summary

Purpose and design of the case study

1. In 2013 the UK Department for Transport commissioned a number of 'Case Study evaluations' of the impacts of Local Sustainable Transport Fund (LSTF) investment. One of these was an evaluation of LSTF impacts on Strategic Employment Sites and Business Parks. The study was carried out between late 2013 and early 2016 by a research team led by Hertfordshire County Council and comprising: the University of Hertfordshire; the University of the West of England, Bristol (UWE); the West of England local authorities; and Atkins.
2. The aims of the evaluation were: to establish the impact of sustainable transport measures on commute mode use at selected strategic employment sites and business parks; to assess the impacts of these measures on the business performance of employers located at the sites; and to review the effectiveness of the LSTF delivery process.
3. The employment sites and business parks chosen for evaluation were: the North Fringe and Ports areas of Bristol, West of England; Maylands Business Park, Hemel Hempstead, Hertfordshire; Western Trading Estates, Slough, Berkshire; and Hatfield Business Park, Hatfield, Hertfordshire (comparator site, not in receipt of LSTF). This report presents the evaluation of LSTF impacts in the two sites located in the West of England: the North Fringe and Ports areas of Bristol.
4. Overall, the West of England local authorities (Bath and North East Somerset, Bristol City, North Somerset and South Gloucestershire Councils) were awarded nearly £34m from the LSTF between 2011/12 and 2015/16. Of this, expenditure on the LSTF business engagement programme during the 2-year evaluation period totalled over £2.2 million. Approximately 35% of this total was spent on business engagement in the two strategic employment sites selected for the case study (5% in the Bristol Ports area and 30% in the Bristol North Fringe).
5. In the West of England, a case study research approach was used to gather in-depth data from 25 employer organisations of different sizes and sectors, using a variety of research methods: employee travel surveys; in-depth semi-structured interviews with senior managers; and bus passenger surveys. All data collection was conducted in 2014 (Phase 1) and repeated in 2015/16 (Phase 2). In addition, a commuter panel survey ran between July 2014 and October 2015. Twenty of the 25 businesses and organisations took part in both research phases, whilst five were able to participate only once.

Key findings: Impacts of LSTF funding on commute mode share

6. There were statistically significant decreases in mode share for car alone (2.3% points) and car sharing (2.4% points) among North Fringe employees between March 2014 and March 2016. There were statistically significant increases in mode share for cycling (2.0% points), walking (1.1% points) and bus use (2.6% points). There were minimal changes in mode share among Ports area employees. After accounting for differences in sample characteristics in the two survey years, it was deduced that the probability of driving alone was 10% less likely in 2016 for North Fringe employees and the probability of using bus was 35% more likely (both statistically significant), but changes in

the probability of using other modes were not statistically significant.

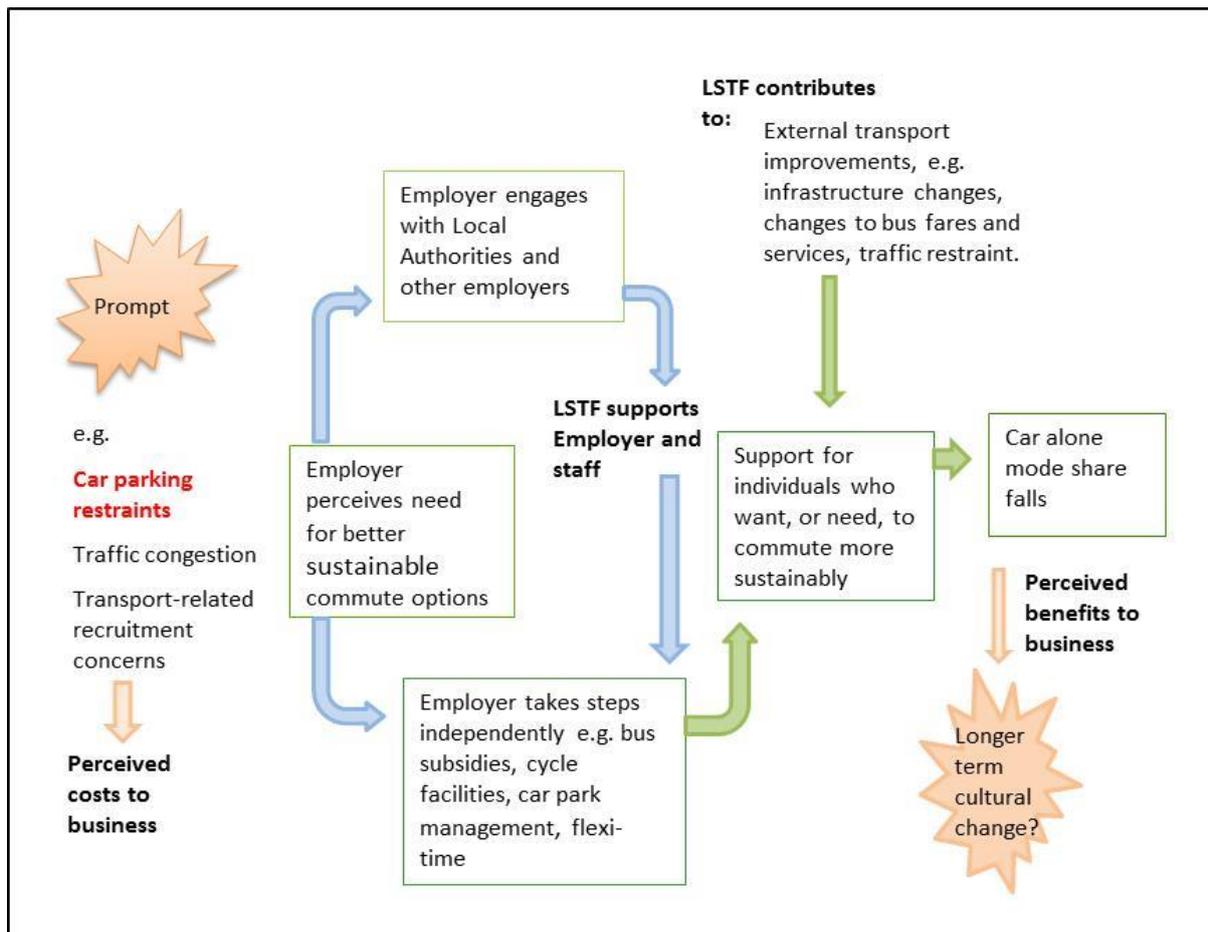
7. Looking at longer-term trends in mode share it was apparent that there was a more substantial reduction in car alone mode share of 4% points between March 2013 and March 2014 among North Fringe employees. This indicates that the WEST LSTF programme might have had a greater impact in its first year after which there was sustained impact at a lower level. It is also notable that reductions in single occupancy car use after 2013 in the North Fringe occurred against a backdrop of petrol price reductions, of a national trend of increasing car use and a regional trend of increasing car commuting.
8. To assess the role of the WEST programme in contributing to the mode share outcomes identified above, a number of matters should be considered. Firstly, a reduction in single occupancy car-use between March 2014 and March 2016 was statistically significant at only three out of 20 SES Case Study employers, all located in the North Fringe (single occupancy car-use increased among employers in the Ports area). Reductions in car parking availability had occurred at two of these employers (NHS Trust and University). Moreover, the NHS Trust was in some ways untypical because it had undergone a major site relocation in 2014 (after the March 2014 survey). Further analysis of the employee travel survey data showed that changes in mode share between March 2014 and March 2016 were explained well by changes in parking availability and not by the extent of exposure to LSTF measures (as measured at the employer level).
9. In exploring further whether there was evidence of a direct relationship between LSTF interventions and observed mode changes, the analysis of the employee travel survey data showed a decreased probability of car alone commuting, and increased probabilities of cycling and bus use, for individuals who used LSTF measures (but not if they were merely 'aware' of LSTF measures). This does not reveal direction of causality, although some insights into the self-reported influence of measures on individual behaviour were provided by the March 2016 employee survey. Of those respondents who reported using car alone less than two years ago, 29% said that the listed measures had made a little, or a lot, of difference to the way they travel to work. However, 64% said that the measures had made no difference. The closest associations were seen between using specific measures, e.g. on-site cycling facilities, and increasing use of the relevant mode (in this case, cycling), although the numbers involved were small.
10. This suggests that specific measures had a positive influence on reducing car use among a small proportion of individuals. However, LSTF measures might have helped to maintain existing levels of sustainable transport use in the face of a wider trend of increasing car mode share for commuter journeys in South-West England during the study period.
11. Qualitative evidence supports the view that LSTF measures had played a facilitating role in some individuals' decision to commute more often by sustainable modes, or to maintain existing use, although they were rarely reported to be the most important reasons. The narrative within many individuals' explanations of mode choice was of change or stability reflecting their own personal circumstances (e.g. moving house or job location, taking children to school, other responsibilities and interests outside work, or a desire to be more physically active).

12. Taken together, the results above suggest that reduction in parking availability was the chief factor in mode share changes seen between 2014 and 2016 with the LSTF programme playing an important role in facilitating mode changes of individual commuters. There is evidence of a greater reduction in single occupancy car use for employers in the North Fringe in the first part of the LSTF programme (up to March 2014) and it can be argued that the programme helped consolidate those gains in the second part of the programme (between April 2014 and March 2016).

Key findings: Impacts of LSTF funding on business performance

13. Senior managers perceived transport issues as important to their business performance in terms of both employee access (commuting) and operational transport (deliveries and logistics; business travel; client/visitor access). In particular, the quality of the commuter travel experience was seen as an important contributor to staff satisfaction, with improvements to the commute thought to bring about productivity gains by enhancing staff wellbeing.
14. Within this context, sustainable transport options were perceived as part of the 'mix' of transport investments required to ensure smooth business operations and support the recruitment, retention and productivity of appropriately skilled staff.
15. By 2016, most interviewees were either positive or neutral about the role the LSTF had played in increasing cycle-use by staff and improving bus services. Many interviewees in the North Fringe believed that business benefits (albeit indirect and unquantifiable) were starting to accrue from sustainable transport improvements. However, it was also felt that more time and greater investment in transport infrastructure and services was needed to make a substantial difference. In the Ports area, where implementation of LSTF measures started later, some employers thought that a new bus service was starting to make a positive difference by widening access to jobs, but it was too soon to be able to detect direct impacts.
16. Employers adversely affected by congestion, limits on parking, recruitment difficulties etc. perceived a greater need for investment in sustainable transport. When faced with pressures such as these, they were more willing to engage with the local authorities and other businesses on sustainable transport, which in turn created a 'virtuous circle' whereby they also accrued greater benefit from the LSTF (see Figure ES-1 below).

Figure ES-0-1: The role of LSTF interventions in the process of commute mode change



Key Findings: Delivery and process

17. The business networks, North Bristol SusCom and SevernNet, played an important part in developing and maintaining contacts with employers through which LSTF measures could be delivered by the Local Authority Business Engagement officers. Joint action through the networks gave employers an opportunity to help shape local transport policies and measures. Because the networks represented the employers’ own interests, they were perceived by the local authorities as offering ‘credibility gains’ to the work undertaken by LSTF officers. The networks also provided important continuity in the face of staff turnover within the local authorities during the LSTF evaluation period and beyond.

Conclusions

18. The results showed that ‘pull factors’ were unlikely to bring about significant changes in commuter travel behaviour without measures which also ‘pushed’ employees into reducing their car-use. In the case of the North Fringe, which saw a statistically significant fall in car-alone mode share, the need to enforce parking restraints was a key issue for many employers. Statistical analysis showed that reduction in car parking availability was the primary factor leading to reduced car alone commuting.

19. Nonetheless, there was evidence from both surveys and interviews that LSTF measures assisted individuals in using alternatives to the car once they had been prompted to do so by ‘push factors’ such as those listed above. LSTF measures to support cycling stood out in the North Fringe as attracting high levels of awareness among both senior managers and employees, and relatively high levels of use among employees.

20. The importance of 'push factors' such as limits on parking also applied to employers' engagement with sustainable transport issues, which tended to be prompted by a specific transport 'problem'. Those employers adversely affected by limited parking, local traffic congestion, and/or transport-related recruitment difficulties, perceived a need for greater investment in sustainable transport, and were more likely to have engaged with the LSTF than those less affected.
21. Employers who had engaged actively with the LSTF saw publically funded investment as part of a collaboration in which they also bore a responsibility. These employers regarded LSTF as useful 'leverage' for sustainable transport measures they wished to undertake themselves. LSTF grants could, for example, also lend weight to arguments within an organisation for investment in sustainable transport measures at a time when employers faced competing financial pressures.
22. Longer term acceptance and use of sustainable travel modes among commuters can be informed by levels of satisfaction with the commute. A comparison of employees' levels of satisfaction with their normal mode of travel to work in 2014 and 2016 showed a marked increase in bus users' trip satisfaction by 2016, which suggests that the higher bus mode share demonstrated in 2016 may be maintained. The finding that those who walked or cycled remained the groups most satisfied with their commutes can be considered as a positive outcome of interventions to support these modes.

1 Introduction

In 2013 the UK Department for Transport commissioned a number of 'Case Study' evaluations of the impacts of Local Sustainable Transport Fund (LSTF) investment. One of these was an evaluation of LSTF impacts on Strategic Employment Sites and Business Parks (referred to subsequently as SES Case Study) between late 2013 and early 2016. The purpose of this evaluation was to fill an evidence-gap on the impact of sustainable transport measures on travel behaviour and business activity in large, out-of-town employment areas which have typically relied on access by car. It was important to understand how interventions aimed at promoting sustainable transport can help tackle transport challenges and support economic growth in such areas. The findings from the full SES Case Study are provided in a Summary Report¹.

Hertfordshire County Council led a research team from: the University of Hertfordshire; the University of the West of England, Bristol (UWE); the West of England local authorities; and Atkins, to evaluate the impact of travel behavioural change measures delivered through the LSTF programme at five strategic employment site and business park locations in England which had varying characteristics with regard to business sector composition, transport connectivity and proximity to population.

The aims of the SES Case Study were:

1. To establish the impact of a package of sustainable transport measures on modal shift in strategic employment sites, and understand which interventions were most effective in different contexts.
2. To assess the impacts on business performance, including access for existing and potential employees, of implementing sustainable transport measures in strategic employment sites.
3. To review the effectiveness of the process of delivering sustainable transport measures in strategic employment sites.

The employment sites and business parks chosen for the evaluation were:

- Bristol North Fringe, West of England;
- Bristol Ports area, West of England;
- Maylands Business Park, Hertfordshire;
- Western Trading Estates, Slough;
- Hatfield Business Park, Hertfordshire (comparator site, not in receipt of LSTF).

The sites were chosen because each (with the exception of Hatfield) was a focal point for LSTF business engagement interventions in the Hertfordshire, Slough and West of England LSTF programmes,

¹ Chatterjee, K., Bartle, C., Smyth, A. and Kelleher, L. (2017). Local Sustainable Transport Fund Case Study Evaluation: Strategic Employment Sites and Business Parks. Summary Report.

and because each was located on the periphery of an urban centre. They represented a mix of different transport challenges, employment types, and local economic conditions.

This report presents the evaluation of LSTF impacts in the two sites located in the West of England: the North Fringe and Ports areas of Bristol. The research was led by the Centre for Transport & Society at the University of the West of England, in partnership with Bristol City Council, South Gloucestershire Council, and two local business networks: North Bristol SusCom and SevernNet. A summary version of this report is also available².

The report starts by introducing the sites in the West of England and providing context about them and trends occurring during the period of the evaluation. It then explains how the research aims and questions of the SES Case Study project applied to the West of England and the evaluation approach that was taken. In chapter 4, the research methods used to obtain relevant data to answer the research questions are described. Findings are reported in chapters 5, 6 and 7 before conclusions are made in chapter 8.

² Bartle, C. and Chatterjee, K. (2017). Local Sustainable Transport Fund Case Study Evaluation : Strategic Employment Sites and Business Parks. West of England Summary Report.

2 The SES Case Study sites in the West of England

2.1 The West of England LSTF programme

The Local Sustainable Transport Fund was launched in January 2011 with the four West of England local authorities (Bath and North East Somerset, Bristol City, North Somerset and South Gloucestershire Councils) being awarded nearly £30 million by the Department for Transport from the fund for two separate but integrated project programmes: the ‘Key Commuter Routes’ programme, implemented in 2011/12 and 2012/13; and the West of England Sustainable Travel (WEST) ‘Large Project’ programme, implemented from 2012/13 to 2014/15. Subsequent funding of £4 million was awarded for an extension year, concluding in March 2016.

This report is concerned with the evaluation of impacts from the WEST programme and its extension in two strategic employment sites in the West of England: the North Fringe and Ports areas of Bristol. The collection of new data for the specific purpose of the SES Case Study commenced in 2014, hence the evaluation primarily covers the period March 2014 to March 2016, although where possible it seeks to assess what impacts occurred since the start of the WEST programme in April 2012.

The WEST programme had a main emphasis on influencing travel made at peak times of day with nine projects under the following three themes:

- Stimulating Growth in Priority Areas (‘tackling congestion to get business and our economy moving’ with aims to reduce peak-hour congestion, make it easier for employees to gain access to work and reduce carbon emissions):
 - Area Travel Plans
 - Key Commuter Routes (continuing work started with Key Commuter Routes LSTF project programme)
 - Business travel
- Connected and Thriving Centres (‘completing end-to-end journeys’ with aims to support the local economy, improve access to employment, training and education, encourage walking and cycling for local journeys and ensure that our town and city centres can continue to prosper):
 - Local economic activity in urban areas
 - Sustainable travel in key centres

³ All dates in this section refer to financial years.

- Transitions to a Low-Carbon Lifestyle ('Training, skills and securing long term benefits' which recognises that our interventions to change travel behaviour are more likely to be effective if they occur at times of change in people's lives, and focuses effort on influencing travel choice at these life transitions to taking advantage of life transitions as opportunities for behavioural change):
 - The move to secondary school
 - Access to work and skills
 - Universities
 - New developments

The WEST programme was delivered via dedicated LSTF teams in five delivery areas working with the four unitary authorities:

- Business engagement
- Marketing and communications
- Public transport
- Support services
- Transitions

The business engagement team delivered interventions and engaged with employers and employees in the four local authorities, involving a series of LSTF measures delivered between August 2012 and March 2016. It is the work of the business engagement team in the North Fringe and Ports areas of Bristol that is a core focus of this report. Expenditure on the WEST business engagement programme between 2014/15 and 2015/16 totalled over £2.2 million.

Implementation of the WEST business engagement programme was led by designated local authority officers. Employers in the Bristol North Fringe area were engaged by the South Gloucestershire Business Engagement Account Manager (BEAM). The Bristol Ports area had a dedicated, full-time BEAM until July 2014, after which the businesses in the area received support from engagement officers from the three unitary authorities which the area spanned. As LSTF funding in the West of England continued until March 2016, BEAMs were in post throughout the full period of the evaluation. Two local business networks also were active in engaging with employers on sustainable transport issues: North Bristol SusCom (North Fringe) and SevernNet (Ports area). Each network was run by a part-time coordinator, both of whom had built up effective working relationships with local businesses prior to 2014.

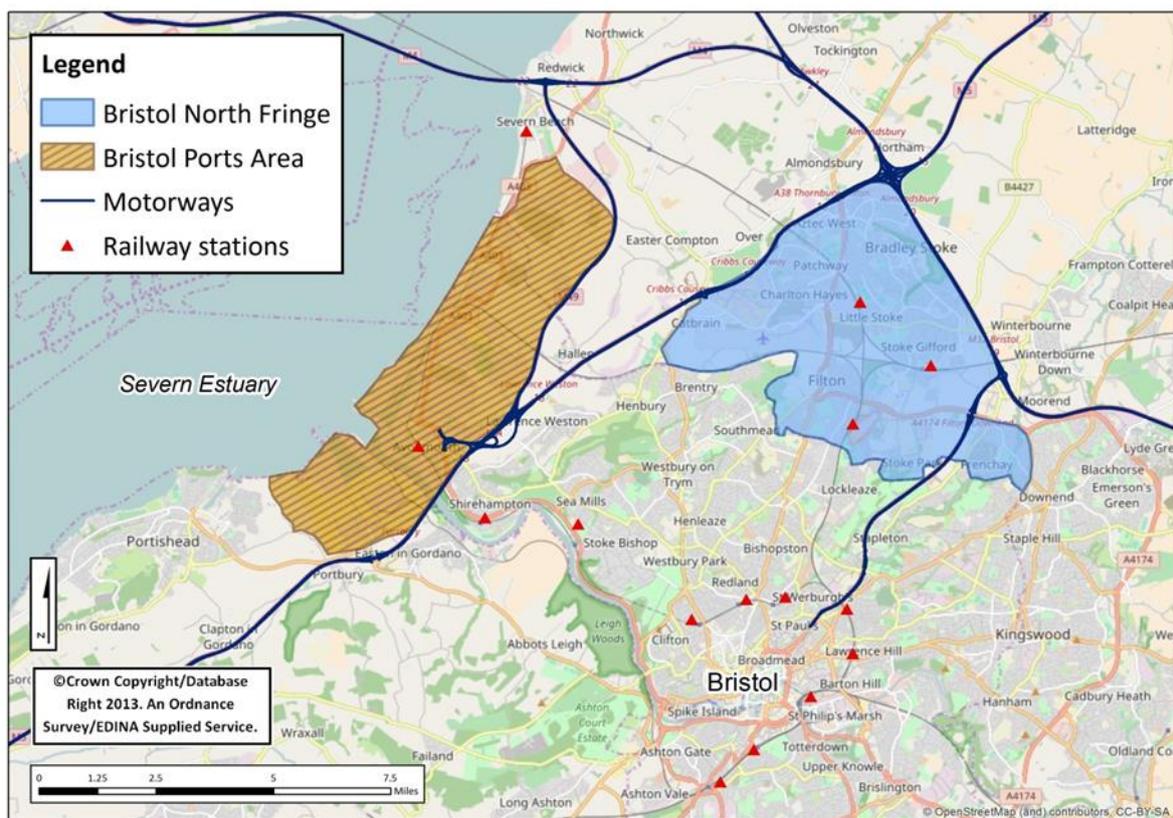
The value for money assessment in the WEST funding submission to DfT estimated a net present value of £381.8m and benefit-cost ratio of 6.21 for the programme. The impact of WEST measures was forecasted for 2016 by using available evidence from previous studies on the reduction in vehicle trips/mileage from walk and cycle measures, information/engagement measures, public

transport measures and car club measures⁴. No specific estimate was made of modal shift for commuting but an annual reduction in car trips of 0.85% was predicted across the Greater Bristol area, associated with a reduction in vehicle kilometres of 2% and travel time of 3% in peak periods.

2.2 The North Fringe and Ports areas of Bristol

The WEST programme included the objective of developing Area Travel Plans in three locations in the West of England. Two of these were selected for detailed evaluation as part of the SES Case Study: the *North Fringe Area Travel Plan* area and the *Portside Area Travel Plan* area, located to the north and west of Bristol respectively (see Figure 2-1).

Figure 2-1: Location of Bristol North Fringe and Ports strategic employment areas



Over 80,000 people work in the Bristol North Fringe, with additional transport demand created by 30,000 students. It has a preponderance of large companies in the engineering, aerospace, ICT and financial services sector, as well as a science park and business park housing smaller hi-tech companies, a university, a large hospital and a large government agency.

⁴ Halcrow (2011). West of England Sustainable Travel (WEST) Forecasting Report. Swindon: Halcrow Group Limited.

Figure 2-2: Peak period commuting in Bristol North Fringe



Around 30,000 people are employed in the Bristol Ports area. It is characterised by storage and distribution centres for retail operations, chemical and other manufacturers, and hundreds of businesses of various sizes, many connected with shipping, logistics, energy and waste.

Figure 2-3: Aerial view of Avonmouth and Severnside in Ports area



The North Fringe is located 5-7 miles to the north of the centre of Bristol and is subject to greater road congestion and pressure on parking than the Ports area. The Ports area stretches five miles alongside the Severn Estuary, south of the Second Severn Crossing. The area between central/west Bristol and the Ports is semi-rural. Both areas are well connected to the M4 and M5 motorways, but the North Fringe is better served than Ports area by public transport, cycling and walking routes. The two areas therefore present very different transport challenges, which makes comparisons between the two illuminating.

The SES Case Study research was undertaken with assistance from two local business networks: North Bristol SusCom (North Fringe) and SevernNet (the Ports area). SusCom⁵ is a group of employers located in North Bristol which promotes sustainable commuting for employees and students in the area. Its members range from SMEs to some of Bristol's largest international companies. It aims to influence and improve local transport provision to combat traffic congestion and reduce impact on the environment. SevernNet⁶ is a not-for-profit enterprise, run by, and working for the benefit of, the businesses, organisations and the local community in Portbury, Avonmouth and Severnside. One of its key aims is to improve transport facilities across the area.

2.3 LSTF measures in North Fringe and Ports areas

Expenditure on the business engagement programme between 2014/15 and 2015/16 totalled over £2.2 million across the four local authorities taking part in the WEST LSTF programme with approximately 35% of this total spent on business engagement in the two strategic employment sites selected for the SES Case Study (5% in the Bristol Ports area and 30% in the Bristol North Fringe). Services offered to employers through the business engagement programme included:

- Employer grants (50% funding for, e.g. on-site cycle facilities)
- TravelWest 'Roadshows' (travel advisors, known as the Sustainable Travel Team, visiting employer sites to offer information and advice to employees)
- 'Dr Bike' (cycle mechanics visiting employer sites to carry out free repairs)
- Cycle repair kits for use by employees
- Cycle loans for employees
- Electric pool vehicles
- Electric vehicle recharging points (ECVPs) on employer sites
- Sustainable travel awards for employers
- Lift-share partnering services

As well as LSTF-funded business engagement, employers in the two areas benefitted to varying degrees from improvements to cycling and walking infrastructure and bus services in the surrounding areas, as well as improvements to travel information and awareness-raising activities. Improvements to cycling infrastructure and bus services are shown in Figure 2-4.

⁵ See <http://www.northbristolsuscom.org/index.php>

⁶ See <http://severnnet.org/>

Figure 2-4: Cycling infrastructure and bus service improvements in North Fringe and Ports areas

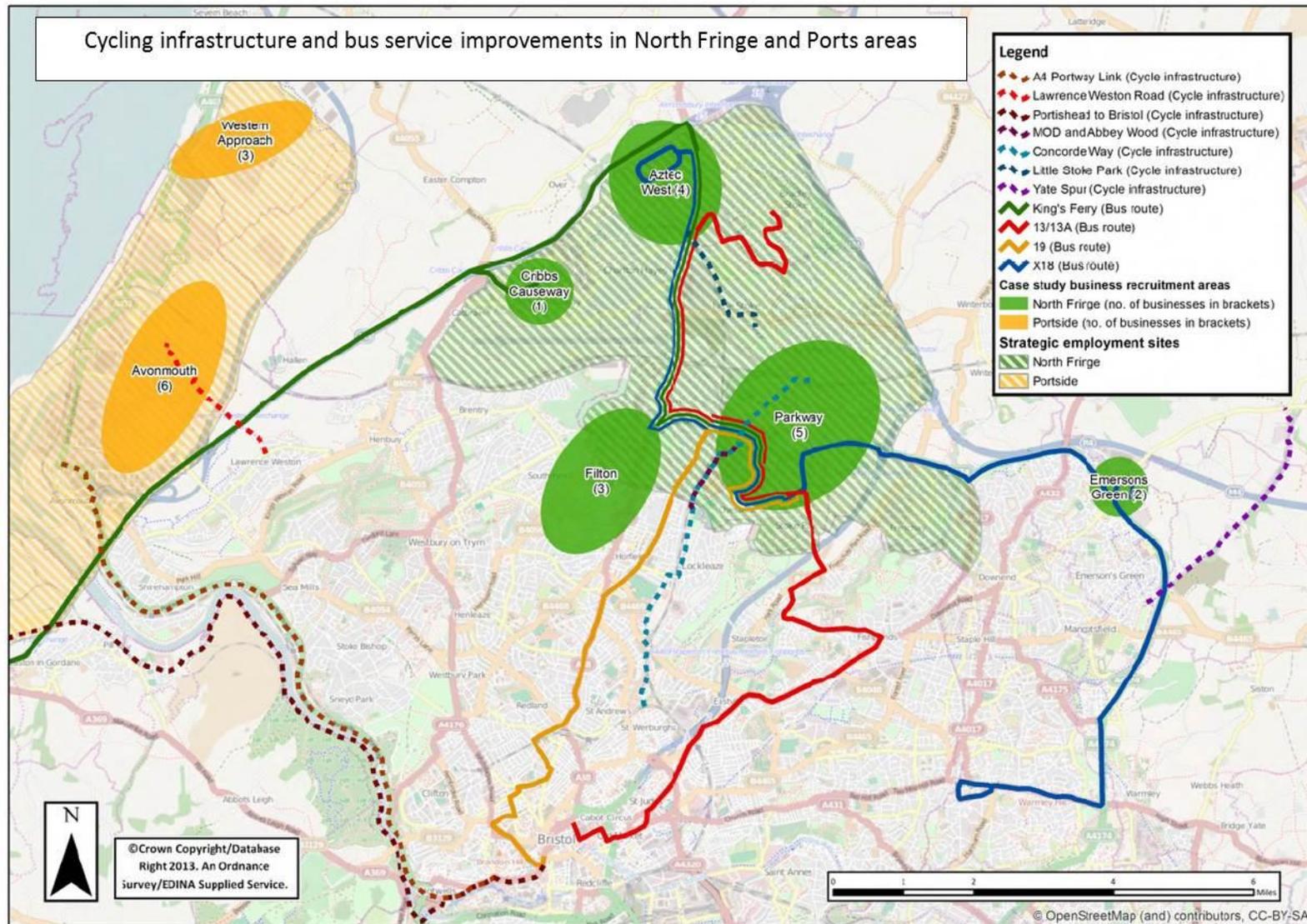


Table 2-1 and Table 2-2 show the types of measures funded by the WEST LSTF programme and related funding sources in the North Fringe and Ports areas, and provides examples of specific measures in each of seven sub-areas (Emersons Green, Stoke Gifford/Parkway, Filton, Aztec West and Cribbs Causeway in the North Fringe and Avonmouth and Western Approach in the Ports area). The anonymised names of the employers which took part in the SES Case Study in each sub-area are listed under the relevant heading within the tables.

Table 2-3 and Table 2-4 list specific LSTF measures which individual employers benefitted from directly (e.g. employer grants), as well as indicating measures initiated and funded by employers themselves.

2.4 Non-LSTF measures and other contextual factors in the North Fringe and Ports areas

Table 2-1 and Table 2-2 also show a number of contextual factors contributed to the transport environment in the North Fringe and Ports areas between 2014 and 2016, which are likely to have influenced the outcomes of LSTF interventions.

Table 2-1: LSTF measures in North Fringe by sub-area

Employer (anonymised)	LSTF measures in each sub-area 2014-16				Other sustainable transport measures (non-LSTF) 2014-16	Other relevant factors in each sub-area 2014-16
	Cycling & walking infrastructure Improvements	Bus service improvements	Bus infrastructure improvements (bus stops, real time information)	Travel information improvements and promotion		
Emersons Green						
Science Park	✓	✓	✓	✓		- Adjacent new housing. - Roadworks.
Energy Technology Company	e.g. 'Yate Spur'	e.g.X18				
Stoke Gifford (Parkway)						
Financial Services Company	✓	✓	✓	✓	- Bus fare reductions - 2+ lane on A4174 - M32 variable speed restrictions	- Peak time traffic congestion from roadworks and bridge work associated with rail electrification, road junction improvement and Metrobus works.
Construction Services Company	- e.g. lighting improvements on A4174 - Brompton cycle hire at Parkway Rail station	e.g. Kings Ferry Commuter Coach; X13(X74) X18, X19	e.g. bus punctuality improvements on A4174	e.g. TravelWest website and bus checker app, with coverage across the WEST area		
Technology Company 1						
Large Public Sector Employer						
University						
Filton						
Aerospace Manufacturer 1		✓	✓	✓	- Kings Ferry Business Shuttle - Section 106 funds for bus subsidies (NHS)	- Traffic congestion on A38 & Filton roundabout - Housing development.
Business Park		e.g. X18				
NHS Trust						
Aztec West Business Park						
Engineering Consultancy 1		✓	✓	✓	- Various bus services run by employers, either shared or single-employer. - New lift-share service across business park	- Major congestion for vehicles exiting the business park - Major roadworks immediately outside business park, including Metrobus works.
Engineering Consultancy 2		e.g. Kings Ferry Commuter Coach				
Technology Consultancy						
Technology Company 2						
Environmental Compliance						
Cribbs Causeway						
Retail Company			✓	✓		Adjacent new housing.

Table 2-2: LSTF measures in Ports area by sub-area

Employer (anonymised)	LSTF measures in each sub-area 2014-16				Other sustainable transport measures (non-LSTF) 2014-16	Other relevant factors in each sub-area 2014-16
	Cycling & walking infrastructure Improvements	Bus service improvements	Bus infrastructure improvements (bus stops, real time information)	Travel information improvements and promotion		
Sevenside (Western Approach)						
Aerospace Manufacturer 2				✓		- Congestion from roadworks resulting from improvements to A403. - Increased HGV traffic.
Mail Distribution Company						
Power station						
Avonmouth						
Catering Products Company	✓	✓		✓	✓	- Prolonged period of congestion from major roadworks to improve the A403 (St Andrews Rd). - Growing traffic congestion on M5, causing long tailbacks into Avonmouth. - Continued problem with HGV parking around the area, despite increased parking restraints.
Skincare Products Company	- e.g. lighting on Kings Weston Lane (partial);	- Extension of service 41 (3) into the employment area.		- e.g. TravelWest website and bus checker app, with coverage across the WEST LSTF area	- SevernNet Flyer shuttle bus service - Section 106 funding used for cycle parking etc.	
Candle Products Company	- cycle parking at Avonmouth Rail station;					
Bioscience Manufacturer	- new cycle & pedestrian path alongside A403.					
Waste Recycling Company 1						
Waste Recycling Company 2						

Table 2-3: Sustainable transport measures at individual employers in North Fringe

Employer (anonymised)	LSTF measures benefitting each employer 2014-16						Employer-led measures 2014-16				
	'Intensive engagement' by LSTF ⁷	Employer grant/s	TravelWest Roadshows & Dr Bike ⁸	Cycle repair kit	EVCP ⁹	Electric pool vehicles	Buses		Car parking		Improved cycling facilities
							Own buses	Bus subsidies	Parking restraint	More spaces	
Science Park	✓	✓	✓	✓	✓	✓					
Energy Technology Company ¹⁰			✓								✓
Financial Services Company	✓		✓	✓			✓				
Construction Services	✓		✓	✓							
Technology Company 1	✓	✓	✓	✓	✓						
Large Public Sector Employer	✓		✓	✓			✓				✓
University (main campus)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Aerospace Manufacturer 1	✓	✓ ¹¹	✓	✓							✓
Business Park	✓	✓	✓	✓						✓	✓
NHS Trust	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Engineering Consultancy 1	✓	✓	✓	✓			✓				
Engineering Consultancy 2	✓	✓	✓	✓	✓	✓					
Technology Consultancy	✓		✓	✓	✓						
Technology Company 2	✓	✓	✓	✓							
Environmental Compliance	✓	✓	✓	✓	✓						
Retail Company	✓	✓	✓	✓							

⁷ Meeting between LSTF officer and employer, plus the take-up of one or more services (e.g. TravelWest Roadshow), or the awarding of an LSTF employer grant

⁸ Information stands staffed by LSTF travel advisers, offering travel planning and follow-up services; often accompanied by 'Dr Bike' - a free cycle repair service.

⁹ Electric Vehicle Charging Point

¹⁰ Company was dissolved in 2015

¹¹ Awarded 2013

Table 2-4: Sustainable transport measures at individual employers in Ports area

Employer (anonymised)	LSTF measures benefitting each employer 2014-16						Employer-led measures 2014-16				
	'Intensive engagement' by LSTF	Employer grant/s	Travel Road-shows & Dr Bike	Cycle repair kit	EVCP	Electric pool vehicles	Buses		Car parking		Improved cycling facilities
							Own buses	Bus subsidies	Parking restraint	More spaces	
Aerospace Manufacturer 2	✓	✓ ¹³		?						✓	
Mail Distribution Company											
Power station				✓							
Catering Products Company	✓		✓	✓			✓			✓	✓
Skincare Products Company											
Candle Products Company											
Bioscience Manufacturer										✓	✓
Waste Recycling Company 1				✓							
Waste Recycling Company 2											

Note: Some businesses in the Ports area received no direct employer-based LSTF support in the evaluation period, but did benefit from the area-wide LSTF measures (as shown in Table 2-2). Their inclusion in the study was consistent with the research design, which was to recruit a range of employers with differing characteristics. One of these was level of engagement with the LSTF.

¹³ Awarded 2013

2.5 Background trends

It is important to consider background trends when assessing changes to travel behaviour in the Case Study areas during the period of the study and interpreting the impact of the LSTF programme.

Road traffic statistics from the Department for Transport (published May 2016)¹⁴ show that annual car vehicle traffic in South Gloucestershire rose from 2,955,000 km in 2013 to 3,133,000 in 2015 (a 6% increase between 2013 and 2015). Increases in Bristol over this period were 2% and in the south west of England (and England overall) were 3%. This period also saw reductions in petrol prices. The average annual retail price of premium unleaded petrol dropped from 134.2p per litre in 2013 to 127.5p per litre in 2014 and 111.1p per litre in 2015 (a 17% decrease between 2013 and 2015)¹⁵.

According to the Labour Force Survey, the trend between 2013 and 2015 for car total mode share for commuting in England was a reduction of 0.4% points¹⁶. This suggests there was negligible change in car driver mode share or car total mode share across England during the period of interest. However, the trend for the South West region (in which the Bristol employment areas are located) was an increase in car total mode share for commuting of 1.4% points. This indicates that the WEST LSTF interventions were introduced in the context of a small modal shift in commuting towards car travel.

¹⁴ DfT (2016). Road Traffic Statistics. Available from www.gov.uk/government/organisations/department-for-transport/series/road-traffic-statistics (last accessed 14 November 2016).

¹⁵ National Statistics (2016). Quarterly Energy Prices: September 2016. Available from <https://www.gov.uk/government/statistics/quarterly-energy-prices-september-2016> (last accessed 14 November 2016).

¹⁶ DfT (2016). Transport Statistics Great Britain. TSGB0109. Available from <https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons#table-tsgb0109> (last accessed 14 November 2016). Figures derived from Labour Force Survey 'usual method of travel to work' collected annually in October-December. Separate figures not available for car alone and car share.

3 Evaluation Approach

3.1 Overview

This section summarises the LSTF intervention logic across all the SES Case Study sites in the West of England, Hertfordshire and Slough. It shows how the research aims and questions were devised to evaluate the outcomes and impacts of LSTF interventions in the strategic employment sites and business parks. The evaluation approach and research methods are then described, showing how the different research methods were used to answer individual research questions and how they linked to one another.

3.2 LSTF intervention logic

Intervention logic is a method of systematically linking the main components of an intervention to produce a causal pathway across the:

- Context: the framework within which an intervention is delivered;
- Inputs: what is being invested in terms of resources and activities;
- Outputs: what has been produced, e.g. target groups reached, infrastructure built, products developed;
- Outcomes: short and medium-term results, such as changes in modal share; and
- Impacts: long-term results such as better quality of life, improved health, environmental benefits etc.¹⁷.

Figure 3-1 is an intervention logic map for LSTF interventions in the four strategic employment sites receiving LSTF funding in the full study (West of England, Hertfordshire and Slough). The logic map shows common features across all the sites, but differences between the sites are also shown where appropriate. Although they form two separate sites, the Bristol North Fringe and Ports areas are combined under the 'West of England' heading in the logic map because they fall within the same sub-regional LSTF programme.

The first column shows the context of the LSTF interventions. Essentially these are the 'problems' which create the reasoning behind the development and intended outcomes of the measures as outlined in the rest of the logic map. The longer-term impact of the interventions should include the addressing of problems identified in the context column. Inputs comprise: the staff delivering the interventions, in particular the Local Authority-employed Business Engagement Managers; as well as the capital and revenue funding required to implement the measures. Outputs comprise a number of activities supporting sustainable transport which are common to all four sites, as well as some which are site-specific.

¹⁷ Hills, D. and Junge, K. (2010). Guidance for Transport Impact Evaluations: Choosing an Evaluation Approach to Achieve Better Attribution. London: The Tavistock Institute. Available from <https://www.gov.uk/government/publications/transport-impact-evaluations-choosing-an-evaluation-approach-to-achieve-better-attribution> (13 June 2017)

The Outcomes column shows the anticipated short- and medium-term measurable results, whilst Impact shows the longer term, broader effects which are sought through the interventions. Very broadly, the anticipated longer-term impacts start with the meeting of overall LSTF objectives, namely: reducing CO₂ emissions and supporting economic growth. Mitigation of the problems identified in the Context column follows in the form of: economic benefits to business; improvements to wellbeing among commuters, and changes to attitudes and norms, such that the car ceases to be perceived as the 'normal' mode of travel to work.

In the next section we set out the aims of the SES Case Study and the research questions, showing how these are intended to elucidate the relationship between inputs/outputs and outcomes/impacts, and to identify attribution where applicable.

