



# A Study of the value of local bus services to society

**A report for Greener Journeys**

**August 2016**



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# Preface

This report presents the findings of a study that aimed to identify, articulate and quantify the economic, social and environmental impacts of frequent and reliable local bus services, considering the impact that bus services have on the ability of households to participate in economic and social activities and ultimately on levels of economic, social and environmental deprivation.

The work was commissioned by Greener Journeys and was independently undertaken by KPMG LLP in association with the Institute for Transport Studies at the University of Leeds.

# Executive summary

## Building successful and sustainable communities

Building successful and sustainable communities requires the pursuit of policies attuned to economic, social and environmental objectives.

This is especially true for transport policy and investment decisions which require a balanced approach to delivering economic prosperity, supporting social inclusion and protecting the natural environment.

Whilst much has been done over the last 10 years to improve our understanding of the wider economic impacts of transport investment and policy decisions, much less has been done to develop a better understanding of the wider social and environmental impacts of transport investment and policy decisions.

In this report we develop new evidence on the significance of local bus service connectivity to achieving economic, social and environmental objectives. The work takes a holistic view of the impact that local bus services have on the ability of households to participate in economic and social activities and ultimately on levels of economic, social and environmental deprivation.

The analysis shows that neighbourhoods with better local bus connectivity are, all else equal, more likely to have lower levels of economic, social and environmental deprivation.

## Importance of frequent and reliable local bus services

The latest statistics produced by the Department for Transport show that more than 5 billion journeys were made by bus in Britain in 2014/15.

The journeys were made on a wide range of services for a wide range of reasons: 23% of journeys were made to commute to and from work, 16% to get to and from education, 26% for shopping, 10% for personal business such as going to the doctors, and 21% for other socially orientated activities.

Local bus services are particularly important for those without access to other forms of transport, with those who do not have access to a car making around 25% of all of their travel by bus. They are used more by the young and those over the age of 70 and are used more in towns and cities.

Analysis undertaken on behalf of the Department for Transport shows that where local bus services are withdrawn, some passengers are able to make alternative transport arrangements but for 1 in every 5 journeys a practical alternative does not exist<sup>1</sup>. For some, this may mean not taking a job, not taking advantage of educational opportunities, not taking care of health needs or simply not seeing friends and family.

With almost 1 in 4 people in the UK at risk of social exclusion<sup>2</sup> and almost 1 in 4 households in Britain without access to a car<sup>3</sup>, the importance of local bus services to enabling households to participate in society is clear for all neighbourhoods and not just the most deprived.

<sup>1</sup> Department for Transport WebTAG Table A 1.3.17.

<sup>2</sup> Eurostat, 2015, People at risk of poverty or social exclusion, [http://ec.europa.eu/eurostat/statistics-explained/index.php/People\\_at\\_risk\\_of\\_poverty\\_or\\_social\\_exclusion](http://ec.europa.eu/eurostat/statistics-explained/index.php/People_at_risk_of_poverty_or_social_exclusion)

<sup>3</sup> Transport Statistics Great Britain, 2014, Department for Transport

## Areas with better connectivity have lower levels of deprivation

New econometric analysis undertaken by the University of Leeds as part of this study quantifies the strength of the relationship between local bus service connectivity and economic, social and environmental deprivation.

The analysis shows that, after allowing for other factors that influence deprivation, a 10% improvement in local bus service connectivity in town and city neighbourhoods in England is associated with a 3.6% reduction in deprivation as measured by the Department of Communities and Local Government's Index of Multiple Deprivation (IMD).

To put this in context, Table 1 provides an illustration of what a 3.6% improvement in IMD scores means for the key economic, social and environment metrics for the most deprived 10% of neighbourhoods in English towns and cities, the least deprived 10%, and the average value across all such neighbourhoods.

**Table 1 Economic and social impacts associated with a 3.6% improvement in IMD scores**

	Most deprived neighbourhoods	Least deprived neighbourhoods	Mean over all neighbourhoods
<b>Total population</b>	<b>2,246,950</b>	<b>1,983,367</b>	<b>2,276,823</b>
Reduction in unemployment (jobs)	9,909	571	4,240
Reduction in income deprived (number of individuals)	22,647	1,079	9,404
Reduction in those with no adult skills (number of individuals)	7,313	1,245	4,247
Years of potential life lost (years)	-2,596	-471	-1,641

Notes: Further details of the definition and computation of the numbers in this table are presented in Section 7 of the report.

In taking a holistic view of the relationship between local bus service connectivity and economic, social and environmental deprivation, we can begin to understand the wider social implications of transport policy and investment decisions.

Whilst frequent and reliable local bus services are not an end in themselves they do enable individuals to take employment, participate in education and take better care of themselves – activities which are clearly important to individual and community well-being.

## Stakeholder views

We interviewed representatives from 18 organisations during the course of this work, including stakeholders from central government departments, local authorities, charities and transport groups. The interviews sought views on the importance of the wider social impacts arising from the provision local bus services. The interviews provided the following important insights:

- There is widespread recognition that social benefits arising from changes to the public transport provision are important.
- Understanding the social dimension of all impacts resulting from changes to local bus service provision is key to estimating their true value. Sometimes social benefits may not be direct and may be hidden behind other impacts.
- Some social impacts also have an impact on the public accounts in addition to providing benefits to individuals and communities.
- Many of the impacts classified as social, such as benefits from volunteering, are not captured in traditional appraisals of transport investment and policy interventions. This may result in sub-optimal decisions on policy and investment.