Figure 3-1: Programme logic map of LSTF interventions in strategic employment sites and business parks

Context	Inputs	Outputs	Outcomes	Impacts
<p>LSTF objectives</p> <ul style="list-style-type: none"> • Reduce CO₂ • Support economy growth <p>Transport impacts on business performance Car-dominated commuting leading to congestion which negatively affects:</p> <ul style="list-style-type: none"> • Business travel • Freight operations <p>Poor access to SES and BPs by non-car modes affects:</p> <ul style="list-style-type: none"> • Recruitment • Retention • Absenteeism • Employee satisfaction <p>Car parking and planning:</p> <ul style="list-style-type: none"> • Employers increasingly face car parking restraint due to planning rules and insufficient space on site <p>Commuting and wellbeing Driving in congested conditions contributing to:</p> <ul style="list-style-type: none"> • Lost personal time • Increased travel costs • Stressful commutes • Sedentary lifestyles <p>Attitudes and norms Car seen as 'normal' commute mode</p>	<p>Appropriate levels of staff, skills and funding to deliver outputs, e.g.</p> <ul style="list-style-type: none"> • Business Engagement Managers, business network coordinators) • Funding for: <ul style="list-style-type: none"> - Bus subsidies - Cycle/walking infrastructure improvements - Car-share matching services - PTP/promotion - Employer grants <p>etc.</p>	<p>All Case Study areas:</p> <ul style="list-style-type: none"> • Area/employer travel plans • New bus/coach services • Improvement of cycling and walking infrastructure • Business network engagement • Travel promotion, marketing and communication <p>West of England:</p> <ul style="list-style-type: none"> • Employer grants for onsite measures • Support for car-share services • Provision of loan bicycles • Delivery of electric charging infrastructure and low emission vehicles for business travel <p>Hertfordshire:</p> <ul style="list-style-type: none"> • Travel Plan Co-ordinator for Business Park • Dedicated lift share website • Improvements in quality and ticketing for commercial bus services • Cycle hire scheme, cycle hub and employer cycle parking grants • Intensive workplace behaviour change programme <p>Slough:</p> <ul style="list-style-type: none"> • Cycle Hire Scheme • Intelligent Traffic Management System • Wayfinding improvements 	<p>Measurable Outcomes</p> <ul style="list-style-type: none"> • Employer and employee engagement in LSTF interventions (e.g. employer engagement in business networks) • Improved access to SESs and BPs for potential employees • More positive perceptions of alternatives to car driving alone • Higher proportion of workforce commuting by public transport, car share, cycling or walking 	<p>LSTF objectives</p> <ul style="list-style-type: none"> • Reduced CO₂ • Employment growth <p>Traffic conditions</p> <ul style="list-style-type: none"> • Reduced congestion • Increased journey time reliability <p>Transport impacts on business performance Reduction in travel costs:</p> <ul style="list-style-type: none"> • Reduction in car parking provision • Less costly business travel and freight operations <p>Increases in productivity:</p> <ul style="list-style-type: none"> • Reduced recruitment costs • Staff productivity <p>Business confidence:</p> <ul style="list-style-type: none"> • More positive perceptions of transport conditions • Jobs expansion <p>Commuting and wellbeing Improved travel conditions:</p> <ul style="list-style-type: none"> • Reduced travel costs and time spent commuting • Increased satisfaction with journey to work • Increased health and wellbeing <p>Attitudes and norms Alternatives to car seen as 'normal' commute modes</p>

3.3 Research aims and questions

Research Aim 1 – Modal Shift

To establish the impact of a package of sustainable transport measures on modal shift in strategic employment sites and understand which interventions are most effective in different contexts.

Research Questions

- 1a *What changes in modal share are found to occur in the strategic employment sites and how does this vary depending on the amount of exposure to LSTF interventions?*
- 1b *What LSTF interventions have the greatest impacts on car driver mode share and how is this affected by context (e.g. characteristics of location, employer, and employees)?*
- 1c *What changes in perceptions and attitudes towards low carbon travel alternatives are found to occur for employees working for businesses in strategic employment sites and how is this affected by exposure to LSTF interventions?*

Research Aim 2 – Economic Impacts

To assess the impacts on business performance, including access for existing and potential employees, of implementing sustainable transport measures in strategic employment sites.

Research Questions

- 2a *What are the impacts on business performance (objectively and subjectively measured) of the LSTF programme in terms of: (i) Operational transport issues; (ii) Commuting and staffing issues; and (iii) Productivity?*
- 2b *How do the impacts on business performance vary by type of business, location and site characteristics and exposure to LSTF interventions?*

Research Aim 3 – Delivery and Process

To review the effectiveness of the process of delivering sustainable transport measures in strategic employment sites

Research Questions

- 3a *What level of engagement was achieved with employers and employees and what factors led to increased engagement?*
- 3b *What measures have been delivered successfully and why, and what measures have been less successful and why?*

3.4 Relationship between the research questions and intervention logic

It is explained below how the research questions will help to test the intervention logic.

Research Aim 1 – Modal Shift

Measurement and qualitative exploration of changes in mode share (RQ1a) and attitudes (RQ1c), and their association with both LSTF interventions and contextual factors (RQ1b), are required to understand the relationship between Inputs/Outputs and Outcomes/Impacts in terms of modal shift and change in attitudes among commuters. Findings on modal shift are reported in chapter 5.

Research Aim 2 – Economic Impacts

Better understanding of the impacts of sustainable transport measures on business performance of employers (RQ2a) are required to identify links between Inputs/Outputs and Impacts with regard to economic impacts. Understanding of the variation in impacts on different employers will provide further explanation of these links (RQ2b). Findings on economic impacts are reported in chapter 6.

Research Aim 3 – Delivery and Process

The process evaluation questions (RQs 3a and 3b) are required to provide understanding of the relationship between Inputs and Outputs/Outcomes. Findings on delivery and process are reported in chapter 7.

3.5 Evaluation approach

The evaluation can be seen, at its simplest, as an outcomes study where the situation prior to the intervention is compared to the situation after the intervention. For the purpose of the SES Case Study evaluation, outcomes were assessed in terms of modal shift and business performance. Separate outcomes studies were conducted in each of the four intervention sites. A comparator site (Hatfield Business Park) was also included in the full research evaluation, enabling quasi-experimental research analysis/comparisons to be made across the four sites experiencing LSTF interventions and the one not experiencing LSTF interventions. However, caution needs to be applied in drawing conclusions from such analysis as contextual factors and intervention implementation vary significantly between sites. The evaluation therefore has many features of a theory of change evaluation approach which systematically studies the links between activities, outcomes, and context of an intervention, to provide some answers as to why change was produced.

It was therefore determined that an extended intervention logic evaluation approach was most appropriate for the SES Case Study. The approach involves bringing in elements of a theory-based approach into a study of outcomes so that the evaluation can answer questions about why change was produced (as well as what change occurred)¹⁸. Both quantitative and qualitative research methods were used.

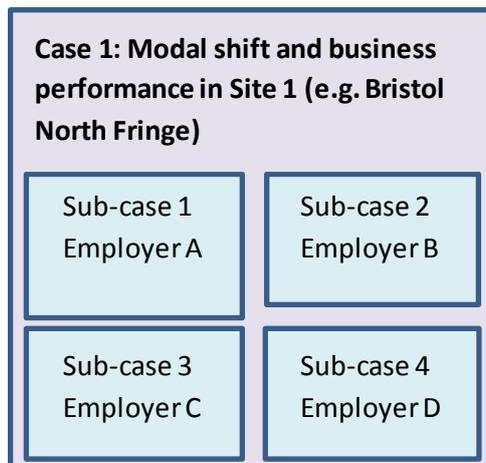
¹⁸ Hills, D. and Junge, K. (2010). Guidance for Transport Impact Evaluations: Choosing an Evaluation Approach to Achieve Better Attribution. London: The Tavistock Institute. Available from <https://www.gov.uk/government/publications/transport-impact-evaluations-choosing-an-evaluation-approach-to-achieve-better-attribution> (13 June 2017)

3.5.1 Ability to generalise from the findings

Given the heterogeneity of the SES Case Study sites, it is important to understand how findings might be generalised beyond the four intervention sites. To do so, it is helpful to view the evaluation as a case study in a methodological sense. The case study research approach has been described as: “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (Robson, 2000, p.178)¹⁹.

A case study aims for theoretical generalisation (also referred to as analytic generalisation): this is where a particular set of results are generalised to broader theory²⁰. Methodologically, theoretical generalisation is possible if the cases act as exemplars with which to compare other similar cases as they arise. This evaluation constitutes a multiple, embedded case study design, in which ‘modal shift and business performance’ in each of the intervention sites and Hatfield is considered to be a single case, within which sub-cases are embedded. The ‘case’ (e.g. modal shift and business performance in the Bristol North Fringe) represents the main unit of analysis from which theoretical generalisations might be made to modal shift and business performance at other locations with similar characteristics and under similar conditions. The sub-units of analysis embedded within each case are ‘modal shift and business performance’ within employers at each of the sites. Figure 3-2 illustrates this diagrammatically, using the Bristol North Fringe as an example of each of the five sites (cases).

Figure 3-2: Embedded case study design



In the West of England, statistical generalisation could be used within each sub-case (i.e. employer), using the employee staff survey data obtained for each employer, assuming a large enough response. However, sub-cases could not be generalised to the whole case (i.e. North Fringe or Ports area), as the sample of employers was not intended to be fully representative of all employers in the area. Instead, theoretical generalisation was used within the case and beyond the case (to other locations).

¹⁹ Robson, C. (2002). *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Second Edition. Oxford: Blackwell.

²⁰ Yin, R.K. (2009) *Case Study Research: Design and methods*. Fourth Edition. Thousand Oaks, CA: Sage.

4 Research Methods

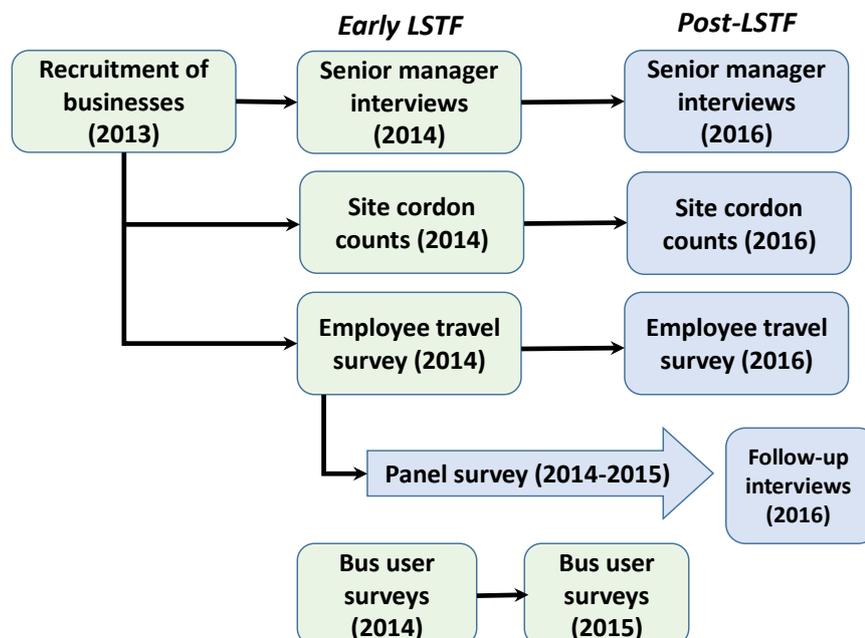
4.1 Overview

Both qualitative and quantitative research methods were used to obtain data from 25 employer organisations across the North Fringe and Ports areas in order to evaluate the impact of LSTF measures on commuting behaviour and business performance between 2014 and 2016. Twenty of the employers took part in both the baseline and follow-up research, whilst five were able to contribute at only one of the time points. The following data collection methods were used:

- Senior manager interviews (early 2014 and 2016)
- Site cordon counts (March 2014 and 2016)
- Employee travel to work surveys (March 2014 and 2016)
- Panel survey (6 waves, July 2014 to October 2015) and follow-up interviews (April 2016)
- Bus user surveys (early 2014 and 2015)

The different methods and the relationship between them are shown in Figure 4-1.

Figure 4-1: Overview of data collection methods



4.2 Sample selection and recruitment

4.2.1 Recruitment of employers in 2014

The West of England research partners set out to recruit 10 to 15 employers in each of the two sites (North Fringe and Ports areas) to participate in the SES Case Study research. Each employer was requested to take part in all the data collection activities in both 2014 and 2016. The aim was to select employers according to a number of criteria: size, industry sector, level of engagement with LSTF, and location within the North Fringe or Ports area. This was intended to provide a range of employers (as sub-cases) which vary on these dimensions, which would enable identification and understanding of the factors which contribute to different outcomes. Full details of the sampling strategy and recruitment process are included in Appendix 2. Table 4-1 and Table 4-2 provide an overview of each employer recruited to the SES Case Study. Table 2-1 to Table 2-4 summarise the LSTF measures to which they were exposed, by sub-area and as individual employers.

In the North Fringe area, 15 employers were recruited in 2013. Of these, eight were in manufacturing, telecommunications and IT. The manufacturing participants included a major aerospace company. Two of the participants among this eight were science/business parks, each representing a large number of small companies (mainly aerospace and hi-tech). Two businesses provided engineering consultancy and support services. Additionally, there was one employer in each of the following sectors: construction; financial services; and retail. Finally, there were three large public sector employers, representing a substantial share of the total employment in the area (two of these employers had over 9000 employees). In the Ports area, the target minimum of 10 businesses was recruited, although one of these businesses withdrew in early March 2014 due to restructuring within the company. Four of the recruited participants were distribution businesses specialising in packaging and distribution of, respectively: catering equipment; skincare products; candles; and mail. Two were manufacturing companies: one in aerospace, the other in bioscience products. There was also a power station, and two waste and recycling companies.

4.2.2 Re-engagement of employers in 2016

All the participating employers were re-approached in 2015 for the follow-up data collection, with the exception of two North Fringe businesses: the Energy Technology Company, which was no longer in business, and Technology Company 2, which had just suffered heavy redundancies. It was decided not to replace the former as it had been located within the Science Park, which was still taking part in the study as a collective participant. However, it was decided to replace the latter with another business located at Aztec West – the Environmental Compliance Company - in order to maintain a range of employer types in this sub-area, but without making a direct comparison between the findings from the original employer and replacement employer (although the responses from employees in all the businesses were included in the analysis of the employee travel survey data). All other original participants in the North Fringe agreed to participate in the follow-up study. In the Ports area, all participants were successfully re-engaged, with the exception of the Candle Products Company and the Mail Distribution Company. Overall, 21 West of England employers took part in the follow-up, compared with 24 in the baseline.

Table 4-1: Overview of employers in North Fringe

Employer name (anonymised)	Sector	Number of employees on site		Number of car parking spaces				Proportion of spaces typically utilised	Number of cycle parking spaces		Travel Plan	Site relocation	
				Total		Dedicated to car-sharers							
		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N ²¹	Y/N
Emerson's Green													
Science Park	Range of high-tech sectors	200	366 ²²	200	240	0	0 ²³	100%	100%	50	50	Y	N
Energy Technology Company	Energy/Utilities	70	DNP	38	DNP	0	DNP	100%	DNP	unknown ²⁴	DNP	Y	n/a
Stoke Gifford (Parkway)		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	Y/N
Financial Services Company	Accountancy/Financial Services	3000	2374	1800	1776	30	0	96%	high	120	200	N	N
Construction Services Company	Construction/Engineering/Materials	300	300 ²⁵	200	200	0	0	60-70%	50-60%	5	5	N	N
Technology Company 1	IT/Communications/Electronic Components	800	750 ²⁶	442	442	36	18	60-70%	65%	160	160	N	N
Large Public Sector Employer	MoD/Emergencies/Government	10000	9846	3595	3595	523	523	100%	100%	727	767	Y	N
University (main campus)	Education	2800	2800	1500	1200 ²⁷	150	150	40%-90%	90%	450	700	Y	N

²¹ Some employers without a Travel Plan were working with other local employers, SusCom and the local authorities to produce sub-area Travel Plans.

²² Plus 300 at the National Composites Centre.

²³ Plus 3 dedicated to electric pool cars in 2014 and 1 in 2016.

²⁴ Shared cycle parking within Science Park.

²⁵ Daily occupation on site approx. 80.

²⁶ Daily occupation on site 400-500.

²⁷ Dedicated staff parking spaces, although staff can also use additional general parking areas.

Employer name (anonymised) (continued)	Sector	Number of employees on site		Number of car parking spaces				Proportion of spaces typically utilised		Number of cycle parking spaces		Travel Plan	Site relocation
				Total		Dedicated to car-sharers							
Filton		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	Y/N
Aerospace Manufacturer 1	Manufacturing	4000	3018	2500	2548	200+	137	90%	92%	750	957	Y	N
Business Park	MoD/Emergencies/ Government	1200 ²⁸	1145	1200	1700	0	150	70%	70%	150	200	N	N
NHS Trust	Healthcare/NHS	9500	9000	2700 ²⁹	711 ³⁰	unknown	0	unknown	Up to 100%	unknown	631	Y	Y
Aztec West Business Park		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	Y/N
Engineering Consultancy 1	Construction/Engineering	1050	1050	286	286	66	66	100%	100%	126	126	Y	N
Engineering Consultancy 2	MoD/Emergencies/ Government	400	400	226	226	212	212	80%	80%	40	40	N	N
Technology Consultancy	Business Services IT/Communications	200	49	unknown	81	unknown	6	unknown	50%	unknown	12	Y	N
Technology Company 2	IT/Communications/Electronic Components	205	DNP	122	DNP	10	DNP	98%	DNP	50	DNP	N	N
Environmental Compliance Company	Environmental	DNP	41	DNP	>100	DNP	0	100%	DNP	10	DNP	N	N
Cribbs Causeway		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	Y/N
Retail Company	Retail	1000	800	n/a ³¹	n/a	n/a	n/a	n/a	n/a	24	24	N	N

²⁸ Overall employee numbers at the business park are substantially greater than the numbers invited to take part in the employee survey, as only a small number of individual businesses located at the park took part in the surveys.

²⁹ This figure includes visitor parking. Staff-only figure in 2014 unknown.

³⁰ Staff only parking spaces in 2016. Additional 872 visitor spaces in 2016.

³¹ No allocated car parking but adequate parking available within staff parking areas in the retail park (staff may also park in customer parking areas).

Table 4-2: Overview of employers in Ports area

Employer name (anonymised)	Sector	Number of employees on site		Number of car parking spaces				Proportion of spaces typically utilised		Number of bicycle parking spaces		Travel plan	Site relocation
				Total		Dedicated to car-sharers							
Sevenside		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	Y/N
Aerospace Manufacturer 2	Manufacturing	370	470	150	326	0	0	75%	75%	40	40	Y	N
Mail Distribution Company	Distribution/Logistics	200	DNP	unkn own	DNP	unkn own	DNP	unkn own	DNP	unkn own	DNP	N	N
Power Station	Energy/Utilities	55	56	56	50	6	0	70%	70%	12	10	N	N
Avonmouth		2014	2016	2014	2016	2014	2016	2014	2016	2014	2016	Y/N	
Catering Products Company	Distribution/Logistics	800	865	475	492	8	0	100%	100%	45	45	Y	N
Skincare Products Company	Distribution/Logistics	73	87	71	80	0	0	100%	100%	5	5-10	N	N
Candle Products Company	Distribution/Logistics	200	DNP	132	DNP	0	DNP	100%	DNP	16	DNP	N	N
Bioscience Manufacturer	Manufacturing	55	55	30	unkn own	0	unkn own	100%	unkn own	unkn own	unkn own	Y	Y
Waste Recycling Company 1	Materials/Energy/Utilities	65	75	60	70	0	0	75%	70%	4	0	N	N
Waste Recycling Company 2	Materials/Energy/Utilities	38 + 40	69	30	80	0	0	100%	100%	0	8	N	N

4.3 Data collection and analysis methods

4.3.1 Senior manager interviews

In the Bristol North Fringe and Ports area, in-depth, semi-structured interviews were used to explore senior managers' perceptions of transport and the WEST LSTF programme. This contrasted with Hertfordshire and Slough where structured telephone surveys were conducted with a large number of businesses. The aim in the West of England was to conduct an in-depth interview with a senior manager from each of the participating employers. Twenty five interviews were carried out in 2014 by the UWE researcher: one with a manager from each of the 24 participating employers, as well as one with the business which withdrew from the study after the senior manager interview had taken place. Twenty four interviews were carried out face-to-face, and one by telephone. The majority of interviews were between 45 minutes and 1 hour in length. In 2016, the interviews were repeated at each of the 21 employers participating in the follow-up.

Recruitment of interviewees in 2014

In each organisation an interview was sought with a member of the senior management team – preferably an individual whose remit included site and transport issues, but who was not engaged in detailed transport issues on a daily basis. The aim was to obtain a senior level, 'corporate' perspective on the impact of transport on overall business performance, within the context of wider issues affecting overall operational performance.

The process of identifying and approaching a senior manager was initiated by the contact in each employer organisation, following a request from the SusCom or SevernNet Director, one of the LSTF Business Engagement Managers, or the UWE researcher. This was normally undertaken as part of the overall process of recruiting each organisation to the study. Once the contact had secured agreement in principle from the senior manager, more detailed arrangements for the interview were made by the UWE researcher, or by the contact him/herself. In a number of instances, the transport contact also took part in the interview. In some cases, especially in the smaller businesses, the senior manager interviewed was also the contact person.

The professional roles of the managers interviewed in each organisation are identified in Appendix 1.

Recruitment of interviewees in 2016

The recruitment process was repeated in late 2015. The same interviewee was recruited in each employer if he or she was still in the same post, in order to ensure as much continuity as possible. Where the 2014 interviewee had retired or changed jobs, an interview was arranged with the senior manager now carrying out an equivalent role. Thus, the 2016 interviews at eleven of the 2016 employers were with the same person or people as in 2014; at nine employers the interview was with a manager in the same or similar role; and one employer was new to the study.

Design of the West of England employer interviews in 2014

The interview content was principally designed to answer Research Questions 2a and 2b. A topic guide was developed, as shown in Appendix 3. It covered the following broad areas:

- The relative importance of transport compared with other business concerns
- Identification of specific transport issues relevant to the business
- Commuter transport issues
- Awareness and views of LTSF

The topic guide was piloted by interviewing the UWE travel planner, after which a number of refinements were made.

At the beginning of the interview, each interviewee was asked to sign two versions of a consent form – one retained by the interviewee and the other by the researcher. Matters of personal anonymity in the storage of data and reporting were discussed at this stage (some interviewees were happy to be personally identified; others were not). At the end of the interview, each interviewee was asked whether he/she would be happy for the company name to be used in the reporting of the research; in the majority of cases the interviewee did not wish the company to be named.

As the interviews were semi-structured, rather than structured, different areas of interest relevant to individual employers were probed in different interviews and some questions were phrased differently from the topic guide or re-ordered in response to what interviewees had previously said. Maps were used to facilitate discussion about the location and physical transport infrastructure relating to each of the organisations.

At the end of the interview, each person was asked to answer a number of quantitative questions, drawn from the telephone survey used in Hertfordshire and Slough, in order to obtain comparable data (see Appendix 3).

Design of the West of England employer interviews in 2016

The follow-up interviews comprised the same areas of questioning as 2014, but interviewees were also invited to reflect on any changes which might have occurred over the two years. A bespoke topic guide was prepared for each interview by referring to notes of the interviewee's responses in 2014. Thus, if the interviewee responded differently in 2016, this was probed for reasons. When unprompted responses were very similar to 2014, the interviewee was also asked directly whether he or she believed that any changes had occurred. Compared with 2014, more emphasis was placed on probing managers' knowledge and assessment of LTSF measures and other sustainable transport measures. At the end of the interview, as in 2014, each person was asked to answer a number of quantitative questions from the telephone survey used in Hertfordshire and Slough. The template for the individual topic guides is provided in Appendix 4.

Analysis of employer interview data in 2014 and 2016

In 2014 all but one of the interviews were recorded and transcribed, producing approximately 500 pages of transcript (in the remaining case, the interviewees did not wish to be recorded, so the researcher relied on notes). Higher level themes were identified through an initial reading of the transcripts, and a coding hierarchy developed, comprising approximately 100 codes. The transcripts were then coded using NVivo qualitative analysis software and analysed thematically.

In 2016 all interviews were recorded and transcribed. The analysis of the 2016 interview data was less 'grounded' than the baseline analysis, as it was necessary to apply the thematic structure which had arisen from the 2014 analysis, in order to be able identify any change. Following the case study research approach employed in the West of England, each employer was regarded as an individual sub-case. Therefore, the first step in the follow-up analysis was to identify key perceptions articulated by the interviewee representing each employer, and compare them with those expressed by each person or his/her predecessor in 2014. This was formulated into a 'case summary' for each employer, which also contained an outline of any broader changes to the business which might have influenced commuter and business travel behaviour over the two years (e.g. a site relocation, change in employee numbers, or change in parking availability).

The initial case-based analysis was followed by a thematic analysis which involved coding the case summaries within Nvivo, using the same coding structure as 2014, and in the same Nvivo file as the 2014 interview data. This meant that the data could be 'sliced' both horizontally (across all employers in 2014 and all employers in 2016), and vertically by each individual employer in 2014 and 2016. Codes could also be sorted by geographical sub-area, allowing a comparison of the views of all employers located in each sub-area in 2016 with the views of the same employers in 2014.

4.3.2 Employee travel survey

The employee travel surveys for the SES Case Study businesses in the West of England were carried out as part of the annual South Gloucestershire travel-to-work survey which takes place in March each year. South Gloucestershire Council adopted (with a few minor changes) the 'new' employee survey designed by UWE in collaboration with the national Case Study partners to allow direct comparison of West of England results with those from the surveys conducted in Hertfordshire and Slough.

The 2014 survey initially ran from 10 to 16 March, but was kept open a further two weeks because one of the larger employers was only able to take part two weeks later. The 24 SES Case Study employers agreed to run the survey among their employees as part of their commitment to the study over two years. Other South Gloucestershire employers were also encouraged to take part in the survey, as well as a smaller number of businesses in Avonmouth and Portbury located within the Bristol and North Somerset local authority areas.

The 2016 travel to work survey initially ran from 7 to 13 March, but was extended for a further week as a courtesy to (non-SES Case Study) employers who were participating in the travel-to-work survey for the first time. Although still managed by South Gloucestershire Council, the survey was extended this time to employers across the other three local authority areas in the West of England (Bristol;

Bath and North East Somerset; and North Somerset). Twenty one SES Case Study employers participated in the 2016 survey. This comprised the 20 original employers who were also able to take part in the follow-up, plus the Environmental Compliance business which joined the SES Case Study in 2016.

Design of the employee travel survey in 2014

The West of England survey contained a smaller number of questions than the Maylands and Slough surveys, due to feedback from businesses that a higher response would be obtained if the questionnaire did not exceed 20 questions. Moreover, UWE considered that some of the questions contained in the other two surveys would be addressed through other data collection methods in the West of England (i.e. panel survey and interviews).

The final questionnaire is attached as Appendix 5. It differed from the Hertfordshire and Slough questionnaire mainly in its omission of:

- Why did you choose to travel by the mode of transport you chose today/choose normally?
- What would encourage you to commute using(mode)?

Although the West of England survey asked respondents if they used/use more than one mode to travel to work, it asked them to tick all modes that apply – a simpler version of the question used by Hertfordshire and Slough, which asked respondents to indicate the stage of the journey for which each mode was used.

The survey was piloted with members of the Centre for Transport and Society at UWE and final adjustments made in response to feedback.

Design of the employee travel survey in 2016

In order to meet the needs of the evaluation, the 2016 travel to work survey repeated the majority of the 2014 questions to allow direct comparison. However, a number of changes were made in order to gather data on the direct influence of LSTF measures on individual respondents (see Table 4-3). The final questionnaire is provided in Appendix 6.

Table 4-3: Changes made in the 2016 survey

2014 question	2016 question
Are you considering changing how you travel to work in the next 6 months? If applicable, please state which modes you are considering.	Compared to 2 years ago, has the amount that you use each of these forms of transport to travel to work changed? Please tick one box for each form of transport.
If you are considering changing how you travel to work, please tell us why.	Not applicable in 2016
Not applicable in 2014	Please look at the list of local transport initiatives implemented in the West of England area in recent years. Please indicate whether you were aware of these initiatives or have used them.
Not applicable in 2014	Overall, how much difference, if any, have these local travel initiatives made to the way you travel to work over the last two years?

Administration of the employee travel survey in 2014

The following steps were undertaken to assist and direct the SES Case Study businesses in the administration of the survey:

- Guidance note sent to contact (Appendix 7) confirming survey dates (10-16 March 2014), survey aims, cordon count, and administration requirements in order to maximise the number of responses.
- Site information collated to facilitate the organisation of the cordon count and practical issues relating to the administration of the survey. This information was then compiled in a spreadsheet:
 - Number of sites / name of site and postcode for each
 - Number of employees
 - Estimated number of staff without regular computer access
 - Approach to circulating online link to staff
 - Shift times (if applicable)
 - Peak arrival times

- Establishing whether assistance would be required from the West of England team in setting up, running and encouraging participation in the survey at their site during survey week.
- Each contact was sent a survey promotion pack (containing poster, web link to 30 second video, suggested communication text) by email.
- Contacts were sent a preliminary link to the online survey and asked to arrange for IT clearance to ensure that the link would be accessible to all staff by 10 March.
- During survey week, the number of responses per business was monitored regularly and contacts asked to issues reminder emails to staff as required.

After the survey, the contact in each SES Case Study employer completed a short questionnaire indicating how many employees were invited to complete the survey, how it was publicised, and the staff groups to whom they were circulated. The main method of publicising the survey was to send an 'all staff email' with various levels of additional publicity, such as posters, newsletter items and intranet 'pop-up' messages. For some organisations, it was identified that a significant number of staff could not be contacted effectively via email or the intranet, and efforts were made to distribute paper questionnaires to these staff. This occurred in the Retail Company, the Catering Products Company, the Skincare Products Company and the Large Public Sector Employer.

Administration of the employee travel survey in 2016

All employers participating in the 2016 survey received the same communications about the survey, regardless of whether or not they were SES Case Study participants; the same wording was used as in 2014 (Appendix 8). The 2016 administration was a repeat of 2014, with the following refinement: employers were requested to register online, by 22 February, their intention to take part in the survey. As part of their registration, employers were requested to provide details such as location of sites, number of employees, and number of paper questionnaires required. After the survey had closed, as in 2014, the contact in each SES Case Study employer was asked to complete a short questionnaire indicating how many employees were invited to complete the survey, how it was publicised, and the staff groups to whom they were circulated. This revealed only minor differences in the ways most employers administered the survey in 2016 compared with 2014. At the Large Public Sector Employer, however, the 2014 travel survey questions had preceded an internal staff survey about on-site car-parking (a contentious issue at the time), whilst this was not the case in 2016.

Response rates for the employee travel survey in 2014 and 2016

In 2014 the survey achieved 11,609 responses, of which 9,684 were from employees in the 24 SES Case Study organisations. The SES Case Study employers constituted approximately one quarter of those which eventually took part, but their responses accounted for 84% of the total survey response. In 2016, having expanded across the four local authorities, the survey attracted 19,697 responses, of which 5,728 were from the 21 SES Case Study employers. In 2014, 365 (3.8%) of total responses were received via paper questionnaires rather than online, and in 2016, this figure was 218 (also 3.8%).

Table 4-4 shows the approximate number of employees invited to take part in the survey in each SES Case Study organisation, the number of responses, and the corresponding response rates in 2014 and 2016. The response rate fell to some degree in all organisations in 2016, and the total response across all SES Case Study employers fell by 41%. The decrease was particularly marked at the 'Large Public Sector Employer', where there were 1,834 fewer responses than in 2014. This decrease alone accounted for nearly half of the total reduction across all SES Case Study employers.

Analysis of the employee travel survey

The online surveys in both years were administered using Snap software³². Responses provided on paper questionnaires were manually entered into the Snap system. The data were then imported into Excel, and from there into the SPSS data analysis software system. Following cleaning of the data in 2014, a descriptive analysis was undertaken to provide baseline statistics. In 2016, the survey data set was cleaned and merged with the 2014 data to allow analysis of change over time. Various methods of data analysis were used to answer the SES Case Study research questions. These are described in Chapter 5.

Discussion of response rates and composition of the sample

The response rates shown in Table 4-4 are likely to be underestimates as some employees would not have been at work in the week of the survey. Technology Company 1 reported in 2014 that only 500 out of 800 staff were regularly based at their site and the Large Public Sector Employer reported that an average of 6600 staff and contractors were on site during the survey week. The Construction Services Company had only 80 people regularly on site in 2016, from a total of 290 officially based there.

Feedback from the promoters of the survey in each organisation suggested that it had, in most cases, been administered in the same way at both time points, so this issue is unlikely to have been responsible for the reduction in response in most businesses. However, it is likely that the level of the 2014 response at the Large Public Sector Employer had been boosted by the requirement for employees to complete the travel survey before they could access an internal survey.

Regarding composition of the sample, it is very difficult to assess bias in the response sample without having specific information on the composition of the workforce at the participating employers. The reasonable spread of respondents across occupation classification type gives confidence that the response sample is not systematically biased on this criterion across the full sample. However, the response sample in the Ports area businesses employing a high proportion of warehouse staff may have been biased towards office-based workers. This can be inferred from the observation that warehouse staff were more likely to complete the survey in paper form (rather than online), as they did not have regular use of a computer, but the number of paper forms completed was not proportional to the number of warehouse staff. For example, at the Catering Products Company, 75% of the employees in 2014 were warehouse staff, but only 27% of the surveys were completed in paper form. Possible bias in the survey response can also be assessed by

³² Snap Surveys – see <https://www.snapsurveys.com/>

comparing the results of the cordon count to the survey. This comparison is made in Appendices 9 and 10, and discussed in 5.3.1.

Table 4-4: Employee travel survey response rates per employer

Employer	No. of staff in 2014	No. of resp. in 2014	Resp. rate in 2014 (%)	No. of staff in 2016	No. of resp. in 2016	Resp. rate in 2016 (%)
North Fringe						
Aerospace Manufacturer 1	4,000	1,033	26	3,018	520	17
Business Park	177	82	46	1,145	306	26
Engineering Consultancy 1	1,050	465	44	1,050	321	30
Engineering Consultancy 2	400	170	43	400	107	26
Science Park	200	69	35	366	63	17
Technology Consultancy	200	92	46	49	19	33
Financial Services Company	3,000	903	30	2,374	624	26
Technology Company 1	800	254	32	750	203	25
Construction Services Company	300	90	30	300	47	16
Retail Company	1000	145	15	800	92	11
Energy Technology Company	70	48	69	DNP	DNP	DNP
Large Public Sector Employer	10,000	2,644	26	9,846	810	8
NHS Trust	9,500	1,812	19	9,131	1,549	17
Technology Company 2	205	115	56	DNP	DNP	DNP
Environmental Compliance Company	DNP	DNP	DNP	41	28	68
University	2,800	943	34	2,800	624	22
Ports area						
Skincare Products Company	73	56	77	87	29	33
Waste recycling Company 2	78	45	58	69	35	51
Aerospace Manufacturer 2	370	99	27	470	89	19
Catering Products Company	800	356	45	865	340	39
Mail Distribution Company	200	70	35	DNP	DNP	DNP
Power Station	55	31	56	56	27	48
Waste Recycling Company 1	65	16	25	75	7	9
Bioscience Manufacturer	55	39	71	55	16	29
Candle Products Company	180	107	59	DNP	DNP	DNP
Total	35,578	9,684	27%	33,747	5,856	17%

Key: Resp. = response; DNP = did not participate

4.3.3 Site cordon counts

As part of the baseline data collection in the West of England, peak arrival time cordon counts were carried out by the partner local authorities at 18 employer sites, covering 19 of the 24 SES Case Study employers, between 12 March and 2 April 2014. The Energy Technology Company did not receive a separate count as it was located within the Science Park. Five employers did not receive a cordon count in 2014 for the following reasons:

- The University and NHS Trust had large, complex sites with multiple entrances, and it would not have been possible to differentiate between employees and students/visitors/patients.
- The Retail Company did not wish to have a cordon count because every employee enters the building on foot, and it was not considered appropriate that each person be stopped and questioned as they arrived.
- The Business Park had a count conducted but it was not possible to separate those people arriving to work on the business park from those working at an adjacent site.
- One employer (Waste Recycling Company 1) was extremely small (20-40 people on site per day).

The follow-up cordon counts were conducted between 8 and 17 March 2016. Peak-time arrivals by mode were counted at 18 of the 21 employers participating in the SES Case Study. This comprised 15 employers who had participated in the cordon counts in 2014, two which were in the study in 2014 but did not receive a cordon count (Waste Recycling Company 2 and the Business Park) plus the Environmental Compliance Company, which joined the study in 2016. As in 2014, it was not deemed feasible to undertake counts at the University, NHS Trust or Retail Company.

Design of the cordon counts in 2014 and 2016

The process of arranging and conducting the cordon counts was as follows: once businesses had confirmed their interest in receiving a count, members of the local authority LSTF team held conversations with the contact in each one to identify site requirements. Site visits were then made to assess the levels of use of each entrance point and confirm the number of enumerators required. The information was then collated as a brief and sent to the enumerators.

Administration of the cordon counts in 2014 and 2016

In 2014, on the morning of each count, a supervisor from the LSTF team met enumerators on site and held a briefing session prior to the start of the count. In 2016, however, a briefing meeting was held by the local authority LSTF team for all enumerators, at a date prior to the start of the counts. On-site supervision of enumerators during the actual counts was undertaken by a senior enumerator at each employer site, rather than by a member of the LSTF team. Aside from this, the setting up and running of the counts replicated the 2014 process.

In 2014, the counting took place between 07:15 and 09:30. For staff arriving on foot, enumerators asked them the main method of transport they had used for their journey to work (the method of transport used for the longest distance). For cars and vans, enumerators noted the number of occupants. Numbers of arrivals by each mode were totalled for each 15-minute time slot. In 2016, the majority of the counts were held between 07:00 and 10:00, but a small number started at 6:00, 6:30 or 07:30, if this was the time when staff normally began to arrive.

Analysis of the cordon counts

The data collected by the enumerators was compiled within an Excel spreadsheet and summarised into tables comparing the two years, and comparing the mode share results with those collected from the employee survey at each respective employer. Comparisons were all made based on 07:15 – 09:30 counts to ensure consistency.

4.3.4 Bus user surveys

Bus user surveys were conducted in March 2014 and 2015 on LSTF-funded bus and coach services serving the North Fringe employment area in the West of England. The surveys aimed to understand if the new bus services had attracted car commuters and how satisfied users were with the services. Two LSTF-funded services which served the Bristol North Fringe were evaluated in this way as part of the SES Case Study: the X18 commuter bus service and the Kings Ferry Commuter Coach service.

Design of the bus user surveys

The four unitary authorities (UAs) in the West of England each have existing bus user satisfaction surveys which they run periodically on a range of different services, with the aim of monitoring levels of satisfaction on services as a part of the Greater Bristol Bus Network (GBBN). It was decided to use an updated version of the survey forms already in use. By consolidating the design of the survey forms further to ensure comparability across services and UAs, it was possible to collect data which could be analysed at both the sub-regional and individual service levels. The questionnaire can be found in Appendix 11.

Administration of the bus user surveys

It was decided to run on-board surveys, with the aim of achieving high response rates from existing users. The survey followed a dual administration method, utilising both a self-completion and a face-to-face interview approach. All passengers on the surveyed services were approached and asked to participate in the self-completion survey, which was designed to take approximately five minutes to complete. If they preferred, the surveyor asked the questions and completed the form on behalf of the passenger.

The X18 bus user surveys were conducted over two day periods in both March of 2014 and 2015, with all services in the morning peak surveyed on the first day, and services in the afternoon peak surveyed on the second day. The Kings Ferry bus user surveys were conducted on a single day in both March of 2014 and 2015, on all of the services in the morning peak.

Composition of the bus user survey samples

The 2015 X18 survey collected 94 valid responses, compared with 124 valid responses in 2014. Fifty four Kings Ferry passengers participated in the 2015 survey, compared with 36 in 2014. There was very little change in the composition of the overall sample with regard to trip purpose: in 2014, 86% of passengers on both services combined were travelling for the purpose of employment (commuting or business), whilst in 2015, 85% were travelling for the purpose of employment.

For the purposes of the SES Case Study, results were analysed only for those passengers travelling in the morning peak for the purposes of employment on inbound trips to the North Fringe. The revised sample sizes for these analyses are provided in Table 4-5.

Table 4-5: Bus user survey sample sizes for employees on commuting services

	N		
	All	X18	Kings Ferry
2014: Travelling for employment	76	45	31
2015: Travelling for employment	102	50	52

Analysis of the bus user surveys

The paper survey responses were manually entered into a spreadsheet and imported into SPSS; a descriptive statistical analysis was then undertaken and is reported in Appendix 12.

4.3.5 Panel survey and follow-up interviews

The *North Bristol Commuter Panel* was set up as part of the SES Case Study to collect longitudinal data, tracking the perceptions and behaviour of approximately 1,900 commuters every three months over a period of 18 months between March 2014 and October 2015. The aims of the panel study were:

- To gain understanding of changes made by individuals to their commuting mode choice behaviour which will help to explain aggregate outcomes (i. e. measured from 2014 and 2016 surveys) and assist with attribution of outcomes to the LSTF programme
- To identify levels of awareness and influence of LSTF measures to provide knowledge which can be used in the design of future sustainable transport measures.

Composition of the North Bristol Commuter Panel

The initial sampling frame for the panel was the employees from SES Case Study businesses who responded to the March 2014 employee travel survey, and were willing to be contacted about further research (3417 respondents). This population was filtered by the following criteria, resulting in a survey sampling frame at wave 1 of 3233 people:

- SES Case Study Employer = yes
- Normal mode of travel = all except taxi, work at home, 'other' and missing (i.e. car alone, car with others, motorbike or scooter, cycle, walk, public or employer bus/coach, train).
- Email address provided (as the survey was run online and an email address was required to contact potential participants)

At wave 2, those who had not responded to the wave 1 survey were re-invited to join the panel and take the wave 2 survey. By wave 3, those who had responded to the panel survey at either wave 1 or 2 were considered to be members of the panel (N=1947). It was decided to return to these same people at each subsequent wave unless they notified the researchers that they wished to leave the panel.

The timing of the panel waves and response numbers at each wave are shown in Table 4-6 below. There were 658 people who responded to all six waves of the panel survey. Characteristics of the wave 1 sample, such as age, gender and employment status, are shown in Appendix 13.

Table 4-6: Panel survey response rates at each wave

	Date	Invited	Responded	
		N	N	%
Wave 1	July 2014	3233	1526	47
Wave 2	October 2014	3104	1539	50
Wave 3	January 2015	1947	1494	77
Wave 4	April 2015	1917	1383	72
Wave 5	July 2015	1909	1255	66
Wave 6	October 2015	1902	1237	65

Following the final wave of the survey (wave 6), semi-structured interviews were carried out over the telephone with 10 respondents to explore in more depth the influence of LSTF measures on commuting behaviour. Given that time and budget allowed for only a limited number of interviews, focus was placed on exploring the influence of cycling interventions on the commuter travel choices of individuals who had been shown by the survey to vary between driving alone and cycling.

Individuals were selected as potential interviewees if their survey responses showed they had made a change between car as their normal commute mode and cycling or the reverse (car-cycle

switchers), and commented on the influence of specific measures on their perceptions of cycling as an option and/or their actual cycling behaviour, and if they had taken part in at least 4 of the 6 survey waves. Through this process, 25 potential interviewees were identified. A target group of ten people was then generated with the aim of covering a number of characteristics across the group. A list of ‘substitutes’ was created from the remaining 15: people who could be matched with the original 10 according to gender, employer, etc., and who could be contacted to replace those who declined to take part, or failed to respond.

The final group of 10 interviewees comprised employees of six different organisations in the North Fringe, plus one business in Ports area.

Table 4-7 shows the gender and age characteristics of the sample.

Table 4-7: Sample characteristics of panel follow-up interviews

	Age group				Total
	20-29	30-39	40-49	50-59	
Women	1	2	2	0	5
Men	1	2	0	2	5
Total	2	4	2	2	10

Design of the panel survey and follow-up interviews

The panel survey questions concerned: normal commuting mode, reasons for change in normal commuting mode (where applicable), commuting mode perceptions, a one-week travel diary, awareness of LSTF measures and any influence of LSTF measures on attitudes or behaviour.