## Implications for transport policy and appraisal

The econometric analysis developed as part of this study addresses the concern of many of the stakeholders that we interviewed in seeking to quantify the economic, social and environmental impact of local bus services. The analysis shows a strong association between changes in bus service connectivity and changes in DCLG's Index of Multiple Deprivation, which when combined with what the data shows about the relationship between local bus service connectivity and participation in economic and social activities provides powerful evidence on the importance of connecting people and places for individual and community well-being.

This new econometric evidence prompts reasonable questions to be asked about the scope of traditional transport appraisal methods which may not take account of all of the wider social impacts arising from participation in employment, education, health and community based activities. Many of these activities are likely to have a value to society that is over and above the value to the individual. By not accounting for these wider social impacts in policy and scheme appraisals, we risk under-estimating the value of local bus services.

It is easy to think of examples of where frequent and reliable local bus services enable participation in voluntary work or participation in further and higher education and training. It is also easy to think about the positive physical and mental well-being impacts gained by older and disabled people enjoying a more active lifestyle made possible through concessionary travel on local bus services. The challenge is in assigning a value to the contribution that local bus services have on making these activities possible.

To illustrate the magnitude of the benefits arising from wider social impacts we have developed a cost benefit analysis of the Bus Service Operators Grant – a government intervention which aims to help to improve bus service levels and keep bus fares low. In this case BSOG represents general expenditure on bus services aimed at providing a more attractive service to the customer, which could be in the form of either capital or revenue investments. The analysis shows that including wider social benefits in the appraisal of the costs and benefits of local bus services may add as much as a third to the Benefit Cost Ratio, increasing the value from £3 of benefit for every £1 spent to £4 of benefit for every £1 spent. This potential increase can be applied equally to revenue and capital expenditure.

The key point from this is that a programme of transport and non-transport policies may contribute together to achieve certain social outcomes that individual policies in isolation would not be able to achieve. These synergies are particularly relevant for local bus services which carry a greater share of socially orientated trips relative to other modes. The wider social benefits need to be explicitly recognised within appraisals of transport policy and investment to ensure that the value of bus projects are properly understood.

The work presented in this document demonstrates that investment in bus services may lead to benefits not fully captured within current appraisals and that a more holistic view of the role of buses in society is required to maximise people's access to opportunities.



# 1 Introduction

## 1.1 This report

This report presents the findings of new research and analysis which seeks to estimate aspects of the value of local bus services to society. The work was commissioned by Greener Journeys and independently undertaken by KPMG LLP in association with the Institute for Transport Studies at the University of Leeds.

## 1.2 Greener Journeys

Greener Journeys is a campaign dedicated to encouraging people to make more sustainable travel choices. The Campaign aims to reduce CO2 emissions from transport by encouraging people to switch some of their car journeys to bus or coach instead. Greener Journeys commission research on the wider benefits of the bus, present evidence to government and Parliament, build partnerships and run modal switch campaigns.

## 1.3 KPMG LLP and the Institute for Transport Studies

KPMG LLP operates as a global network of independent member firms offering audit, tax and advisory services. KPMG member firms can be found in 155 countries. Collectively they employ more than 174,000 people across a range of disciplines.

The Institute for Transport Studies is a free-standing academic department of the University of Leeds and part of the Faculty of Environment. The Institute's primary purpose is to advance the understanding of transport activity, operations and use, and to develop skills and best practice among transport professionals and decision-makers. The history of ITS goes back more than forty years.

## 1.4 Objective of the study

The objective of the study is to identify, articulate and quantify the economic, social and environmental impacts of frequent and reliable local bus services, considering the impact that bus services have on the ability of households to participate in economic and social activities and ultimately on levels of economic, social and environmental deprivation.

This is a complex area of analysis characterised by a multitude of concepts and definitions, with confounding interactions between many of the factors that contribute to individual and community well-being.

In this work we aim to simplify the narrative by demonstrating clear, empirical links between transport connectivity, participation in economic and social activities, and levels of economic, social and environmental deprivation.

Over the last 10 years the Department for Transport and others have done much to improve our understanding of the wider economic impacts of transport, however much less work has been done to develop a better understanding of the wider social impacts. This work seeks to redress the balance by considering the extent to which wider social impacts contribute to the true value of local bus services.

The work uses a combination of desk-based research, stakeholder consultation and new econometric analysis to develop an improved understanding of the types, scale and distribution of economic, social and environment impacts generated by local bus services.

## 1.5 Context to the study

In 2003 the Government's Social Exclusion Unit – A predecessor to the Social Exclusion Task Force – published research which revealed that poor transport provision can pose significant barriers to social inclusion and reinforce trends in social exclusion<sup>4</sup>. The findings of the research led the government at the time to introduce local policies in accessibility planning based on the idea that improving access to health, employment, education, food shops and other activities can have profound impacts on individual and community welfare.

Social exclusion is still a major concern today with almost one in four people in the UK at risk of social exclusion<sup>5</sup>. Whilst the 'solutions' to these challenges are many and varied, it remains clear that good transport connectivity is a clear enabler to employment, education, healthcare and other important activities.

With almost one in four households in Britain not having access to a car<sup>6</sup>, local bus services play an important role in connecting households and communities to the places and activities.

## 1.6 Structure of this report

The report is structured as follows:

- Section 2 identifies why local bus services are important to society.
- Section 3 outlines our methodological approach to the study.
- Section 4 reports the views of key stakeholders.
- Section 5 sets out a framework to understand the social impacts of local bus services.
- Section 6 shows the empirical evidence on the relationship between local bus service connectivity and economic, social and environmental deprivation.
- Section 7 draws out the implications of the analysis for transport policy and appraisal.

<sup>4</sup> Social Exclusion Unit, 2003, Making the Connections: Final Report on Transport and Social Exclusion, Office of the Deputy Prime Minister.

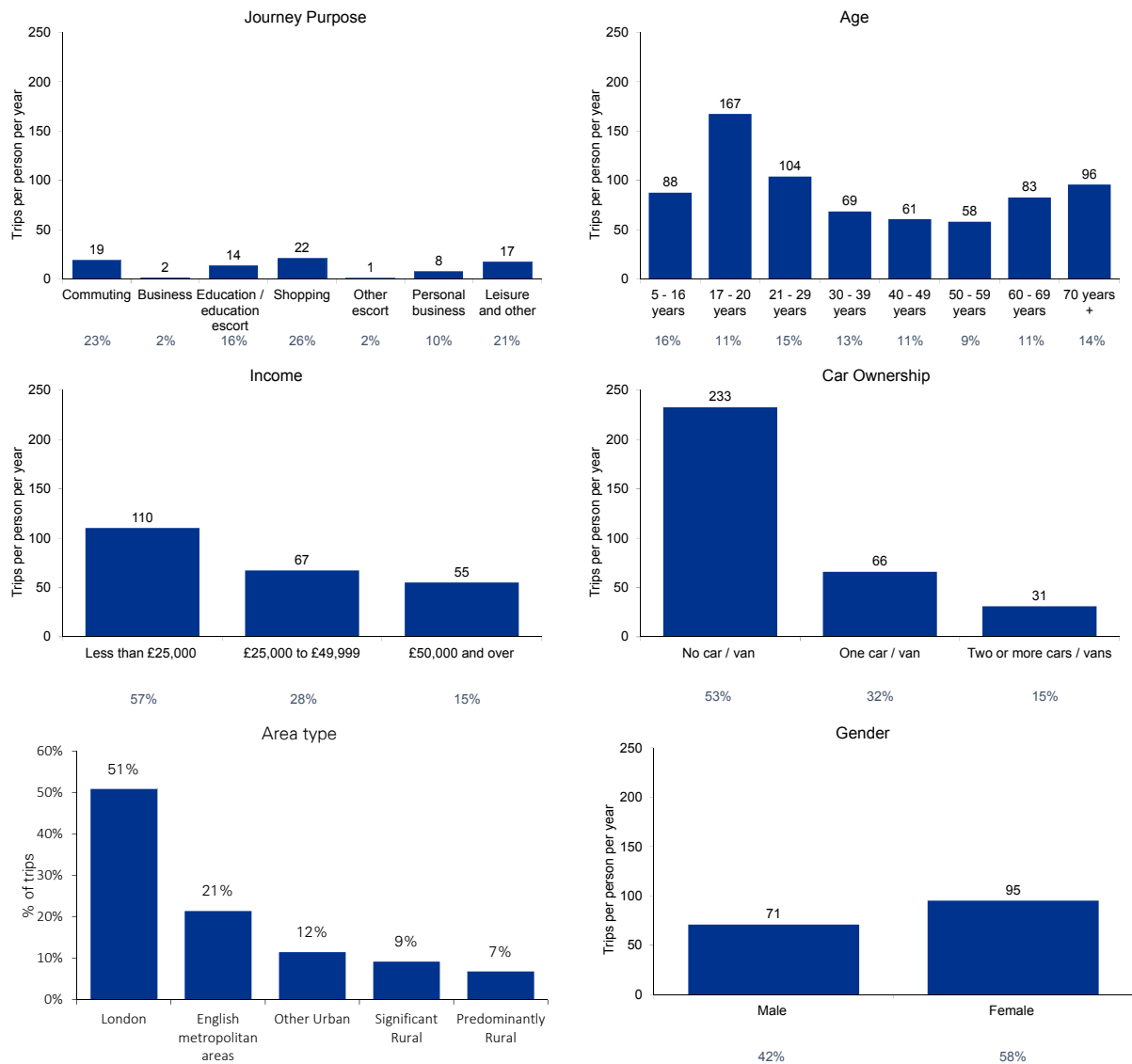
<sup>5</sup> Eurostat, 2015, People at risk of poverty or social exclusion, [http://ec.europa.eu/eurostat/statistics-explained/index.php/People\\_at\\_risk\\_of\\_poverty\\_or\\_social\\_exclusion](http://ec.europa.eu/eurostat/statistics-explained/index.php/People_at_risk_of_poverty_or_social_exclusion)

<sup>6</sup> Transport Statistics Great Britain, 2014, Department for Transport

## 2 Why bus services are important

The latest statistics produced by the Department for Transport show that more than 5 billion journeys were made by bus in Britain in 2014/15. The journeys were made on a wide range of services for a wide range of reasons.

Figure 1: Who uses local bus services and why



Source: Department for Transport Bus Statistics and National Travel Survey

Around 20% of journeys were made to commute to and from work, 16% to get to and from education, 26% for shopping and bulk of the remainder of journeys for other, socially orientated activities. Buses are used more by the young and old, those with lower household incomes, those without access to a car and women more than men. By allowing people to access these services and activities, buses bring substantial value to society<sup>7</sup>.

<sup>7</sup> An example of this is the value of shopping trips – people travelling by bus spend approx. £27bn on retail goods per year, having a substantial impact on the local economies of cities and towns across the country. "Bus 2020, the case for the bus" Greener Journeys 2015 (<http://www.greenerjourneys.com/wp-content/uploads/2015/02/Bus-2020.pdf>)

## 3 Approach to the study

Our approach to the study included a literature review, interviews with stakeholders and new empirical analysis and econometric investigation of the strength of the relationship between local bus service connectivity and economic, social and environmental deprivation. The approach builds a picture of the true value of local bus services and concludes with a discussion of how important social impacts can be included in transport policy and investment decision-making. A brief description of each of the five tasks which went towards building our overall approach is presented in Table 2.