The survey was created using SurveyMonkey³³. It comprised up to 25 questions, with the number of questions per respondent varying depending on their responses; this is because the survey was designed using question logic to direct a respondent to those questions relevant to him or her, to reduce the time burden on panel members. The panel survey did not include socio-demographic questions or questions asking personal details, as this information had been provided in the March 2014 survey, to which panel survey responses could be linked. An example questionnaire is provided in Appendix 14.

The follow-up telephone interview questions were designed to explore interviewees’ perceptions of the influence (both instrumental and affective) of different cycling interventions on their attitudes to, and levels of cycling. A topic guide was developed (see Appendix 15) as a template, and an individual version created for each interviewee with elements of each question tailored to his/or responses in the survey.

³³ SurveyMonkey online survey software. See <https://www.surveymonkey.co.uk/>

Administration of the panel survey and follow-up interviews

All communication with participants was by email. At each wave, a personalised message was emailed to each respondent on the Monday of the 'survey week' giving them advance notice that they would receive the survey link on the Friday. The survey was distributed online only.

The interviews were undertaken after the completion of the final survey wave. The first ten people were emailed in March 2016, with an invitation to be interviewed for 20 to 30 minutes by telephone, at a date and time of their choice. A £10 shopping voucher was offered by way of thanks. Those who had failed to respond after a week were sent a reminder. If the second message elicited no response, a 'substitute' was then contacted.

Analysis of the panel survey and follow-up interviews

The panel data from each wave was cleaned in SPSS and merged by case (individual) using the Stata statistical software analysis program. Information was added for each case of the normal commuting mode which the panel participants had provided in the original March 2014 employee travel survey (thus providing up to seven observations of 'normal mode' per participant). Descriptive quantitative analysis was undertaken of respondents' mode changes from March 2014 to wave 1, and from each subsequent wave to the next.

Statistical analysis of mode patterns reported in the diary data was then conducted. At each wave respondents were categorised into three mode use groups: only used car alone to commute to work (car alone); partially used car alone to commute to work along with other modes (partial car alone); and not used car alone to commute to work (no car alone). Multinomial logit models were estimated to identify associations between independent variables (including sustainable transport promotion) and probability of transition from one group to another (fully reported in Chatterjee, Clark and Bartle, 2016³⁴).

Finally, a comprehensive analysis was conducted of both qualitative and quantitative survey responses from selected individuals whose normal commute mode had changed between waves. The qualitative analysis of responses from selected individuals comprised both thematic ('horizontal') analysis of open responses across different individuals, and case-study ('vertical') analysis of open and closed responses of each individual.

The ten follow-up telephone interviews were recorded and transcribed. A case-based analysis was first undertaken by combining each interviewee's interview and survey responses. A simple thematic analysis was then carried out across the ten cases.

³⁴ Chatterjee, K., Clark, B. and Bartle, C. (2016). Commute mode choice dynamics: Accounting for day-to-day variability in longer term change. *European Journal of Transport and Infrastructure Research*, 16(4), 713-734. Available from <http://tlo.tbm.tudelft.nl/ejtir>

5 Findings: Modal Shift

5.1 Overview

This chapter addresses Research Aim 1: *To establish the impact of a package of sustainable transport measures on modal shift in strategic employment sites and understand which interventions are most effective in different contexts.* The principle sources of data are the 2014 and 2016 employee travel surveys. These are supplemented where appropriate by data from the site cordon counts, bus user surveys and panel survey and follow-up interviews to answer the following research questions:

- *RQ 1a: What changes in modal share are found to occur in the strategic employment sites and how does this vary depending on the amount of exposure to LSTF interventions?*
- *RQ 1b: What LSTF interventions have the greatest impacts on car driver mode share and how is this affected by context (e.g. characteristics of location, employer, and employees)?*
- *RQ 1c: What changes in perceptions and attitudes towards low carbon travel alternatives are found to occur for employees working for businesses in strategic employment sites and how is this affected by exposure to LSTF interventions?*

Section 5.2 outlines the characteristics of the employee travel survey samples. Sections 5.3 and 0 address research question 1a and then Sections 5.5 and 5.6 then address research questions 1b to 1c respectively.

5.2 Characteristics of the employee travel survey samples

5.2.1 Demographic, employment and mobility characteristics

Table 5-1 provides a summary of the demographic, employment mobility characteristics of the survey samples in 2014 and 2016. It also compares driver licencing and access to a car and bicycle for the two years. It shows that women were more strongly represented in 2016 (48.1% in 2016, 43.8% in 2014), and that the 21 to 39 age group was slightly more strongly represented in 2016 (19.1% in 2016, 17.0% in 2014). The proportion of skilled manual employees was slightly higher in 2016, and the proportion of middle managers slightly lower. The proportion of respondents with a driving licence, and the share of those with access to a car for work were both greater in 2016. The proportion of respondents with access to a bicycle for work increased from 36.8% in 2014 to 42.6% in 2016.

In one of the subsequent analyses, we account for differences in sample characteristics in 2014 and 2016 when assessing changes in mode shares between 2014 and 2016.

Table 5-1: Characteristics of employee travel survey samples

Characteristic		2014		2016	
		N	%	N	%
Gender	Female	4222	43.8%	2731	48.1%
	Male	5407	56.2%	2949	51.9%
	Total	9629	100.0%	5680	100.0%
	Missing	55		176	
Age	17-21	64	.7%	47	.8%
	21-29	1634	17.0%	1094	19.1%
	30-39	2291	23.8%	1405	24.5%
	40-49	2702	28.1%	1498	26.1%
	50-59	2428	25.2%	1364	23.8%
	60-69	497	5.2%	316	5.5%
	70+	14	.1%	12	.2%
	Total	9630	100.0%	5736	100.0%
	Missing	54		120	
Disability	Yes	390	4.1%	238	4.2%
	No	9091	95.9%	5393	95.8%
	Total	9481	100.0%	5631	100.0%
	Missing	203		225	
Full-time or part-time	Full-time	8235	85.9%	4927	84.8%
	Part-time	1355	14.1%	885	15.2%
	Total	9590	100.0%	5812	100.0%
	Missing	94		44	
Job type	Professional/senior managerial	4254	44.5%	2568	44.5%
	Skilled manual	859	9.0%	678	11.8%
	Middle-management	1891	19.8%	1011	17.5%
	Unskilled manual	450	4.7%	259	4.5%
	Junior management/clerical/supervisory	2103	22.0%	1249	21.7%
	Total	9557	100.0%	5765	100.0%
	Missing	127		91	
Job contract type	Permanent	8715	90.5%	5225	90.6%
	Temporary/fixed term	918	9.5%	544	9.4%
	Total	9633	100.0%	5769	100.0%
	Missing	51		87	
Driving licence	Yes	8597	88.8%	5404	92.3%
	No	1087	11.2%	452	7.7%
	Total	9684	100%	5856	100%
Access to car for work	Yes	7539	77.9%	4675	79.8%
	No	2145	22.1%	1181	20.2%
	Total	9684	100.0%	5856	100.0%
Access to bicycle for work	Yes	3563	36.8%	2492	42.6%
	No	6121	63.2%	3364	57.4%
	Total	9684	100.0%	5856	100.0%

5.2.2 Commute distance and duration

Table 5-2 to Table 5-5 show commute distance and duration separately for the North Fringe and Ports areas, as the former is considerably closer to large residential areas than the latter. Moreover, the evaluation period had also seen an expansion of housing within the North Fringe itself.

Among respondents working in the North Fringe, the proportion commuting up to 5 miles had increased by 3.4 percentage points in 2016, whilst the share of those travelling between 25 and 50 miles had fallen by 2.8 percentage points. Mean distance to work fell significantly – from 14.5 to 12.5 miles. In the Ports area, the greatest change in the sample was the proportion commuting between 10 and 25 miles, which was 2.9 percentage points lower in 2016, compensated for by a slight increase in the share of those travelling up to 5 miles. Mean distance to work for respondents employed in the Ports area had fallen very slightly by 2016 (by a third of a mile).

An independent samples t-test (comparison of means) showed that the change in mean distance from 2014 to 2016 is statistically highly significant ($p=0.000$) at 99.9% confidence interval for the North Fringe.

There was little difference in the composition of the samples with regard to commute duration. The greatest difference was in the proportion of those whose commute took between 46 and 60 minutes, which was 3.6 percentage points higher in the Ports area in 2016, compared with 2014. The mean trip duration had increased very slightly (less than a minute) in both areas in 2016. An independent samples t-test (comparison of means) showed that the change in mean duration from 2014 to 2016 is not statistically significant in either the North Fringe or Ports area.

The decrease in trip distance between 2014 and 2016 was not, therefore, matched by a decrease in trip duration, which could reflect an increase in traffic congestion and/or increased use of slower modes (walking, cycling and bus).

Table 5-2: Commute distance to work of the employee travel survey samples

Distance to work		North Fringe		Ports area		Total	
		2014	2016	2014	2016	2014	2016
< 2 miles	N	387	244	13	12	400	256
	%	4.5%	4.8%	1.7%	2.3%	4.2%	4.5%
2 - 4.99 miles	N	2199	1457	69	53	2268	1510
	%	25.4%	28.4%	8.8%	10.3%	24.0%	26.8%
5 - 9.99 miles	N	2342	1422	215	145	2557	1567
	%	27.0%	27.7%	27.5%	28.0%	27.1%	27.8%
10 - 24.99 miles	N	2078	1196	356	221	2434	1417
	%	24.0%	23.3%	45.6%	42.7%	25.8%	25.1%
25 - 49.99 miles	N	1320	644	98	63	1418	707
	%	15.2%	12.6%	12.5%	12.2%	15.0%	12.5%
50 - 99.99 miles	N	293	147	23	22	316	169
	%	3.4%	2.9%	2.9%	4.3%	3.3%	3.0%
100+ miles	N	50	15	7	1	57	16
	%	.6%	.3%	.9%	.2%	.6%	.3%
Total	N	8669	5125	781	517	9450	5642
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Missing	N	196	188	38	26	234	214

Sample sizes: 2014 = 9684; 2016 = 5856

Table 5-3: Mean commute distance to work of the employee travel survey samples

	North Fringe		Ports area		Total	
	Mean (miles)	N	Mean (miles)	N	Mean (miles)	N
2014	14.15	8669	16.05	781	14.30	9450
2016	12.58	5125	15.72	517	12.87	5642

Sample sizes: 2014 = 9684; 2016 = 5856

Table 5-4: Commute duration of the employee travel survey samples

		North Fringe		Ports area		Total	
		2014	2016	2014	2016	2014	2016
0 - 5 minutes	N	145	84	20	18	165	102
	%	1.6%	1.6%	2.5%	3.3%	1.7%	1.7%
6 - 10 minutes	N	450	251	36	17	486	268
	%	5.1%	4.7%	4.4%	3.1%	5.0%	4.6%
11 - 15 minutes	N	815	471	79	58	894	529
	%	9.2%	8.9%	9.7%	10.7%	9.3%	9.1%
16 - 20 minutes	N	1198	707	134	81	1332	788
	%	13.5%	13.4%	16.4%	15.0%	13.8%	13.5%
21 - 30 minutes	N	2178	1274	230	145	2408	1419
	%	24.6%	24.1%	28.2%	26.9%	24.9%	24.3%
31 - 45 minutes	N	2218	1315	198	118	2416	1433
	%	25.1%	24.9%	24.3%	21.9%	25.0%	24.6%
46 - 60 minutes	N	1164	782	75	69	1239	851
	%	13.2%	14.8%	9.2%	12.8%	12.8%	14.6%
61 - 90 minutes	N	519	338	35	29	554	367
	%	5.9%	6.4%	4.3%	5.4%	5.7%	6.3%
91 - 120 minutes	N	110	48	4	5	114	53
	%	1.2%	.9%	.5%	.9%	1.2%	.9%
121 - 240 minutes	N	45	20	3	0	48	20
	%	.5%	.4%	.4%	0.0%	.5%	.3%
241+ minutes	N	3	1	1	0	4	1
	%	.0%	.0%	.1%	0.0%	.0%	.0%
Total	N	8845	5291	815	540	9660	5831
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Missing		20	4	22	3	24	25

Sample sizes: 2014 = 9684; 2016 = 5856

Table 5-5: Mean commute duration of the employee travel survey samples

	North Fringe		Ports		Total	
	Mean (mins)	N	Mean (mins)	N	Mean (mins)	N
2014	36.03	8845	33.06	815	35.78	9660
2016	36.33	5291	33.97	540	36.11	5831

Sample sizes: 2014 = 9684; 2016 = 5856

5.3 Changes in mode share

The first modal shift research question was: *What changes in modal share are found to occur in the strategic employment sites and how does this vary depending on the amount of exposure to LSTF interventions?* Section 5.3 reports on changes in commute mode share found to occur in the Bristol North Fringe and Ports area. It mainly refers to results from the employee travel surveys conducted in March 2014 and March 2016 with some reference to results from site cordon counts and the panel survey.

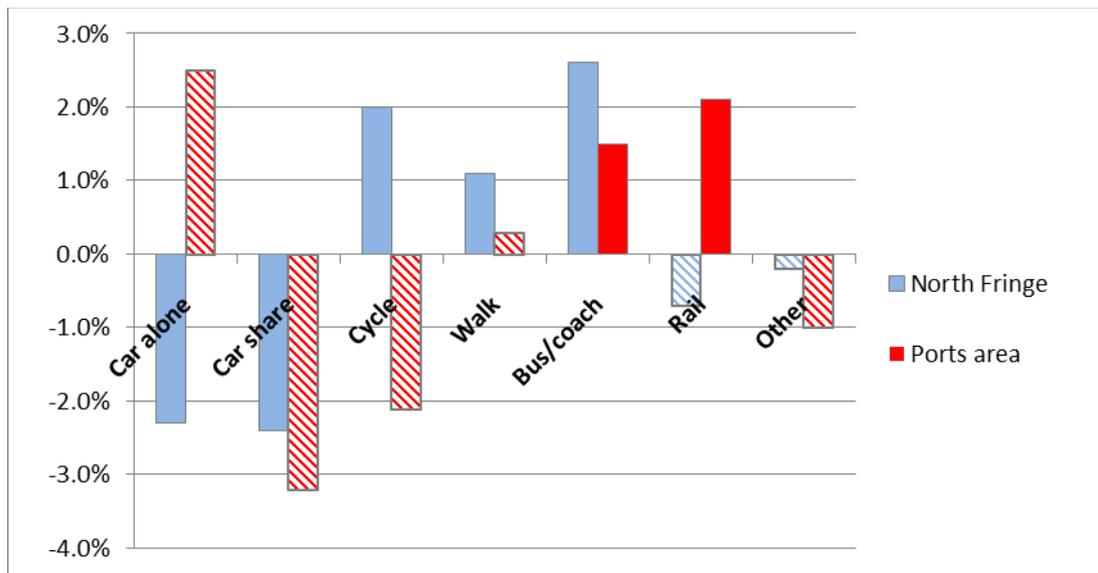
5.3.1 Travel to work today

This section presents mode share results from the employee survey question ‘How did you travel to work today?’ in 2014 and 2016, and mode share results observed through site cordon counts.

Table 5-6 shows mode share results for the combined survey responses from employees of all SES Case Study employers in the North Fringe and Port area. It shows there was a reduction in the share of commuting by car. Car alone mode share decreased by 1.7% points and car with passenger (car share) mode share decreased by 2.5% points. Cycling increased by 1.6% points, walking increased by 1.0% points and bus/coach use increased by 2.6% points. These differences are all statistically significant at the 95% confidence level or greater.

Table 5-7, Table 5-8 and Figure 5-1 show mode share results disaggregated by North Fringe and Ports employment areas.

Figure 5-1: Mode share % point changes for North Fringe and Ports area



Note: Statistical significance at 95% level shown in solid colour.

Table 5-7 shows that the North Fringe strategic employment area had a low base (2014) car alone mode share of 51.3% points and base cycle and bus mode shares of 12.3% points and 6.1% points respectively. The large sample sizes obtained in the 2014 and 2016 surveys (amongst staff working for employers who participated in the study) enabled a good degree of certainty to be obtained in the mode share estimates and the changes between 2014 and 2016. There was a statistically significant decrease in car alone mode share of 2.3% points, as well as a decrease in car share mode share of 2.4% points. This represents a statistically significant decrease in the total car mode share of 4.8% points. There were statistically significant increases in cycling mode share (2.0% points), walking mode share (1.1% points) and bus mode share (2.6% points).

Table 5-8 shows that the Ports area had a base car alone mode share of 66.5% points and a base car share mode share of 21.0% points. It had a low base share of alternatives to the car. No reduction in car alone mode share was found (instead a 2.5% points increase)³⁵. There were decreases in car share mode share of 3.2% points and cycling mode share of 2.1% points). Small increases in bus and rail mode share were found (1.5% points and 2.1% points respectively).

The changes in mode share in the two employment areas between 2014 and 2016 can be contrasted with national and regional trends. As noted in section 2.5, the trend between 2013 and 2015 for car mode share (car as driver or passenger) for commuting in England was a reduction of 0.4% points according to the Labour Force Survey. The trend for the South West region (in which the Bristol employment areas are located) was an increase in car total mode share for commuting of 1.4% points. The 4.8% point decrease in total car mode share in the Bristol North Fringe area is even more notable given the South West regional trend of an increase of 1.4% points.

In the WEST LSTF funding submission the value for money assessment of the programme assumed an annual car trip reduction of 0.85% across all trip purposes based on evidence from past studies. The reduction in car alone mode share from 52.6% points to 50.9% points observed across the combined North Fringe and Ports area survey samples represents a 3.2% reduction in car trips without considering the car share mode share reduction. This indicates that the target car trip reduction rate was exceeded in terms of commuting to the two employment areas over the two year period between March 2014 and March 2016.

A breakdown of mode share changes at the level of individual employers reveals variation within the samples. Car alone percentage point changes across employers are summarised in Figure 5-2 and Figure 5-3 with more detailed results for all modes shown in Table 5-9 and Table 5-10. Figure 5-2 shows that statistically significant reductions in car alone mode share at a 99% confidence level occurred at three of the 13 case study employers in the North Fringe that participated in the employee surveys in both years. These employers were among the largest employers, in terms of number of employees, and had limited parking availability (less than one space per two employees) in 2014 with two of them experiencing reductions in parking availability between 2014 and 2016 (the University and NHS Trust). All of them had 'intensively' engaged with the WEST LSTF programme. They each saw increases in mode share of walking and bus use with two of them seeing

³⁵ Tests of statistical significance were based on the assumption that samples were drawn from large (infinite) populations but in the case of Bristol Ports area a high proportion of the target population staff responded to the surveys, so the tests are conservative in this case.

increases in cycling (the exception was Large Public Sector Employer). These were the modes prioritised in the WEST LSTF programme.

Figure 5-3 shows that no changes in car alone mode share were statistically significant for the Ports area employers.

Car with passenger mode share only increased at four of the 13 employers in the North Fringe and one employer in the Ports area. Cycling mode share increased at 11 of the 13 employers in the North Fringe and one employer in the Ports area. Walking mode share increased at 9 of the 13 employers in the North Fringe with negligible numbers of employees walking to work in the Ports area. Bus/coach mode share increased at 6 of the 13 employers in the North Fringe with negligible numbers of employees using bus/coach in the Ports area. These results provide an indication of success in promoting cycling to work in the North Fringe and an indication that car sharing became less popular across both areas between 2014 and 2016.

Employee survey results were also available for other years than 2014 and 2016 for some SES Case Study employers, particularly those in the North Fringe³⁶, and it was possible to assess the annual trend in mode share between 2011, before the WEST LSTF programme commenced, and 2016. The longer-term trends in mode shares can be seen in Figure 5-4 and Figure 5-5, and Table 5-11 and Table 5-12. The data available is limited for Ports employers but for the North Fringe the trend for car alone mode share was an increase between 2011 and 2013³⁷ followed by a large reduction from 2013 to 2014 of 56.3% to 52.0%, a reduction from 2014 to 2015 of 52.0% to 50.6% and reduction from 2015 to 2016 of 50.6% to 49.6%³⁸. This provides evidence there was a break in trend coinciding with the start of the WEST LSTF programme and the programme may have had largest impact in the Bristol North Fringe in the first part of the funding period, followed by sustained impact at a lower level subsequently. The trend for cycling is similar but opposite to car alone, with an overall increase in mode share of 10.5% to 14.4% between 2013 and 2016.

Appendix 1 shows the time-series trends for individual employers and demonstrates car alone mode share reductions occurring between 2013 and 2014 for six North Fringe employers (Construction Services Company, Technology Company 1, University, Aerospace Manufacturer 1, NHS Trust and Engineering Consultancy 1) with increases at only two employers (Large Public Sector Employer and Retail Company).

The site cordon counts offered a further source of evidence on mode share changes. Before considering changes between 2014 and 2016 it is important to comment first on consistency in mode shares estimated from the employee travel surveys and cordon counts within each year. Comparison tables can be found in Appendices 9 and 10. In both years it was found that car alone

³⁶ Some caution should be applied with results for years other than 2014 and 2016 since more effort was made to achieve high response rates in 2014 and 2016 at the employers participating in the study.

³⁷ The increase in car mode share observed between 2011 and 2013 may be spurious given the small number of employers who participated in the surveys in 2011 and 2012. A fairly stable set of employers in the North Fringe participated in the surveys in 2013, 2014, 2015 and 2016.

³⁸ The figures are not exactly the same as reported earlier for 2014 and 2016 as responses from employees at some employers who did not participate in both 2014 and 2016 surveys are included in the longer-term trend and working from home has been removed in the longer-term trend.

mode shares from the cordon count were higher than from the employee travel survey for most employers (possibly explained by car alone users being less likely to respond to survey), car share and cycling mode shares were generally lower from the cordon count (possibly explained by under-recording of car occupants and cyclists in the cordon count and/or car sharers and cyclists being more likely to respond to survey) and walk mode shares were generally higher from the cordon count (possibly explained by people arriving on foot having been recorded as 'walk' by enumerators when they had used another form of transport for the main part of their journey, despite efforts having been made to avoid this by instructing enumerators to ask people arriving on foot their main method of transport).

Table 5-13 and Table 5-14 provide a comparison between the mode share percentage point changes between 2014 and 2016 revealed by the employee travel surveys and cordon counts in the North Fringe and Ports area respectively. In the North Fringe, it shows that car alone mode share fell at three of the nine employers which had a cordon count in both years (Engineering Consultancy 1, Technology Consultancy, Construction Services Company). Two of these three employers recorded increases in car alone mode share from the employee travel survey. Of the six North Fringe employers where car alone mode share increased according to the cordon count, two recorded decreases in car alone mode share from the employee travel survey. In the Ports area, car alone mode share fell at two of the six employers which had a cordon count in both years with one recording an increase in the employee travel survey. Of the four Ports area employers where car alone mode share increased according to the cordon count, one recorded a decrease in car alone mode share from the employee travel survey.

Perhaps of more concern than inconsistencies in the trends observed was that the magnitude of car alone mode share changes calculated from the cordon surveys was much larger. There were double digit percentage changes at nine of the 15 employers with cordon surveys in both years, while only two of the 20 employers with employee travel surveys in both years had double digit changes. Taking the case of larger employers (Aerospace Manufacturer 1, Financial Services Company and Large Public Sector Employer) it is also noted that the walking mode shares recorded in 2014 were higher than those recorded from the employee travel survey for that year and those recorded in 2016 from the cordon counts. A plausible explanation for this is that greater efforts were made in 2016 to ask those arriving on foot what their main method of transport had been to get to work. Hence walking would have been over-estimated in 2014 and car alone and other modes under-estimated in that year.

Discussions with local authority partners (who organised the counts) led us to believe that efforts made to improve the accuracy of the cordon counts in 2016, learning from issues arising in 2014, unwittingly resulted in systematic differences in results. The methodology used in the employee travel surveys was consistent between 2014 and 2016 and it is therefore considered that the results from the employee travel surveys are more valid.

Table 5-6: Mode share for North Fringe and Ports area combined

		2014	2016	% point change	Significance
Car alone	Count	5095	2972		*p=0.035
	%	52.6%	50.9%	-1.7	
Car share	Count	1472	744		***p=0.000
	%	15.2%	12.7%	-2.5	
Motorbike or scooter ³⁹	Count	170	112		p=0.466
	%	1.8%	1.9%	+0.2	
Cycle	Count	1132	755		**p=0.004
	%	11.7%	13.3%	+1.6	
Walk	Count	589	412		*p=0.017
	%	6.1%	7.1%	+1.0	
Bus/coach	Count	466	435		***p=0.000
	%	4.8%	7.4%	+2.6	
Employer bus/coach	Count	81	37		p=0.158
	%	0.8%	0.6%	-0.2	
Rail	Count	469	254		p=0.155
	%	4.8%	4.3%	-0.5	
Work from home	Count	117	63		p=0.464
	%	1.2%	1.1%	-0.1	
Other	Count	93	39		p=0.054
	%	1.0%	0.7%	-0.3	
Car combined	Count	6567	3716		***p=0.000
	%	67.8%	63.6%	-4.2	
Bus/coach combined	Count	547	472		***p=0.000
	%	5.6%	8.1%	+2.4	
Other combined	Count	380	214		p=0.411
	%	3.9%	3.7%	-0.3	
Total	Count	9684	5843		
	%	100.0%	100.0%		
Missing cases		0	13		

Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 9684; 2016 = 5856

³⁹ Referred to as 'Motorbike' in subsequent tables.

Table 5-7: Mode share for North Fringe

		2014	2016	% point change	Significance
Car alone	Count	4550	2600		**p=0.008
	%	51.3%	49.0%	-2.3	
Car share	Count	1300	648		***p=0.000
	%	14.7%	12.2%	-2.4	
Motorbike or scooter	Count	160	109		p=0.291
	%	1.8%	2.1%	+0.3	
Cycle	Count	1086	756		***p=0.001
	%	12.3%	14.3%	+2.0	
Walk	Count	573	400		*p=0.014
	%	6.5%	7.5%	+1.1	
Bus/coach	Count	460	429		***p=0.000
	%	5.2%	8.1%	+2.9	
Employer bus/coach	Count	81	31		*p=0.032
	%	0.9%	0.6%	-0.3	
Rail	Count	454	233		p=0.051
	%	5.1%	4.4%	-0.7	
Work from home	Count	115	63		p=0.571
	%	1.3%	1.2%	-0.1	
Other	Count	86	35		p=0.052
	%	1.0%	0.7%	-0.3	
Car combined	Count	5850	3248		***p=0.000
	%	66.0%	61.2%	-4.8	
Bus/coach combined	Count	541	460		***p=0.000
	%	6.1%	8.7%	+2.6	
Other combined	Count	361	207		p=0.619
	%	4.1%	3.9%	-0.2	
Total	Count	8865	5304		
	%	100.0%	100.0%		
Missing cases		0	9		

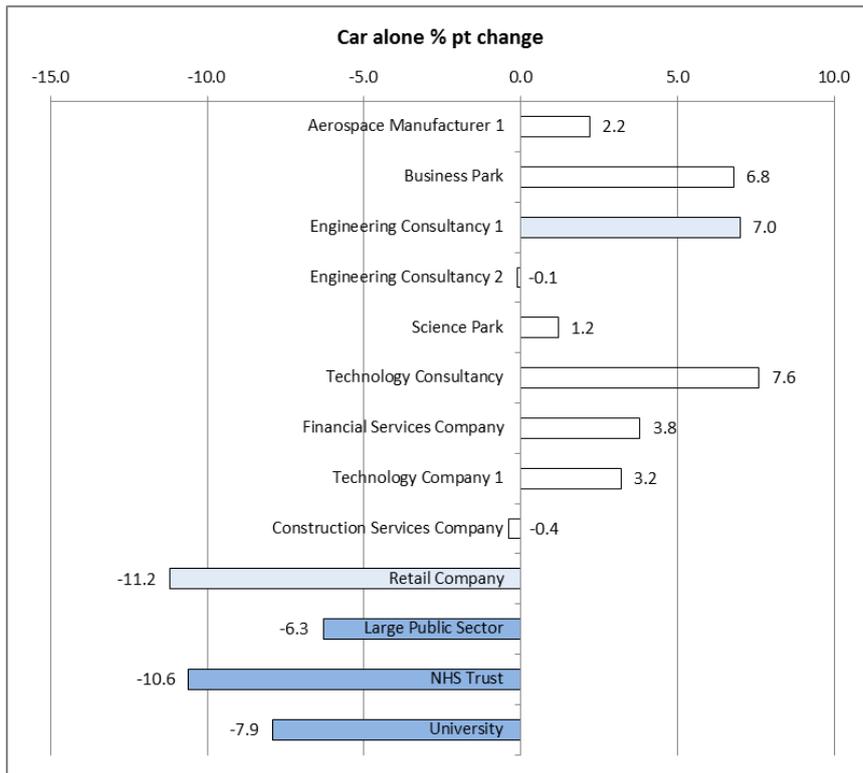
Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 8865; 2016 = 5313

Table 5-8: Mode share for Ports area

		2014	2016	% point change	Significance
Car alone	Count	545	372		p=0.342
	%	66.5%	69.0%	+2.5	
Car share	Count	172	96		p=0.149
	%	21.0%	17.8%	-3.2	
Motorbike or scooter	Count	10	3		p=0.219
	%	1.2%	0.6%	-0.7	
Cycle	Count	46	19		p=0.077
	%	5.6%	3.5%	-2.1	
Walk	Count	16	12		p=0.730
	%	2.0%	2.2%	+0.3	
Bus/coach	Count	6	6		p=0.464
	%	0.7%	1.1%	+0.4	
Employer bus/coach	Count	0	6		**p=0.002
	%	0.0%	1.1%	+1.1	
Rail	Count	15	21		*p=0.020
	%	1.8%	3.9%	+2.1	
Work from home	Count	2	0		p=0.251
	%	0.2%	0.0%	-0.2	
Other	Count	7	4		p=0.821
	%	0.9%	0.7%	-0.1	
Car combined	Count	717	468		p<0.698
	%	87.5%	86.8%	-0.7	
Bus/coach combined	Count	6	12		*p=0.019
	%	0.7%	2.2%	+1.5	
Other combined	Count	19	7		p=0.179
	%	2.3%	1.3%	-1.0	
Total	Count	819	539		
	%	100.0%	100.0%		
Missing cases		0	4		

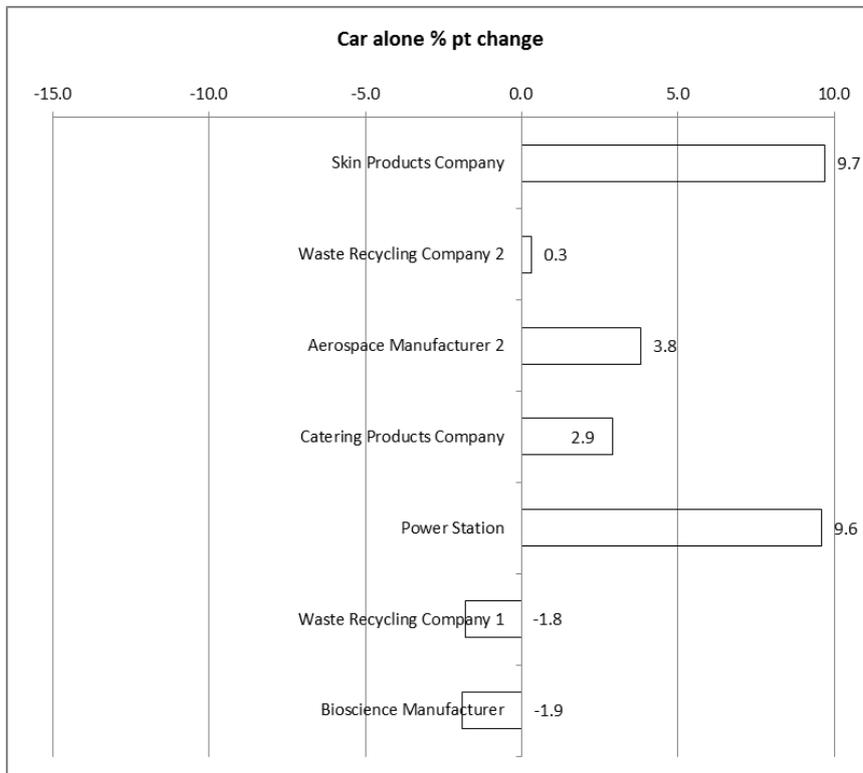
Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 819; 2016 = 543

Figure 5-2: Car alone mode share percentage point changes for North Fringe employers



Note: Statistical significance at 99% level shown in dark blue and at 90% level shown in light blue.

Figure 5-3: Car alone mode share percentage point changes for Ports area employers



Note: Statistical significance at 99% level shown in dark blue and at 90% level shown in light blue.

Table 5-9: Mode share for North Fringe employers

North Fringe		Aerospace Manufacturer 1		Business Park		Engineering Consultancy 1		Engineering Consultancy 2		Science Park		Technology Consultancy		Financial Services Company		Technology Company 1	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Car alone	2014	508	49.2%	48	58.5%	198	42.6%	86	50.6%	43	62.3%	56	60.9%	492	54.5%	107	42.1%
	2016	267	51.3%	200	65.4%	159	49.5%	54	50.5%	40	63.5%	13	68.4%	364	58.3%	92	45.3%
	% pt change		2.2		6.8		7.0		-0.1		1.2		7.6		3.8		3.2
Car share	2014	144	13.9%	6	7.3%	74	15.9%	49	28.8%	7	10.1%	12	13.0%	114	12.6%	21	8.3%
	2016	57	11.0%	27	8.8%	44	13.7%	27	25.2%	4	6.3%	0	0.0%	58	9.3%	18	8.9%
	% pt change		-3.0		1.5		-2.2		-3.6		-3.8		-13.0		-3.3		0.6
Motorbike	2014	32	3.1%	3	3.7%	6	1.3%	4	2.4%	2	2.9%	3	3.3%	10	1.1%	6	2.4%
	2016	15	2.9%	10	3.3%	4	1.2%	3	2.8%	0	0.0%	0	0.0%	6	1.0%	7	3.4%
	% pt change		-0.2		-0.4		0.0		0.5		-2.9		-3.3		-0.1		1.1
Cycle	2014	192	18.6%	10	12.2%	74	15.9%	14	8.2%	9	13.0%	6	6.5%	79	8.7%	54	21.3%
	2016	107	20.6%	38	12.4%	40	12.5%	14	13.1%	10	15.9%	2	10.5%	68	10.9%	45	22.2%
	% pt change		2.0		0.2		-3.5		4.8		2.8		4.0		2.1		0.9
Walk	2014	77	7.5%	7	8.5%	20	4.3%	4	2.4%	1	1.4%	2	2.2%	64	7.1%	12	4.7%
	2016	40	7.7%	10	3.3%	9	2.8%	3	2.8%	1	1.6%	0	0.0%	37	5.9%	12	5.9%
	% pt change		0.2		-5.3		-1.5		0.5		0.1		-2.2		-1.2		1.2
Bus/coach	2014	44	4.3%	5	6.1%	45	9.7%	8	4.7%	3	4.3%	1	1.1%	37	4.1%	11	4.3%
	2016	21	4.0%	5	1.6%	36	11.2%	4	3.7%	6	9.5%	0	0.0%	21	3.4%	9	4.4%
	% pt change		-0.2		-4.5		1.5		-1.0		5.2		-1.1		-0.7		0.1
Employer bus/coach	2014	5	.5%	0	0.0%	27	5.8%	1	.6%	0	0.0%	0	0.0%	34	3.8%	0	0.0%
	2016	1	.2%	0	0.0%	13	4.0%	0	0.0%	0	0.0%	0	0.0%	17	2.7%	0	0.0%
	% pt change		-0.3		0.0		-1.8		-0.6		0.0		0.0		-1.0		0.0
Train	2014	15	1.5%	2	2.4%	11	2.4%	2	1.2%	1	1.4%	2	2.2%	62	6.9%	5	2.0%
	2016	5	1.0%	7	2.3%	4	1.2%	0	0.0%	0	0.0%	0	0.0%	48	7.7%	7	3.4%
	% pt change		-0.5		-0.2		-1.1		-1.2		-1.4		-2.2		0.8		1.5
Work from home	2014	2	.2%	1	1.2%	6	1.3%	1	.6%	3	4.3%	10	10.9%	6	.7%	31	12.2%
	2016	1	.2%	5	1.6%	10	3.1%	2	1.9%	2	3.2%	3	15.8%	3	.5%	13	6.4%
	% pt change		0.0		0.4		1.8		1.3		-1.2		4.9		-0.2		-5.8
Other	2014	14	1.4%	0	0.0%	4	.9%	1	.6%	0	0.0%	0	0.0%	5	.6%	7	2.8%
	2016	6	1.2%	4	1.3%	2	.6%	0	0.0%	0	0.0%	1	5.3%	2	.3%	0	0.0%
	% pt change		-0.2		1.3		-0.2		-0.6		0.0		5.3		-0.2		-2.8
Total (per employer)	2014	1033	100.0%	82	100.0%	465	100.0%	170	100.0%	69	100.0%	92	100.0%	903	100.0%	254	100.0%
	2016	520	100.0%	306	100.0%	321	100.0%	107	100.0%	63	100.0%	19	100.0%	624	100.0%	203	100.0%

North Fringe (continued)		Construction Services Co.		Retail Company		Energy Technology Co.		Large Public Sector		NHS Trust		Technology Company 2		Env'tal Compl. Co.		University		Total (North Fringe)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Caralone	2014	77	85.6%	97	66.9%	28	58.3%	1234	46.7%	1036	57.2%	80	69.6			460	48.8%	4550	51.3%
	2016	40	85.1%	49	55.7%			327	40.4%	719	46.6%			21	75.0%	255	40.9%	2600	49.0%
	% pt change		-0.4		-11.2				-6.3		-10.6						-7.9		-2.3
Carshare	2014	9	10.0%	17	11.7%	6	12.5%	546	20.7%	176	9.7%	7	6.1%			112	11.9%	1300	14.7%
	2016	0	0.0%	20	22.7%			178	22.0%	138	8.9%			4	14.3%	73	11.7%	648	12.2%
	% pt change		-10.0		11.0				1.3		-0.8						-0.2		-2.4
Motorbike	2014	2	2.2%	1	.7%	2	4.2%	39	1.5%	37	2.0%	0	0.0%			13	1.4%	160	1.8%
	2016	0	0.0%	2	2.3%			13	1.6%	41	2.7%			0	0.0%	8	1.3%	109	2.1%
	% pt change		-2.2		1.6				0.1		0.6						-0.1		0.3
Cycle	2014	1	1.1%	8	5.5%	10	20.8%	233	8.8%	241	13.3%	14	12.2			141	15.0%	1086	12.3%
	2016	2	4.3%	5	5.7%			67	8.3%	233	15.1%			2	7.1%	123	19.7%	756	14.3%
	% pt change		3.1		0.2				-0.5		1.8						4.8		2.0
Walk	2014	0	0.0%	1	.7%	0	0.0%	159	6.0%	164	9.1%	5	4.3%			57	6.0%	573	6.5%
	2016	2	4.3%	4	4.5%			56	6.9%	175	11.3%			0	0.0%	51	8.2%	400	7.5%
	% pt change		4.3		3.9				0.9		2.3						2.1		1.1
Bus/coach	2014	0	0.0%	21	14.5%	1	2.1%	80	3.0%	106	5.8%	7	6.1%			91	9.7%	460	5.2%
	2016	0	0.0%	8	9.1%			35	4.3%	209	13.5%			1	3.6%	74	11.9%	429	8.1%
	% pt change		0.0		-5.4				1.3		7.7						2.2		2.9
Employer bus/coach	2014	0	0.0%	0	0.0%	0	0.0%	2	.1%	11	.6%	0	0.0%			1	.1%	81	.9%
	2016	0	0.0%	0	0.0%			0	0.0%	0	0.0%			0	0.0%	0	0.0%	31	.6%
	% pt change		0.0		0.0				-0.1		-0.6						-0.1		-0.3
Train	2014	1	1.1%	0	0.0%	0	0.0%	300	11.3%	12	.7%	2	1.7%			39	4.1%	454	5.1%
	2016	2	4.3%	0	0.0%			117	14.4%	11	.7%			0	0.0%	32	5.1%	233	4.4%
	% pt change		3.1		0.0				3.1		0.1						1.0		-0.7
Work from home	2014	0	0.0%	0	0.0%	0	0.0%	26	1.0%	5	.3%	0	0.0%			24	2.5%	115	1.3%
	2016	0	0.0%	0	0.0%			15	1.9%	4	.3%			0	0.0%	5	.8%	63	1.2%
	% pt change		0.0		0.0				0.9		0.0						-1.7		-0.1
Other	2014	0	0.0%	0	0.0%	1	2.1%	25	.9%	24	1.3%	0	0.0%			5	.5%	86	1.0%
	2016	1	2.1%	0	0.0%			2	.2%	14	.9%			0	0.0%	3	.5%	35	.7%
	% pt change		2.1		0.0				-0.7		-0.4						0.0		-0.3
Total (per employer)	2014	90	100.0	145	100.0	48	100.0%	2644	100.0	1812	100.0%	115	100.0			943	100.0%	8865	100.0
	2016	47	100.0	88	100.0			810	100.0	1544	100.0			28	100.0	624	100.0	5304	100.0