**Table 2 Approach to the study**

<b>Task</b>	<b>Description</b>
<b>1. Literature review</b>	Our first task was to review the extant literature on the social impacts of transport networks and services to provide clarity on key concepts, insight into the relationships between transport connectivity and social impacts, and evidence on the strengths of these relationships. We present the key points from our literature review in Section 4.
<b>2. Interviews with stakeholders</b>	Our second task involved interviews with government and industry stakeholders covering the social impacts of local bus services and the treatment of these impacts in transport policy and investment decisions. The interviews also covered integrating transport policy with other economic and social policies to create value and cost efficiencies. We report on the key findings from the stakeholder interviews in Section 5.
<b>3. Analytical framework</b>	Based on the insights from the literature review and the stakeholder interviews, our third task involved developing a framework for understanding the links between transport connectivity and social impacts. The framework provides a structure for the empirical analysis and supporting policy narrative. We describe our deliberations on the specification of the framework in Section 6.
<b>4. Econometric analysis</b>	The econometric analysis part of the study seeks to quantify the strength of the relationship between local bus service connectivity and economic, social and environmental deprivation. We report the findings of this analysis in Section 7.
<b>5. Implications for transport policy and appraisal</b>	The final task brings together the findings of the study to draw out the implications for transport policy and investment decision-making with reference to an illustrative appraisal of the true value of local bus services based on HMT Green Book supported methodologies. The results of this appraisal are set out and discussed in Section 8.

## 4 Literature review

### 4.1 Introduction

The social impacts of local bus services, and transport more generally, are complex. Our first task was therefore to review previous work in the area to obtain clarity on concepts, definitions, theories of change, and evidence of the scope and scale of the impacts.

### 4.2 Concepts and definitions

Our starting point was to consider concepts and definitions of social impacts. Table 3 presents a selection of definitions used by different parts of Government by way of example.

**Table 3 Example definitions for social impacts**

Concept	Description	Source
<b>Social impacts</b>	Social impacts cover the human experience of the transport system and its impact on social factors, not considered as part of economic or environmental impacts. The DfT define eight social impacts including: accidents, physical activity, security, severance, journey quality, option and non-use values, accessibility and personal affordability.	Department for Transport – WebTAG Unit A4.1
<b>Social benefits</b>	... gains which accrue to society – For instance, improved health and wellbeing or increased satisfaction with the community.	New Economy Tool 2013 and HM Treasury CBA guidance for local partnerships 2014
<b>Social return</b>	Social Return on Investment (SROI) measures the economic, environmental and social value of businesses or policies in monetary values, in addition to the financial value generated by these.	Cabinet Office guide on Social Return on Investment 2009

Comparing the definitions in Table 3, we see that social impacts are sometimes considered separately from economic and environmental impacts and sometimes as part of a broader measure of economic welfare incorporating economic, social and environmental impacts.

Whilst it is convenient to allocate impacts from transport interventions to separate categories including economic, social and environmental, as defined by the Department for Transport, in practice the categorisation of costs and benefits may be difficult as specific impacts may sit in multiple categories.

There are other concepts and variations on the social impacts theme that are important to understanding the overall impacts of frequent and reliable local bus services. These appear repeatedly in the literature.

Some of these concepts can be used to understand the link between transport and social impacts, while other concepts can be used to measure social impacts. These are shown in Table 4 and are later incorporated into the analytical framework presented in Section 6 of this report.

**Table 4 Other relevant concepts and variations on the social impacts theme**

Concept	Description	Source
<b>Concepts to assess the link between transport and social impacts</b>		
<b>Accessibility</b>	<p>'The extent to which land-use and transport systems enable individuals to reach activities or destinations by means of a combination of transport modes.'</p> <p>'Can people get to key services at reasonable cost, in reasonable time and with reasonable ease? Accessibility depends on several things: does transport exist between the people and the service? Do people know about the transport, trust its reliability and feel safe using it? Are people physically and financially able to access transport? Are the services and activities within a reasonable distance?'</p>	<p>Geurs and Van We, 2004</p> <p>Social Exclusion Unit, 2003</p>
<b>Transport poverty/Transport disadvantage</b>	<p>'The cumulative effect of poor public transport services, poor provision for walking and cycling (including access to public transport) and low levels of car ownership, particularly affecting women, the poor, the disabled, dwellers in rural areas and other classically disadvantaged groups.'</p> <p>Households at serious risk of being cut off from work and healthcare because of the rising costs of owning and running a car, and a lack of alternative transport methods.</p> <p>A related concept is 'transport wealth', described as the transport and accessibility opportunities available to people – In terms of access to modes (car, bus, rail, etc.) and to the ability to reach services on foot.</p>	<p>Palacin and Vigar, 2015</p> <p>Sustrans, 2012; RAC Foundation 2014</p> <p>Stokes and Lucas, 2011</p>
<b>Concepts to measure social impacts</b>		
<b>Social exclusion</b>	<p>'Social exclusion is the process by which people are prevented from participating in the economic, political and social life of the community because of reduced accessibility to opportunities, services and social networks, due in whole or part to insufficient mobility in a society and environment built around the assumption of high mobility.'</p>	<p>Kenyon et al, 2006</p>
<b>Social connectedness</b>	<p>'Social connectedness is defined as the social interactions, relationships and networks that people have with others and the benefits these relationships can bring to the individual as well as to society. It can be viewed as one aspect of community cohesion.'</p>	<p>Quigley and Thornley, 2011</p>
<b>Distributional impacts</b>	<p>'Distributional impacts (DIs) consider the variance of transport intervention impacts across different social groups.'</p> <p>Distributional impacts are not the same as social impacts, and they can be assessed for economic, environmental and social impacts. Three dimensions are identified: temporal, spatial and demographic.</p>	<p>Department for Transport – WebTAG Unit A4.2</p> <p>Lucas and Jones, 2012</p>
<b>Social justice/ social equity</b>	<p>Social justice theories examine transport-related disadvantages and their relation to poverty from a perspective of inequality. They are therefore related to distributional impacts.</p>	<p>Titheridge et al, 2014</p>
<b>Deprivation</b>	<p>Deprivation is defined as the 'the damaging lack of material benefits considered to be basic necessities in a society'</p> <p>The DCLG Indices of Multiple Deprivation (IMD) identify the following main categories of deprivation: Income, Employment, Education, skills and training</p> <p>Health and disability, Crime, Barriers to housing and services, Living environment</p>	<p>Oxford Dictionaries</p> <p>Department for Communities and Local Government (DCLG)</p>
<b>Social mobility</b>	<p>The ability of individuals from disadvantaged backgrounds to move up in the world, akin to the notion of equality of opportunity.</p>	<p>Department for Business, Innovation and Skills 2011</p>

## 4.3 Dimensions of social impacts

Transport can have a range of positive and negative social impacts, some of which are direct and some of which are indirect, some impact on the individual and others on the community, some occur in the short term and others in the long term, some have a market value and others do not, some have implications for the public accounts and others do not, some affect everyone and other affect specific groups more than others.

### Direct and indirect

Direct individual impacts lead to indirect individual impacts. Direct impacts refer to impacts directly caused by changes in accessibility resulting from a change in the provision of public transport – for example, improved skills resulting from an increase in attendance of training courses and skills due to better accessibility by bus to these courses. Additional direct impacts include employment and health impacts from improved access to employment centres and health facilities. Indirect impacts refer to impacts to the individual arising from direct impacts. For instance, access to employment may have significant knock-on impacts by preventing individuals from falling into a vicious circle of poverty and social exclusion<sup>8</sup>.

### Individual and community impacts

Transport provides access to social networks and therefore has a wider impact on society. Both direct and indirect impacts to individuals may result in changes in other people's behaviour who are not directly affected by the changes to the provision of bus services. Individual impacts contribute to wider community impacts through spill-over effects. Examples of community impacts are more liveable communities and neighbourhoods<sup>9</sup> and improved social connectedness and integration<sup>10</sup>.

### Short term and long term

Some studies distinguish between short-term and long-term impacts. Long-term impacts may include: health, individual and community well-being, social equity and justice (Lucas and Jones, 2012).

### Impacts on specific groups

Social impacts vary by population group. Many studies on the social impacts of buses analyse these impacts from this perspective. For example, a recent report produced by the European Parliament on the impact of public transport on social inclusion (2015) identifies social groups at a higher risk of social exclusion and describes how transport affects them in different ways. These groups include: unemployed people, people in precarious work, elderly people, people with low level of education or training, disabled and long-term ill people, young adults, single parents, children, immigrants, and women. For example, it identifies how social isolation is an impact related to the elderly population. This report also argues that the groups at higher risk of social exclusion are also in higher risk of suffering from transport disadvantage.

### Impacts on the public accounts

Finally, impacts from both transport and non-transport policies may affect the cost of providing cross-sector services, and therefore the public accounts. This is recognised in the Cost-Benefit Analysis Guidance developed by the New Economy Manchester, now added as supplementary guidance to the HM Treasury Green Book, which provides guidance on how to monetise a wide range of impacts to individuals' and society's wellbeing to assess the cost-effectiveness of public policy interventions. This guidance makes a distinction between the fiscal, economic and social dimensions of these impacts and provides separate monetary values for them.

We have identified impacts to individuals and society based on above discussion as well as the ONS definition of wellbeing and its different dimensions<sup>11</sup>. Clearly some of the impacts have direct impacts

<sup>8</sup> European Parliament, 2015

<sup>9</sup> Boschmann and Kwan, 2008.

<sup>10</sup> New Zealand Transport Authority, 2012

<sup>11</sup> <http://www.neighbourhood.statistics.gov.uk/HTMLDocs/dvc146/wrapper.html>

on both the individual and society as a whole. The challenge when appraising the impacts is to make sure that they are all included once.

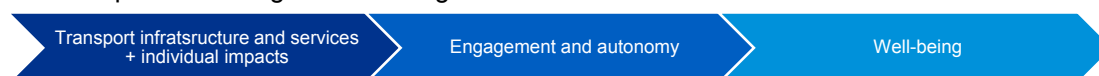
**Table 5 Social impacts to individuals and society**

Impacts on the individual	Impacts on society
— Physical and mental health	— Environmental (noise, air quality)
— Employment	— Safety
— Education and skills	— Community cohesion and well-being
— Culture	— Reduced deprivation
— Leisure and shopping	— Social inclusion
— Personal safety and security	— Fiscal impacts
— Journey quality	— Distributional / equality impacts
— Civic participation	— Civic participation
— Personal finance	

## 4.4 Theories of Change

Transportation can create positive social impacts through several mechanisms. Establishing a causal relationship or ‘Theory of Change’ for these mechanisms is a key part of the appraisal process. Two examples of theories of change include:

- The Social Impacts Toolkit developed by DfT presents the following framework to understand social impacts focusing on well-being<sup>12</sup>:



- Other examples from the literature focusing on how impacts flow from individuals to society<sup>13</sup>:



The DfT toolkit also advises that certain individual benefits may result in wider well-being benefits. This is a common theme in these logic maps, which present the flow of benefits from transport provision affecting individuals first, and then impacting the behaviour and well-being of society as a whole. The wider effects to society may be seen as ‘social multiplier impacts’<sup>14</sup>. The discussion on theories of change is continued in Section 6.