Table 5-10: Mode share for Ports area employers

Ports area		Skin Products Company		Waste Rec. Co. 2		Aerospace Man. 2		Catering Products Co.		Mail Dist. Co.		Power Station		Waste Rec. Co. 1		Bioscience Man.		Candle Products Co.		Total (Ports area)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Caralone	2014	39	69.6%	32	71.1%	83	83.8%	210	59.0%	47	67.1%	20	64.5%	14	87.5%	30	76.9%	70	65.4%	545	66.5%
	2016	23	79.3%	25	71.4%	78	87.6%	208	61.9%			20	74.1%	6	85.7%	12	75.0%			372	69.0%
	% pt change		9.7		0.3		3.8		2.9				9.6		-1.8		-1.9				
Car share	2014	12	21.4%	5	11.1%	9	9.1%	89	25.0%	17	24.3%	8	25.8%	1	6.3%	5	12.8%	26	24.3%	172	21.0%
	2016	4	13.8%	4	11.4%	5	5.6%	78	23.2%			5	18.5%	0	0.0%	0	0.0%			96	17.8%
	% pt change		-7.6		0.3		-3.5		-1.8				-7.3		-6.3		-12.8				
Motorbike	2014	1	1.8%	1	2.2%	1	1.0%	3	.8%	1	1.4%	0	0.0%	1	6.3%	0	0.0%	2	1.9%	10	1.2%
	2016	0	0.0%	0	0.0%	2	2.2%	1	.3%			0	0.0%	0	0.0%	0	0.0%			3	.6%
	% pt change		-1.8		-2.2		1.2		-0.5				0.0		-6.3		0.0				
Cycle	2014	3	5.4%	2	4.4%	5	5.1%	23	6.5%	4	5.7%	3	9.7%	0	0.0%	2	5.1%	4	3.7%	46	5.6%
	2016	0	0.0%	1	2.9%	2	2.2%	13	3.9%			2	7.4%	1	14.3%	0	0.0%			19	3.5%
	% pt change		-5.4		-1.6		-2.8		-2.6				-2.3		14.3		-5.1				
Walk	2014	0	0.0%	0	0.0%	0	0.0%	16	4.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	16	2.0%
	2016	0	0.0%	0	0.0%	0	0.0%	10	3.0%			0	0.0%	0	0.0%	2	12.5%			12	2.2%
	% pt change		0.0		0.0		0.0		-1.5				0.0		0.0		12.5				
Bus/coach	2014	0	0.0%	0	0.0%	0	0.0%	5	1.4%	0	0.0%	0	0.0%	0	0.0%	1	2.6%	0	0.0%	6	.7%
	2016	1	3.4%	0	0.0%	0	0.0%	5	1.5%			0	0.0%	0	0.0%	0	0.0%			6	1.1%
	% pt change		3.4		0.0		0.0		0.1				0.0		0.0		-2.6				
Employer bus/coach	2014	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	.0%
	2016	0	0.0%	0	0.0%	0	0.0%	6	1.8%			0	0.0%	0	0.0%	0	0.0%			6	1.1%
	% pt change		0.0		0.0		0.0		1.8				0.0		0.0						
Train	2014	1	1.8%	1	2.2%	1	1.0%	8	2.2%	1	1.4%	0	0.0%	0	0.0%	1	2.6%	2	1.9%	15	1.8%
	2016	1	3.4%	2	5.7%	2	2.2%	14	4.2%			0	0.0%	0	0.0%	2	12.5%			21	3.9%
	% pt change		1.7		3.5		1.2		1.9				0.0		0.0		9.9				
Work from home	2014	0	0.0%	1	2.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	.9%	2	.2%
	2016	0	0.0%	0	0.0%	0	0.0%	0	0.0%			0	0.0%	0	0.0%	0	0.0%			0	.0%
	% pt change		0.0		-2.2		0.0		0.0				0.0		0.0		0.0				
Other	2014	0	0.0%	3	6.7%	0	0.0%	2	.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	1.9%	7	.9%
	2016	0	0.0%	3	8.6%	0	0.0%	1	.3%			0	0.0%	0	0.0%	0	0.0%			4	.7%
	% pt change		0.0		1.9		0.0		-0.3				0.0		0.0		0.0				
Total (per employer)	2014	56	100.0	45	100.0	99	100.0%	356	100.0%	70	100.0	31	100.0%	16	100.0%	39	100.0%	107	100.0	819	100.0
	2016	29	100.0	35	100.0	89	100.0%	336	100.0%			27	100.0%	7	100.0%	16	100.0%			539	100.0

Figure 5-4: Aggregate mode share for North Fringe from employee travel surveys 2011-2016

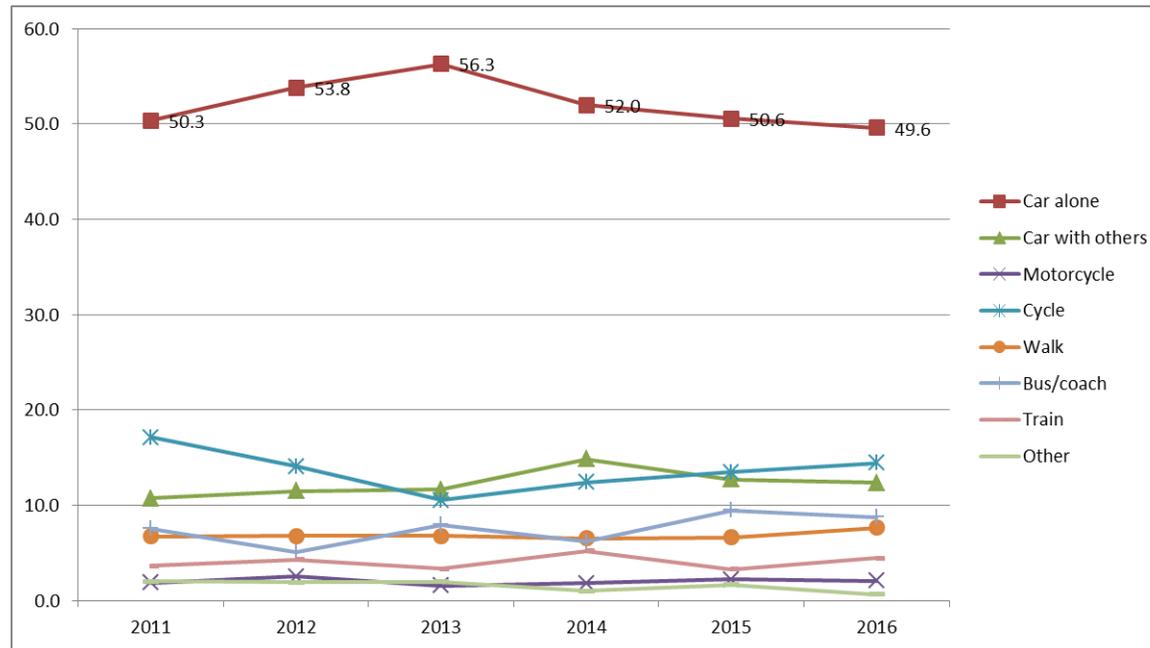


Table 5-11: Aggregate mode share for North Fringe from employee travel surveys 2011-2016

Year	Car alone	Car with others	Motorbike	Cycle	Walk	Bus/ coach	Train	Other	Total	Total survey respondents	No. participating employers	Total no. employees	Survey response rate
2011	50.3	10.8	1.9	17.1	6.7	7.5	3.6	2.0	100	3301	5	16050	19.1
2012	53.8	11.5	2.5	14.1	6.8	5.1	4.3	1.9	100	3396	6	27900	11.8
2013	56.3	11.6	1.6	10.5	6.8	8.0	3.3	1.9	100	3763	10	27413	13.1
2014	52.0	14.9	1.8	12.4	6.5	6.2	5.2	1.0	100	8865	15	34725	25.2
2015	50.6	12.7	2.2	13.5	6.6	9.5	3.3	1.6	100	5070	13	32525	15.4
2016	49.6	12.4	2.1	14.4	7.6	8.8	4.4	0.7	100	5302	14	32070	16.3

Figure 5-5 : Aggregate mode share for Ports area from employee travel surveys 2011-2016

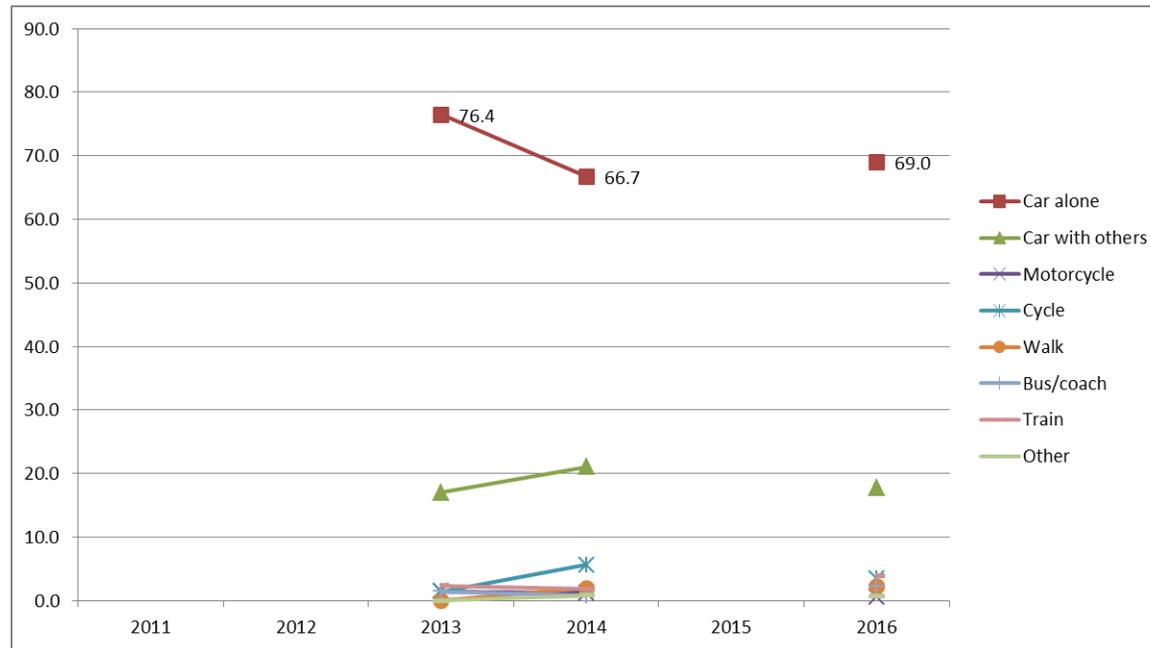


Table 5-12 : Aggregate mode share for Ports area from employee travel surveys 2011-2016

Year	Car alone	Car with others	Motorbike	Cycle	Walk	Bus/ coach	Train	Other	Total	Total survey respondents	No. participating employees	Total no. employees	Survey response rate
2011										0	0	0	
2012										0	0	0	
2013	76.4	17.0	1.4	1.4	0.0	1.4	2.4	0.0	100	212	5	690	30.7
2014	66.7	21.1	1.2	5.6	2.0	0.7	1.8	0.9	100	819	9	1896	43.1
2015										0	0	0	
2016	69.0	17.8	0.6	3.5	2.2	2.2	3.9	0.7	100	539	7	1677	32.1

Table 5-13: Comparison of mode share results from employee travel surveys and site cordon counts for North Fringe employers

North Fringe		Aerospace Manufacturer 1		Engineering Consultancy 1		Engineering Consultancy 2		Science Park		Technology Consultancy		Financial Services Company	
		Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor
Car alone%	2014	49.3	52.7	43.1	60.5	50.9	55.1	65.2	60.0	68.3	78.6	54.8	55.3
	2016	51.4	65.7	51.1	35.9	51.4	61.9	65.6	78.6	81.3	76.7	58.6	59.5
	% chg	2.2	13.0	8.0	-24.6	0.5	6.8	0.4	18.6	13.0	-1.9	3.8	4.2
Car share%	2014	14.0	12.9	16.1	7.2	29.0	22.7	10.6	19.3	14.6	4.8	12.7	9.9
	2016	11.0	7.4	14.1	17.0	25.7	18.0	6.6	4.1	0.0	14.0	9.3	11.4
	% chg	-3.0	-5.5	-2.0	9.8	-3.3	-4.7	-4.0	-15.2	-14.6	9.2	-3.4	1.5
Motorbike %	2014	3.1	1.9	1.3	1.0	2.4	0.8	3.0	2.7	3.7	1.2	1.1	0.5
	2016	2.9	2.1	1.3	2.3	2.9	0.4	0.0	1.0	0.0	0.0	1.0	0.5
	% chg	-0.2	0.2	0.0	1.3	0.5	-0.4	-3.0	-1.7	-3.7	-1.2	-0.1	0.0
Cycle %	2014	18.6	8.5	16.1	9.6	8.3	4.0	13.6	7.3	7.3	7.1	8.8	3.7
	2016	20.6	11.6	12.9	6.1	13.3	1.7	16.4	9.2	12.5	2.3	11.0	5.3
	% chg	2.0	3.1	-3.3	-3.5	5.0	-2.3	2.8	1.9	5.2	-4.8	2.1	1.6
Walk %	2014	7.5	15.0	4.4	5.4	2.4	11.7	1.5	2.0	2.4	0.0	7.1	14.0
	2016	7.7	7.5	2.9	12.2	2.9	8.4	1.6	5.1	0.0	4.7	6.0	8.3
	% chg	0.2	-7.5	-1.5	6.8	0.5	-3.3	0.1	3.1	-2.4	4.7	-1.2	-5.7
Bus/coach %	2014	4.8	6.0	15.7	13.0	5.3	2.8	4.5	7.3	1.2	0.0	7.9	7.4
	2016	4.2	3.8	15.8	20.1	3.8	5.4	9.8	1.0	0.0	0.0	6.1	4.0
	% chg	-0.5	-2.2	0.1	7.1	-1.5	2.6	5.3	-6.3	-1.2	0.0	-1.8	-3.4
Train %	2014	1.5	0.1	2.4	0.0	1.2	0.4	1.5	0.7	2.4	0.0	6.9	8.8
	2016	1.0	0.3	1.3	1.8	0.0	0.8	0.0	0.0	0.0	0.0	7.7	0.1
	% chg	-0.5	0.2	-1.1	1.8	-1.2	0.4	-1.5	-0.7	-2.4	0.0	0.8	-8.7
Other %	2014	1.4	2.9	0.9	3.2	0.6	2.4	0.0	0.7	0.0	8.3	0.6	0.4
	2016	1.2	1.5	0.6	4.6	0.0	3.3	0.0	1.0	6.3	2.3	0.3	0.4
	% chg	-0.2	-1.4	-0.2	1.4	-0.6	0.9	0.0	0.3	6.3	-6.0	-0.2	0.0
Total Count	2014	1031	1291	459	499	169	247	66	150	82	84	897	1963
	2016	519	2418	311	393	105	239	61	98	16	43	621	1784

North Fringe (continued)		Technology Company 1		Construction Company		Large Public Sector Employer		Total North Fringe ⁴⁰	
		Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor
Car alone%	2014	48.0	59.8	85.6	91.2	47.1	38.8	52.0	48.5
	2016	48.4	62.9	85.1	85.9	41.1	44.7	49.6	54.1
	% chg	0.4	3.1	-0.4	-5.3	-6.0	5.9	-2.4	5.6
Car share%	2014	9.4	8.7	10.0	0.0	20.9	14.7	14.9	12.8
	2016	9.5	2.9	0.0	5.1	22.4	10.8	12.4	9.9
	% chg	0.1	-5.8	-10.0	5.1	1.5	-3.9	-2.5	-2.9
Motorbike %	2014	2.7	0.9	2.2	1.8	1.5	1.7	1.8	1.3
	2016	3.7	3.6	0.0	2.6	1.6	1.1	2.1	1.4
	% chg	1.0	2.7	-2.2	0.8	0.1	-0.6	0.3	0.1
Cycle %	2014	24.2	16.6	1.1	0.0	8.9	8.4	12.4	7.5
	2016	23.7	16.0	4.3	0.0	8.4	9.0	14.4	8.9
	% chg	-0.5	-0.6	3.1	0.0	-0.5	0.6	2.0	1.4
Walk %	2014	5.4	6.4	0.0	1.8	6.1	10.4	6.5	11.0
	2016	6.3	5.8	4.3	2.6	7.0	9.0	7.6	8.4
	% chg	0.9	-0.6	4.3	0.8	1.0	-1.4	1.1	-2.6
Bus/coach %	2014	4.9	2.6	0.0	1.8	3.1	2.5	6.2	4.6
	2016	4.7	2.2	0.0	0.0	4.4	2.6	8.8	3.7
	% chg	-0.2	-0.4	0.0	-1.8	1.3	0.1	2.6	-0.9
Train %	2014	2.2	2.3	1.1	2.6	11.5	20.3	5.2	12.0
	2016	3.7	3.3	4.3	3.8	14.7	19.4	4.4	11.0
	% chg	1.4	1.0	3.1	1.2	3.3	-0.9	-0.7	-1.0
Other %	2014	3.1	2.6	0.0	0.9	1.0	3.1	1.0	2.4
	2016	0.0	3.3	2.1	0.0	0.3	3.3	0.7	2.6
	% chg	-3.1	0.7	2.1	-0.9	-0.7	0.2	-0.3	0.2
Total Count	2014	223	343	90	114	2618	4882	8750	9808
	2016	190	275	47	78	795	5358	5241	11472

⁴⁰ Total percentage mode shares for each year are based on all employers participating in employee survey/cordon count in that year

Table 5-14: Comparison of mode share results from employee travel surveys and site cordon counts for Ports area employers

Ports area		Aerospace Manufacturer 2		Catering Products Company		Skincare Products Company		Power Station		Bioscience Manufacturer		Waste Recycling Company 1		Total Ports area ⁴¹	
		Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor	Sur	Cor
Car alone %	2014	83.8	87.0	59.0	60.6	69.6	67.3	64.5	90.3	76.9	73.5	87.5	67.9	66.7	69.5
	2016	87.6	98.0	61.9	72.6	79.3	80.4	74.1	63.1	75.0	57.8	85.7	84.6	69.0	73.2
	% chg	3.8	11.0	2.9	12.0	9.7	13.1	9.6	-27.2	-1.9	-15.7	-1.8	16.7	2.3	3.7
Car share %	2014	9.1	0.0	25.0	25.5	21.4	20.4	25.8	6.5	12.8	17.6	6.3	10.7	21.1	18.8
	2016	5.6	0.0	23.2	18.3	13.8	0.0	18.5	34.0	0.0	4.4	0.0	7.7	17.8	17.2
	% chg	-3.5	0.0	-1.8	-7.2	-7.6	-20.4	-7.3	27.5	-12.8	-13.2	-6.3	-3.0	-3.2	-1.6
Motorbike %	2014	1.0	1.4	0.8	0.5	1.8	0.0	0.0	0.0	0.0	0.0	6.3	0.0	1.2	0.7
	2016	2.2	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3
	% chg	1.2	-1.4	-0.5	0.0	-1.8	0.0	0.0	0.0	0.0	0.0	-6.3	0.0	-0.7	-0.4
Cycle %	2014	5.1	4.3	6.5	6.0	5.4	4.1	9.7	3.2	5.1	8.8	0.0	0.0	5.6	4.8
	2016	2.2	2.0	3.9	1.1	0.0	0.0	7.4	1.0	0.0	13.3	14.3	0.0	3.5	1.9
	% chg	-2.8	-2.3	-2.6	-4.9	-5.4	-4.1	-2.3	-2.2	-5.1	4.5	14.3	0.0	-2.1	-2.9
Walk %	2014	0.0	0.0	4.5	1.4	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.9
	2016	0.0	0.0	3.0	2.3	0.0	0.0	0.0	1.0	12.5	4.4	0.0	0.0	2.2	1.8
	% chg	0.0	0.0	-1.5	0.9	0.0	-2.0	0.0	1.0	12.5	4.4	0.0	0.0	0.3	0.9
Bus/coach %	2014	0.0	0.0	1.4	1.7	0.0	0.0	0.0	0.0	2.6	0.0	0.0	21.4	0.7	1.7
	2016	0.0	0.0	3.3	3.0	3.4	15.2	0.0	1.0	0.0	15.6	0.0	7.7	2.2	3.8
	% chg	0.0	0.0	1.9	1.3	3.4	15.2	0.0	1.0	-2.6	15.6	0.0	-13.7	1.5	2.1
Train %	2014	1.0	1.4	2.2	1.9	1.8	0.0	0.0	0.0	2.6	0.0	0.0	0.0	1.8	1.3
	2016	2.2	0.0	4.2	0.9	3.4	4.3	0.0	0.0	12.5	4.4	0.0	0.0	3.9	1.0
	% chg	1.2	-1.4	1.9	-1.0	1.7	4.3	0.0	0.0	9.9	4.4	0.0	0.0	2.1	-0.3
Other %	2014	0.0	5.8	0.6	2.4	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.4
	2016	0.0	0.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.8
	% chg	0.0	-5.8	-0.3	-1.2	0.0	-6.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-1.6
Total Count	2014	99	69	356	419	56	49	31	31	39	34	16	28	817	757
	2016	89	50	336	563	29	46	27	103	16	45	7	26	539	895

⁴¹ Total percentage mode shares for each year are based on all employers participating in employee survey/cordon count in that year

5.3.2 Travel to work normally

This section presents results from responses to the employee travel survey question 'How do you travel to work normally?'⁴².

The percentage point changes in 'travel to work normally' mode shares shown in Table 5-15 for North Fringe and Ports area combined are similar overall to the changes in 'travel to work today' mode shares reported in Table 5-6. Consistency is also apparent for North Fringe when considered separately (Table 5-16 compared to Table 5-7) and for Ports area when considered separately (Table 5-17 compared to Table 5-8).

The mode share changes for North Fringe were slightly greater with a reduction in car alone commuting of 3.4% points based on 'travel to work normally' question compared to a reduction of 2.3% points based on 'travel to work today' question. An increase in cycling mode share of 2.7% points was obtained based on travel to work normally' question compared to 2.0% points based on 'travel to work today' question.

In general the results for 'travel to work normally' question corroborate the results for 'travel to work today' question and the consistency in the two sets of results is reassuring.

⁴² The travel to work today question is considered to provide a more objective measure of mode use as modes that are used occasionally (such as bicycle for example) will be under-represented in responses on normal mode. This is acknowledged in Department for Transport's 2002 Making Travel Plans Work Research Report. However, there is a risk that differences in weather conditions or other conditions may make comparisons between surveys in different years based on mode today problematic.

Table 5-15: Travel to work 'normally' mode share for North Fringe and Ports area combined

		2014	2016	% point change	Significance
Car alone	Count	4969	2820		***p=0.001
	%	52.2%	49.4%	-2.7	
Car share	Count	1448	731		***p=0.000
	%	15.2%	12.8%	-2.4	
Motorbike	Count	175	127		p=0.095
	%	1.8%	2.2%	+0.4	
Cycle	Count	1206	849		***p=0.000
	%	12.7%	14.9%	+2.2	
Walk	Count	604	432		**p=0.003
	%	6.3%	7.6%	+1.2	
Bus/coach	Count	448	412		***p=0.000
	%	4.7%	7.2%	+2.5	
Employer bus/coach	Count	89	42		p=0.201
	%	.9%	.7%	-0.2	
Rail	Count	475	248		p=0.074
	%	5.0%	4.3%	-0.6	
Work from home	Count	16	9		p=0.881
	%	0.2%	0.2%	0.0	
Other	Count	98	33		**p=0.004
	%	1.0%	.6%	-0.4	
Car combined	Count	6417	3551		***p=0.000
	%	67.3%	62.3%	-5.1	
Bus/coach combined	Count	537	454		***p=0.000
	%	5.6%	8.0%	+2.3	
Other combined	Count	289	169		p=0.807
	%	3.0%	3.0%	-0.1	
Total	Count	9528	5703		
	%	100.0%	100.0%		
Missing		156	153		

Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 9684; 2016 = 5856

Table 5-16: Travel to work 'normally' mode share for North Fringe

		2014	2016	% point change	Significance
Car alone	Count	4438	2461		***p=0.000
	%	50.9%	47.5%	-3.4	
Car share	Count	1280	635		***p=0.000
	%	14.7%	12.3%	-2.4	
Motorbike	Count	163	122		*p=0.050
	%	1.9%	2.4%	+0.5	
Cycle	Count	1163	830		***p=0.000
	%	13.3%	16.0%	+2.7	
Walk	Count	585	418		**p=0.003
	%	6.7%	8.1%	+1.4	
Bus/coach	Count	441	408		***p=0.000
	%	5.1%	7.9%	+2.8	
Employer bus/coach	Count	89	37		p=0.066
	%	1.0%	0.7%	-0.3	
Rail	Count	458	231		*p=0.037
	%	5.3%	4.5%	-0.8	
Work from home	Count	16	9		p=0.896
	%	0.2%	0.2%	0.0	
Other	Count	90	30		**p=0.005
	%	1.0%	0.6%	-0.5	
Car combined	Count	5718	3096		***p=0.000
	%	65.6%	59.8%	-5.8	
Bus/coach combined	Count	530	445		***p=0.000
	%	6.1%	8.6%	+2.5	
Other combined	Count	269	161		p=0.938
	%	3.1%	3.1%	0.0	
Total	Count	8723	5181		
	%	100.0%	100.0%		
Missing		142	132		

Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 8865; 2016 = 5313

Table 5-17: Travel to work 'normally' mode share for Ports area

		2014	2016	% point change	Significance
Car alone	Count	531	359		p=0.287
	%	66.0%	68.8%	+2.8	
Car share	Count	168	96		p=0.270
	%	20.9%	18.4%	-2.5	
Motorbike	Count	12	5		p=0.400
	%	1.5%	1.0%	-0.5	
Cycle	Count	43	19		p=0.152
	%	5.3%	3.6%	-1.7	
Walk	Count	19	14		p=0.713
	%	2.4%	2.7%	+0.3	
Bus/coach	Count	7	4		p=0.840
	%	0.9%	0.8%	-0.1	
Employer bus/coach	Count	0	5		**p=0.005
	%	0.0%	1.0%	+1.0	
Rail	Count	17	17		p=0.198
	%	2.1%	3.3%	+1.1	
Work from home	Count	0	0		-
	%	0.0%	0.0%	0.0	
Other	Count	8	3		p=0.411
	%	1.0%	0.6%	-0.4	
Car combined	Count	699	455		p=0.861
	%	86.8%	87.2%	+0.3	
Bus/coach combined	Count	7	9		p=0.164
	%	0.9%	1.7%	+0.9	
Other combined	Count	20	8		p=0.239
	%	2.5%	1.5%	-0.1	
Total	Count	805	522		
	%	100.0%	100.0%		
Missing		14	21		

Statistical significance: p<0.05*, p<0.01**, p<0.001***. Sample sizes: 2014 = 819; 2016 = 543

5.3.3 Changes in frequency of mode use

Another indication of change in mode share is available from a question in the 2016 employee travel survey which directly asked respondents whether, compared with two years ago, they were using specific transport modes more, the same, less, or had not used them. Results for this question for driving alone, cycling, walking and public bus use are shown in Table 5-18 to Table 5-21.

In the Bristol North Fringe a notably higher number (of those who had been working for their employer at least two years) reported cycling more than cycling less (397 compared to 306) and walking more than walking less (402 compared to 235). There was little difference between those driving more and driving less (711 compared to 684), and those using public bus more and less (286 compared to 284). This provides evidence to support modal shift having occurred to cycling and walking. For the Bristol Ports area the numbers reporting change in the amount they cycled, walked and used public bus was low, but more reported driving alone more than less (87 compared to 32). This is consistent with the result shown in Table 5-8 that car alone mode share increased in the Ports area.

Table 5-18: Change in the amount drive alone to work (for those who have worked for current employer more than two years)

	North Fringe		Ports area	
	Number	%	Number	%
Use more	711	19.3	87	27.6
Use less	684	18.6	32	10.2
Use the same	1748	47.6	164	52.1
Have not used	533	14.5	32	10.2
Total	3676	100	315	100
Missing	358	-	27	-
Worked for less than two years	1279	-	201	-
Total sample	5313	-	543	-

Table 5-19: Change in the amount cycle to work (for those who have worked for current employer more than two years)

	North Fringe		Ports area	
	Number	%	Number	%
Use more	397	13.8	16	7.1
Use less	306	10.6	21	9.3
Use the same	503	17.5	17	7.5
Have not used	1670	58.1	172	76.1
Total	2876	100	226	100
Missing	1158	-	116	-
Worked for less than two years	1279	-	201	-
Total sample	5313	-	543	-

Table 5-20: Change in the amount walk to work (for those who have worked for current employer more than two years)

	North Fringe		Ports	
	Number	%	Number	%
Use more	402	14.3	16	7.6
Use less	235	8.4	16	7.6
Use the same	476	16.9	13	6.2
Have not used	1700	60.4	165	78.6
Total	2813	100	210	100
Missing	1221	-	132	-
Worked for less than two years	1279	-	201	-
Total sample	5313	-	543	-

Table 5-21: Change in the amount use public bus to travel to work (for those who have worked for current employer more than two years)

	North Fringe		Ports	
	Number	%	Number	%
Use more	286	10.3	9	4.2
Use less	284	10.2	11	5.2
Use the same	368	13.2	6	2.8
Have not used	1844	66.3	187	87.8
Total	2782	100	213	100
Missing	1252	-	129	-
Worked for less than two years	1279	-	201	-
Total sample	5313	-	543	-

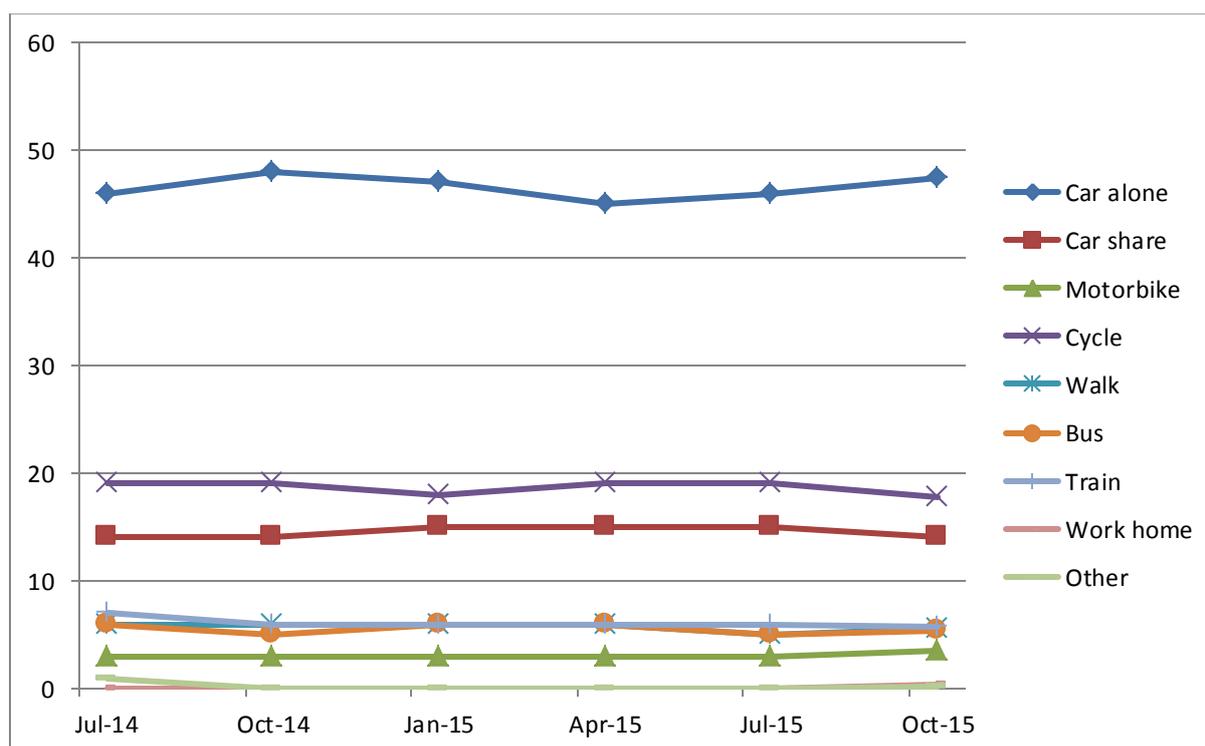
5.3.4 Mode use from the panel survey

An alternative indication of changes in mode share over time was revealed by the *North Bristol Commuter Panel*, which ran between the two employee travel surveys. The panel comprised a subset of respondents to the 2014 employee travel survey, who were invited to answer the same set of questions once every three months from July 2014 to October 2015. This allowed the commuting behaviour of a specific sample to be tracked over six waves. The composition of the panel and contents of the survey are explained in section 4.3.5. Most of the panel survey members worked in the North Fringe with only 5% of wave 1 respondents working in the Ports area. One question asked at each wave was 'What form of transport do you normally use to travel to work?'. Table 5-22 provides results for this question across the six panel waves for the full sample of respondents at each wave (respondents from North Fringe and Ports areas combined). The same data are presented as a chart in Figure 5-6. These show consistency in mode shares over time, but with a slight reduction in car alone use in the spring and summer, and a slight reduction in cycling in the winter.

Table 5-22: Panel survey responses for travel to work 'normally'

	Wave 1 July-14		Wave 2 Oct-14		Wave 3 Jan-15		Wave 4 Apr-15		Wave 5 July-15		Wave 6 Oct-15	
	N	%	N	%	N	%	N	%	N	%	N	%
Invited	3233	-	3104	-	1947	-	1917	-	1909	-	1902	
Responses	1526	47	1539	50	1494	77	1383	72	1255	66	1237	65
Car alone	708	46	737	48	702	47	620	45	580	46	588	48
Car share	210	14	211	14	221	15	201	15	188	15	175	14
Motorbike	39	3	44	3	39	3	45	3	40	3	44	4
Cycle	294	19	290	19	269	18	268	19	235	19	220	18
Walk	86	6	85	6	87	6	78	6	66	5	68	6
Bus	84	6	83	5	84	6	76	6	65	5	66	5
Train	101	7	85	6	82	6	84	6	76	6	70	6
Work home	2	0	3	0	5	0	6	0	5	0	4	0
Other	2	1	1	0	5	0	5	0	0	0	2	0

Figure 5-6: Panel survey responses for travel to work 'normally'



5.4 Changes in mode share and exposure to LSTF interventions

Section 0 investigates how changes in commute mode share varied according to exposure to LSTF interventions. This is carried out using data from the employee travel surveys and the *North Bristol Commuter Panel*.

5.4.1 Multiple regression analysis of employee travel survey data

It has been shown from the employee travel survey responses across all employers in the North Fringe and Ports areas that there were statistically significant decreases in driving alone and car sharing in 2016 and statistically significant increases in cycling, walking and bus use. At the employer level, there was considerable variation in results with statistically significant decreases in driving alone at three employers: the Large Public Sector Employer, the NHS Trust and the University.

Multiple regression analysis was conducted to investigate how variables representing personal, journey and employer characteristics were associated with the observed commute mode choices made in 2014 and 2016. This was performed to address three objectives:

- To assess if there were differences in probability of using a commute mode in 2016 after accounting for differences in sample characteristics in 2014 and 2016. If differences remain after controlling for sample characteristics then this provides confidence that results are not an artefact of the samples obtained.
- To assess if differences in probability of using a commute mode in 2016 were related to level of exposure to LSTF measures at the employer level, or to changes in parking availability at the employer level.
- To assess if differences in probability of using a commute mode in 2016 were related to awareness and engagement with LSTF measures at the level of the individual commuter.

Separate sets of multiple regression models were estimated for the choices of driving alone, car sharing, cycling, walking and using bus/coach. In each case the dependent variable in the regression took two values: '1' for those respondents who reported using the relevant mode (from mode today question) and '0' otherwise. An appropriate form of regression modelling to use with a binary dependent variable is binary logistic regression. Stata 13⁴³ has been used to estimate binary logistic regression models. Stata 13 reports coefficients for each independent variable included in the model and these reveal the change in probability of using the relevant mode for a one-unit change in the value of the independent variable (when other independent variables are held constant).

Models designed to assess if there were differences in probability of using a commute mode in 2016 after accounting for differences in sample characteristics in 2014 and 2016 are reported in Table 5-23. Model 1 confirms the finding reported in Section 5.3.1 of statistically significant differences at the 95% confidence level in probabilities of using each of the five modes in 2016 (compared to 2014). For example, the probability of driving alone in 2016 was 0.93 times that in 2014.

⁴³ Data analysis and statistical software. See <https://www.stata.com>

Model 2 shows that, after accounting for the employer for which respondents worked, the differences in probabilities were attenuated except for driving alone. Differences for car sharing, cycling and walking were no longer significant at 95% confidence level. For example, this implies that there were relatively more responses in 2016 from employees at employers where cycling levels were higher and after accounting for this there was no longer a statistically significant difference at 95% level in probability to cycle in 2016 (and the greater probability to cycle in 2016 decreases from 1.16 times to 1.11 times). Model 3 shows further attenuation in probability differences in 2016 when also accounting for socio-economic characteristics of individuals⁴⁴. Model 4 shows results are stable when additionally accounting for distance to work of commutes with statistically significant differences at 95% confidence level in car alone and bus use probabilities remaining.

In Model 5 an interaction effect between 2016 and each employer was added to Model 4 to assess whether differences in mode choice probabilities applied to employees working at certain employers or all employees. This showed statistically significant reductions in driving alone probabilities in 2016 for the Retail Company, Large Public Sector Employer, NHS Trust and University with no general effect across all employers. Interaction effects between 2016 and employers were hardly evident for the other four modes.

Models designed to assess if exposure to LSTF measures or changes to parking availability made a difference to mode choice probabilities in 2016 are reported in Table 5-24. Including car park spaces per employee (allowed to vary between 2014 and 2016 according to conditions – see Table 4-1 and Table 4-2) in Model 6 showed that this explains well the mode choice probabilities across both 2014 and 2016 for car alone, walking and bus use and a 2016 effect is not statistically significant for any of the five modes after including this variable.

Model 7 represents the effect of car parking availability through a dummy variable for the three employers where car parking spaces per employee were substantially reduced in 2016. The results show a decreased probability of car alone commuting in 2016 (of 0.65 times the probability in 2014) and increased probability of cycling, walking and bus use in 2016 (respectively of 1.26, 1.39, 1.85 times the probability in 2014) for employees at the three employers where there was a substantial decrease in parking availability. The results from Models 6 and 7 suggest that change in parking availability provides a good explanation for the differences in mode use between 2014 and 2016.

The level of exposure to LSTF measures at each employer was tested in Model 8 (as an alternative explanatory variable to parking availability) to see if this explained differences in probabilities of mode choice in 2016. The results show that there were not statistically significant differences in probabilities to use the five modes in 2016 compared to 2014 for individuals working for employers with higher exposure to LSTF measures.

Models 9 and 10 include variables for individual awareness of LSTF measures (Model 9) and individual use of LSTF measures (Model 10). There was not strong or systematic evidence of differences in probabilities to use the five modes in 2016 for individuals with greater awareness of LSTF measures, but decreased probability of car alone commuting and increased probabilities of

⁴⁴ For example, driving alone is more likely for females, older employees, part-time workers, permanently employed workers, those working non-standard hours and those with longer commute journeys.

cycling and bus use for individuals who used LSTF measures. Model 11 includes both car park spaces per employee and individual use of LSTF measures and shows that car park spaces per employee was strongly associated with car alone, walking and bus choice probabilities (across both 2014 and 2016) and greater use of LSTF measures was associated with reduced probabilities of car alone and increased probabilities of cycling and bus use in 2016.

Further to the above, model tests were carried out to see if individuals with particular socio-economic characteristics (e.g. age, employment classification) had changed their probability of using the five different modes in 2016 (compared to 2014) but this was not found to be the case. A variable for duration worked for current employer was included as a socio-economics variable in all of the above models. It was of interest to assess if those working a shorter duration of time with their current employer were more likely to use alternatives to car on the basis that they would have been less likely to have developed habitual car use. No difference was found in probability of driving alone for different lengths of time working for current employer. It was found that those who had worked for their current employer for more than five years were more likely to car share than those who had worked for up to five years. It was found that those who had worked for their current employer for more than five years were less likely to use bus than those who had worked for up to five years. Those who had worked for their current employer for up to six months were less likely to cycle than those who had worked for a longer duration in 2014, but not in 2016. In other words, new employees were more likely to take up cycling in 2016 which may have been helped by improvements to cycling facilities and information.

The multiple regression results are summarised in Table 5-25, while Table 5-26 shows the same results when only considering employees working in the North Fringe. Changes in probability of mode use are slightly greater and more statistically significant in the latter case, consistent with the finding that there were no statistically changes in mode share in Ports area (see Table 5-8).

In summary, the multiple regression results show that the decrease in the prevalence of driving alone and increase in prevalence of bus use in 2016 identified in Section 5.3.1 are robust to differences in survey sample compositions (between 2014 and 2016) but these are largely explained by reductions in car parking space availability at a small number of employers. The results also show additionally that those employees who engaged with LSTF measures were less likely to drive alone and more likely to cycle and use bus in 2016. From this it cannot be concluded that the LSTF measures prompted a modal shift – a more plausible interpretation is that restraint on parking or other ‘push’ factors prompted commuters to use alternatives to car commuting and LSTF measures assisted them in doing this.

Table 5-23: Odds ratios for changes in probability of mode choice in 2016 accounting for differences in sample characteristics in 2014 and 2016

Model number	Independent variables	Odds ratios for 2016					Interpretation
		Car alone	Car sharing	Cycling	Walking	Bus	
1	Year only	0.93**	0.81***	1.16***	1.17**	1.59***	Statistically significant differences in mode choice probabilities in 2016
2	Employer	0.88***	0.91*	1.11*	1.13*	1.47***	Employer attenuates 2016 associations except for car alone
3	Employer + Socio-economics ⁴⁵	0.92**	0.92*	1.06	1.07	1.38***	Socio-economics attenuate 2016 associations
4	Employer + Socio-economics + Distance to work	0.92**	0.92*	1.05	1.09	1.35***	Distance to work does not attenuate 2016 associations
5	Employer interacted with 2016 + Socio-economics + Distance to work	1.17 (negative association with 2016 for 4 employers ⁴⁶)	0.76 (positive association with 2016 for 1 employer ⁴⁷)	1.10 (no associations with 2016)	0.80 (positive association with 2016 for 1 employer ⁴⁸)	0.97 (positive association with 2016 for 1 employer ⁴⁹)	Statistically significant differences (p<=0.05) in mode choice probabilities in 2016 apply to only a small number of employers

Statistical significance: *** p<=0.01 ** p<=0.05 * p<=0.1. Sample size = 15527 (includes employees in North Fringe and Port area)

⁴⁵ Socio-economics variables - gender, age, mobility difficulties, part-time worker, temporarily employed worker, employment classification, working non-standard hours, duration worked for current employer

⁴⁶ Retail Company, Large Public Sector Employer, NHS Trust and University

⁴⁷ Retail Company

⁴⁸ Retail Company

⁴⁹ NHS Trust

Table 5-24: Odds ratios for changes in probability of mode choice in 2016 accounting for external factors and LSTF exposure

Model number	Independent variables	Odds ratios for 2016 and external factor/exposure variables (in brackets)					Interpretation
		Car alone	Car sharing	Cycling	Walking	Bus	
6	Employer + Socio-economics + Distance to work + Car park spaces per employee (CPSE) ⁵⁰	0.94 (CPSE 3.48***)	0.91* (CPSE 0.57)	1.05 (CPSE 0.78)	1.04 (CPSE 0.30**)	1.15 (CPSE 0.09***)	CPSE strongly associated with car alone, walking and bus choice probabilities in 2014 and 2016 (no difference in choice probabilities in 2016 after accounting for this)
7	Employer + Socio-economics + Distance to work + Dummy variable for three employers ⁵¹ where car park spaces per employee reduced by at least 0.1 (CPSR)	1.08* (CPSR 0.65***)	0.90* (CPSR 1.07)	0.95 (CPSR 1.26**)	0.93 (CPSR 1.39*)	0.96 (CPSR 1.85***)	CPSR associated with differences in mode choice probabilities in 2016 for car alone, cycling and bus
8	Employer + Socio-economics + Distance to work + Low, medium or high exposure to LSTF measures (at employer level) ⁵²	1.33 (Low 0.90 Med 0.76 High 0.60*)	0.67 (Low 0.96 Med 1.49 High 1.38)	0.57 (Low 2.11 Med 1.44 High 2.09)	1.15 (Low 0.86 Med 0.89 High n/e ⁵³)	323301 ⁵⁴ (Low 2.5 10 ⁻⁶ Med 3.3 10 ⁻⁶ High 4.9 10 ⁻⁶)	Exposure to LSTF not associated with differences in mode choice probabilities in 2016

⁵⁰ Allowed to vary between 2014 and 2016 according to site conditions (see Table 4-1 and Table 4-2).