## 4.5 Evidence on the social impacts of transport

There is a growing body of evidence showing the social impacts of changes to local bus services. Examples of qualitative and quantitative studies presenting evidence for the UK and outside the UK are presented in Table 6.

<sup>12</sup> Reardon and Abdallah, 2013

<sup>13</sup> based on Mouette and Waisman, 2004 and New Zealand Transport Authority, 2012

<sup>14</sup> These impacts are explained in more detail in Section 6.



**Table 6 Evidence on social impacts**

Study	Description
Assessing the value of transport initiatives in deprived neighbourhoods, Lucas et al, 2009	This study analyses case studies of four different transport projects funded under the UK Department for Transport's Urban Bus Challenge Fund. The study showed that the projects contributed to the take-up of employment, to widen access to employment, and to increase social interactions – elderly residents were better able to get out of the house and parents with children were better able to visit family and friends. Some residents felt the bus service had made the area a better place to live. This study highlights that there is a lack of valuation of the contribution of new transport interventions in deprived areas.
Impact of free bus travel on young people, NHS, 2014	This study investigates the impact of free travel on the well-being of young people under the age of 18 in London. The qualitative data obtained as part of this study suggested a number of benefits from increased bus use for young people, including increased mobility, increased travel options, and fostering a feeling of 'belonging' to London.
The Social and Distributional Impacts of Transport: A Literature Review, Markovich and Lucas, 2011	<p>This report provides a summary of evidence by type of social benefit. Examples include:</p> <ul style="list-style-type: none"> <li>— Health – The World Health Organisation (WHO) attributes traffic-related noise to the annual loss of 1 million 'healthy years' of life through ill health, disability, and early death; a statistic that applies to western countries of the WHO European Region alone (WHO, 2011).</li> <li>— Employment – Dobbs (2005 and 2007) reveals how poor access to public transport in north east England has posed problems for women in accessing employment opportunities;</li> <li>— Access to services – The operating hours of transport systems have been identified as a factor adversely affecting the ability of socially disadvantaged groups to access such important services as: before-and-after school activities, health care facilities, food shops and employment opportunities (Social Exclusion Unit, 2003)</li> </ul>
Social exclusion and the value of mobility, Stanley et al, 2011	The authors find that in Australia people are less likely to be at risk of social exclusion if they have regular contact with significant others, have a sense of community, are not poor, are mobile and are open to new experiences.
State Roles in Providing Affordable Mass Transport Services for Low-Income Residents, Cervero, 2011	This paper argues that 'The ability to widen the territorial sphere for job searching, save on food purchases, reach medical clinics fairly quickly, and seek out better educational opportunities is likely to benefit the poor more than saving a few minutes of time moving along an expanded roadway' (p. 17). It references evidence for the US, Thakuriah and Tang (2008) estimated that those facing transportation problems suffered an annual social welfare loss of around \$2,500 compared to those without mobility problems.
Why community transport matters, ECT Charity 2016	A report focused on quantifying the social impacts of community transport estimates that between 2 and 4 million people over the age of 60 may be suffering from loneliness and isolation. The report estimates that a wide-scale roll-out of services by community transport operators across the UK, reducing the number of older people experiencing loneliness and isolation and mitigate the health and social care costs of those that still suffer, could lead to annual cost savings of around £0.75bn each year.
DfT WebTAG Unit A1.3.18	DfT appraisal guidance contains values estimated in a study by Mott Macdonald and the University of Leeds in 2013 quantifying the social value of a bus trip. Here, the definition of social impacts corresponded to '... the value bus users enjoy from accessing particular services that they would not otherwise have had easy access to'. Based on stated preference analysis, they estimated a social value of £3.84 for concessionary pass holders and £8.17 for non-holders per return trip (2010 values and prices).

Study	Description
Distributional Impacts Appraisal in WebTAG: Review of Evidence, DfT 2015	<p>The DfT published a study in early 2015 summarising evidence gathered on the impacts included in the social and distributional impacts (DI) guidance, including the views of appraisal users regarding evidence on these impacts and the current process to appraise these.</p> <p>The review presents general evidence demonstrating the social impacts of transport included in WebTAG, and other categories of impacts, such as the link between transport and social inclusion. The study acknowledges that transport schemes have different impacts across social groups and geographies, which vary depending on the transport scheme.</p> <p>The interviews with appraisal users focused on both existing evidence and the appraisal process. The conclusions from the user engagement were:</p> <ul style="list-style-type: none"> <li>— The majority of users expressed doubts on the DIs appraisals' role in influencing decisions in comparison with economic appraisals.</li> <li>— There is a need for more engagement/feedback with the DfT on the process. Feedback on appraisal submissions would reinforce good practice.</li> <li>— The new DI guidance released in 2014 looks more approachable</li> <li>— Appraisal inputs heavily reliant on Census data, which raises issues of out-date information.</li> <li>— There is no specific guidance for strategic schemes on whether the distributional impacts should be considered at a local, regional or national level</li> </ul>

In summary our review of the literature highlights several issues:

- There are gaps in the literature on the social and distributional impacts of transportation. For example, evidence related to psychological and mental health impacts, environmental evidence of public transport, and the extent to which increasing density reduces distributional impacts (DfT, 2015)<sup>15</sup>.
- There is a lack of ex-post evaluation of changes to bus services from a social point of view.
- There is limited evidence of the social impacts from transport at a macro level.
- Appraisal users have stated that more evidence on social and distributional impacts is needed to improve decision-making in transport investment.