⁵¹ Science Park, NHS Trust and University

⁵² Classified as low, medium or high based on how many of following occurred: employer grant; roadshow visits; employer-led improved cycle facilities (1=low, 2=medium, 3=high).

⁵³ Not estimable (due to no walking recorded at some employers)

9	Employer + Socio-economics + Distance to work + Level of awareness of LSTF measures (ordered categorical variable at individual level)	No significant relationships	No significant relationships	Awareness of 13-15 measures associated with reduced cycling	Awareness of 7-9 measures associated with increased walking	Awareness of none, 4-6 and 7-9 measures associated with increased bus use	Greater level of awareness in LSTF measures not strongly or systematically associated with differences in mode choice probabilities in 2016
10	Employer + Socio-economics + Distance to work + No, moderate or high use of LSTF measures (ordered categorical variable at individual level) ⁵⁵	(No 1.30*** Mod 0.55*** High 0.31***)	(No 0.86** Mod 1.03 High 0.88)	(No 0.57*** Mod 1.62*** High 2.91***)	(No 1.16 Mod 0.98 High 1.23)	(No 0.87 Mod 2.09*** High 1.67**)	Greater use of LSTF measures associated with reduced probabilities of car alone and increased probabilities of cycling and bus in 2016
11	Employer + Socio-economics + Distance to work + Car park spaces per employee (CPSE) + No, moderate or high use of LSTF measures (ordered categorical variable at individual level) ⁵⁶	(CPSE 3.64***) (No 1.33*** Mod 0.56*** High 0.31***)	(CPSE 0.57) (No 0.86** Mod 1.02 High 0.88)	(CPSE 0.67) (No 0.56*** Mod 1.61*** High 2.88***)	(CPSE 0.31**) (No 1.10 Mod 0.94 High 1.17)	(CPSE 0.07***) (No 0.72*** Mod 1.78*** High 1.40)	CPSE strongly associated with car alone, walking and bus choice probabilities and greater use of LSTF measures associated with reduced probabilities of car alone and increased probabilities of cycling and bus use in 2016

Statistical significance: *** p<=0.01 ** p<=0.05 * p<=0.1. Sample size = 15527 (includes employees in North Fringe and Port area)

⁵⁴ Model not well estimated (due to collinearity in variables)

⁵⁵ No = No use of LSTF measures, Mod = used 1-3 measures, High = used 4-15 measures.

⁵⁶ No = No use of LSTF measures, Mod = used 1-3 measures, High = used 4-15 measures.

Table 5-25: Summary of odds ratios for changes in probability of mode choice in 2016 for North Fringe and Ports area combined

	Mode share changes 2014 to 2016	Odds ratio for changes in probability of mode choice in 2016 compared to 2014		
		Basic changes in probability	Accounting for sample characteristics	Accounting for sample characteristics & parking availability
Car alone	-1.7%*	0.93*	0.92*	0.94
Car share	-2.5%***	0.81***	0.92	0.91
Cycle	+1.6%**	1.16*	1.05	1.05
Walk	+1.0%*	1.17*	1.09	1.04
Bus/coach	+2.4%***	1.59***	1.35***	1.15

Statistical significance: *** p<=0.01 ** p<=0.05 * p<=0.1. Sample size = 15527 (includes employees in North Fringe and Port area)

Table 5-26: Summary of odds ratios for changes in probability of mode choice in 2016 for North Fringe only

	Mode share changes 2014 to 2016	Odds ratio for changes in probability of mode choice in 2016 compared to 2014		
		Basic changes in probability	Accounting for sample characteristics	Accounting for sample characteristics & parking availability
Car alone	-2.3%**	0.91**	0.90**	0.93
Car share	-2.4%***	0.81***	0.94	0.93
Cycle	+2.0%***	1.19**	1.08	1.08
Walk	+1.1%*	1.18*	1.12	1.07
Bus/coach	+2.6%***	1.61***	1.35***	1.15

Statistical significance: *** p<=0.01 ** p<=0.05 * p<=0.1. Sample size = 14169 (employees in North Fringe only)

5.4.2 Changes in frequency of mode use and awareness and use of LSTF measures

Results for self-reported changes in frequency of mode use were reported in 5.3.3. A series of cross-tabulations is now presented to explore relationships between self-reported changes in frequency of mode use and the number of LSTF measures of which respondents were aware and had used. Table 5-27 to Table 5-34 show the results for car alone, cycling, walking and public bus. Results are reported for the North Fringe and Ports areas combined. Chi-square tests showed that associations were highly statistically significant (at 99.9% confidence level) between self-reported changes in use of each of these four modes and the number of LSTF measures used. For example, 63% of all respondents reported not using any LSTF measures, but this proportion was lower among the section of the sample who said they were driving alone less than they were two years ago. Only 52% of this group reported not using LSTF measures.

Relationships were also highly significant between changes in use of both car alone and public bus and the number of measures of which respondents were aware. Relationships between changes in use of both cycling and walking and the number of measures of which respondents were aware were not statistically significant. Comments are now made about the associations between changes in use of each mode in turn, and the number of measures used.

Forty percent of those who reported commuting less often by car alone than they were two years ago had also used between 1 and 3 LSTF measures, compared with only 29% who reported commuting more often by car alone, and 25% who had reported commuting the same amount by car alone (Table 5-28). Conversely, a higher proportion of those who had used no LSTF measures were using car alone more, or the same, than were using it less. Hence there is a positive association between use of LSTF measures and reduced car alone commuting.

A higher proportion of respondents who reported cycling more had used 1 to 3, or 4 to 6 measures, compared with those who were cycling less. Conversely, of those who were cycling less, a higher percentage had used no measures compared with those who were cycling more (Table 5-30). Again, there is a positive relationship between use of LSTF measures and cycling more often.

Of those who were walking more than they were two years ago, 51% had not used any LSTF measures. Of those who were walking less, slightly more (54%) had used no measures. A similar proportion of both groups had used 1 to 3 measures. There is not a strong association between LSTF measures and increased walking.

Among those who were using the public bus more than they had two years ago, 54% had used 1 to 3 measures, while for those who were using the bus less than they had two years ago, 49% had used 1 to 3 measures. There is a positive relationship between use of LSTF measures and using bus more.

Table 5-27: Change in use of car alone and number of LSTF measures of which aware

Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?		Number of LSTF measures of which aware						Total
		0	1-3	4-6	7-9	10-12	12-15	
Use more	N	182	409	342	164	53	23	1173
	%	15.5%	34.9%	29.2%	14.0%	4.5%	2.0%	100.0%
Use less	N	112	328	318	189	64	13	1024
	%	10.9%	32.0%	31.1%	18.5%	6.3%	1.3%	100.0%
Use the same	N	278	682	703	380	146	59	2248
	%	12.4%	30.3%	31.3%	16.9%	6.5%	2.6%	100.0%
Have not used	N	123	266	257	164	54	19	883
	%	13.9%	30.1%	29.1%	18.6%	6.1%	2.2%	100.0%
Total	N	695	1685	1620	897	317	114	5328
	%	13.0%	31.6%	30.4%	16.8%	5.9%	2.1%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 528 (9.0%)

Table 5-28: Change in use of car alone and number of LSTF measures used

Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?		Number of LSTF measures used					Total
		0	1-3	4-6	7-9	10-12	
Use more	N	808	335	26	3	1	1173
	%	68.9%	28.6%	2.2%	.3%	.1%	100.0%
Use less	N	544	410	61	8	1	1024
	%	53.1%	40.0%	6.0%	.8%	.1%	100.0%
Use the same	N	1614	565	64	5	0	2248
	%	71.8%	25.1%	2.8%	.2%	0.0%	100.0%
Have not used	N	395	395	85	7	1	883
	%	44.7%	44.7%	9.6%	.8%	.1%	100.0%
Total	N	3361	1705	236	23	3	5328
	%	63.1%	32.0%	4.4%	.4%	.1%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 528 (9.0%)

Table 5-29: Change in use of cycling and number of LSTF measures of which aware

Has the amount you travelled by bicycle changed compared with 2 years ago?		Number of LSTF measures of which aware						Total
		0	1-3	4-6	7-9	10-12	12-15	
Use more	N	67	183	209	110	39	6	614
	%	10.9%	29.8%	34.0%	17.9%	6.4%	1.0%	100.0%
Use less	N	46	148	147	85	38	9	473
	%	9.7%	31.3%	31.1%	18.0%	8.0%	1.9%	100.0%
Use the same	N	49	187	222	123	44	10	635
	%	7.7%	29.4%	35.0%	19.4%	6.9%	1.6%	100.0%
Have not used	N	311	808	763	441	139	55	2517
	%	12.4%	32.1%	30.3%	17.5%	5.5%	2.2%	100.0%
Total	N	473	1326	1341	759	260	80	4239
	%	11.2%	31.3%	31.6%	17.9%	6.1%	1.9%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1617 (27.6%)

Table 5-30: Change in use of cycling and number of LSTF measures used

Has the amount you travelled by bicycle changed compared with 2 years ago?		Number of LSTF measures used					Total
		0	1-3	4-6	7-9	10-12	
Use more	N	209	326	72	7	0	614
	%	34.0%	53.1%	11.7%	1.1%	0.0%	100.0%
Use less	N	222	205	44	2	0	473
	%	46.9%	43.3%	9.3%	.4%	0.0%	100.0%
Use the same	N	215	329	81	9	1	635
	%	33.9%	51.8%	12.8%	1.4%	.2%	100.0%
Have not used	N	1778	695	38	4	2	2517
	%	70.6%	27.6%	1.5%	.2%	.1%	100.0%
Total	N	2424	1555	235	22	3	4239
	%	57.2%	36.7%	5.5%	.5%	.1%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1617 (27.6%)

Table 5-31: Change in use of walking and number of LSTF measures of which aware

Has the amount you travelled on foot changed compared with 2 years ago?		Number of LSTF measures of which aware						Total
		0	1-3	4-6	7-9	10-12	12-15	
Use more	N	78	171	209	130	52	13	653
	%	11.9%	26.2%	32.0%	19.9%	8.0%	2.0%	100.0%
Use less	N	57	138	148	81	20	7	451
	%	12.6%	30.6%	32.8%	18.0%	4.4%	1.6%	100.0%
Use the same	N	71	190	198	128	53	13	653
	%	10.9%	29.1%	30.3%	19.6%	8.1%	2.0%	100.0%
Have not used	N	280	782	755	394	133	44	2388
	%	11.7%	32.7%	31.6%	16.5%	5.6%	1.8%	100.0%
Total	N	486	1281	1310	733	258	77	4145
	%	11.7%	30.9%	31.6%	17.7%	6.2%	1.9%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1711 (29.2%)

Table 5-32: Change in use of walking and number of LSTF measures used

Has the amount you travelled on foot changed compared with 2 years ago?		Number of LSTF measures used					Total
		0	1-3	4-6	7-9	10-12	
Use more	N	331	268	51	3	0	653
	%	50.7%	41.0%	7.8%	.5%	0.0%	100.0%
Use less	N	245	184	21	1	0	451
	%	54.3%	40.8%	4.7%	.2%	0.0%	100.0%
Use the same	N	331	276	42	3	1	653
	%	50.7%	42.3%	6.4%	.5%	.2%	100.0%
Have not used	N	1531	735	104	16	2	2388
	%	64.1%	30.8%	4.4%	.7%	.1%	100.0%
Total	N	2438	1463	218	23	3	4145
	%	58.8%	35.3%	5.3%	.6%	.1%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1711 (29.2%)

Table 5-33: Change in use of public bus and number of LSTF measures used

Has the amount you travelled by public bus changed compared with 2 years ago?		Number of LSTF measures used					Total
		0	1-3	4-6	7-9	10-12	
Use more	N	185	276	47	1	0	509
	%	36.3%	54.2%	9.2%	.2%	0.0%	100.0%
Use less	N	223	247	34	3	0	507
	%	44.0%	48.7%	6.7%	.6%	0.0%	100.0%
Use the same	N	210	219	48	5	1	483
	%	43.5%	45.3%	9.9%	1.0%	.2%	100.0%
Have not used	N	1775	752	90	13	1	2631
	%	67.5%	28.6%	3.4%	.5%	.0%	100.0%
Total	N	2393	1494	219	22	2	4130
	%	57.9%	36.2%	5.3%	.5%	.0%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1726 (29.5%)

Table 5-34: Change in use of public bus and number of LSTF measures of which aware

Has the amount you travelled by bus changed compared with 2 years ago?		Number of LSTF measures of which aware						Total
		0	1-3	4-6	7-9	10-12	12-15	
Use more	N	53	145	152	112	36	11	509
	%	10.4%	28.5%	29.9%	22.0%	7.1%	2.2%	100.0%
Use less	N	56	151	149	112	28	11	507
	%	11.0%	29.8%	29.4%	22.1%	5.5%	2.2%	100.0%
Use the same	N	40	131	156	103	41	12	483
	%	8.3%	27.1%	32.3%	21.3%	8.5%	2.5%	100.0%
Have not used	N	334	857	830	415	148	47	2631
	%	12.7%	32.6%	31.5%	15.8%	5.6%	1.8%	100.0%
Total	N	483	1284	1287	742	253	81	4130
	%	11.7%	31.1%	31.2%	18.0%	6.1%	2.0%	100.0%

Sample size = 5856 (both North Fringe and Ports area); Missing cases = 1726 (29.5%)

5.4.3 Explanations for changes in mode use from panel survey and follow-up interviews

In section 5.3.4 it was seen that the net percentages of panel respondents using different modes (as their 'normal' mode) remained relatively stable over the six waves of the panel survey. However, the net stability in mode shares masks considerable 'churn' at the individual level with about 10% of respondents changing their normal mode at each wave. Table 5-35 shows the prevalence of stability and change in normal mode across the whole panel survey including the March 2014 baseline (for respondents of both North Fringe and Ports areas). This was created by combining 8,390 pairs of consecutive observations of normal mode. The row totals show the number of times each mode was the starting mode in each pair, whilst the column totals show the number of times each mode was the finishing mode in each pair. Car alone was thus the starting mode in each pair on 3,929 occasions, and the finishing point on 3,916 occasions. The largest number in each column and row is the number of instances when an individual's normal mode in one wave was the same as his or her normal mode in the subsequent wave. Hence, there were 3,621 instances where an individual was normally driving to work alone at one wave, and still doing so at the following wave.

Table 5-35: Panel survey normal mode transitions from wave to wave

	Car alone	Car share	Motorbike	Cycle	Walk	Bus/coach	Train	Did not commute	Total
Car alone	3,621	148	16	61	21	29	17	16	3,929
Car share	155	990	0	17	8	19	2	3	1,194
Motorbike	11	1	224	0	2	0	1	1	240
Cycle	64	20	6	1,440	15	9	10	6	1,570
Walk	16	12	3	27	404	19	3	0	484
Bus/coach	21	23	0	8	13	375	5	1	446
Train	22	5	1	9	5	6	457	0	505
Did not commute	6	1	0	2	0	0	0	13	22
Total	3,916	1,200	250	1,564	468	457	495	40	8,390

There were 7,524 instances of no mode change taking place from one wave to the next; this is the sum of the top left-to-right diagonal in Table 5-35. There were 866 instances where a change in normal mode did take place. Changes to and from each pair of modes were relatively symmetrical. For example, there were 148 wave-to-wave changes from car alone to car share across the seven time points and 155 changes from car share to car alone. There were 61 changes from car alone to cycling, and 64 changes from cycling to car alone. The switches between car alone and car share, and between car alone and cycling (in either direction), were the most numerous pair-wise changes.

On each occasion when respondents indicated that their normal mode was different to that reported at a previous wave, they were asked to provide a brief explanation in their own words of why they had changed their normal mode since the last survey. The explanations given suggested that in many cases commuters did not have a single mode that they used every time, but rather that they mixed modes over time (during the working week or at different times of year). In other words,

a change in normal mode reflected a change in the balance of modes that they used rather than a complete change in how they got to work.

This was corroborated by analysis of the one-week commuting diaries collected from the panel survey, which revealed a high degree of modal mixing. For example, in wave 1, 11% of respondents solely cycled to work during the survey week, but 23% of respondents reported cycling on at least one day. In wave 1, 39% of respondents solely drove alone, but 61% of respondents drove alone on at least one day.

In order to better understand why panel members made changes to their normal mode, and to explore the self-reported explanations for these changes, a sub-set of participants was selected for more detailed analysis. To select a group of interest, the sequence of modes used across waves ('run pattern') by each panel participant was identified, concentrating on those respondents who had participated in all six waves plus the March 2014 baseline (658 participants). The run patterns identified 37 people who changed their normal mode from car alone to cycling, or vice versa, at least once during the study. The responses of these individuals were selected for further analysis because the quantitative analysis had shown change between car alone and cycling was the second most common mode change. The most common mode change was from car alone to car share, or vice versa, but this was considered to be of less interest for the SES Case Study because respondents' open comments suggested that these changes occurred largely as a result of changes in the commute routines of friends, family members and colleagues.

Thematic qualitative analysis of the open survey responses revealed four distinct categories of reasons for changing from cycling to car, or the reverse:

- Occurrence of life events
- Variations in day-to-day life
- Changes in access to cars and bicycles
- Changes in external conditions

Life events, such as job changes or children starting school, and day-to-day variations in work or family routines, are change factors within an individual's personal realm. Such factors were often given prime importance in respondents' accounts. Changes in access to cars and vehicles also usually took place within an individual's personal realm (e.g. the breakdown of a private car, or the purchase of bicycle). External conditions represent changes to the context in which travel decisions take place. Seasonal changes in the weather and hours of daylight were the most commonly cited external reasons given for change to and from cycling. However, this category also included changes to transport services and systems, including measures taken by local authorities and employers to discourage solo car-use (e.g. parking restrictions), and encourage use of other modes (e.g. cycling information, events and on-site facilities).

Whilst changes in parking arrangements or a change in traffic congestion were crucial factors for some, contextual factors (such as LSTF measures) generally played a supporting rather than a decisive role in prompting mode change – that is, they were secondary to occurrences within the

personal realm. However, interventions to encourage cycling, such as improved cycle paths and onsite facilities, and events/competitions, were an additional motivating factor for some respondents who switched to (more) cycling. Weather, safety concerns and cycling accidents all played a strong role in motivating switches to (more) driving.

An analysis was carried out of the panel survey data to investigate if transitions away from driving alone between waves were associated with exposure to LSTF interventions and other personal circumstances. It is fully reported in a paper published in the European Journal of Transport and Infrastructure Research⁵⁷. The analysis was based on the one-week commuting diaries which collected the main mode of transport used on each day a respondent had worked during the week of the survey wave. At each wave respondents were categorised into three groups: only used car alone to commute to work (car alone); partially used car alone to commute to work along with other modes (partial car alone); and not used car alone to commute to work (no car alone). The analysis was performed on respondents from both North Fringe and Ports areas.

Table 5-36 shows the frequency of transitions between car alone commuting groups across four different wave-pairs (wave 1 to 2, wave 2 to 3, wave 3 to 4, wave 4 to 5) for all valid cases where responses were received from panel participants at consecutive waves.

Table 5-36: Panel survey transition frequencies between car alone commuting groups

Transition	Wave 2		Wave 3		Wave 4		Wave 5		Pooled	
	n	%	n	%	n	%	n	%	n	%
car alone to car alone	336	31	373	31	357	31	330	32	1396	31.48
car alone to partial car alone	64	6	50	4	63	5	43	4	220	4.96
car alone to no car alone	16	1	16	1	14	1	2	0	48	1.08
Subtotal	416		439		434		375		1664	
partial car alone to partial car alone	131	12	169	14	167	15	146	14	613	13.82
partial car alone to car alone	56	5	79	7	49	4	49	5	233	5.25
partial car alone to no car alone	58	5	60	5	58	5	57	6	233	5.25
Subtotal	245		308		274		252		1079	
no car alone to no car alone	333	31	372	31	369	32	324	32	1398	31.52
no car alone to car alone	11	1	9	1	18	2	12	1	50	1.13
no car alone to partial car alone	63	6	66	6	56	5	59	6	244	5.50
Subtotal	407		447		443		395		1692	
Missing	421		234		153		145		2422	
Total (excluding missing)	1068	100	1194	100	1151	100	1022	100	4435	100

⁵⁷ Chatterjee, K., Clark, B. and Bartle, C. (2016). Commute mode choice dynamics: Accounting for day-to-day variability in longer term change. European Journal of Transport and Infrastructure Research, 16(4), 713-734. Available from <http://tlo.tbm.tudelft.nl/ejtir>

It is apparent that transitions from car alone commuting to partial car alone commuting were more likely than from car alone commuting to no car alone commuting. Similarly, transitions from no car alone commuting to partial car alone commuting were more likely than from no car alone commuting to car alone commuting. Transitions from partial car alone commuting were equally probable to either of the other groups. Probabilities of transitions appear to be consistent over time.

Multinomial logit models were estimated with Stata 13 for each of the three groups to identify associations between independent variables and transitions to other groups (the reference group is stay in the same group). The data has been pooled. For example, for transitions from the car alone group all wave-pairs have been considered where the commuter started in the car alone group (and for which there was a valid response at the next wave)⁵⁸.

The following different types of independent variables were tested:

- Demographic and employment characteristics - fixed (time constant) dummy variables.
- Access to mobility resources - dummy variables for access to car and bicycle at the second observation period.
- Commute journey characteristics – fixed variables based on employer (employment location and car parking spaces per employee) and variables measured at second observation period for commute distance and worked in another location during survey week and measured at first observation period for satisfaction with commuting.
- Season of year - dummy variables for season at second observation period.
- Sustainable transport promotion - dummy variables for sustainable transport promotional visit to workplace between first and second observation period (based on employer) and individually reported awareness of recent sustainable transport measures at second observation period.
- Life events - dummy variables for individuals who had changed workplace (but not employer) and moved home between first and second observation period.

No statistically significant association was found between sustainable transport promotion visits to the workplace and any of the transitions. However, individually reported awareness of sustainable transport measures increased probability of a transition from car alone commuting to partial car alone commuting by 1.46 times (significant at 95% confidence level) and from partial car alone commuting to no car alone commuting by 1.47 times (significant at 95% confidence level)⁵⁹. This suggests that sustainable transport measures can facilitate commuters in taking incremental steps to reduce their car alone commuting. It is acknowledged that the causal relationship is uncertain. Those

⁵⁸ The cluster option is used (in estimating the multinomial logit models) to produce robust standard error estimates which account for intra-individual correlation in outcomes.

⁵⁹ When constraining analysis to North Fringe employees, individually reported awareness of sustainable transport measures increased probability of a transition from car alone commuting to partial car alone commuting by 1.47 times (significant at 95% confidence level), and from partial car alone commuting to no car alone commuting by 1.38 times (significant at 90% confidence level).

workers making these transitions may have been prompted to do so for other reasons and actively sought information about sustainable transport options.

5.5 Impacts of specific LSTF interventions

The second research question relating to modal shift was: *What LSTF interventions have the greatest impacts on car alone mode share and how is this affected by context (e.g. characteristics of location, employer, and employees)?* This is answered with reference to the 2016 employee travel survey, the panel survey and the 2014 and 2015 bus user surveys.

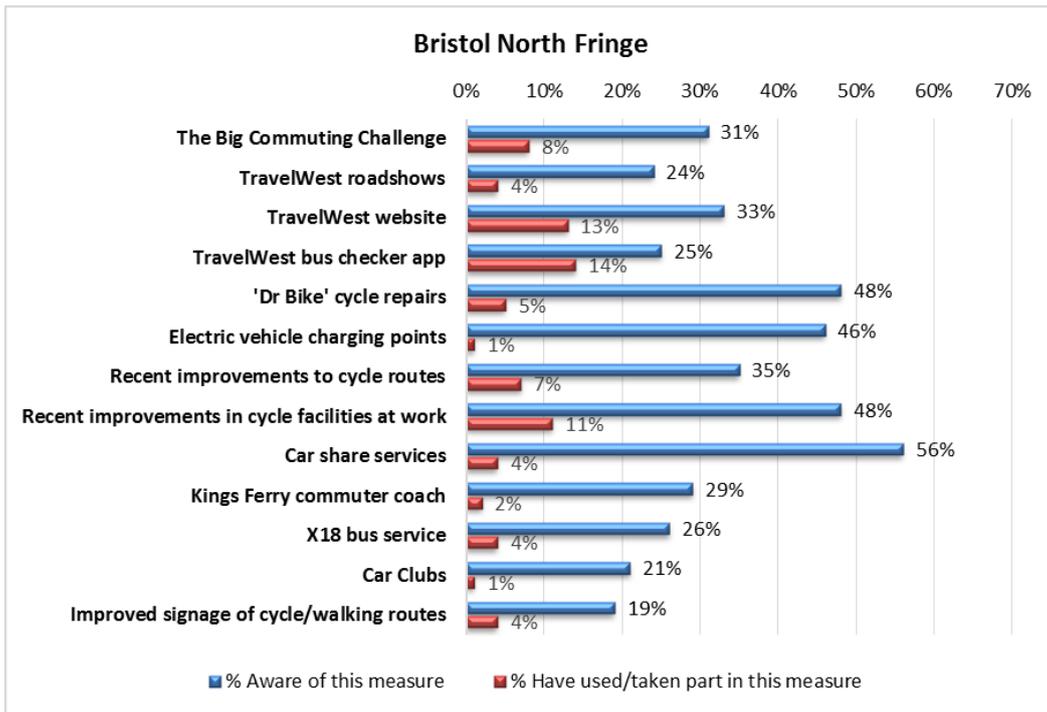
5.5.1 Awareness and use of specific LSTF measures

Figure 5-7 and Figure 5-8 show the proportion of the 2016 employee travel survey samples who reported that they were aware of individual LSTF-supported measures, and the proportion who reported that they had used or participated in them. It is subsequently reported to what extent survey respondents reported that LSTF measures influenced how they travelled to work.

The measure to have attracted the greatest awareness was car-share services (56% and 38% respectively in North Fringe and Ports area). Awareness levels of new bus services serving the North Fringe and Ports area varied from 12% to 29%. Cycling-related measures attracted high levels of awareness. In the North Fringe, 48% of respondents were aware of the 'Dr Bike' repair services, and the same proportion was aware of improvements to on-site cycle facilities at work. The latter reflected both investments made by employers themselves and LSTF employer grants awarded to support improvements such as new cycle parking, changing facilities and lockers. In the Ports area, where fewer LSTF grants had been awarded and fewer employees cycled to work, awareness of improvements to on-site facilities was lower at 27%. In the Ports area, 27% of respondents were aware of recent improvements to local cycle routes, compared with 35% in the North Fringe (which had benefitted from the building of a more extensive cycle route network over a longer period). 31% of North Fringe respondents were aware of the 'Big Commuting Challenge' – an annual competition to encourage all forms of sustainable travel.

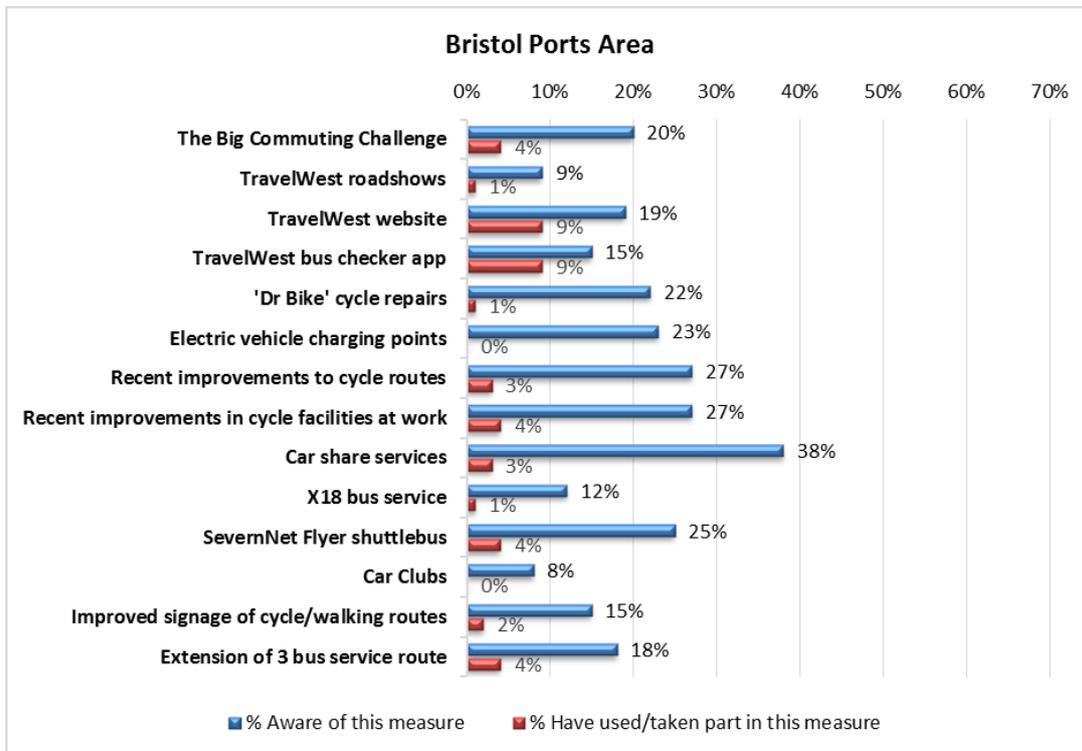
Levels of usage of LSTF measures were considerably lower than levels of awareness. The proportion of respondents who had used individual services or facilities, or participated in an event, varied from 0% to 14%. 11% of respondents in the North Fringe had used improved cycling facilities at work. This is consistent with the previously reported relatively high (and increasing) levels of cycling in the North Fringe. Levels of awareness and usage were more closely aligned for measures such as the new 'bus checker app' for smart phones (25% aware and 14% used in North Fringe).

Figure 5-7: Awareness and use of LSTF measures in the North Fringe



Sample size = 5313

Figure 5-8: Awareness and use of LSTF measures in the Ports area



Sample size = 543

The panel survey also asked respondents whether they were aware of specific transport measures in their area, presenting a list of events, services and road changes. The listed measures were varied at each wave of the survey according to which measures were being applied at the time. Most of the measures listed in the 2016 employee travel survey had previously been included in waves 1 and 2 of the panel (in July and October 2014), which allows a comparison to be made across the two data sources. Table 5-37 and Table 5-38 show the percentage of respondents aware, in 2014, of some of the measures shown in Figure 5-7 and Figure 5-8 above. Among the panel respondents, the Dr Bike cycle repairs attracted the highest awareness. The awareness of different measures in 2014 of panel respondents was similar to that of the respondents to the employee travel survey in 2016.

Table 5-37: Awareness of local transport measures in wave 1 of panel survey

Measure	% respondents aware
The Big Commuting Challenge	41%
Travel West Roadshows	18%
'Dr Bike' cycle repairs	47%
Electric car charging points	18%
Recent improvements to cycle routes	26%
Recent improvements to cycle facilities where you work	32%
Car-share 'pairing' services	32%
Kings Ferry Commuter Coach (North Somerset to Bristol North Fringe)	29%

Sample size = 1526 (respondents from North Fringe and Ports areas)

Table 5-38: Awareness of local transport measures in wave 2 of panel survey

Measure	% respondents aware
TravelWest website	41%
TravelWest bus checker app	24%

Sample size = 1539 (respondents from North Fringe and Ports areas)

5.5.2 Impacts of LSTF measures on mode use

To assess which LSTF measures had the greatest impact on mode use, relationships between respondents' use of specific measures were cross-tabulated with self-reported changes in mode use based on responses to the 2016 employee travel survey. Results are reported for the North Fringe and Ports areas combined.

Table 5-39 shows these relationships in response to the question 'Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?'. Among those who had used a particular measure, the proportion using car alone less was, in most cases, greater than the proportion using car alone more (highlighted in the table). This was not the case for those who had used car share services, the x18 bus, or the SevernNet Flyer; among these groups, more were using the car more. However, absolute numbers of people who had used these services were low.

Comparing the relationships between use of individual measures and car alone use suggests that the following measures were both the most used, and also linked to a higher proportion of respondents using car alone less than using it more:

- TravelWest bus checker app: 724 had used it of whom 22% were using car alone less, compared with 18% using car alone more.
- TravelWest website: 705 had used it of whom 23% were using car alone less, and 17% using car alone more.
- Recent improvements to cycle facilities at workplace: 563 had used these of whom 32% were using car alone less, and only 14% using car alone more.
- Big Commuting Challenge: 405 had participated in this of whom 27% were using car alone less, and 16% using car alone more.
- Recent improvement to cycle routes: 347 had used these of whom 32% were using car alone less, and 12% were using car alone more.

In two of the above cases (improvements to on-site cycle facilities, and improvements to cycle routes) the proportion of respondents using the car less also exceeded the proportion using it the same amount.

When use of specific LSTF measures was cross-tabulated with reported changes in use of relevant, modes (e.g. use of workplace cycling facilities with changes in cycling levels) a stronger association could be seen. For example, 39% of those who had used on-site cycling facilities were cycling to work more often, compared with 16% who were cycling less and 39% who were cycling the same amount.

These associations do not, of course, suggest a direction of causality. Respondents to 2016 employee travel survey were directly asked whether LSTF measures had made a difference to the way they travelled to work. To get a stronger indication of causality, self-reported changes in car alone use were cross-tabulated with respondents' perceptions of whether LSTF measures had made a difference to the way they travelled to work.

Table 5-40 shows that 2.5% (133) of the 5222 respondents from the North Fringe and Ports areas who answered this question said they had made a large difference and 14.5% (757) said they had made a little difference. Of those respondents who reported using car alone less than two years ago, 29% said that the listed measures had made a little, or a lot, of difference to the way they travel to work. However, 64% said that the measures had made no difference. To put this in the context of the overall response, the 290 respondents who were driving to work (alone) less than two years ago, and who also said that LSTF measures had made a difference to their commute, constituted 5% of the total survey sample (of 5856 respondents).

When changes in car use were cross-tabulated with the influence of measures among respondents who had used specific initiatives, a closer relationship was found. For example, among those who had used on-site cycling facilities and were also driving to work less often, 58% said the listed measures had made a little, or a lot, of difference, compared with only 37% who said they had made no difference. However, only 105 people were in this category, constituting 2% of the total sample. This indicates that specific measures had a positive influence on reducing car use among a small proportion of individuals.

Table 5-39: LSTF measures used cross-tabulated with self-reported change in car alone use

LSTF Measure	Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?										
		Use more		Use less		Use the same		Have not used		Total	
		N	%	N	%	N	%	N	%	N	%
Have used TravelWest website	No	948	22.4%	792	18.7%	1856	43.8%	644	15.2%	4240	100.0%
	Yes	119	16.9%	159	22.6%	225	31.9%	202	28.7%	705	100.0%
	Total	1067	21.6%	951	19.2%	2081	42.1%	846	17.1%	4945	100.0%
Have used The Big Commuting Challenge	No	1018	22.2%	855	18.7%	1975	43.1%	735	16.0%	4583	100.0%
	Yes	66	16.3%	109	26.9%	117	28.9%	113	27.9%	405	100.0%
	Total	1084	21.7%	964	19.3%	2092	41.9%	848	17.0%	4988	100.0%
Have used TravelWest roadshows	No	1033	21.8%	907	19.2%	2011	42.5%	781	16.5%	4732	100.0%
	Yes	33	17.0%	45	23.2%	60	30.9%	56	28.9%	194	100.0%
	Total	1066	21.6%	952	19.3%	2071	42.0%	837	17.0%	4926	100.0%
Have used Recent improvements to cycle routes	No	1026	22.4%	835	18.2%	1983	43.3%	740	16.1%	4584	100.0%
	Yes	40	11.5%	110	31.7%	93	26.8%	104	30.0%	347	100.0%
	Total	1066	21.6%	945	19.2%	2076	42.1%	844	17.1%	4931	100.0%
Have used Improved signage of cycle/walking routes	No	1025	22.1%	857	18.4%	1996	42.9%	770	16.6%	4648	100.0%
	Yes	27	12.6%	81	37.7%	42	19.5%	65	30.2%	215	100.0%
	Total	1052	21.6%	938	19.3%	2038	41.9%	835	17.2%	4863	100.0%
Have used TravelWest bus checker app	No	922	22.1%	787	18.9%	1836	44.0%	627	15.0%	4172	100.0%
	Yes	132	18.2%	158	21.8%	219	30.2%	215	29.7%	724	100.0%
	Total	1054	21.5%	945	19.3%	2055	42.0%	842	17.2%	4896	100.0%
Have used 'Dr Bike' cycle repairs	No	1042	22.0%	902	19.0%	2022	42.7%	770	16.3%	4736	100.0%
	Yes	48	18.5%	64	24.6%	71	27.3%	77	29.6%	260	100.0%
	Total	1090	21.8%	966	19.3%	2093	41.9%	847	17.0%	4996	100.0%

LSTF Measure (continued)	Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?										
		Use more		Use less		Use the same		Have not used		Total	
		N	%	N	%	N	%	N	%	N	%
Have used Electric vehicle charging points	No	1054	21.6%	941	19.3%	2057	42.1%	830	17.0%	4882	100.0%
	Yes	6	15.8%	7	18.4%	13	34.2%	12	31.6%	38	100.0%
	Total	1060	21.5%	948	19.3%	2070	42.1%	842	17.1%	4920	100.0%
Have used Recent improvements in cycle facilities where I work	No	983	22.5%	772	17.7%	1912	43.7%	705	16.1%	4372	100.0%
	Yes	81	14.4%	182	32.3%	168	29.8%	132	23.4%	563	100.0%
	Total	1064	21.6%	954	19.3%	2080	42.1%	837	17.0%	4935	100.0%
Have used Car share services	No	1011	21.3%	895	18.9%	2022	42.6%	813	17.1%	4741	100.0%
	Yes	65	29.1%	59	26.5%	73	32.7%	26	11.7%	223	100.0%
	Total	1076	21.7%	954	19.2%	2095	42.2%	839	16.9%	4964	100.0%
Have used Kings Ferry commuter coach	No	1040	21.7%	916	19.1%	2017	42.1%	822	17.1%	4795	100.0%
	Yes	19	19.6%	19	19.6%	42	43.3%	17	17.5%	97	100.0%
	Total	1059	21.6%	935	19.1%	2059	42.1%	839	17.2%	4892	100.0%
Have used X18 bus service	No	1018	21.6%	902	19.2%	2001	42.5%	786	16.7%	4707	100.0%
	Yes	47	25.7%	36	19.7%	44	24.0%	56	30.6%	183	100.0%
	Total	1065	21.8%	938	19.2%	2045	41.8%	842	17.2%	4890	100.0%
Have used SevernNet Flyer shuttlebus	No	1043	21.7%	921	19.2%	2021	42.0%	824	17.1%	4809	100.0%
	Yes	6	21.4%	5	17.9%	8	28.6%	9	32.1%	28	100.0%
	Total	1049	21.7%	926	19.1%	2029	41.9%	833	17.2%	4837	100.0%
Have used Car Clubs	No	1044	21.8%	910	19.0%	2024	42.3%	810	16.9%	4788	100.0%
	Yes	6	8.3%	22	30.6%	18	25.0%	26	36.1%	72	100.0%
	Total	1050	21.6%	932	19.2%	2042	42.0%	836	17.2%	4860	100.0%
Have used Extension of 3 bus service route	No	1038	21.7%	915	19.2%	2009	42.1%	815	17.1%	4777	100.0%
	Yes	7	14.6%	13	27.1%	8	16.7%	20	41.7%	48	100.0%
	Total	1045	21.7%	928	19.2%	2017	41.8%	835	17.3%	4825	100.0%

Sample size = 5856 (both North Fringe and Ports areas); Missing cases = vary by LSTF measure

Table 5-40: Change in car alone use cross-tabulated with influence of local transport initiatives

Has the amount you travelled as a car driver (alone) changed compared with 2 years ago?		Overall, how much difference, if any, have these local transport initiatives made to the way you travel to work over the past two years?				Total
		A lot of difference	A little difference	No difference	Don't know	
Use more	N	25	151	866	102	1144
	%	2.2%	13.2%	75.7%	8.9%	100.0%
Use less	N	62	228	649	69	1008
	%	6.2%	22.6%	64.4%	6.8%	100.0%
Use the same	N	18	184	1892	115	2209
	%	.8%	8.3%	85.6%	5.2%	100.0%
Have not used	N	28	194	552	87	861
	%	3.3%	22.5%	64.1%	10.1%	100.0%
Total	N	133	757	3959	373	5222
	%	2.5%	14.5%	75.8%	7.1%	100.0%

Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 624

5.5.3 Impacts of LSTF-supported bus services

The surveys carried out on the LSTF-supported X18 and Kings Ferry bus/coach services in 2014 and 2015 provided an additional source of information on the influence of these two services on car use. Passengers were asked in the survey how they were making their journey before the introduction of the X18 or Kings Ferry service and results are reported next for passengers travelling in the morning peak for the purposes of employment on inbound trips to the North Fringe.

Table 5-41 shows about one half of survey respondents in 2014 reported having previously made the trip by car for both X18 and Kings Ferry services (53% and 55% respectively). In 2015, this continued to be the case with regard to Kings Ferry users (47%). One in five Kings Ferry respondents had not made the journey before in 2015 (20%). This suggests that the Kings Ferry service was effective at both attracting car users, and also at providing a link from North Somerset to the North Fringe which did not exist before for some passengers.

In 2015 the proportion of X18 respondents who reported having switched from the car fell to 4%. The largest proportions were those who had not made the journey before the introduction of the service (47%), or had switched from using another bus service (40%). This suggests that initially the service was attractive mainly to car users, but subsequently it attracted users of other bus services and people not previously making journeys to the North Fringe.

Table 5-41: Previous mode of travel amongst bus survey respondents

All			X18			Kings Ferry		
Previous mode	N	%	Previous mode	N	%	Previous mode	N	%
2014								
Car	35	53.8	Car	18	52.9	Car	17	54.8
Car share	5	7.7	Car share	5	14.7	Car share	0	0
Other bus	6	9.2	Other bus	3	8.8	Other bus	3	9.7
Rail	8	12.3	Rail	0	0	Rail	8	25.8
Cycle	1	1.5	Cycle	1	2.9	Cycle	0	0
Walk	0	0	Walk	0	0	Walk	0	0
Didn't make trip	10	15.4	Didn't make trip	7	20.6	Didn't make trip	3	9.7
Total	65		Total	34		Total	31	
2015								
Car	26	26.5	Car	2	4.3	Car	24	47.1
Car share	4	4.1	Car share	1	2.1	Car share	3	5.9
Other bus	27	27.6	Other bus	19	40.4	Other bus	8	15.7
Rail	5	5.1	Rail	0	0	Rail	5	9.8
Cycle	2	2.0	Cycle	1	2.1	Cycle	1	2.0
Walk	1	1.0	Walk	1	2.1	Walk	0	0
Didn't make trip	32	32.7	Didn't make trip	22	46.8	Didn't make trip	10	19.6
Total	98		Total	47		Total	51	

The long-term viability of the two LSTF-funded bus services depended upon their ability to attract sufficient users. Patronage data demonstrated that the X18 service experienced a steady growth in passengers after its launch in December 2012 (as part of the Key Commuter Routes LSTF programme) up to February 2015 (when the last data was available) (see Chart 1 in Appendix 12). The Kings Ferry service experienced initially high patronage when it was introduced in November 2013, which fell at the end of the two-month promotional free travel period introduced at the service's inception (see Chart 2 in Appendix 12). Following this initial decline, the Kings Ferry Commuter Coach service saw a moderate increase in patronage up to March 2015 (when the last data was available). The evidence suggests that both services were successful in attracting car commuters to the North Fringe and that moderate growth in users was sustained over time. Since March 2015, subsidies for both of these bus services were no longer available. The Kings Ferry service was transferred to a new operator and new timetables and routes introduced (lengthening journey time). By early 2017, the service had ceased to operate. The X18 service continued with some adjustments to its routing and timetable to account for changes in employment patterns in the North Fringe (in particular the move of NHS North Bristol staff from the Frenchay site to the Southmead site), but had also ceased to operate by early 2017.

5.5.4 Contextual factors

As previously reported in section 5.4.1, regression analysis showed that individuals working for employers where car parking spaces per employee had fallen substantially in 2016 had a decreased probability of car alone commuting, and an increased probability of cycling and bus use compared to individuals working at other employers. The NHS Trust and the University, where parking restraints had increased over the two years, had both also benefitted from particularly intensive support from the LSTF business engagement programme; they had, for example, received multiple visits from the TravelWest roadshow teams and Dr Bike, and had each received several employer grants. Both had also made substantial investments themselves to encourage sustainable travel, for example, through active engagement with, and subsidising of, bus services. Both were located in areas benefitting from more bus services and cycle routes compared with the other sub-areas within the study.

With one exception, all other employers with relatively low levels of baseline car mode share (50% or less) already had some degree of parking management in place before 2014 – often related to planning restrictions. All these employers were located in areas of the North Fringe. All were in areas with relatively heavy congestion at peak times. These employers have been particularly active in taking their own steps to encourage sustainable transport use among their staff, and alongside this had been enthusiastic to engage with the LSTF and the SusCom business network. In turn, they had benefitted from greater support from the LSTF than those which were less engaged.

The Ports area businesses experienced fewer constraints on parking, but also suffered from heavy congestion into and out of the area at peak times. As was evident from the interviews with senior managers (reported in chapter 6), car commuting continued to be seen as the norm in this area. Overall, the SES Case Study businesses in the Ports area perceived a less urgent need for sustainable commute options than those in the North Fringe, were less engaged with the LSTF, and had benefitted from fewer LSTF measures.

5.6 Changes in satisfaction with the journey to work

The third research question relating to modal shift was: *What changes in perceptions and attitudes towards low carbon travel alternatives are found to occur for employees working for businesses in strategic employment sites and how is this affected by exposure to LSTF interventions?* This has mainly been answered by responses obtained on satisfaction with the journey to work from the employee travel surveys.

5.6.1 Satisfaction with the journey to work by mode

Table 5-42 and Table 5-43 show satisfaction with the journey to work by mode for 2014 and 2016 respectively. Results are for respondents from both North Fringe and Port areas. Respondents who walked or cycled were most satisfied with their journey to work in both years. Among those who walked, 45% were very satisfied in both 2014 and 2016, and a further 31% were quite satisfied in both years. Cyclists were not quite as happy as walkers, with 28% very satisfied in 2014 and 27% very satisfied in 2016. These results suggest that there was very little change in the positive attitudes of these mode users.

The mode groups where the greatest changes in satisfaction levels occurred were bus and train travellers. The proportion of public bus users who were either very satisfied or quite satisfied rose from 31% in 2014 to 38% in 2016. The proportion who were either quite dissatisfied or very dissatisfied fell from 47% to 41%, but nonetheless bus travellers remained the most dissatisfied of all mode user groups. Among train travellers, the share of those either very satisfied or quite satisfied increased from 41% to 45%, whilst the proportion of those quite dissatisfied or very dissatisfied fell from 37% to 31%. Overall, the evaluation period saw a positive change in satisfaction with their commutes among public transport users.

Among car alone commuters and car sharers, the share of those quite satisfied or very satisfied remained similar over the two years, but there was a rise in those either quite or very dissatisfied. For car alone commuters, this category increased from 27% to 35%, and for car sharers it rose from 30% to 37%. By 2016, these levels were almost as high as those for bus users.

The transition analysis undertaken using diary data from the panel survey, and described in section 5.4.3, showed that satisfaction with the journey to work of those that mixed driving alone and use of other modes was associated with increased probability of switching to full non-car alone commuting. This indicates that satisfaction with the journey to work can encourage mode change.

Table 5-42: Satisfaction with the journey to work by mode in 2014

How satisfied or dissatisfied are you with your journey to work? 2014		How do you normally travel to work?										
		Car (alone)	Car share	Motor-bike/scooter	Cycle	Walk	Bus/coach	Employer bus/coach	Train	Work from home	Other	Total
Very satisfied	N	650	145	26	330	267	21	8	35	5	16	1503
	%	13.4%	10.2%	15.1%	27.8%	45.2%	4.8%	9.1%	7.5%	31.3%	17.0%	16.1%
Quite satisfied	N	1474	421	67	546	181	115	35	156	4	31	3030
	%	30.3%	29.6%	39.0%	46.0%	30.6%	26.3%	39.8%	33.5%	25.0%	33.0%	32.4%
Neither	N	1434	429	46	183	96	98	25	101	4	23	2439
	%	29.5%	30.1%	26.7%	15.4%	16.2%	22.4%	28.4%	21.7%	25.0%	24.5%	26.1%
Quite dissatisfied	N	945	321	20	107	36	134	17	125	2	18	1725
	%	19.4%	22.5%	11.6%	9.0%	6.1%	30.6%	19.3%	26.8%	12.5%	19.1%	18.5%
Very dissatisfied	N	359	108	13	22	11	70	3	49	1	6	642
	%	7.4%	7.6%	7.6%	1.9%	1.9%	16.0%	3.4%	10.5%	6.3%	6.4%	6.9%
Total	N	4862	1424	172	1188	591	438	88	466	16	94	9339
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sample size = 9684 (both North Fringe and Ports areas); Missing cases = 345 (3.6%)

Table 5-43: Satisfaction with the journey to work by mode in 2016

How satisfied or dissatisfied are you with your journey to work? 2016		How do you normally travel to work?										
		Car (alone)	Car share	Motor-bike/scooter	Cycle	Walk	Bus/coach	Employer bus/coach	Train	Work from home	Other	Total
Very satisfied	N	361	87	28	222	195	28	6	19	5	9	960
	%	12.9%	12.1%	22.0%	26.5%	45.5%	6.9%	14.3%	7.7%	55.6%	27.3%	17.0%
Quite satisfied	N	845	198	39	392	135	125	15	92	1	9	1851
	%	30.3%	27.5%	30.7%	46.7%	31.5%	30.9%	35.7%	37.2%	11.1%	27.3%	32.8%
Neither	N	601	167	39	120	61	88	11	59	3	5	1154
	%	21.5%	23.2%	30.7%	14.3%	14.2%	21.7%	26.2%	23.9%	33.3%	15.2%	20.4%
Quite dissatisfied	N	646	177	15	83	24	113	9	63	0	7	1137
	%	23.1%	24.5%	11.8%	9.9%	5.6%	27.9%	21.4%	25.5%	0.0%	21.2%	20.1%
Very Dissatisfied	N	339	92	6	22	14	51	1	14	0	3	542
	%	12.1%	12.8%	4.7%	2.6%	3.3%	12.6%	2.4%	5.7%	0.0%	9.1%	9.6%
Total	N	2792	721	127	839	429	405	42	247	9	33	5644
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 212 (3.6%)

5.6.2 Satisfaction with the journey to work and LSTF measure awareness and use

This section considers whether there was an association between journey to work satisfaction and exposure to LSTF interventions, by cross-tabulating respondents' satisfaction with the journey to work with their awareness and use of LSTF measures (from the 2016 employee travel survey).

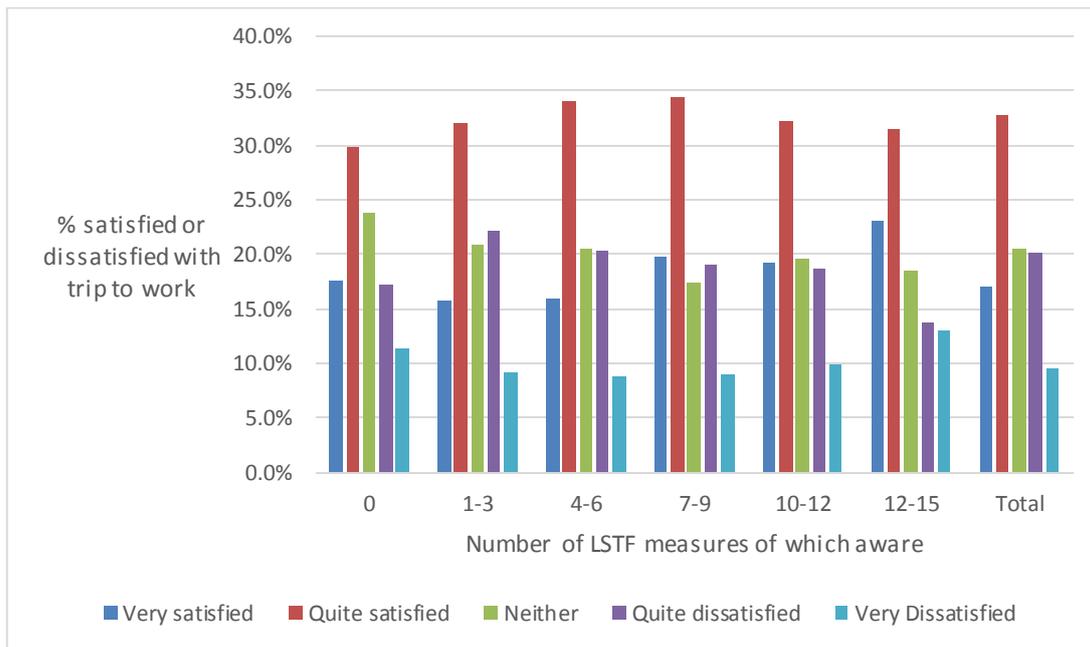
Table 5-44 shows the number and proportion of respondents who were satisfied or dissatisfied with their commute according to the number of LSTF measures of which they were aware. Numerically, the largest groups were those who were aware of 1 to 3, or 4 to 6 measures, but levels of satisfaction were spread reasonably evenly within each group - Figure 5-9 shows this graphically. The proportion of those who were 'very satisfied' was higher among those aware of at least 7-9 measures. Overall, however, there is no strong association between awareness of LSTF measures and commute satisfaction with a Chi-square test showing that the relationship is not significant.

Table 5-44: Satisfaction with the journey to work and awareness of LSTF measures

How satisfied or dissatisfied are you with your journey to work?		Number of LSTF measures of which aware						Total
		0	1-3	4-6	7-9	10-12	12-15	
Very satisfied	N	143	287	274	192	66	30	992
	%	17.6%	15.7%	16.0%	19.9%	19.4%	23.1%	17.1%
Quite satisfied	N	243	585	585	334	110	41	1898
	%	29.9%	32.1%	34.1%	34.5%	32.3%	31.5%	32.8%
Neither	N	193	380	354	168	67	24	1186
	%	23.8%	20.8%	20.6%	17.4%	19.6%	18.5%	20.5%
Quite dissatisfied	N	140	406	351	185	64	18	1164
	%	17.2%	22.2%	20.4%	19.1%	18.8%	13.8%	20.1%
Very Dissatisfied	N	93	167	153	88	34	17	552
	%	11.5%	9.2%	8.9%	9.1%	10.0%	13.1%	9.5%
Total	N	812	1825	1717	967	341	130	5792
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 64 (1.1%)

Figure 5-9: Satisfaction with the journey to work and awareness of LSTF measures



Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 64 (1.1%)

Table 5-45 and Figure 5-10 suggest that there is an association, however, between commute satisfaction and the number of LSTF measures which respondents have used. The proportion of respondents who were quite satisfied or very satisfied increases as the number of measures used rises. However, the number of respondents using 4 to 6 measures or more is small. Sixty three percent of respondents had not used any measures at all (compared with only 14% who were not aware of any measures). A Chi-square test showed that this relationship is highly significant ($p < 0.000$).

The association between higher commute satisfaction and greater use of LSTF measures might be explained by the previous observation that cyclists have a higher than average propensity to be satisfied with their commute, and are also more likely to have benefitted directly from the listed LSTF measures. Sixty six percent of those who had cycled to work on the day of the survey had used between 1 and 6 measures, compared with only 36% across the sample as a whole.

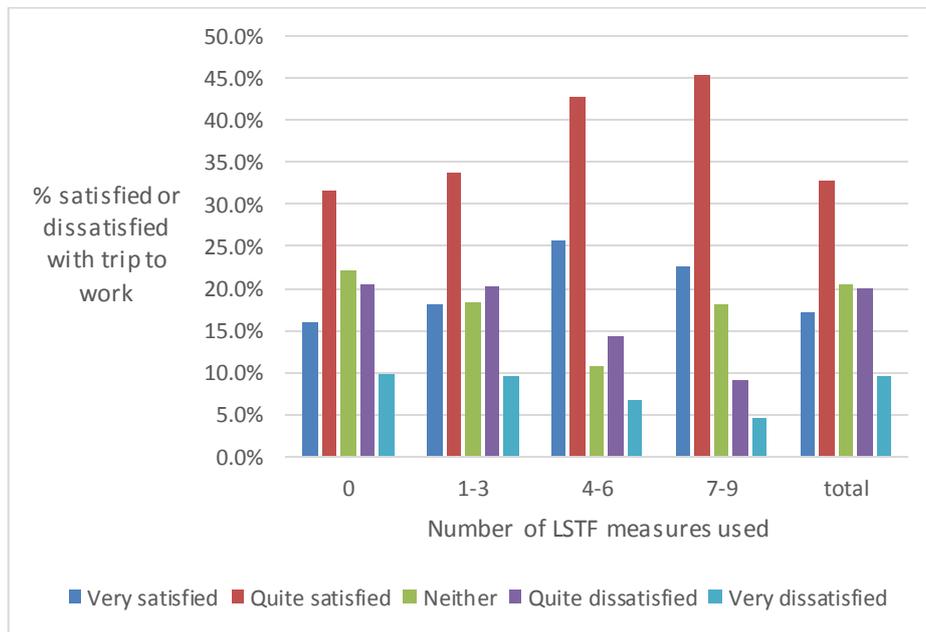
Those who had travelled to work by public bus in 2016 had also used a higher than average number of measures, with 61% having used between 1 and 6. It was noted in the previous section that although commute satisfaction was still relatively low among bus users, it had increased by 5 percentage points between 2014 and 2016.

Table 5-45: Satisfaction with the journey to work and number of LSTF measures used

How satisfied or dissatisfied are you with your journey to work?		Number of LSTF measures used					Total
		0	1-3	4-6	7-9	10-12	
Very satisfied	N	586	335	65	5	1	992
	%	16.0%	18.1%	25.7%	22.7%	50.0%	17.1%
Quite satisfied	N	1156	624	108	10	0	1898
	%	31.5%	33.7%	42.7%	45.5%	0.0%	32.8%
Neither	N	816	339	27	4	0	1186
	%	22.3%	18.3%	10.7%	18.2%	0.0%	20.5%
Quite dissatisfied	N	750	375	36	2	1	1164
	%	20.5%	20.3%	14.2%	9.1%	50.0%	20.1%
Very Dissatisfied	N	358	176	17	1	0	552
	%	9.8%	9.5%	6.7%	4.5%	0.0%	9.5%
Total	N	3666	1849	253	22	2	5792
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 64 (1.1%)

Figure 5-10: Satisfaction with the journey to work and number of LSTF measures used



Sample size = 5856 (both North Fringe and Ports areas); Missing cases = 64 (1.1%)

5.6.3 Satisfaction with the journey to work of passengers using LSTF-supported bus services

The surveys carried out among passengers of the two new LSTF-supported services in 2014 and 2015 offer an additional view of satisfaction levels among bus users. Overall satisfaction levels with these two services were considerably higher than the satisfaction levels with public bus services in general as revealed by the results of the 2014 and 2016 employee travel survey (see Table 5-42 and Table 5-43).

Table 5-46 shows that in 2015, the majority of passengers (76%) were either satisfied or very satisfied with the services. This is an increase of 11% points in overall general satisfaction since 2014. This increase in general satisfaction could be largely attributed to improvements on the X18 service; 51% identified themselves as satisfied or very satisfied in 2015, compared to 41% in 2014. However, punctuality and frequency were a cause of dissatisfaction to some users of the X18. Satisfaction of Kings Ferry Commuter Coach users was high in both years, with 100% of passengers reporting themselves as satisfied or very satisfied. This demonstrates that the objective of establishing public transport services that were rated highly by commuters was achieved.

Table 5-46: Satisfaction with overall standard of service of LSTF-supported bus services

All			X18			Kings Ferry		
Satisfaction	N	%	Satisfaction	N	%	Satisfaction	N	%
2014								
Very satisfied	22	29.3	Very satisfied	0	0	Very satisfied	22	71.0
Satisfied	27	36.0	Satisfied	18	40.9	Satisfied	9	29.0
Neutral	21	28.0	Neutral	21	47.7	Neutral	0	0
Dissatisfied	5	6.7	Dissatisfied	5	11.4	Dissatisfied	0	0
Very dissatisfied	0	0	Very dissatisfied	0	0	Very dissatisfied	0	0
Total	75		Total	44		Total	31	
2015								
Very satisfied	45	44.6	Very satisfied	6	12.2	Very satisfied	39	75.0
Satisfied	32	31.7	Satisfied	19	38.8	Satisfied	13	25.0
Neutral	19	18.8	Neutral	19	38.8	Neutral	0	0.0
Dissatisfied	5	5.0	Dissatisfied	5	10.2	Dissatisfied	0	0.0
Very dissatisfied	0	0.0	Very dissatisfied	0	0.0	Very dissatisfied	0	0.0
Total	101		Total	49		Total	52	

5.7 Modal shift summary

As shown in Table 5-26, there were statistically significant decreases in mode share for car alone (2.3% points) and car sharing (2.4% points) among North Fringe employees between March 2014 and March 2016. There were statistically significant increases in mode share for cycling (2.0% points), walking (1.1% points) and bus use (2.6% points). There were minimal changes in mode share among Ports area employees. After accounting for differences in sample characteristics in the two survey years, it was deduced that the probability of driving alone was 8% less likely in 2016 for North Fringe employees and the probability of using bus was 35% more likely (both statistically significant), but changes in probability of using other modes were not statistically significant.

Looking at longer-term trends in mode share it was apparent that there was a more substantial reduction in car alone mode share of 4% points between March 2013 and March 2014 among North Fringe employees. This indicates that the WEST LSTF programme might have had a greater impact in its first year after which there was sustained impact at a lower level. It is also notable that reductions in single occupancy car use after 2013 in the North Fringe occurred against a backdrop of petrol price reductions, of a national trend of increasing car use and a regional trend of increasing car commuting.

To assess the role of the WEST programme in contributing to the mode share outcomes identified above, a number of matters should be considered. Firstly, a reduction in single occupancy car-use between March 2014 and March 2016 was statistically significant at only three out of 20 SES Case Study employers, all located in the North Fringe (single occupancy car-use increased among employers in the Ports area). Reductions in car parking availability had occurred at two of these employers (NHS Trust and University). Moreover, the NHS Trust was in some ways untypical because it had undergone a major site relocation in 2014 (after the March 2014 survey). Further analysis of the employee travel survey data showed that changes in mode share between March 2014 and March 2016 were explained well by changes in parking availability (Table 5-26 shows that changes in probability of car along commuting and bus commuting were no longer statistically significant after accounting for changes in parking availability) and not by the extent of exposure to LSTF measures (as measured at the employer level).

In exploring further whether there was evidence of a direct relationship between LSTF interventions and observed mode changes, the analysis of the employee travel survey data showed a decreased probability of car alone commuting, and increased probabilities of cycling and bus use, for individuals who used LSTF measures (but not if they were merely 'aware' of LSTF measures). This does not reveal direction of causality, although some insights into the self-reported influence of measures on individual behaviour were provided by the March 2016 employee survey. Of those respondents who reported using car alone less than two years ago, 29% said that the listed measures had made a little, or a lot, of difference to the way they travel to work. However, 64% said that the measures had made no difference. The closest associations were seen between using specific measures, e.g. on-site cycling facilities, and increasing use of the relevant mode (in this case, cycling), although the numbers involved were small.

This suggests that specific measures had a positive influence on reducing car use among a small proportion of individuals. However, LSTF measures might have helped to maintain existing levels of sustainable transport use in the face of a wider trend of increasing car mode share for commuter journeys in South-West England during the study period.

Qualitative evidence supports the view that LSTF measures had played a facilitating role in some individuals' decision to commute more often by sustainable modes, or to maintain existing use, although they were rarely reported to be the most important reasons. The narrative within many individuals' explanations of mode choice was of change or stability reflecting their own personal circumstances (e.g. moving house or job location, taking children to school, other responsibilities and interests outside work, or a desire to be more physically active).

Taken together, the results above suggest that reduction in parking availability was the chief factor in mode share changes seen between 2014 and 2016 with the LSTF programme playing an important role in facilitating mode changes of individual commuters. There is evidence of a greater reduction in single occupancy car use for employers in the North Fringe in the first part of the LSTF programme (up to March 2014) and it can be argued that the programme helped consolidate those gains in the second part of the programme (between April 2014 and March 2016).

Predicted use of sustainable travel modes in the future can be informed by commuters' levels of satisfaction with their journey to work. A comparison of respondents' levels of satisfaction with their normal mode of travel to work in March 2014 and March 2016 showed a marked increase in bus users' journey satisfaction by 2016, which suggests that the higher bus mode share demonstrated in 2016 may be maintained. However, this must be tempered by the findings that bus users were still the least satisfied group overall compared with users of other modes. The finding that those who walked or cycled remained the groups most satisfied with their commutes can be considered as a positive outcome of interventions to support these modes.

6 Findings: Economic Impacts

6.1 Overview

This chapter reports findings for the West of England strategic employment sites for the impacts on business performance of implementing sustainable transport measures (Research Aim 2). Sections 0 and 6.3 below present, respectively, findings in response to the following research questions:

- *RQ 2a: What are the impacts on business performance (objectively and subjectively measured) of the LSTF programme in terms of: (i) Operational transport issues; (ii) Commuting and staffing issues; and (iii) Productivity?*
- *RQ 2b: How do the impacts on business performance vary by type of business, location and site characteristics and exposure to LSTF interventions?*

In the West of England, these questions were addressed principally through the use of semi-structured interviews to elicit the perceptions of one or more senior managers at each of the 24 SES Case Study employers in 2014, and at each of the 21 employers which participated in 2016. In 2016, the interviewees at 11 of the businesses were with the same individual/s as in 2014; at nine employers the interview was with a manager in the same or a similar role; and one employer was new to the study.

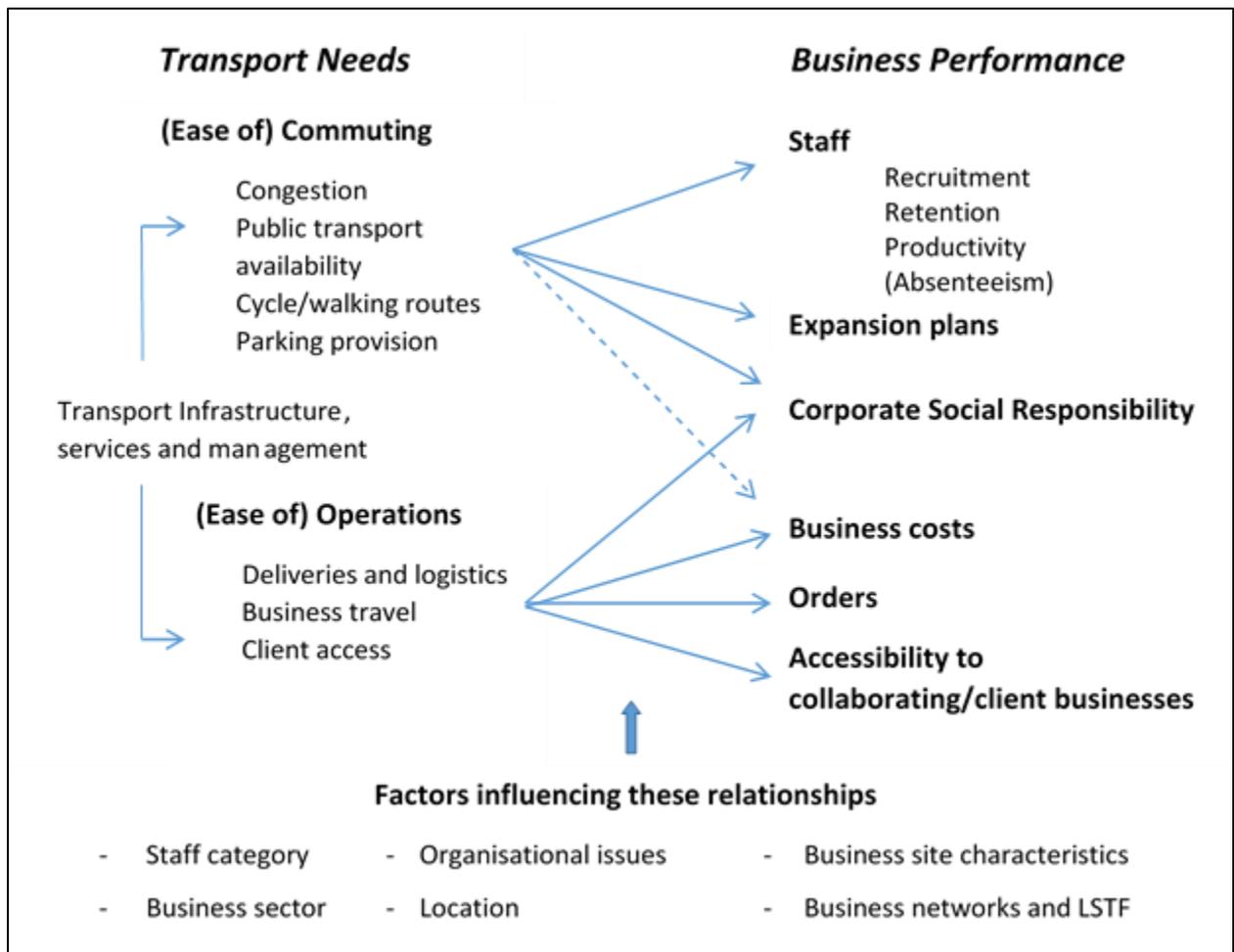
The baseline interviews (2014) explored: the level of importance attached by senior managers to transport for their business; the specific transport issues they were experiencing; and how they believed LSTF measures and other sustainable initiatives could address these. The follow-up interviews sought to identify and explore any changes in managers' perceptions over the two years, and to probe their assessment of specific LSTF and other sustainable transport measures which had been implemented during the period. A number of case examples are provided in this chapter (in text boxes), to illustrate points made in the main text in a little more depth.

Figure 6-1 summarises the ways in which transport was seen by managers to influence business performance. Relationships between transport needs and business performance were hypothesised during the development of the baseline 2014 employer interviews, informed by previous studies, and were subsequently refined during analysis of the interviews. The two main areas of transport need were categorised as Commuting and Operations. The former concerns the need for employees to be able to access their place of work, and the factors which facilitate or impede this (e.g. levels of congestion and provision of public transport services). The latter concerns transport needs arising from business operations: business travel, deliveries and client access. Both of these areas require a suitable transport infrastructure and management of that infrastructure. Section 0 presents interviewees' perceptions of these relationships at both the baseline and follow-up, and the perceived impact of LSTF interventions on these relationships.

Figure 6-1 also shows those characteristics of a business which were found, at the baseline, to influence the relationships between transport and business performance. These factors were: category of staff (job type); organisational issues (e.g. flexible working, shift work); business site characteristics (e.g. level of parking provision); business sector (e.g. knowledge-based,

manufacturing or distribution); location (e.g. how well served by public transport); and level of engagement with business networks and LSTF. Section 6.3 presents a thematic overview of these influencing factors, based on interviewees' accounts in both 2014 and 2016. It explores ways in which the variations between employers on these factors were linked to different LSTF impacts on different employers.

Figure 6-1: Schematic overview of impact of transport on business performance



6.2 Perceived impacts of sustainable transport and LSTF programme on business performance

The first research question was: What are the impacts on business performance (objectively and subjectively measured) of the LSTF programme in terms of: (i) Operational transport issues; (ii) Commuting and staffing issues; and (iii) Productivity?

To answer this question, it was helpful first to explore ways in which senior managers considered transport issues in general to affect their business performance. The relevance and role of sustainable transport interventions within this broader context could then be explored.

Senior manager interviewees expressed a variety of views as to how, and to what extent, transport affected their business performance. One managing director regarded transport as the “*oxygen of the economy*” which directly affected his business efficiency; another thought it was becoming “*increasingly more important*”; others, however, saw transport as a matter of little concern for their business. There was little change in the assessments voiced by interviewees at individual employers between 2014 and 2016, as exemplified by one of the engineering consultancies:

“Well they’re right up there with the top issues for a range of reasons really. Business efficiency - that’s important to us and an absolutely crucial question for us is the ability to attract and retain the right people and talent. The ease of getting to work and getting out to clients is critical in that. Also we have a corporate responsibility policy which puts sustainability right at the top of our agenda”

(Managing Director, Engineering Consultancy 1, North Fringe, 2014)

“It affects the business in quite a number of ways. So, it obviously has a daily impact on all of our existing staff, on how they get to work and the amount of time that they have to devote to getting to work....I think the secondary effect is on our clients, on their willingness to come and visit us. And there’s also quite an effect....on recruitment as well.....So I think it actually has quite a big impact on our business”.

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

The degree of importance attributed to different types of transport need also varied, with many interviewees focussing on the impact of commuting on their staff, whilst others also identified deliveries, business travel and client access as key aspects of their business operations shaped by transport. These views reflected factors such as the nature of the business, its geographical location, and its staff profile – factors which will be discussed in section 6.3. Overall, however, there was a correspondence between employer concerns about commuter travel and the focus which the WEST business engagement programme placed on improving the commute experience. The WEST business engagement programme was not focussed on operational transport issues, although some WEST measures did aim to improve sustainable travel options for local business travel.

6.2.1 Commuting, staffing and productivity

Views on the role of commuter travel for business performance

In both 2014 and 2016, staff commuting was considered by the majority of interviewees in the North Fringe to be the most significant transport issue for their business. In the Ports area, concerns were more evenly spread across operational transport and staff commuting issues. Ease (or difficulty) of commuting was thought to affect business performance principally through its impact on staffing issues such as recruitment, retention and staff morale. The impact on business performance was thought to be indirect: difficult commuting lowered staff morale, which could lead to falling staff productivity and hence might reduce business efficiency.

Conversely, many thought that offering a range of commuter travel alternatives, including good cycling and public transport options, was important to their business because it helped to attract and retain certain types of employee, such as recent graduates, urban Bristol residents, and lower paid staff who did not own a car. Some interviewees also identified the benefits for employees' health and wellbeing – and hence productivity - of cycling and walking in particular.

"I think it's a cultural benefit; it's a benefit for employees. It's not direct. You know, we don't make more revenue because we do these things, or as far as I'm aware, I haven't seen any correlation there. We do have happier employees and happier employees is a good thing to have".

(Vice President, Technology Company 1, North Fringe, 2014)

However, these benefits were thought difficult to quantify, and (with notable exceptions) reflected a certain ambivalence about whether commuter travel had so far warranted serious concern at Board level, even if it was climbing up some senior management agendas. The following excerpts from the 2014 and 2016 interview at a major aerospace company illustrate this view:

"If the transport connections and the cycle ways were more developed, easier to use, more integrated, the ease of getting to and from work actually helps people's satisfaction of going to and from work rather than having a real struggle. So I think if it could be smoothed out and improved, it would help. I think people's wherewithal and motivation in coming to work. Would it change fundamentally our business? No, I don't think so."

(Vice President, Aerospace Manufacturer 1, North Fringe, 2014)

"I think it is noticed. Whether it has become an issue, whether there has been enough registering of these comments to do a synthesis and come out with a fundamental conclusion that we need to do something about, I'm not sure. But certainly there is awareness of traffic and transport issues and density of the traffic around this area amongst everybody who works at Filton".

(UK Head of Engineering, Aerospace Manufacturer 1, North Fringe, 2016)

The density of traffic on local roads, congestion at peak times, and the prolonged time it was taking to enter and exit some sites by car (and bus) was a consistent narrative in interviewees' accounts. Access and egress delays were most problematic at the Aztec West Business Park, and the

Avonmouth employment area; this situation was not deemed to have changed over the two years. Indeed, the majority of North Fringe interviewees thought that traffic had become even heavier by 2016. However, it was also noted that this had been a period of above-average disruption due to roadworks which were intended to improve public transport in the longer run – notably the Metrobus road works, and railway bridge improvements required for rail electrification. Employers in the Ports area also believed overall traffic and congestion to have increased over the two years.

At the same time, there was a view that the improvements which had been made to cycle routes and some bus services over the two years had mitigated the traffic problems to a degree. All the interviewees held positive attitudes about sustainable transport in principle, including those measures supported by the LSTF, but the dominant view was that not enough had been done yet to make a significant impact, particularly in the face of continued house building in the North Fringe.

“...there may not have been as much impact this time round but I am guessing it's one of those things that takes quite a few years and that there needs to be a constant stream of different initiatives..... I just think it's changing paths and cultures. It's a long term game when you're not in the city centre. So I think there needs to be a sort of continuous effort.”

(Director, Science Park, North Fringe, 2016)

Perceptions of LSTF impacts on commuting

North Fringe interviewees expressed, in the main, a ‘guardedly positive’ assessment of the role of sustainable transport measures in reducing use of the car for commuter travel, a view which was also reflected in their responses to a number of quantitative questions posed during the 2016 interviews. These were incorporated into the interviews to provide direct comparison with quantitative data collected in the SES Case Study sites in Hertfordshire and Slough.

Table 6-1 shows that in 2016, nine of the 14 North Fringe interviewees thought that LSTF had increased cycle use by their staff compared with 2014. Six out of 14 thought that LSTF had improved bus services, and five thought this had translated into more staff using public transport. However more people disagreed than agreed with the statement that LSTF had reduced journey times – which corresponds with the perception that traffic had become heavier.

Table 6-1: Perceptions of impacts of LSTF on commuting in the North Fringe

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has increased cycle use by staff	N	0	3	1	8	1	1	14
	%	0%	21%	7%	57%	7%	7%	100%
LSTF has improved bus services	N	1	1	3	6	0	3	14
	%	7%	7%	21%	43%	0%	21%	100%
LSTF has increased public transport use by staff	N	1	2	4	5	0	2	14
	%	7%	14%	29%	36%	0%	14%	100%
LSTF has reduced journey times	N	1	5	3	2	0	3	14
	%	7%	36%	21%	14%	0%	21%	100%

Table 6-2: Perceptions of impacts of LSTF on commuting in the Ports area

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has increased cycle use by staff	N	0	0	4	2	1	0	7
	%	0%	0%	57%	29%	14%	0%	100%
LSTF has improved bus services	N	0	2	1	3	1	0	7
	%	0%	29%	14%	43%	14%	0%	100%
LSTF has increased public transport use by staff	N	0	3	1	1	1	1	7
	%	0%	43%	14%	14%	14%	14%	100%
LSTF has reduced journey times	N	0	3	2	0	0	2	7
	%	0%	43%	29%	0%	0%	29%	100%

Managers' perceptions of increased cycling by staff corresponds with the employee travel survey results, which show that the proportion of North Fringe employees who reported cycling to work on the day of the survey rose from 12.3% in 2014 to 14.3% in 2016. In the Ports area, where LSTF expenditure had been more limited, interviewees had less positive perceptions of the influence of LSTF on commuting. In both the North Fringe and the Ports area, it was relatively common for managers to select either 'don't know' or 'neither agree nor disagree' in response to these questions, explaining that they lacked sufficient knowledge of LSTF measures and/or could not separate LSTF impacts from those of the measures they had funded themselves.

Perceptions of LSTF impacts on recruitment and retention

In both 2014 and 2016, some interviewees explained that commuter transport issues had a direct impact on staffing, and saw the wider provision and encouragement of alternatives to single occupancy car-use as one way of helping to attract and retain staff. Difficulties with commuter travel which could affect recruitment took two main forms:

- Employer sites accessible only by car (applicable to part of the Ports area). This was creating a barrier to the recruitment of people who lacked access to a car, and particularly affected businesses dependent on lower-skilled workers.
- Limited supply of on-site car parking, and/or peak-time traffic congestion around the site (parts of the North Fringe), which could create barriers to recruitment and business expansion if access by alternative modes was limited.

The first issue was seen as a problem not only for lower-income individuals seeking work, but also for the affected businesses, as it narrowed the choice of potential recruits. This was a serious issue for some businesses in Avonmouth:

“Effectively we are deliberately discriminating against anybody that hasn’t got their own transport to get to work and when we instruct an agency to find people for us we would state that the person will have to have their own transport.”

(Human Resources Director, Candle Products Company, Ports area, 2014).

“And an absolute fact: it is affecting our recruitment. And not only ours but everybody else within Avonmouth. You know? It’s a real issue; it’s a real, serious issue.....Our success as a business will stand and fall on our ability to recruit people. I mean, literally that. We’re a good business and we’ve made lots of money, and that’s really great. But if I carry on growing, we need more people....And we’ve got to attract them and somehow get them here..... the thing that will kill us more than anything is recruitment.”

(Managing Director, Catering Products Company, Ports area, 2016)

In 2014, there were no bus services into the Avonmouth employment area, and cycling to work was generally discouraged due to heavy goods vehicle traffic and poor quality off-road paths, so car-sharing was thought to offer the only real alternative to single occupancy car use. By 2016, there had been improvements to bus services and cycle paths, some funded by the LSTF (see Table 2-2), and this was thought to be starting to make a difference to some Avonmouth employers. The SevernNet Flyer shuttle bus was particularly appreciated – this was funded by a Coastal Communities grant and came into operation in early 2016.

“...[so] people couldn’t get her[e] if they didn’t drive or they would have a long walk if they did, if they got the train or the bus in, so it did limit a lot of people or they had to turn down positions because they couldn’t get here necessarily so since that started (the shuttle bus), that has helped”.

(Office Coordinator, Skincare Products Company, Ports area, 2016)

However, a single shuttle bus service could not serve the whole area, or the multitude of different shift patterns across the businesses, leaving some employers still critical of overall service provision and feeling compelled to provide their own buses for staff:

“So it’s really hard for them to get to Avonmouth because the public transport has not changed in two years: it’s still a joke. So, you know, they’ve got to want to come and work for us. So, what we have done, we have made some changes to try and sort it out ourselves”.

(Managing Director, Catering Products Company, Ports area, 2016)

Some noted that potential employees had turned down jobs offered to them upon , realising that the commute would be challenging or even impossible. This was particularly thought to be the case in the Avonmouth area, but also at Cribbs Causeway.

Compared with the Ports area, fewer North Fringe interviewees believed that travel to work issues caused recruitment problems of this type. A greater proportion of employees in these businesses was in higher-skill posts, and was thought unlikely to face difficulties in being able to afford a car to get to work. On the contrary, it was restrictions on commuting by car that posed the greater impediment to recruitment for some employers, especially those with limited on-site parking and/or serious traffic congestion around the site.

“We often interview here and people will decline the...., well, pass through the interview but they’ll decline to come and work for us because of the issues of transport, so it has an immediate effect on our ability to recruit into this area”.

(Engineering Director, Engineering Consultancy 2, North Fringe, 2016)

Whilst restrictions on car parking were thought to discourage some people from wishing to join a business, good opportunities to commute to work by alternative means were thought to attract others. For example, several interviewees expressed the view that good bus services and cycle routes/facilities helped them recruit younger people/recent graduates, because they were more likely to live in the city centre, have no family commitments and not own a car. Sustainable transport measures were therefore thought advantageous, although employers did not have quantifiable evidence as to how far they had facilitated recruitment. These issues were considered more acute in relation to the recruitment of people with skills which were highly sought-after: positive or negative travel factors could tip the balance in favour, or against, such people accepting a job.

A small number of employers considered bus access to be absolutely essential for recruitment and retention, and therefore provided their own buses at considerable expense. As previously noted, the Catering Products Company did this to address the problem of not being able to recruit local people who do not have a car. Engineering Consultancy 1 provided a staff bus service from central Bristol because on-site car parking was limited to approximately one space per four employees. The Financial Services Company provided a staff bus to/from the city centre. This service was originally set up when some staff were relocated from a city centre office to the North Fringe; the service was maintained beyond the transition period because it was popular, and perceived by managers as a contributor to staff satisfaction.

“It’s something that staff value and it was decided for completely that reason - for staff morale, then it would retained”.

(Facilities Manager, Financial Services Company, North Fringe, 2016)

Most interviewees did not think that the quality of sustainable transport provision had a marked effect on staff retention, with two exceptions. At the Retail Company, it was thought in both 2014 and 2016 that some lower-paid staff had left due to the inconvenience of the commute by bus. At the Business Park, sustainable travel options were seen as a way of contributing to staff retention: *“To retain staff: I think it’s massive. ...”*

Others reported in both 2014 and 2016 that dissatisfaction with the commute had been cited in some staff exit interviews as a reason for leaving, but was unlikely to be the main reason. Even for those whose recruitment was affected by travel to work issues, retaining staff once they had started was less likely to be a problem because employees often found that the reality of commuting (by bus for example) was not as bad as they feared. Moreover, compared with 2014, there was a view in 2016 that people were becoming more used to workplace restrictions on car parking.

“So wherever they go they’re going to have the same sort of challenge.”

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

Table 6-3 and Table 6-4 demonstrate the ambivalence of interviewees with regard to the role of LSTF measures in recruitment and retention. More disagreed than agreed with the statements that the LSTF had made it easier to recruit and retain skilled staff, but many felt that they did not have enough knowledge about these measures to make a sound judgement.