There are some gaps in the UK social impacts appraisal guidance. Despite recognising that WebTAG compares favourably with other countries with well-developed appraisal guidance such as the Netherlands, a study by DfT (2015) reviewing evidence related to social and distributional impacts identified some shortcomings in the UK guidance. Key points highlighted in this review include:

- WebTAG includes a wide spectrum of social impacts but it does not cover the full range of impacts identified in the literature (Geurs et al, 2009).
- Social and distributional impacts have been generally given low priority in transport appraisal. These impacts are not all readily quantifiable, which makes them more difficult to be assessed and integrated into transport policy. There has been an oversight into cognitive and personal skills issues. (Markovich and Lucas, 2010).
- Well-being is an important concept that requires further attention in transport appraisal (Stanley and Lucas, 2008).

<sup>15</sup> Evidence from Parkhurst and Shergold (2009) reported in DfT (2015).

## 4.6 Summary

In summary, the literature review has shown a wide range of social benefits resulting from the provision of bus services. These benefits affect not only individuals using the bus but also wider society.

The literature review has shown a growing interest in social impacts in public transport and across sectors. A significant number of studies have analysed the social impacts of public transport from different perspectives, identifying a wide range of benefits including impacts on poverty, health, social inclusion and wellbeing. These studies recognise that some social groups may be affected by bus services more than others and in different ways, and that benefits to the individual may impact on society in the long-term.

The review also shows that there is evidence demonstrating the social impacts of public transport and buses, however few studies attempt to quantify these benefits specifically. The ex-post evaluation of the social impacts of buses is also still relatively limited. Finally, guidance to appraise social impacts has improved considerably in recent years but it stills excludes some social impacts that are hard to measure.

# 5 Interviews with stakeholders

## 5.1 Introduction

We engaged with relevant stakeholders to seek their views on the wider social impacts of buses and their treatment in transport policy and appraisal. This consultation complemented our review of the literature and has provided an update on the latest policy issues related to social impacts.

The interviews with stakeholders were conducted either as face-to-face meetings or as a call and covered three main areas:

- Important social impacts related to bus services.
- Social impacts in policy appraisal and investment decisions.
- The coordination of transport and non-transport policies from a social impacts perspective.

Overall, stakeholders agree that the social benefits of bus services are substantial and wide reaching across population groups. Most stakeholders think that these impacts have not been sufficiently prioritised in investment decisions in the past, although they do recognise that these impacts are increasingly being taken into consideration.

With regards to appraising these benefits, the majority of stakeholders thought that more evidence, further development of appraisal methodologies and training would be beneficial. Different views as to how to achieve this were collected throughout the stakeholder engagement.

Finally, there was a clear consensus that increased coordination of transport and non-transport policies would lead to positive social benefits, which could additionally lead to savings to the public accounts.

## 5.2 Stakeholder organisations

A wide range of transport and non-transport organisations participated in our consultation, including Central Government Departments, Local Government, charities and transport groups. In total, we spoke with 18 organisations listed below during the initial period of the study between November 2015 and January 2016.

**Table 7 Stakeholder organisations**

Organisation	
Department for Environment, Food and Rural Affairs	Age UK
Department for Communities and Local Government	Joseph Rowntree Foundation
Department for Work and Pensions	Campaign for Better Transport
Department for Transport	Association of Transport Coordinating Offices
HM Treasury	Transport for London
New Economy Manchester	Transport Focus
Disabled Persons Transport Advisory Committee	Community Transport Association
Local Government Association	Equality trust
Urban Transport Group	Association of Local Bus Company Managers

## 5.3 Stakeholder responses

This section presents a summary of the responses received from stakeholders.

### (a) The social impacts associated with local bus services

To gain a better understanding of the social impacts of buses, we first asked stakeholders about the most important social impacts of buses from the point of view of their organisation.

#### Q1. What do you consider to be the most important social impacts from the provision of local bus services?

- There are significant social benefits from buses resulting from improved accessibility to jobs, activities, goods and services. Social and economic benefits are often intertwined.
- Local bus services are particularly vital to some social groups, such as the elderly and young people in ways of reducing social isolation, providing access to social activities and improving the general health and well-being of individuals.
- The provision of bus services can help democratise accessibility and reduce inequality especially amongst rural and deprived areas.

Many respondents highlighted the need to clarify the concept of social impacts and recognised that social and economic benefits are often hard to separate, especially in the case of transport – social impacts often lead to economic outcomes and vice versa through knock-on effects. An example of this is access to health services which allows people and, especially the elderly, to visit the hospital and doctor appointments. This can prevent them from having to go into residential care, reducing costs for the local authority. Another example is improved access to employment which can have wider social impacts on health, education, etc.

All of the respondents stated that accessibility is one of the most important social impacts, with over half of all respondents recognising access to employment/training/education as important. Half of respondents cited access to leisure facilities, particularly in the case of the elderly and youth, as important and almost half of them mentioned access to health services, such as GPs and hospitals as a vital outcome of the bus services.

The next highest benefit cited was reducing social isolation. This was particularly the case for the elderly as bus services help them to maintain their independence and social life. One respondent even stated that the buses themselves served as a social platform for many bus users, helping to increase confidence and communication as well as general well-being. Alongside reducing social isolation, some respondents highlighted that bus services help to improve the general health and well-being of individuals with no alternative forms of travel. In particular, buses help the elderly and the young to be more active and social, thus reducing their chance of depression and other health related issues.

Local bus services are especially important for those living in rural areas as they often lack other modes of transport, this was referenced by some respondents. For instance, a respondent stated that local bus services lead to a good 'community vibe' and that they act as a connector. In terms of deprivation and inequality good transport links are vital, especially for the accessibility element, to help reduce poverty, increase employment, promote social inclusion and enable those with limited mobility from accessing goods and services.