Table 6-3: Perceptions of impacts of LSTF on recruitment and retention in the North Fringe

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has made it easier to recruit skilled staff	N	0	7	4	3	0	0	14
	%	0%	50%	29%	21%	0%	0%	100%
LSTF has made it easier to retain skilled staff	N	0	8	5	1	0	0	14
	%	0%	57%	36%	7%	0%	0%	100%

Table 6-4: Perceptions of impacts of LSTF on recruitment and retention in the Ports area

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has made it easier to recruit skilled staff	N	0	2	4	1	0	0	7
	%	0%	29%	57%	14%	0%	0%	100%
LSTF has made it easier to retain skilled staff	N	0	2	3	1	0	1	7
	%	0%	29%	43%	14%	0%	14%	100%

Perceptions of LSTF impacts on productivity

In 2014, dissatisfaction with the commute was not generally believed to have led to absenteeism, although most interviewees thought that this would be difficult to bring to light. Staff productivity was more likely to have been affected by late arrival at work as a result of unexpected transport disruption. With regard to more 'everyday' issues such as peak time congestion, it was thought that employees generally adapted their travel times to compensate for this, although it was recognised that some had no choice but to travel in peak times (for example, those with family commitments).

In 2016, many interviewees still took the view that employees' experience of the commute could affect their productivity, but no attempt had been made to quantify this. It was generally expressed in terms of the negative effects on productivity of unpredictable and time-consuming car journeys.

"And whilst that may not be a productivity issue directly, it is indirectly a productivity issue because of people's tiredness, connectivity, morale, etc."

(UK Head of Engineering, Aerospace Manufacturer 1, North Fringe, 2016)

Some, however, referred to the positive effects on staff wellbeing of having the option to travel by a different mode. Cycling was considered by some managers to link directly to improved productivity.

"We're actually going to think about doing our own scheme, which is if you want to cycle to work, I'll buy you a bike. Because, actually, you getting fit is in my interest. You know? we're doing it because it's a good thing to do but, you know, as an aside, there's nearly always a commercial benefit...You get fitter; you feel more committed to (the company) because we literally bought you a bike. Yes? It's just a win-win-win".

(Managing Director, Catering Products Company, Ports area, 2016)

However, overall, employers' main strategies for mitigating the stress of car travel in peak hours was offering flexi-time and mobile working, although it was noted that this was not possible for everyone – some jobs had to be done during fixed hours, could not be done from home, and some people had non-work commitments which limited their time flexibility. There was no discernible change in these perceptions by 2016.

6.2.2 Operational transport issues

The baseline interviews showed that the most relevant operational transport issues among the employers in the West of England were: Deliveries and logistics (mainly for the Avonmouth and Severnside distribution businesses); business travel (of greatest importance to the North Fringe consultancies and the Construction Services Company); and client access (mainly for the North Fringe employers). These issues were not the focus of the WEST business engagement programme in the strategic employment sites; not surprisingly there were therefore perceived to be only limited and indirect impacts of LSTF measures on them.

Perceptions of LSTF impacts on deliveries and logistics

In both 2014 and 2016, deliveries and logistics were not perceived as a concern by the North Fringe employers, and not thought to be influenced by local sustainable transport measures. The nature of the businesses means that their requirement for the physical movement of goods is small. The deliveries they do require are generally timed to avoid peak travel times on the roads.

However, logistics were raised by several interviewees in the Ports area as an important transport issue affecting their business. This view was expressed in both years at two distribution businesses, one of the aerospace manufacturers, and the two waste recycling businesses. Avonmouth and Severnside (Ports area) had continued to see growth in heavy goods vehicle traffic over the two years as distribution businesses in the area expanded; this included the largest of the SES Case Study employers in the area - the Catering Products Company. Aerospace Manufacturer 2, located in Severnside, had also increased its volume of deliveries by 2016, in line with increased production. It had quantified the cost of delayed 'just in time' deliveries when lorries were held up in local traffic. Both companies had endeavoured to manage and improve the efficiency of their deliveries.

"Equally from a logistics perspective, you've probably seen the number of lorries that park up outside, all of those will be for me because I'll have timeslots (.....) and of course if they can't make their timeslot, I can't take the material, the whole site goes on stop effectively. So access is absolutely critical."

(Head of Procurement and Logistics, Aerospace Manufacturer 2, Ports area, 2014).

In 2016, none of the Ports employers believed that LSTF measures had made any impact on the logistics part of their business, but with the caveat that many contracted out their deliveries to haulage and courier companies, so were not necessarily aware of all issues affecting deliveries.

Perceptions of LSTF impacts on business travel

The efficient movement of people on and off site in the course of their work – both employees and clients – was raised as an operational consideration by many interviewees in both 2014 and 2016.

- For some in the North Fringe, proximity and easy transport access to other local employers was of vital importance. This might be collaborating businesses in the same sector, procurement-supplier relationships, or relationships of local businesses with the university and hospitals.
- A number of the North Fringe employers, including two of the consultancies, the Construction Services Company and the Environmental Compliance Company, cited travel to client sites as an important part of routine operations; travel could be local, national or international. For two of these companies, environmental certification (e.g. ISO 14001) was a major inducement to cutting carbon emissions from business travel.
- At some of the large employers, frequent business travel was undertaken to visit other branches of the company, including in the US and continental Europe.

The biggest reported change to business travel practices during the period was the continued increase in the use of Information and Communication Technologies (ICTs) to replace face-to-face business meetings. This was attributed to technological improvements, falling costs, and a greater acceptance of 'virtual' meetings as a normal way of working.

"We're trying really hard to encourage a bit of both. We want the relationship-building that an on-site meeting gives us, but at the same time we can do quite a lot remotely, so we do as much remotely as we can".

(Director, Environmental Compliance Company, North Fringe, 2016)

Improvements in ICTs had also increased capacity for people to work from home, which some employers encouraged as a means of reducing commuter trips.

Local business travel

Although the WEST LSTF programme focussed on commuter travel, some measures aimed to encourage the use of buses, electric pool vehicles and cycling for local business travel – thereby reducing dependence on taxis and employees' own cars. During the evaluation period, LSTF funding had contributed to the provision of electric 'pool' vehicles and electric vehicle charging points (EVCPs) on the sites of larger employers, for people needing to mix working at their office with visits to clients and collaborators during the course of the day. One of the consultancies had bought several Smart⁶⁰ cars for the same purpose (but not supported by LSTF). As well as cutting emissions from local business travel, the availability of pool vehicles removes the need for mobile staff to use their own car to commute to their work base. This had offered indirect benefits to employers struggling with staff dissatisfaction over insufficient on-site parking. However, like many LSTF measures, it was not identified as having a quantifiable direct impact on business performance.

⁶⁰ German manufacturer of microcars

Box 6-1: Sustainable local business travel: The Kings Ferry Business Shuttle

The North Fringe area has a concentration of collaborating businesses which tend to be considered too far apart to travel between on foot, and too unsafe to cycle between (due to busy roads). Restrictions on visitor parking at many employers makes private car use problematic. In the 2014 interviews, improved bus links between the different parts of the North Fringe were identified as a measure which could reduce car use for this type of local business travel.

With assistance from North Bristol SusCom and its member employers, a local shuttle bus scheme was piloted in Summer 2014 by the Kings Ferry coach operator, as an adjunct to its LSTF-supported Commuter Coach service. The shuttle also connected with Bristol Parkway station, which is frequently used by employers for longer business trips as well as visitors to their sites. The service was well-received by the participating businesses due to the savings made on the costs of taxi fares.

“We thought that was great, because it was cutting our taxi bill right down in that we weren’t taxiing anyone to Parkway. We made the decision everyone uses that bus because they were regular and they were good and comfortable.”

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

However, the shuttle service’s longer term business model was unsuccessful, as it required a level of contribution from employers which was judged (by employers) to outweigh the benefits. A key problem was that the size of vehicle was too large, as they were using spare capacity from the Commuter Coach service which was a full size coach. The service ceased in July 2015. Several of the senior managers interviewed mentioned this service, and regretted its demise.

Box 6-2: Sustainable local business travel: The X18 bus service

In the 2014 interviews at the Science Park, the creation of a direct bus link from the site to Bristol Parkway Rail station was said to be highly desirable. This came into being soon afterwards in the form of the LSTF-supported X18 service. Although welcomed by businesses at the Science Park, for whom the national and international connectivity provided by the rail station is essential, this service had not, by 2016, replaced the many taxi journeys between the Science Park and the station, which generated considerable costs to the businesses. One of the perceived reasons for the poor uptake of the X18 at the Science Park was its failure to convince business users that it was an ‘executive service’. Its promotion as such was said to have raised false hopes. There were also some problems with the routing, such as not serving Parkway station when it first started.

Longer distance business travel

Business travel was mentioned as the primary transport concern by two of the employers: the Construction Services Company and the Technology Consultancy. Both had targets for reducing carbon emissions generated by business travel, in order to comply with voluntary energy and environmental standards (ESOS and ISO 14001 respectively), and both had been active in addressing this over the evaluation period. For the Technology Consultancy, this was part of a process which began in the early 2000s, and represented core sustainability values of the business, whereas it was a more recent departure for the Construction Services Company. The former had been successful in meeting targets for reducing carbon emissions from land-based transport (but not from air travel) by replacing non-essential trips with 'virtual meetings', and encouraging train travel. The latter was improving logistical efficiency through its efforts to match projects with local personnel, suppliers and materials.

International connectivity

Links to airports were also extremely important to some of the employers, especially those which were part of an international business or supply chain, or were attracting international investors (for example, the Science Park) or international students (the University). Local transport congestion was seen as adding indirectly to the costs of maintaining international links, particularly by one of the aerospace manufacturers.

"We lose a lot of time of our senior people – very skilled, experienced, expensive – people sitting in traffic jams, sitting on buses, to get to Bristol Airport."

(Vice President, Aerospace Manufacturer 1, North Fringe, 2014).

The company did not try to quantify this in terms of costs, *"but we know it's a critical loss of our people's energy into the business"*. By 2016, local transport congestion was perceived as something which was threatening to erode the international connectivity of the UK part of the company in two ways: firstly, the costs and inconvenience incurred by frequent trips on congested roads to Bristol Airport by senior managers travelling to the company's headquarters in France; and secondly, because employees could not guarantee arriving punctually at their workplaces for 'virtual meetings' with colleagues in France and Germany, due to the unpredictability of the traffic around Filton (exacerbated by the fact that 9.00am meetings on the continent are at 8.00am in the UK). Whilst few meetings were actually missed, this was thought to take its toll on employees in terms of stress.

"So effectively, it puts tension into us about whether we can make it, be at the right meeting, say our piece from the UK in this transnational world. It erodes a little bit our connectivity to the high-level things that are going on in Toulouse. So people do worry about that..."

"So, the less we contribute, the less we participate, the more eroded our position in the overall scheme of things. It's not easily quantifiable. If you're not there, the meeting will still take place and a decision will still be made, but you've not had your tuppence worth in".

(UK Head of Engineering, Aerospace Manufacturer 1, North Fringe, 2016)

This was one of the main reasons for this interviewee's view that further improvements in local sustainable travel options were needed in order to reduce traffic congestion.

The value of travel time

Many interviewees spoke of a growing preference that business travel be undertaken by train, in recognition of the high cost to the employer of working time lost to car travel. None said they quantified this however. Clearly, this needed to be balanced against the greater cost of rail travel.

"Rail costs are an issue for us, just for the record. The cost of rail travel is exorbitant. Single biggest thing you could do to reduce car miles for here? Because I don't think you can affect the commute so much. But it's actual cost of rail travel (for business travel)."

(Vice President, Technology Company 1, North Fringe, 2014)

In 2016, this interviewee said that the costs of rail fares to the business had risen even further.

Other reasons for encouraging more rail travel were a concern for employee safety, and sustainability. Whilst the WEST LSTF programme did not support rail directly, it did support a number of measures to improve non-car access to rail stations for North Bristol business travellers, such as a hire scheme for folding bicycles at Bristol Parkway, and bus links such as the X18. Awareness of these measures among interviewees was low however.

Perceptions of LSTF impacts on client and visitor access

Many businesses in the North Fringe had chosen their location, at least in part, because of easy access to motorways for both business travel and client access, and this was considered a strong asset. Access by clients visiting businesses in the North Fringe and Ports areas was also affected by local transport links within the areas, in the same way as employees' business travel. There were two main types of employer for whom sustainable transport was seen as playing an important role in client access: the Business Park and Science Park (both seeking to attract further business tenants); and the University and NHS Trust (managing a high volume of students, visitors and out-patients).

In both 2014 and 2016, local sustainable transport access was seen as a 'selling point' to tenants by senior managers of the Business Park and the Science Park. The manager at the Business Park, located in Filton, was particularly clear that bus links and cycle facilities were, or had the potential to be, a major draw. In 2016 he believed that the good links from central Bristol were helping to attract some types of business (those with many urban-dwelling employees). For example, recently a team of 20 people had come to work there temporarily:

“...and they love the fact that they could cycle into Bristol and that and there’s a team of about 20 people coming down here and they don’t have to have a car.... so I know that’s been a real selling point to them.”

“So I know they’re very much into their- the cycling and they were quite excited by the fact that they got nice cycle showers and stuff and they can lock their bikes up”.

(Facilities Manager, Business Park, North Fringe, 2016)

Conversely, there had been one case where a prospective tenant had decided to locate in the city centre, despite the disadvantage of higher rent, because the Business Park was thought too awkward to access by staff needing to travel by bus from outlying areas, due to insufficient orbital bus services.

In addition to the infrastructure benefits, the process of engagement with other local companies, SusCom and local Councils, was also seen as an asset by tenants at the Business Park, as it was a means of obtaining information and funding, as well as contributing to lobbying.

“If we’re showing anyone around, I’ll always mention about the sustainable transport fund andand we pay for the local sustainable transport team and the council to come on site and hold these meetings.....to help support businesses, and that’s gone down very well”

“And actually feeling that they have a voice back into it as well is something that they really, really like.”

(Facilities Manager, Business Park, North Fringe, 2016)

The following changes had occurred since 2014 with regard to visitor access issues at the University and NHS Trust: students at the university were no longer allowed to bring a car to campus, but eligible for subsidised bus travel and the use of loan bicycles; reduced visitor parking and better bus provision for visitors to the Hospital. Both sets of changes were linked to reductions in on-site parking availability for both staff and students/visitors. LSTF measures such as subsidised bus services and improved cycling facilities were seen to have benefitted students and hospital visitors, as well as staff. There had been concerns at the University in 2014 that the planned ban on student parking could have a negative impact on student applications, but in 2016 these fears were considered to have been unfounded. At the hospital however, the restrictions on visitor parking did have an impact, and the Trust was obliged to allocate more of its overall parking spaces to visitors, at the expense of staff spaces, thus creating even greater pressure to facilitate staff travel by alternative means.

Table 6-5 and Table 6-6 show that the majority of interviewees in both areas either disagreed, or were neutral, about whether LSTF had increased the reliability of deliveries, cut the costs of deliveries, or facilitated visitor access. However, in some cases (such as the University and NHS Trust), it was thought that sustainable transport improvements had improved visitor access over the two years, but this was due more to their own efforts than to the LSTF.

Table 6-5: Perceptions of impacts of LSTF on deliveries and visitor access in North Fringe

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has increased the reliability of deliveries	N	0	4	7	1	0	2	14
	%	0%	29%	50%	7%	0%	14%	100%
LSTF has cut the costs of deliveries	N	0	3	5	1	0	5	14
	%	0%	21%	36%	7%	0%	36%	100%
LSTF has made our site easier to get to and from for visitors	N	0	7	2	3	0	2	14
	%	0%	50%	14%	21%	0%	14%	100%

Table 6-6: Perceptions of impacts of LSTF on deliveries and visitor access in Ports area

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	Total
LSTF has increased the reliability of deliveries	N	0	2	5	0	0	0	7
	%	0%	29%	57%	0%	0%	14%	100%
LSTF has cut the costs of deliveries	N	0	2	4	0	0	1	7
	%	0%	29%	57%	0%	0%	14%	100%
LSTF has made our site easier to get to and from for visitors	N	0	3	4	0	0	0	7
	%	0%	43%	57%	0%	0%	0%	100%

6.2.3 Employers' knowledge and opinions on LSTF and related sustainable transport measures

Awareness of the LSTF and specific measures

The proportion of interviewees who said they were aware of the LSTF rose from about one third in 2014 to one half in 2016, but most did not have a detailed knowledge of specific interventions. The more senior their position, the less likely they were to have a working knowledge of the Fund, although most 2016 interviewees recognised particular initiatives when shown a list, and were positive about the perceived benefits – either actual or potential. A small number of the interviewees were more familiar with the Fund because they had liaised with the SusCom and SevernNet business networks on behalf of their company. Most of the managers interviewed, however, said this role (and associated knowledge) was delegated to a member of his or her team.

By 2016, cycling-related improvements, both on and off site, were more likely to have come to managers' attention than other measures, and elicited the most positive responses. This corresponds with the information in Table 2-3 and Table 2-4, which show that the majority of employers had received support for cycling in the form of repair kits and free cycle maintenance

sessions (Dr Bike). Moreover, the majority of LSTF employer grants, which 12 of the businesses had received (some had been awarded several) supported improved on-site cycling facilities such as cycle parking, lockers and changing facilities. Several employers had also benefitted from loan bikes. Many had noticed improvements to cycle lanes, paths and signage in their area, including in Avonmouth, where recent improvements (not funded by LSTF) to an arterial road were judged to have made it much safer for cycling:

“I think for a cyclist it’s a massive step forward...

“... Obviously another horrible road like St Andrew’s Road is now going through a major refurbish where it should actually encourage the cyclists to get a little bit closer to work without putting themselves at risk, but still Kings Weston Lane, I wouldn’t cycle down it...”

(Production Manager, Waste Recycling Company 1, Ports area, 2016)

The 2016 employee travel survey had also shown cycling-related LSTF measures to have attracted a relatively high degree of awareness. Forty five percent of respondents reported that they were aware of Dr Bike, 46% were aware of recent improvements to on-site cycling facilities at their place of work and 35% were aware of improvements to surrounding cycle routes.

There was also a high awareness among the senior manager interviewees of the TravelWest ‘Roadshows’, which had visited all the North Fringe employers at least once, and the annual Big Commuting Challenge. In the North Fringe, the Kings Ferry Commuter Coach service was better known than other LSTF-supported bus services. The Kings Ferry Business Shuttle had been valued by those businesses which used it. In the Avonmouth area, there was some awareness of the SevernNet Flyer shuttlebus service (not directly funded by LSTF), and some had noticed improvements to local cycle paths.

Many of the employers had benefitted from the installation of LSTF-supported electric vehicle charging points, and some saw electric vehicles as the most likely area for growth in sustainable transport in the future. This was linked to the view that many people needed, or wanted, to commute by car due to other ‘life factors’, such as the decision to live in a rural area. Several larger employers had received support for electric pool cars, normally provided through the car club Co-wheels. However, electric cars were mainly seen as a niche area still, and one which did not suit employers whose staff travelled long distances for work.

Employers’ overall assessment of the LSTF

In 2014, all interviewees had said they supported improvements to sustainable transport in principle. They thought LSTF measures could be of benefit to their business to some degree, although many thought that this was an indirect benefit in terms of improving employee satisfaction, or contributing to a sustainability agenda, rather than something which might bring tangible, quantifiable benefits to the business. Many thought that sustainable transport measures offered more to individual employees than to the business directly; this was a typical view in those businesses in the Ports area which were not experiencing any recruitment difficulties or restrictions on parking.

In 2016, views about the potential of sustainable transport measures remained positive, and some felt that benefits accrued so far were becoming more tangible. For example, the manager of the Business Park felt that sustainable transport improvements (including those supported by LSTF) were starting to have an effect by helping to encourage more businesses into the North Fringe.

“So we are seeing- starting to see benefits. I think obviously there’s still work to be done around the wider area on the, obviously, the new sort of Metrobus and all of the other stuff. They’re still being built and developed at the moment..... It’s all work in progress at the moment”.

“Obviously it’s going to get a lot busier in the area as well but I think it’s - for the economy, for the northern part of Bristol, I think it’s very, very good, really”.

(Facilities Manager, Business Park, North Fringe, 2016)

Overall, there was a view that the LSTF had contributed to some useful improvements over the evaluation period, but there had not yet been enough time, or enough funding, to have made a significant impact so far.

“For me I think, it’s worthwhile. The only issue, as I’ve repeatedly said, is that these improvements are generally smaller improvements relative to the bigger degradation due to the intensity of what’s going on. So it’s almost like the whole thing is getting worse but it just slows it down a touch..... So I think we see a fundamental issue about density in this area. Density of cars, transport infrastructure is, in its totality, inadequate, and, nevertheless we see these as small steps in improvement”.

(UK Head of Engineering, Aerospace Manufacturer 1, North Fringe, 2016)

“I think all of these measures, they help in a small way but they’re not addressing the fundamental problem, which is too many people trying to get into Filton and out again at the same times.”

(Assistant Head of Infrastructure, Large Public Sector Employer, North Fringe, 2016)

“I guess it’s constrained by money and therefore it’s limited what they do. So they do some great stuff but does it influence, you know, the change in behaviours of commuting? Probably not.”

(Engineering Director, Engineering Consultancy 2, North Fringe, 2016)

“To get a proper step change it needs a significant level of investment and I do wonder whether it’s a political will to actually do anything major. I think if we want sustainable transport then they need to take some big decisions and do some big things”.

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

Several interviewees, particularly from the larger employers, expressed a view in both 2014 and 2016 that transport improvements were the responsibility of both ‘them’ – the public authorities and ‘us’ – the employers themselves, working together.

“In their defence, you know, it’s not their issue – their sole issue – it’s all of our issue”

(Managing Director, Catering Products Company, Ports area, 2016)

Several thought, for example, that LSTF employer grants (50% co-funding) had been useful in providing leverage, assisting them with initiatives that they realised they should be undertaking themselves. At the NHS Trust, the availability of LSTF match-funding had made it easier for the Facilities Director to make a case within the organisation for continued expenditure on sustainable transport over the previous two years.

“It’s very difficult when you’re overspent and in deficit to be spending things on those right things. ...I think anything that can help an organisation to persuade itself to invest is a brilliant thing and, because it is really difficult, and I mean particularly where we are.... and all companies – you know, there are huge economic pressures at the moment; doing the right thing as well as surviving – it’s quite difficult”.

“I think pump priming funding....is incredibly valuable, and I hope it continues and for a long time”.

(Director of Estates, NHS Trust, North Fringe, 2016)

6.3 Differences in perceived impacts on business performance by employer characteristics

The second research question under the Economic Impacts heading was: *how do the impacts on business performance vary by type of business, location and site characteristics and exposure to LSTF interventions?*

The differing perceptions among the interviewees of the relationship between transport needs, business performance and role of the LSTF were influenced by factors such as the employer’s sphere of activity, the main types of job undertaken by its staff, organisation of the working day, and geographical location. This is depicted in the lower portion of Figure 6-1. Location and site characteristics – especially parking availability – were particularly important in framing the senior managers’ perceptions of sustainable transport. The role of these factors, and any changes identified between 2014 and 2016, are now discussed.

6.3.1 Location and transport infrastructure

The SES Case Study employers are located in geographical clusters in an arc from east to west, as depicted in Figure 2-4. By 2016, ease of access by non-car modes still varied across the different sub-areas, and this was reflected in commute mode share (as shown in the results from the employee travel survey), as well as senior managers’ assessment of the LSTF.

Compared with Avonmouth and Severnside (Ports area), the North Fringe is located closer to central Bristol, better connected to public transport networks, better served by cycling and walking routes,

but also subject to greater road congestion and pressure on parking. Whilst interviewees in the Ports area in 2014 felt that employees had little choice over their commuter mode, the discourse in the North Fringe was one of offering greater choice and encouraging alternatives to single occupancy car use as a means of reducing pressure on parking and reducing the costs associated with congestion.

By 2016, commuter travel options around Avonmouth (central Ports area) had started to improve, with the provision of one new, and one extended bus service, plus some improvements to cycle paths. Although the 2016 employee travel survey showed that this had yet to be translated into changes in commute model share, the senior managers interviewed were hopeful that this might change in time. In the meantime, there continued to be concern that cycling and walking in this area could involve significant safety risks due to high traffic speeds and the preponderance of heavy goods vehicles.

Over the two years, Severnside (northern Ports area) did not see any changes in local transport services or infrastructure to facilitate commuting by non-car modes. Interviewees in this area thought that many employees travelled from South Wales, and had a strong incentive to car-share to save the cost of the Severn Bridge toll. Car-sharing was organised among individuals, and was not thought to have benefitted from LSTF support for online car-sharing services; nor did interviewees see a strong need for this. One Severnside employer expressed the view that LSTF measures were 'nice but not essential'. This company was untypical of the case study employers as a whole, as it had ample parking, few problems with road access, a small, high-skilled workforce, and no recruitment or retention difficulties.

"I would say none of these on this list is essential to our business. All we need is a road outside that people can drive along. As long as that's there we are happy. We don't need any particular improvements to anything although things like improved cycle paths would be nice, a shuttle service from Chepstow would be nice but it's not essential, it is not essential whatsoever for our business."

(Production Coordinator, Power Station, Ports area, 2016)

At the other extreme, some employers located in the Aztec West business park in the North Fringe were as vocal in 2016 as they had been in 2014 about the need for further improvements to bus services, safer cycle paths and pedestrian crossings and new Park and Ride facilities. Aztec West was described as having good road links, especially to the M4 and M5, but poor access by any other form of transport, compared with other parts of the North Fringe. Yet there was a serious need for alternative travel modes, as the business park did not physically have enough space to meet demand for car parking, and lengthy bottlenecks were created at peak times to enter and leave the business park via its single access road. This situation was not thought to have improved by 2016.

The two engineering consultancies, both located within the Aztec West business park, had invested in a range of measures to help staff travel by alternative modes, including, in one case, the provision of an employer bus service. Both also managed car parking tightly. Such measures proved costly to their business. Whilst appreciating the support they had received from the LSTF, both interviewees felt that infrastructure investment on a much larger scale was required, and could in fact be essential to the survival of the business park.

“But you can't develop a park like this without putting in the proper infrastructure. This park is based around driving.... But then you restrict the ability of people to drive by not giving them parking spaces or not putting the right infrastructure in that allows people to get in and out at the peak times, to kind of throttle it.”

“Why would you choose to be somewhere that is only really linked by car travel when you can't bring a car to work?”

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

“There aren't enough spaces for people to drive to work and park. And there isn't sufficient - so you can either do that, or have adequate public transport, you know, and we don't have either of them, so we're caught between a rock and a hard place.”

(Engineering Director, Engineering Consultancy 2, North Fringe, 2016)

Concerns relating to transport infrastructure in other sub-areas of the North Fringe lay between the two extremes cases of Severnside and Aztec West. For example, interviewees in the Stoke Gifford (Parkway) area in 2016 considered public transport links and cycle routes into and around the area to be reasonably good, although with room for further improvement. The area was already thought to have benefitted from new or improved segregated cycle paths by 2014. Whilst interviewees in Stoke Gifford were still expressing concerns for the safety of staff who cycled to work in 2016, four of the five case study organisations in this area were thought to have a developed, or developing, 'cycling culture' (a view also suggested by the higher than average cycling mode share figures in the 2016 employee survey). Buses services were thought to have improved by 2016, particularly services to and from the city centre, but orbital routes were still thought to be lacking.

“I don't get the impression that too many people take the buses due to either the distance travelled or the non-direct bus routes which severely increases the travel time to and from the work place..... So I think people who live on the bus route between here and the centre, it would work out very well.”

(Assistant Head of Infrastructure, Large Public Sector Employer, North Fringe, 2016).

Stoke Gifford is also the location of two rail stations (including Bristol Parkway), but there was still a view in 2016 that bus links to and from Parkway station needed to be improved, both for commuters and business travellers. Four of the five interviewees in Stoke Gifford thought that local traffic congestion had become worse over the two years, although hope was expressed that infrastructure improvements such as the bus rapid transit system under development (Metrobus), and rail electrification, might help to alleviate this. However, this was all within a broader context of acceptance that the majority of employees would continue to wish to commute by car.

“We are very aware that car parking is at a premium, that's what people like to do to travel to work, they like to get in their car and although.....we've got a very big cycling community and they are quite vocal.... on the whole, people like to get in their car”.

(Travel Manager, Financial Services Company, North Fringe, 2016)

6.3.2 Parking and other site characteristics

The interviews confirmed in 2016, as in 2014, that the most important on-site facility affecting commuter mode choice was the level of car parking provision for staff. It was found that the lower the ratio of an employer's car parking spaces to staff, the more likely it was that managers would perceive sustainable transport provision as contributing to their performance as a business. In 2014, parking provision at many employer sites had already reached full capacity. This was particularly the case for employers which had moved to new buildings and were therefore bound by planning rules restricting the number of parking spaces.

Between 2014 and 2016, car parking was reduced at the NHS Trust and University. These were among the employers with the lowest ratio of parking spaces to staff in 2016, along with the two engineering consultancies and the Large Public Sector Employer – all located in the North Fringe. All had engaged actively with the LSTF over the evaluation period; all were running car park management schemes and investing in sustainable transport measures. Car parking was described as an emotive issue at all the employers where car parking was in short supply.

"(It's) the biggest headache we have in this building – certainly in my area. And it's the one that you can guarantee, if there's an open forum for discussion, it comes up absolutely every time."

(Engineering Director, Engineering Consultancy 2, North Fringe, 2016)

"We're due the next battle on that one. Yes. It does cause us grief because everyone's got a story of why they need a parking space."

(Engineering Consultancy 1, North Fringe, 2016)

"But it's a difficult delivery of some of the messages, and it gets quite nasty at times"

(Director of Estates, NHS Trust, North Fringe, 2016)

It is notable, however, that senior managers at both the University and NHS Trust felt, by 2016, that the situation had 'calmed down' as staff acclimatised to changes in parking policy. Whilst in 2016, car parking was still *"possibly the most controversial issue that you have to deal with across the university"* (Deputy Vice Chancellor, University, North Fringe, 2016), it was no longer regarded as a serious cause of staff dissatisfaction.

By 2016, the demand for each parking space had fallen slightly at five employer sites, due to either a reduction in staff numbers on site (the Financial Services Company, Technology Consultancy and Aerospace Manufacturer 1) or an increase in available parking spaces (the Business Park and the Bioscience Manufacturer). Interviewees at three of these five employers expressed less concern about commuter transport issues than they or their predecessors had done in 2014. The remaining two retained a position of strong support for sustainable transport improvements in the interests of staff satisfaction. At some of the businesses where the ratio of parking spaces to staff was sufficient to meet demand and had not changed over the two years, sustainable commuter transport options were attributed less importance.

“I would say that most of our businesses probably don't think about transport much. The parking here is free because people aren't in every day, and people can usually find the parking space unless there's a big event on.”

(Director, Science Park, North Fringe, 2016)

All the employers provided cycling facilities such as parking and showers, to some degree – in the North Fringe this was sometimes a ‘carrot’ to balance the ‘stick’ of parking restrictions, but sometimes simply to offer employees more choice and improve staff satisfaction.

“And therefore, to encourage as many people as possible to cycle frees up the car parking spaces. I think we have something like thirty seven here and we've got seventy people, so now in the science park it's okay because it's got quite a big parking area, so we sometimes overspill our area and it's not an issue, but obviously the more people we can encourage to cycle the less pressure we have on those parking.”

(Finance Director, Energy Technology Company, North Fringe, 2014).

Just one of the SES Case Study businesses (Technology Company 1) was notable in having both sufficient car parking with no demand management or charges in place, and a high level of cycling mode share (22% in 2016). An active cycling group in Technology Company 1 had been instrumental in promoting cycling to work prior to the LSTF evaluation period, and managers had also been sympathetic to requests for high quality cycling facilities in the interests of staff wellbeing (i.e. this was not motivated by over-demand for car parking). The interviewee believed that as a consequence a strong cycling culture had developed.

“We have available parking and we have a fairly enthusiastic group of cyclists and more, you know, others are often persuaded to start cycling because there is a big cycle group (...)”

“I think it's because it's been there for a while, so probably in its early days it was a little bit evangelical and might have put people off. Now it's relaxed and people just do it. (...) I don't think people think of cyclists here as the exceptions”.

(Vice President, Technology Company 1, North Fringe, 2016)

Box 6-3: Reducing car parking – the NHS Trust in the North Fringe

The NHS Trust underwent a major transition during the evaluation period, as services were consolidated into a new 'super hospital'. This involved the closure of another hospital four miles away, and the transfer of these services to the new hospital over a concentrated two week period in spring 2014.

Building work on one of the car parks at the new hospital could only start after the transfer to the new buildings had taken place, which meant that car parking availability for staff fell substantially (from 0.3 to 0.1) spaces per employee. During the first 18 months after the move, the NHS Trust provided staff Park and Ride services – including from the site of the closed hospital. However, the construction of the new car park was slower than originally planned, creating considerable competition for parking spaces in 2015. By 2016, more car parking was in place, although the balance between visitor and staff parking was still under review.

At the same time, the NHS Trust invested money (including Section 106 money) and effort in improving and promoting a range of alternative transport modes – particularly bus subsidies. The NHS Trust was active in providing travel information and personal travel planning for staff. Cycle parking was increased at the new site, and this process continued during the evaluation period as demand grew. The NHS Trust engaged intensively with LSTF officers and North Bristol SusCom over this period, benefitting from a number of employer grants and frequent visits from the Sustainable Travel Roadshow team. LSTF support was thought to provide leverage for the NHS Trust's own expenditure on sustainable transport, helping to support the internal case for such measures.

Car alone mode share fell from 57% in 2014 to 47% in 2016. In 2016 it was remarked that the process of 'enforced' change in mode share had been a difficult one in terms of staff-employer relations, and had attracted media criticism. However, it was felt that the situation had now stabilised.

“And, actually, I'm getting quite hard about it with the media now. When they say, oh, there isn't enough parking, it's parking, parking, parking, I will immediately say 'I'm sorry; you're barking up the wrong tree, and it's an old story'. This is not about parking anymore”.

(Director of Estates, NHS Trust, North Fringe, 2016)

6.3.3 Business sector and employment type

Among the SES Case Study employers in the Ports area, the distribution businesses, waste recycling businesses and the aerospace manufacturer were dependent on the physical movement of goods for their day to day operations. The distribution businesses employed a high proportion of warehouse staff working on shift patterns, and the waste recycling businesses and power plant needed 24-hour staff coverage. Several Ports area interviewees expressed a desire to recruit more staff locally, both as a means of contributing to local economic development, but also because some needed specialist staff to be able to get to work at short notice if a problem arose. In contrast, many of the high-tech businesses, as well as the large public sector organisations, in the North Fringe were producing 'knowledge-based products', requiring less physical movement of materials, but more business-related travel among employees. This type of activity was characterised by more flexible and remote working around a core of standard office hours. Employers needed to be located in a position which is accessible to a geographically dispersed workforce.

In 2014, difficulties with the commute were thought to be having a more severe impact on lower paid staff because they were more likely to be negatively affected by the costs of travelling to work, and less likely to own a car. Alternative transport provision, particularly buses, was seen as essential by employers seeking to employ large numbers of lower-paid staff. By 2016, LSTF and related initiatives had started to increase the travel options for those commuting into Avonmouth (Ports area), and this was welcomed by employers as an initial step.

Regarding jobs at a higher level of skill and remuneration, most interviewees believed in 2016, as in 2014, that people were prepared to tolerate, if necessary, a degree of inconvenience with their commute (including the need to commute long distances), if the rewards of their job made it worthwhile. At the same time, most thought that offering employees a choice of good quality travel options was important for staff morale and wellbeing. A number of senior managers saw this as essential to attract and retain those with high level and 'niche' skills – people who might otherwise be tempted instead to work for a company with a more central city location. This view was held strongly among employers in the North Fringe with limited car parking and surrounding traffic congestion. These interviewees saw a strong role for alternative transport provision, were positive about the LSTF and similar public funding mechanisms, but, as previously noted, were convinced that more needed to be done.

6.3.4 Working patterns

With the exception of those people working shift patterns at the NHS Trust and the Retail Company, employees in the North Fringe were reported to be working broadly within 'standard office hours', although most had flexibility around their arrival and departure times. This was the main way in which both employees and employers were adapting their working practices to deal with congestion on the road network. Time flexibility allowed those who wished or needed to commute by car to continue to do so. This had become a more common practice by 2016. Several interviewees remarked that employees were choosing to arrive at work earlier and earlier to beat the morning peak and continue to commute by car.

Flexible working to fit around travel was not afforded to those working fixed shifts. All the Ports area employers in the study, with the exception of the Bioscience Manufacturer, employed a large proportion of their staff on shift patterns. However, some interviewees mentioned that they were prepared to change their employees' shift patterns to fit with public transport timetables or facilitate car-sharing. One effect of shift working was that employees commuting by car were unlikely to be travelling at peak times and were therefore not usually held up by traffic congestion; equally, this also militated against a greater use of public transport, which generally offers less frequent services outside peak hours. The problems posed by this situation for people who did not have access to car have been noted previously. One initiative aiming to address this was the Severnnet Flyer shuttle bus in Avonmouth; the timetable was designed to correspond with the start and end times of popular shifts.

Working at home was seen by some interviewees as a practice which could actively ease pressure on parking and improve employee productivity by removing time and stress spent on the commute. However, the ability to work at home depended very much on job type. Manual staff were clearly required to be on site, and some of the high-tech businesses in the North Fringe discouraged home working because it was thought to hinder collaboration. However, overall, remote working had become a more usual practice in many businesses by 2016. Drivers for this had included improvements in ICTs and a rising cultural acceptance of home/remote working. Although an increase in home working was not reflected in the employee travel surveys in response to the question 'how did you travel to work today?', the proportion of respondents who reported in 2016 that they were working at home more than they had two years ago was notable: 13.3% of the total sample reported that they were working at home more, compared with 4.5% who were working at home less. This suggested a greater change than self-reported changes in the use of any transport mode.

6.3.5 Relationships between business characteristics and positive attitudes to the LSTF

Figure 6-2 identifies factors contributing to positive attitudes among employers to the LSTF from the point of view of commuting. It identifies transport concerns and how these affect staff travel to work and ultimately attitudes to LSTF. It highlights the three strongest drivers associated with positive employer attitudes to sustainable transport investment and interest in engaging with business networks and local authorities on transport issues. The drivers are: on-site parking insufficient to meet staff demand; local traffic congestion causing delays and stress to employees; and recruitment difficulties linked to poor public transport, cycling and walking access to particular areas. Traffic congestion and parking restrictions caused dissatisfaction among staff, which needed to be mitigated by improving alternative travel options. Access by alternatives to the car were required by those businesses which needed to recruit staff who could not necessarily afford to, or did not wish to own a car. Even those employers who were not subject to these issues saw staff satisfaction benefits in offering a good choice of travel options. Environmental and corporate social responsibility also served as a driver for some employers to engage with the LSTF and see actual, or potential, benefit from it.

Figure 6-3 summarises factors contributing to positive attitudes among employers to the LSTF from the point of view of operational transport practices. It identifies transport concerns and how these

affect operational transport and ultimately attitudes to LSTF. With the exception of local business travel, LSTF measures were seen as having a lesser impact on business operations than on commuter travel. This is unsurprising given that the LSTF was not targeting freight transport. Direct economic pressures (fuel costs) were the main driver for maximising efficiency in transport logistics. More sustainable business travel was also motivated by other drivers such as voluntary carbon reduction targets, staff health and safety, and effective use of travel time (e.g. working on the train). Some SES Case Study businesses connected sustainable travel practices with new business opportunities, in the form of sustainable products (e.g. biofuel for buses), or by contributing to their image as environmentally responsible businesses.

Figure 6-2: Factors contributing to positive attitudes among employers to sustainable commuter transport and the LSTF

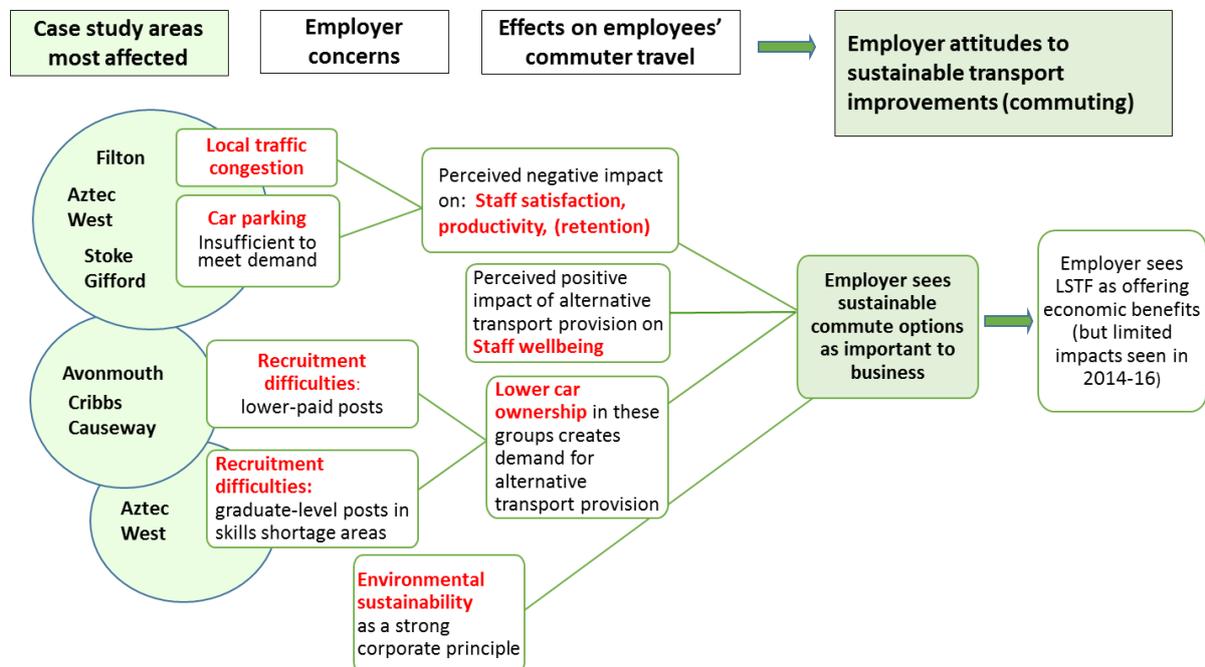
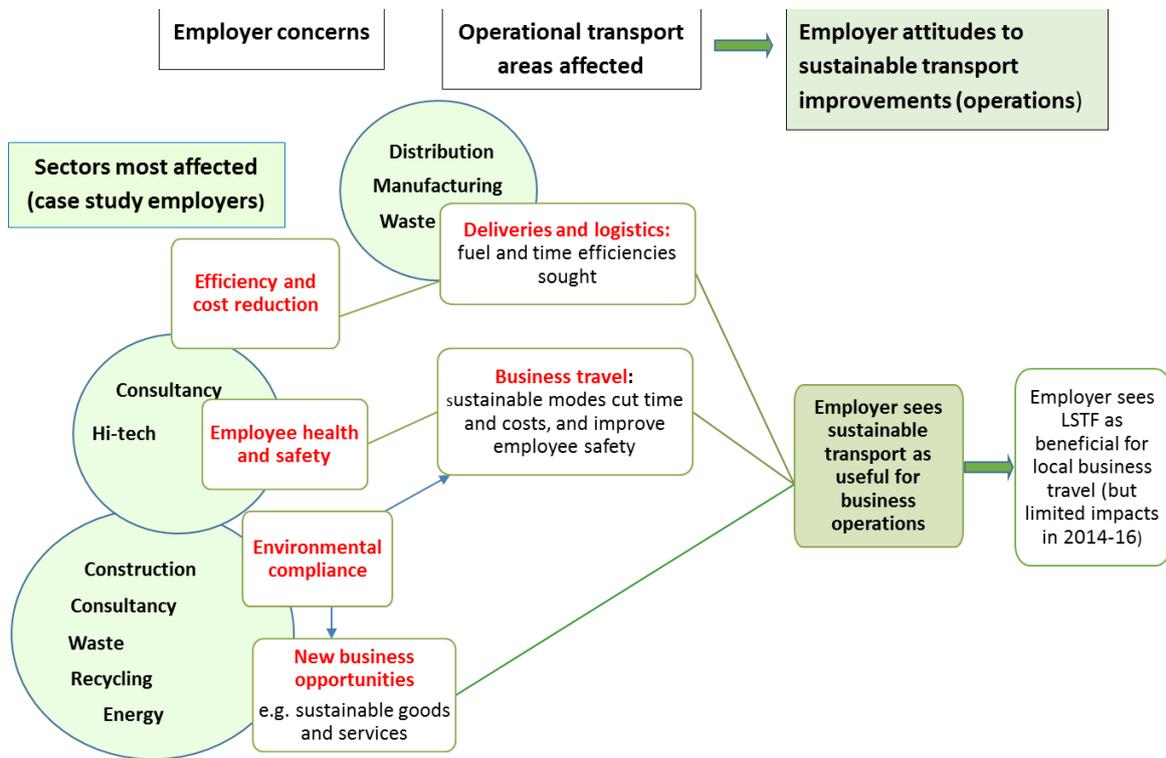


Figure 6-3: Factors contributing to positive attitudes among employers to sustainable transport (business operations) and the LSTF



6.4 Economic impacts summary

A consistent theme across the interviews was that transport impacts on business performance, whilst significant, were indirect and hard to measure – particularly with regard to commuting. For example, improvements to the commute experience were thought to bring about productivity gains by enhancing staff wellbeing, but attempting to quantify this was not something which employers had considered. Similarly, whilst many believed that sustainable transport options widened their recruitment pool or contributed to staff retention, they lacked sufficient ‘hard evidence’ to quantify this in financial terms. The economic impacts of LSTF measures were therefore difficult for employers to assess.

However, sustainable transport initiatives in general were seen as an important part of the ‘mix’ of transport investments required to ensure smooth business operations, including movement of staff between collaborating organisations within an area, as well as supporting recruitment, retention and productivity of appropriately skilled staff. The LSTF was thought to have made a positive –if limited – contribution to improving the quality or range of travel options for commuters during the evaluation period. Even if the benefits could not easily be quantified, the implications of senior managers’ perceptions should not be underestimated, as they influence business confidence, and may affect investment and relocation decisions.

The managers' overall assessment of the LSTF and related measures by 2016 was that these were welcome steps in the right direction, but were insufficient to have made a significant difference so far. In the more congested parts of the North Fringe, it was thought that they had helped control, but not fully counteract, growing traffic volumes arising from new housing development in the area. In the Ports area, employees had had very little alternative to commuting by car in 2014. By 2016, improvements to bus and cycle access were starting to be noticed, but were not thought to be significant enough yet to have translated into any substantial commute modal shift (a perception supported by the results from the 2014 and 2016 employee travel surveys).

For most interviewees, this was an argument for greater efforts to improve and encourage the use of alternative modes, and for these efforts to be sustained over a longer time period. Those employers who had engaged actively with the LSTF (and in particular benefitted from LSTF employer grants) saw publically funded investment as part of a collaboration in which they also bore a responsibility. These employers saw LSTF as useful 'leverage' for sustainable transport measures they wished to undertake themselves. LSTF grants could, for example, also lend weight to arguments within an organisation for investment in sustainable transport measures at a time when employers faced many competing financial pressures.

However, it should also be noted that some managers in the Ports area did not see a strong, business-related need for growth in sustainable transport options – notably those businesses which were facing neither recruitment difficulties nor pressure on car parking. These were among a number of interviewees who believed that LSTF measures could accrue greater benefits to the individual than to the business. Some, in both the Ports area and the North Fringe, also expressed a strong view that travel to work was a matter of individual choice, in which they should not be dictating to their staff. This may partly be a reflection of a convention in the UK that commuting is, ultimately, the responsibility of the worker and not the employer. In some other countries, particularly in continental Europe, employers are expected to play a stronger role in the commuting options of their employees⁶¹. It is notable that those employers in the SES Case Study which had adopted more pro-active approaches to the commuting of their employees were those which also faced strong pressures on parking.

By 2016, parking was still an emotive issue among staff at employers which needed to manage demand. However, some interviewees felt that discontentment over parking restrictions and charges was reducing as people were no longer assuming that they had a 'right' to drive to work and park without charge. This could be interpreted as a gradual cultural change, in which commuting by

⁶¹ Labour legislation is stronger in continental Europe than in the USA and the UK, which can mean that employee transport issues form part of the 'social dialogue' (1). In Belgium, for example, transport allowances form part of collective bargaining agreements between employees and employer, and these can differ between employment sectors. In Belgium, as well as countries such as Denmark, Finland, France, Germany and the Netherlands, commuting costs are considered a tax-deductible expense, whereas in the USA, UK and some southern European countries it is a personal expense. See (1): Vanoutrive T., van Malderen, L., Jourquin, B., Thomas, I., Verhetsel, A. and Witlox, F. (2010). Mobility Management measures by employers: Overview and exploratory analysis for Belgium. *European Journal of Transport and Infrastructure Research*, 10 (2), 121-141. (2) Potter, S., Enoch, M., Rye, T., Black, C. and Ubbels, B. (2006). Tax treatment of employer commuting support: An international review. *Transport Reviews*, 26(2), 221-237.

other modes was no longer considered unusual; cycling to work, in particular, was coming to be seen as more 'normal' at many employers in the North Fringe. Both the senior manager interviews and the employee survey showed in 2016 there was a high awareness of LSTF-supported cycling measures, which may have been contributing to this gradual process of change.

7 Findings: Delivery and Process

7.1 Overview

This chapter assesses the effectiveness of the process of delivering sustainable transport measures, through business engagement, in the West of England strategic employment sites (Research Aim 3) between 2014 and 2016. It reports findings with regard to the following research questions:

- RQ 3a: *What level of engagement was achieved with employers and employees and what factors led to increased engagement?*
- RQ 3b: *What measures have been delivered successfully and why, and what measures have been less successful and why?*

Quantitative findings on the level of employer engagement achieved by LSTF business engagement teams and business networks are drawn from LSTF monitoring data supplied by South Gloucestershire Council and Bristol City Council. The employer interviews provided qualitative insights from senior managers on their company's engagement with the councils and business networks in the field of sustainable transport. Finally, the LSTF work package closure reports written by the local authority Business Engagement managers provided reflections on the business engagement process and the measures which had been delivered with greater or less success over the two years.

7.2 Level of engagement achieved with employers and employees

The business engagement part of the WEST LSTF programme sought to engage with employers principally through the utilisation of local authority officers to develop relationships with business organisations. A Business Engagement Account Manager (BEAM) based in each local authority was allocated a local budget and given access to a range of sub-regional support services (sub-regional referred to the West of England area spanning the four unitary local authorities). In 2014-15, the BEAMs were supported by a sub-regional Business Engagement Coordinator, but this post was dissolved at the end of that financial year. BEAMs offered a range of incentives to businesses to encourage them to engage with the WEST programme. Foremost among these was the offer of employer grants to help employers overcome barriers to sustainable travel by providing 50% of the costs of items such as cycle shelters. Other incentives included the provision of Electrical Vehicle Recharging Points (ECVPs) on employer sites, the provision of emergency cycle repair kits, and encouragement measures such as the Big Commuting Challenge, held every June, the annual Sustainable Travel Business Awards, and the offer to create car share groups.

The annual travel to work survey (the employee travel survey) was another means whereby LSTF officers engaged employers; participating employers received a comprehensive report of the results from respondents in their own business, comparing them with the total results across their local authority area.

Visits to employer sites from the Sustainable Travel Team provided another key engagement tool. This service was sub-contracted by the four local authorities to Steer Davis Gleave, to offer one-to-one engagement with employees through the Travel West 'Roadshows'. These took the form of information stands, staffed by travel advisers who provided travel information, personalised travel planning and offered a range of follow-up services available to individuals through the LSTF programme (e.g. cycle training, loan bicycles, bus taster tickets,). Teams of cycle mechanics ('Dr Bike') also visited the employer sites, offering free repairs.

7.2.1 Quantitative overview

An overview of the LSTF engagement achieved with the SES Case Study employers in 2014-16 is provided in Table 2-3 and Table 2-4 in section 2.3. These tables show that nearly all the North Fringe employers were 'intensively engaged' for at least part of the evaluation period by the LSTF Business Engagement Account Managers (BEAMS) together with the North Bristol Sustainable Commuter Network (SusCom). In the Ports area, two of the nine participating employers were 'intensively engaged' by both the LSTF BEAMS and SevernNet. The other employers in the Ports area engaged with SevernNet on a range of local transport issues, some relating to LSTF.

'Intensive engagement' was defined by the local authorities as a combination of a face-to-face meeting between the BEAM and the employer, plus the take-up of one or more service (e.g. a 'Site Audit', staff survey or TravelWest Roadshow), the awarding of an LSTF employer grant, or assistance in response to a 'significant external pressure'.

The SES Case Study employers which were intensively engaged in the North Fringe were a sub-set of the 37 and 26 employers which received intensive engagement by South Gloucestershire Council in 2014/15 and 2015/16 respectively. The Ports area comprises parts of three local authority areas, and initially benefitted from its own LSTF business engagement programme and LSTF BEAM. However, this ceased in 2014, when Bristol City Council (BCC) took the lead on engagement with Ports area businesses – reasons for this are explained in section 7.3. Intensive engagement was carried out by BCC with two businesses in the Ports area out of the 65 which received intensive engagement across the BCC area as a whole in 2014/15, and 81 in 2015/16.

Table 2-3 and Table 2-4 show that the LSTF Sustainable Travel Field Team ran TravelWest Roadshows at all the North Fringe SES Case Study employers, and one of the Ports employers, during the evaluation period. The numbers of individual employees engaged by Roadshow and Dr Bike teams at both the SES Case Study employers and across the South Gloucestershire and Bristol local authorities are shown in Table 7-1. Column a) shows the number of brief visits to the stand made by employees ('exposures'), whilst b) shows the number of times that a service was provided at the stand or offered as a follow-up service ('participants'). Each visitor to the stand or Dr Bike was categorised as either one or the other on each occasion, although it is possible that some individuals visited the stand on more than one occasion, and could therefore have been counted more than once (several employers were visited by the Roadshow and Dr Bikes on multiple occasions over the two years).

Table 7-1: TravelWest Roadshows at employer sites 2014 to 2016

	Number of Roadshows or Dr Bike events	a) Number of cases of employee 'exposure'	b) Number of cases of employee 'participation'	Total (a+b)
All South Glos. and Bristol (incl. SES Case Study employers)	252	6491	1304	7795
Case Study SES employers only	82	2854	453	3307

The Sustainable Travel Field Team had a core Key Performance Indicator to undertake follow-up customer satisfaction surveys with at least 10% of all roadshow participants (i.e. those who had provided contact details). The survey was administered to the selected 10% of participants either online or by telephone.

The results of the survey (based on Roadshow participants from across South Gloucestershire and Bristol City Councils and including participants at workplaces and other types of location) showed that the majority of respondents gave a high rating to their interactions with the travel advisers and the quality of the materials they received. In 2014/15, 88% rated their interaction as 'good' or 'very good', and 61% rated the quality of the information or support received as 'good' or 'very good' (total sample, all Roadshows: 482). In 2014/15, 35% of respondents said they had changed their travel choices following their conversation with a travel adviser at a TravelWest Roadshow. Those who said they had made changes were then asked whether these changes had been influenced by the conversation they had or the support they had received. One hundred and thirty two (77%) of these respondents said the changes had been influenced by the Roadshow conversation or support, and just 21 (12%) said they had not. The surveys in 2014-16 did not reveal how many of these behaviour changes were in the direction of more sustainable travel. However, previous customer satisfaction surveys completed during 2013-14 suggested that ensuing changes in travel behaviour related mainly to uptake of cycling.

In 2015/16, it was possible to select from the full sample the responses of 108 respondents who had visited a TravelWest stand at their place of work (and not, for example, at a community event). Ninety percent rated them as 'good' or 'very good'. Fifty four percent rated the materials they received as 'good' or 'very good', and 38% said they had made changes to the way they travelled since talking to the travel advisor.

An indication of the general level of awareness and use of the TravelWest Roadshows was shown in Figure 5-7 and Figure 5-8: 24% of North Fringe respondents to the 2016 employee travel survey were aware of them, and 4% had used one (in the Ports area, where far fewer had taken place, 9% were aware of them, and 1% had used them). The related Dr Bike cycle repair stands attracted a high level of awareness in the North Fringe, where of 48% were aware of them, and 5% of respondents had used them (compared with 22% aware in the Ports area, and 1% having used them). A high awareness of Dr Bike had also been found among respondents to wave 1 of the panel survey in July 2014 (47% of the sample of 1526 respondents). Eighteen percent of wave 1 panel survey

respondents were aware of the TravelWest Roadshows. Dr Bike was also the LSTF measure which had attracted the greatest awareness among the senior manager interviewees. The distinction between the Dr Bike sessions and the Roadshows is in some ways artificial, as one often accompanied the other; it is possible that the cycle repairs simply attracted more attention than the TravelWest information stands when both were together.

7.3 Factors leading to increased engagement with employers

North Bristol Suscom and SevernNet were observed by the evaluation team to have played a key liaison role in the engagement of North Fringe and Ports businesses by the local authorities delivering the LSTF programme over the evaluation period; this was also noted by LSTF managers in the work package closure reports. There were several changes of staff carrying out the Business Engagement Account Manager (BEAM) role within the two councils over the two years, which meant that the directors of SevernNet and North Bristol Suscom were vital to the continuity of relationships with employers. Both business networks received contributions from the LSTF to help fund staff time.

The Suscom and SevernNet directors had built up effective working relationships with contact people in many of the businesses participating in the Case Study prior to 2014. Engagement was most effective where the same individual/s had acted as employer contact on transport matters for several years, or where the role had been passed on to someone else with the same job responsibilities – for example, in the larger employers which engaged a transport or parking coordinator. Where the contact person within a business was undertaking the liaison role on a more voluntary basis, often motivated by a personal interest, the relationship with that business was more vulnerable to deterioration in the event of the individual leaving. There was a tendency for businesses to be most responsive to approaches from the business networks and the local authority BEAMS when they had a particular transport-related concern, such as over-demand for parking, or when changes to local infrastructure (e.g. roadworks or alterations to rail or bus services) were affecting access to their site.

Both the North Fringe and the Ports areas were designated as Area Travel Plan (ATP) areas at the beginning of the WEST programme. An ATP was duly developed for each area with strong involvement from SusCom and SevernNet. Overall however, the North Fringe businesses were engaged more actively than the Ports during the evaluation period. The principle reason for this was that the North Fringe was in many ways better primed at the outset to benefit from the WEST business engagement programme, the main focus of which was encouragement and promotion measures. Arguably, such measures can only be effective if an area already benefits from sufficient transport infrastructure and services to offer commuters practical travel alternatives to the car. The North Fringe was considerably better connected to residential areas by bus, cycling and walking infrastructure than the Ports area, and it also benefits from shorter distances to the city centre and suburban settlements. The North Fringe was also experiencing greater traffic congestion and insufficient parking availability, which meant that many employers were particularly receptive to the assistance which LSTF business engagement officers could offer. Moreover, South Gloucestershire LSTF business engagement staff were already working closely with North Bristol SusCom, which had good, established contacts with several of the major employers.

In contrast, there were very few sustainable transport options for commuting into the Ports area (e.g. no bus services and poor cycling routes in 2014, but with some improvements having been made by 2016). People also tended to live further away from work in the Ports area as shown in Table 5-3. With so few transport alternatives on offer, there was little potential for encouraging travel behaviour change among those travelling to work in Avonmouth and Severnside, with the exception of online car-sharing services. Coupled with the dissatisfaction of many businesses in the area with the councils' investment in transport infrastructure, this made the LSTF business engagement officer's task problematic. Furthermore, at the start of the evaluation period, LSTF staff assigned to the Portside Area Travel Plan area did not enjoy a close working relationship with SevernNet. In August 2014, the WEST LSTF Delivery Board decided to close down the Portside business engagement programme, having concluded that the Portside business engagement programme was not worthwhile. The Ports area continued to be supported by LSTF staff and funding, principally through Bristol City Council, but without the assistance of an area-specific programme or business engagement manager. Focus shifted from 'engagement' to delivering more infrastructure and service measures such as cycle path improvements and the extension of the 41 bus service into the Avonmouth employment area.

7.3.1 Perspectives from the LSTF delivery team

Reflections from LSTF BEAMs and programme managers on the overall running of the WEST LSTF programme were provided in work package closure reports. These showed that links to Suscom and SevernNet were seen as critical in increasing support and uptake of schemes such as the Big Commuter Challenge. The development of the Area Travel Plans was seen as having led to stronger relationships between the local authorities and the business networks. Partnership working with Suscom and SevernNet was regarded as giving the LSTF project credibility and made it easier for the BEAMs to find a way into businesses, and allowed "an immediate, relevant and meaningful dialogue where it mattered most".

The setting of WEST budgets at a local level permitted scaling and tailoring to suit business needs within the different local authorities, whilst the existence of a sub-regional Business Engagement Coordinator role in 2014-15 facilitated the coordination of activities across the local authorities. However, it was felt that there were also some failures of coordination, resulting, for example, in a mixture of marketing materials being produced by individual local authorities which had often not liaised with the central LSTF team. In 2014-15 it was noted that there was still an element of 'silo thinking' within each local authority which had affected the business engagement project, leading, for example, to a failure to share information fully in the early part of the programme. It was also noted that staff turnover had meant significant time being taken up with recruitment.

7.3.2 Employer perspectives on LSTF engagement

In both 2014 and 2016, senior manager interviewees expressed varying levels of knowledge about the degree to which their company had been 'engaged' by LSTF officers in their local authorities, and by the business networks. The more senior the interviewee, the less likely he or she was to have had any personal involvement; however, the larger companies and the public sector organisations did have a member of staff whose role covered liaising with the Councils, business networks and other

relevant bodies on transport issues, or an individual who performed the role through personal interest rather than as part of their official role. In the latter case, some managers reflected that the business was perhaps too dependent on the enthusiasm of this one individual when it came to liaising with external organisations on transport matters.

In 2016, interviewees in the North Fringe more frequently mentioned engagement with North Bristol SusCom than directly with the local authority LSTF team, although the two tended to be closely associated. In the Ports area, most of the SES Case Study businesses had been more involved with the SevernNet group than directly with the councils. Those interviewees with knowledge on the subject expressed positive views of SusCom and SevernNet, with a slightly more mixed view of the local authorities.

“We have, on a couple of occasions, raised particular issues with the council and sometimes they’ve been quite receptive and tried to deal with the issues like repainting road markings or making it clear at junctions and so on. Sometimes they’ve just done nothing”.

(Growth and Strategy Director, Engineering Consultancy 1, North Fringe, 2016)

“Principally through SusCom and the thing that I think we have really appreciated is that South Glos has been willing to show some flexibility, if an idea comes up that clearly is sensible and fits in with the overall objectives of what the fund’s trying to achieve they’re very willing to look at it and see whether or not it’s something that they want to contribute to and I think all the businesses have appreciated that. I’m talking about the SusCom members, the businesses out here may be less aware of it”.

(Director, Science Park, North Fringe, 2014)

Some businesses in Avonmouth, were, by 2016, still frustrated with what they perceived as the slow rate of improvement to transport infrastructure in the area, and felt that that local authorities appeared not to be addressing issues such as HGV parking and local congestion hot-spots. They felt that businesses were doing all they could to offer solutions.

“And so it’s really interesting: as users, we’re all looking at the authorities and going why haven't you done something? Why haven't, you know? And there are things that are planned or that have been talked about that would make our lives a lot easier. But, like all things, we need them now and you can't wave a magic wand”.

(Managing Director, Catering Products company, Ports, 2016)

The work done by SusCom was particularly valued in both 2014 and 2016:

“I think they (LSTF measures) are good things to do when you have something like a SusCom -type organisation in the region, because information about the scheme and what it can potentially fund gets out very rapidly to businesses...”

(Director, Science Park, North Fringe, 2016)

“She (the SusCom Director) works very hard at getting everybody involved and engaged and at meetings...”

(Manager, Retail Company, North Fringe, 2016)

SevernNet was at an earlier stage of development in 2014, compared with SusCom, and by 2016 it was thought that it had become established.

“What they need to do now is deliver.... Which they’ve started to with, you know, the bus.”

(Engagement Manager, Catering Products Company, Ports area, 2016).

Some interviewees in the Ports area admitted that although they were in favour of communal action to improve transport in the area, they only participated actively in SevernNet activities when they were directly affected by a particular issue.

7.4 Measures delivered successfully and less successfully

The summary provided in this section draws on reflections made by programme managers within the local authority LSTF Business Engagement delivery team, as noted in their work-package closure reports, coupled with observations from the senior manager interviews, the 2016 employee travel survey and the panel survey. These points relate only to those LSTF measures in the business engagement category, and not to other relevant interventions delivered through other parts of the programme (e.g. improvements to cycle routes, real-time bus information, and the TravelWest website).

Measures delivered successfully

- Overall engagement and awarding of employer grants: across the WEST programme, LSTF officers engaged with significantly more businesses than were identified at the outset. Employer grants totalling £622,000 were awarded in 2014-15 across the West of England area, which resulted in £1,168,000 of match funding from employers. More grants were used for cycling facilities than anything else, and this may have contributed to the high level of awareness among employee travel survey respondents of ‘recent improvements to cycling facilities at work’.
- The Big Commuting Challenge: 4,569 participants registered and 3,591 journeys were logged in 2015/16. This was also seen by BEAMs as a good engagement tool for their work with employers. It attracted a particularly high degree of participation among those who, according to the 2014 employee travel survey, normally cycled to work (24%, compared with 10% of those who normally walked, 9% of those who normally used the bus, and only 3% of those who normally drove a car (alone) to work).
- Emergency Cycle Repair Kits: these were issued to many employers and proved popular.

- The Business Travel Awards: these changed significantly during the life of the project, becoming more successful and raising the profile of the work with the wider business community. They allowed businesses a clear target date to work towards for travel planning activities.
- The Kings Ferry Commuter Coach and the X18 bus service: both were well received, achieving high levels of awareness and very high levels of satisfaction among users. They were also successful in attracting some commuters away from the car. However, neither service survived in its original form following the removal of LSTF subsidies.
- Dr Bike cycle repairs: these proved very popular and achieved high levels of awareness among both employers and employees. Some employers continued to offer the service at their own expense once the LSTF funding had ceased.
- The Sustainable Travel Field Team: the TravelWest roadshows achieved high levels of customer satisfaction in terms of the helpfulness of travel advisers and the quality of information materials. Factors identified as contributing to the success of the Roadshows included:
 - A flexible Travel Adviser team available to engage with individuals;
 - A wide range of key offers to help overcome barriers when engaging with individuals, particularly loan bikes.
 - The development of flexible personal travel planning sessions.
 - Allocating a Travel Adviser to work closely with a business that is going through a transition;
 - Ensuring that Travel Advisers had good local knowledge.
 - Using bus vouchers as opposed to making bulk buys of bus tickets, purchased up front.

Measures delivered less successfully

- In 2014-15, the EVCP process was reported, in South Gloucestershire, as being overly complicated, especially at high security sites. A lesson learnt was to treat the EVCPs as fully funded employer grants rather than trying to arrange purchase and procurement on behalf of the employer. Adapting the system in this way enabled targets for the installation of ECVPs to be met. However, some employers remained resistant to ECVPs because of concerns about tax issues which might arise from providing staff with free electricity.
- In South Gloucestershire, there was no interest in grants for car share barriers, so funding was moved to general employer grants.

- The launch of a new online lift-sharing platform (FAXI): there was less uptake of this service than anticipated. Instead, a new platform called Join My Journey was created by one of the North Fringe SES Case Study businesses, with the assistance of an LSTF employer grant, to help tackle this gap in provision.
- The Kings Ferry Business Shuttle service, which was introduced on a six month trial basis to transport employees among collaborating businesses in the North Fringe, was very popular with some employers who saw it as a means of reducing taxi fare costs for local business travel. However, the service had to be terminated at the end of the pilot as insufficient financial support could be obtained from employers to make the service financially viable.
- It was felt that lack of resources at the end of the LSTF programme led to activities delivered by the Sustainable Travel Field Team being cancelled or compromised.

7.5 Delivery and process summary

The findings discussed in this chapter have highlighted the important role played by the business networks, SusCom and SevernNet, in developing and maintaining contacts with employers through which LSTF measures could be delivered. Joint action through the networks gave employers an opportunity to help shape local transport policies and measures. Because the networks represented the employers' own interests, they were perceived by the local authorities as offering 'credibility gains' to the work undertaken by LSTF officers, thereby overcoming possible cynicism on the part of some employers towards their local councils. Coordination between SusCom and LSTF officers functioned effectively in the North Fringe but was more problematic, particularly at the beginning of the evaluation period, in the Ports area. There, a view among businesses that the area's transport infrastructure needs had been neglected by the local authorities tended to influence their attitudes towards the LSTF programme. By 2016, these attitudes were becoming more positive, in response to some observed improvements in infrastructure and services, but it remained harder to engage businesses on sustainable transport issues than in the North Fringe. This was partly a reflection not just of the LSTF programme itself, but of the different characteristics and transport needs of the two areas, as discussed in section 6.3. In both areas, however, the SusCom and SevernNet networks provided important continuity in the face of staff turnover within the local authorities during the LSTF evaluation period and beyond.

With regard to the engagement of individuals, the employee travel surveys and panel survey showed that some LSTF interventions had attracted a high degree of awareness. Cycling-related measures had a notably wide reach: for example, improvements to cycling facilities at work (many part-funded by LSTF employer grants), improvements to local cycle routes, and Dr Bike cycle repairs. The customer satisfaction surveys completed by people who had received a service through the TravelWest Roadshows suggested that ensuing changes in travel behaviour related mainly to cycling. The Big Commuting Challenge was found to be a good engagement tool at the levels of both the employer and individual employees. Notably, the 2016 employee travel survey showed that the proportion of people who had taken part in the Big Commuting Challenge was highest among those

who normally cycled to work, compared with those who normally used other modes. This suggests that the LSTF was particularly successful at engaging individuals on cycling-related issues.

8 Conclusions of the West of England evaluation

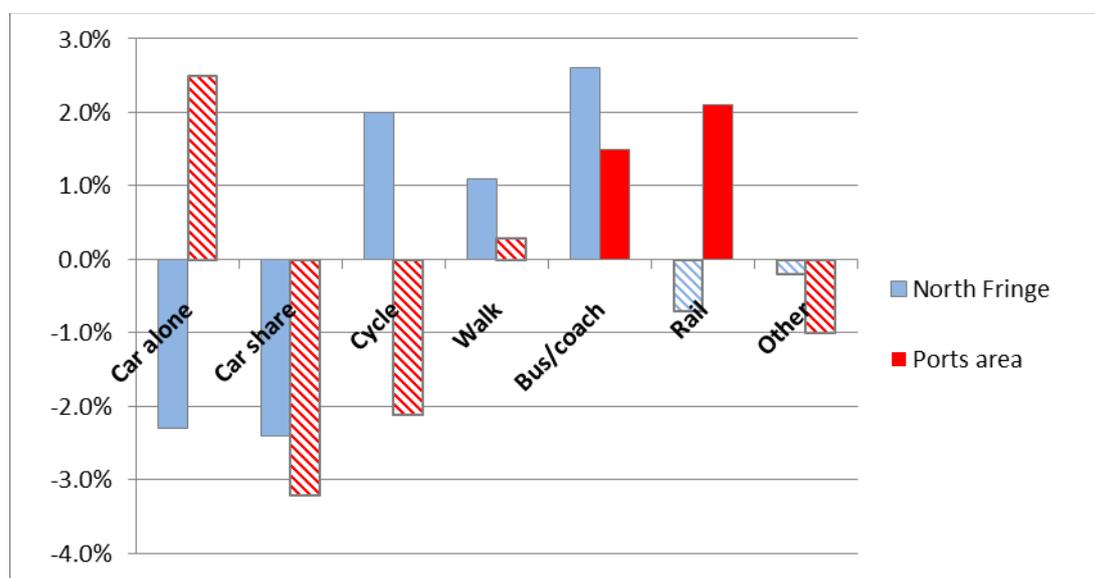
This chapter summarises findings with respect to the three aims of the SES Case Study before considering longer term prospects for the impacts of sustainable transport promotion at the two strategic employment sites in the West of England.

8.1 Modal shift

The first aim of the SES Case Study was to establish the impact of a package of sustainable transport measures on modal shift in strategic employment sites, and understand which interventions were most effective in different contexts.

Figure 8-1 shows that there were statistically significant decreases in mode share for car alone (2.3% points) and car sharing (2.4% points) among North Fringe employees between March 2014 and March 2016. There were statistically significant increases in mode share for cycling (2.0% points), walking (1.1% points) and bus use (2.6% points). There were minimal changes in mode share among Ports area employees. After accounting for differences in sample characteristics in the two survey years, it was deduced that the probability of driving alone was 10% less likely in 2016 for North Fringe employees and the probability of using bus was 35% more likely (both statistically significant), but changes in probability of using other modes were not statistically significant.

Figure 8-1: Mode share % point changes for North Fringe and Ports area



Note: Statistical significance at 95% level shown in solid colour.

Looking at longer-term trends in mode share it was apparent that there was a more substantial reduction in car alone mode share of 4% points between March 2013 and March 2014 among North Fringe employees. This indicates that the WEST LSTF programme might have had a greater impact in its first year after which there was sustained impact at a lower level. It is also notable that reductions in single occupancy car use after 2013 in the North Fringe occurred against a backdrop of petrol

price reductions, of a national trend of increasing car use and a regional trend of increasing car commuting.

To assess the role of the WEST programme in contributing to the mode share outcomes identified above, a number of matters should be considered. Firstly, a reduction in single occupancy car-use between March 2014 and March 2016 was statistically significant at only three out of 20 SES Case Study employers, all located in the North Fringe (single occupancy car-use increased among employers in the Ports area). Reductions in car parking availability had occurred at two of these employers (NHS Trust and University). Moreover, the NHS Trust was in some ways untypical because it had undergone a major site relocation in 2014 (after the March 2014 survey). Further analysis of the employee travel survey data showed that changes in mode share between March 2014 and March 2016 were explained well by changes in parking availability and not by the extent of exposure to LSTF measures (as measured at the employer level).

Interviews with senior managers showed that restricted on-site parking availability was a key motivator to engaging with sustainable transport initiatives such as the LSTF, as part of a drive to improve alternative travel options for staff. The NHS Trust faced particular challenges in managing a site relocation which involved a significant reduction in car parking spaces for staff. By 2016, parking was still an emotive issue among staff at those employers which needed to manage demand. However, some interviewees felt that discontentment over parking restrictions and charges was reducing as people were no longer assuming that they had a 'right' to drive to work and park without charge. This could be interpreted as a gradual cultural change, in which commuting by other modes was no longer considered unusual; cycling to work, in particular, was coming to be seen as more 'normal' at many employers in the North Fringe. The senior manager interviews, the 2016 employee survey and the panel surveys showed a high awareness of LSTF-supported cycling measures, which may have been contributing to this gradual process of change.

In exploring further whether there was evidence of a direct relationship between LSTF interventions and observed mode changes, the analysis of the employee travel survey data showed a decreased probability of car alone commuting, and increased probabilities of cycling and bus use, for individuals who used LSTF measures (but not if they were merely 'aware' of LSTF measures). This does not reveal direction of causality, although some insights into the self-reported influence of measures on individual behaviour were provided by the March 2016 employee survey. Of those respondents who reported using car alone less than two years ago, 29% said that the listed measures had made a little, or a lot, of difference to the way they travel to work. However, 64% said that the measures had made no difference. The closest associations were seen between using specific measures, e.g. on-site cycling facilities, and increasing use of the relevant mode (in this case, cycling), although the numbers involved were small.

This suggests that specific measures had a positive influence on reducing car use among a small proportion of individuals. However, LSTF measures might have helped to maintain existing levels of sustainable transport use in the face of a wider trend of increasing car mode share for commuter journeys in South-West England during the study period.

Qualitative evidence supports the view that LSTF measures had played a facilitating role in some individuals' decision to commute more often by sustainable modes, or to maintain existing use,

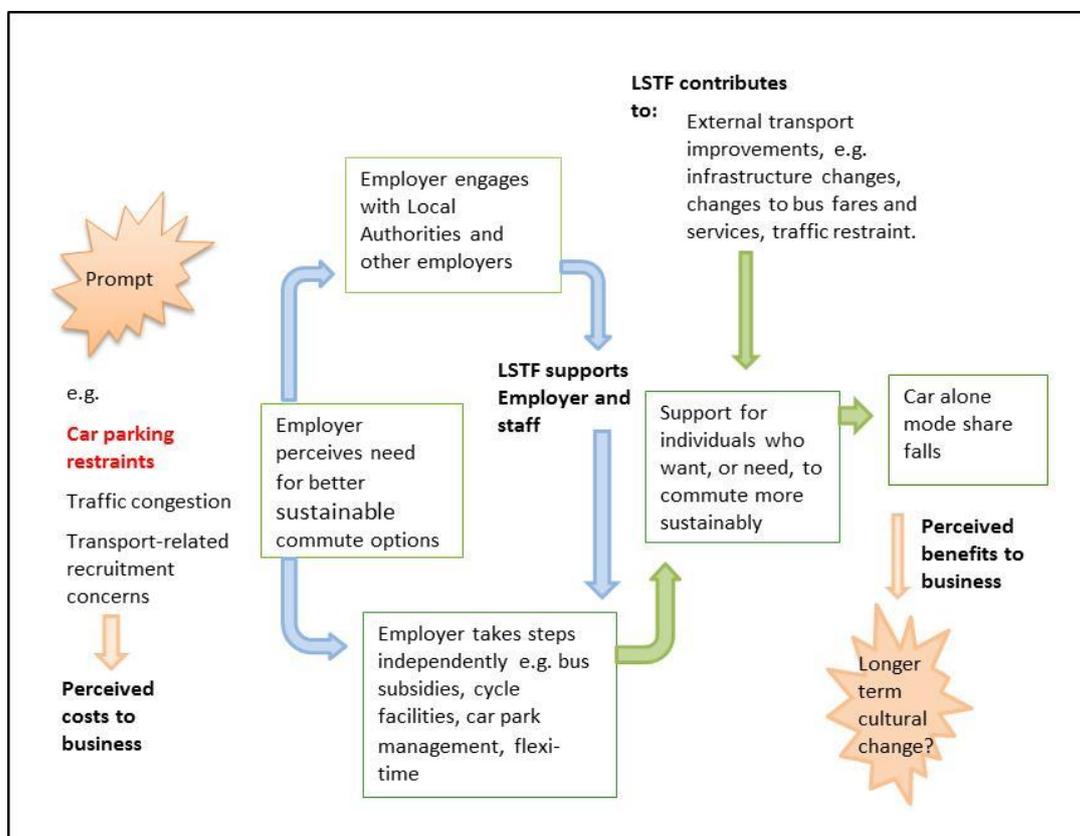
although they were rarely reported to be the most important reasons. The narrative within many individuals' explanations of mode choice was of change or stability reflecting their own personal circumstances (e.g. moving house or job location, taking children to school, other responsibilities and interests outside work, or a desire to be more physically active).

Taken together, the results above suggest that reduction in parking availability was the chief factor in mode share changes seen between 2014 and 2016 with the LSTF programme playing an important role in facilitating mode changes of individual commuters. There is evidence of a greater reduction in single occupancy car use for employers in the North Fringe in the first part of the LSTF programme (up to March 2014) and it can be argued that the programme helped consolidate those gains in the second part of the programme (between April 2014 and March 2016).

8.2 Economic impacts

The second aim of the SES Case Study was to assess the impacts on business performance, including access for existing and potential employees, of implementing sustainable transport measures in strategic employment sites. Whilst senior managers believed that the economic impacts of LSTF and related measures were extremely difficult to quantify, the majority saw commuter travel issues as an important consideration with regard to their business performance. The role of LSTF funding within a 'virtuous circle' of movement towards more sustainable commuter travel is presented in Figure 8-2.

Figure 8-2: The role of LSTF interventions in the process of commute mode change



The interviews underlined that, essentially, employers need their staff to be able to get to and from work, and without getting unnecessarily stressed or delayed, otherwise productivity and wellbeing can be negatively affected. When this is threatened by factors which make car commuting more difficult, such as traffic congestion or the need to reduce parking, they see alternative travel modes as essential. Employers also wish to be able to recruit and retain the best people for the job, and when transport issues threaten this, they want to find solutions –including sustainable transport alternatives if appropriate. Employers in the SES Case Study who were adversely affected by issues such as congestion, limits on parking, and recruitment difficulties, tended to perceive a need for greater investment in sustainable transport. Faced with such pressures, they made their own investment in alternative transport options for staff, and were more willing to engage with the local authorities and other employers on sustainable transport, which in turn meant that they saw more benefits from LSTF business engagement measures. Even without such pressures, employers tended to be in favour of sustainable transport options because they are seen to contribute to staff wellbeing, which indirectly benefits the business. However, for some this was a very marginal concern in the context of a challenging economic environment.

The senior managers' overall assessment of the LSTF and related measures by 2016 was that these were welcome steps in the right direction, but were insufficient to have made a significant difference so far. In the more congested parts of the North Fringe, it was thought that they had helped control, but not fully counteract, growing traffic volumes arising from new housing development in the area. In the Ports area, employees had had very little alternative to commuting by car in 2014. By 2016, improvements to bus and cycle access were starting to be noticed, but were not thought to be significant enough yet to have translated into commute mode change of any size (a perception supported by the results of the 2016 employee travel survey).

For most interviewees, this was an argument for greater efforts to improve and encourage the use of alternative modes, and for these efforts to be sustained over a longer time period. Those employers which had engaged actively with the LSTF – most of whom had benefitted from LSTF employer grants – saw publically funded investment as part of a collaboration in which they also bore a responsibility. These employers saw LSTF as useful 'leverage' for sustainable transport measures they wished to undertake themselves. LSTF grants could, for example, lend weight to arguments within an organisation for investment in sustainable transport measures at a time when employers faced many competing financial pressures.

However, it should also be noted that some senior managers in the Ports area did not see a strong, business-related need for growth in sustainable transport options – notably those businesses which were facing neither recruitment difficulties nor pressure on car parking. These were among a number of interviewees who believed that LSTF measures could accrue greater benefits to the individual than to the business. Some, in both the Ports area and the North Fringe, also expressed a strong view that travel to work was a matter of individual choice, in which they should not be dictating to their staff. This may partly be a reflection of a convention in the UK that commuting is, ultimately, the responsibility of the worker and not the employer. In some other countries, particularly in continental Europe, employers are expected to play a stronger role in the commuting options of their employees.

8.3 Delivery and process

The third and final aim of the SES Case Study was to review the effectiveness of the process of delivering sustainable transport measures in strategic employment sites.

The business networks, SusCom and SevernNet, were observed to have played an important part in developing and maintaining contacts with employers through which LSTF measures could be delivered by the LSTF Business Engagement officers. Joint action through the networks gave employers an opportunity to help shape local transport policies and measures. Because the networks represented the employers' own interests, they were perceived by the local authorities as offering 'credibility gains' to the work undertaken by LSTF officers - thereby overcoming possible cynicism on the part of some employers towards their local councils. The networks also provided important continuity in the face of staff turnover within the local authorities during the LSTF evaluation period and beyond.

8.4 Longer term prospects

The mode share time-series results for the SES Case Study employers in the North Fringe area generated from the 2014 and 2016 employee travel surveys and surveys in other years (see Figure 5-4) showed that car alone travel to work had been increasing prior to the WEST LSTF programme and reduced substantially in the first year of the programme (from 56.3% to 52.0%) after which there was further reduction between 2014 and 2016 (from 52.0% to 49.6%), during a period in which petrol prices fell and an increase in car commuting was seen in the South West of England more generally. Sustained growth in cycling has been seen since 2013 in the North Fringe area (from 10.5% to 14.4% between 2013 and 2016) and some growth in walking and bus use has been seen since 2014. This implies that the WEST LSTF programme may have had largest impact in the first part of the funding period, followed by sustained impact at a lower level subsequently

Predicted use of sustainable travel modes in the future can be informed by commuters' levels of satisfaction with their journey to work. A comparison of respondents' levels of satisfaction with their normal mode of travel to work in March 2014 and March 2016 showed a marked increase in bus users' journey satisfaction by 2016, which suggests that the higher bus mode share demonstrated in 2016 may be maintained. However, this must be tempered by the findings that bus users were still the least satisfied group overall compared with users of other modes. The finding that those who walked or cycled remained the groups most satisfied with their commutes can be considered as a positive outcome of interventions to support these modes.

Patronage growth data and bus user surveys for two LSTF-funded bus services (X18 and Kings Ferry) showed they were successful in attracting car commuters when they were introduced and growth in users was sustained over time, although fewer new users over time were car commuters. This indicated that there was the prospect of these services continuing to contribute to maintain bus mode share. However, this depended on the bus services continuing to operate. Since March 2015, subsidies from LSTF for both of these bus services were no longer available. The North Bristol Commuter Coach service, originally run by Kings Ferry, was transferred to a new operator and new timetables and routes introduced (lengthening journey time). The X18 service continued with some

adjustments to its routing and timetable, but by early 2017 both these services had ceased to operate.

The findings suggest that the gains of the WEST LSTF programme in increasing the share of commuting by alternatives to driving alone can be sustained if promotion of sustainable transport initiatives is continued (for example, to ensure new staff are encouraged to try alternatives as staff turnover occurs) and can be built upon further if it is possible to invest substantially in sustainable transport infrastructure and services (such as the Metrobus system currently being constructed). The evidence from this study shows that reductions in driving alone are most likely to take place where sustainable transport promotion occurs alongside restraints to driving from parking space reductions and congestion.