Some lesser mentioned impacts were the environmental benefits from reduced number of vehicles needed on the road, and reduced congestion.

## (b) Social impacts in investment decisions

Our literature review showed that social impacts are not fully accounted in appraisals<sup>16</sup>. In this context, we asked stakeholders for their opinion on the influence of social impacts on transport policy and whether this has changed over recent years. In particular, we asked about current appraisal guidance and tools, potential improvements to appraisal and investment decisions.

### Q2. To what extent do social impacts influence transport policy and investment decisions?

- Many think higher priority could be given to social impacts. This will only be possible if there is a greater understanding in this area and a better developed methodology to appraise them.
- Greater collaboration between government departments is important for considering the wider social impacts arising from policy and investment decisions.

The response from consultations to this question was mixed. Generally there was a consensus that social impacts are not given the status they should have when making transport policy and investment decisions.

A recurring theme, particularly amongst the transport bodies consulted, indicated that over the last few years 'value for money' has become the key factor in making crucial decisions and social impacts are often treated as a lower priority within government. Government tend to focus on the benefit cost ratio (BCR) - which accounts for the monetary impacts - and sometimes slightly overlook the business case which should include all wider benefits and impacts that may not have a monetary figure associated with them.

However, responses from various government departments also reflected a sense that recently this has been changing. One opinion in particular expressed that social impacts were often at the heart of the direction of public policies and a couple of individual examples used reflected instances of this – for example the community transport minibus fund set up to benefit individuals in isolated localities. This was set up purely for the social benefit of the individuals affected rather than any economic impact.

Therefore there were differing opinions on the extent to which social impacts are fed through into policy and there still seems to be a gap in policy where social impacts could take greater prominence in decision making.

Many were open to using the new tools being developed to increase their understanding of social impacts – for example, tools such as the social return on investment tool (SRI) and the New Economy Manchester CBA tool. These were reported to have been well received by many different government departments and organisations.

One key point raised was that including social impacts in policy decisions is difficult for various reasons that are likely to remain, at least, in the near future:

- Data on social impacts tends to be qualitative – There is a need for quantitative data in appraisal.
- Collaboration and communication between government departments varies and hence one policy decision may not have accounted for the wider impacts to other areas. Budget is generally of higher priority than social impacts.

<sup>16</sup> 'CBA is not an evaluation method that is directly suitable to evaluate social exclusion related policies.' (p. 361, Wee and Geurs 2011)  
'All in all, it can be concluded that there is a long way to go before social impacts of transport projects are completely included in appraisals, in a way that allows us to compare them to economic and ecological effects.' (p.69, Geurs et al 2009)

### **Q3. How well equipped are policy makers to appraise social impacts?**

- The main barriers to successful appraisal of social impacts are a lack of a clear methodology and evidence.
- Many respondents agreed that policy makers are not well equipped or trained to appraise social impacts.

Over recent years new tools have been developed and, in some instances, used by government to try and bridge the gap left by social impacts in policy and investment appraisal. Despite this, the majority of consultees felt government were not completely equipped to appraise social impacts.

Some government departments recognised that further research could improve the decision making process by providing guidance on how to monetise social benefits not currently captured.

Key points highlighted by respondents were:

- The methodology for assessing social impacts is not fully formed yet. This is limiting the appraisal of social impacts at a central level and also at a local level, as the methodology cannot be fed through. The new tools being developed are still very much in the experimental and exploration stages and are not yet completely understood. However, research and development is still underway so this is expected to improve in the future.
- There is evidence available on an array of social impacts, but it was debated whether the available evidence was enough for governments to credibly use it in policy.
- Co-ordination between different government departments is necessary. This would provide fuller understanding of the wider impacts associated with a policy or investment decision. It was argued that there has been little progress in this respect and it can be hard to get all parties to agree and contribute.
- Lack of training - some respondents said policy makers were reasonably well equipped to appraise social impacts but they sometimes lacked awareness of supporting evidence and training in how to use available decision-support tools.

### **Q4. How could social impacts be included in transport policy and investment appraisal?**

- More research and understanding of social impacts will be beneficial in incorporating social impacts in appraisals.
- Devolution represents an opportunity for local authorities to allow accurate consideration of the wider impacts of a policy.
- Greater government co-ordination would result in a truer reflection of the wider impacts of a decision.

Respondents gave a wide range of suggestions of how social impacts could be included in policy and investment appraisal. Inevitably responses were quite varied depending on the type of organisation or the specific government department and what issues they each faced.

Key points emerging from the consultations were:

- Giving social benefits numerical values would increase their prominence in appraisal and policy making
- Increasing awareness and understanding of social impacts is important, including threshold effects and how social impacts affect wider issues.
- There needs to be more research and continuous development of suitable tools to appraise social impacts. For example, providers should have data for existing services run for social reasons, whether they are viable and what their impact is.
- New incentives should be launched such as the local employer partnerships scheme which gives strategic overview of issues within a locality, often prioritising transport.
- Social impacts need to be included in the objectives of the transport strategy or investment framework of the area, and not just at an appraisal level.

- In the context of devolution, if a project has an obvious social value/benefit to a local authority, it should be free to implement it and be accountable for those actions. It should not necessarily have to put forward the economic argument where there may not be one.
- There needs to be more coordination between government departments to include the wider impacts from other areas in policy making.
- There is a need to explicitly reference social costs and benefits. To do this there needs to be appropriate training and guidance on writing business cases which should, if written correctly, include more than the monetary impacts included in the BCR.

**Q5. Would assigning monetary values to social impacts elevate their importance in decision making?**

- Monetising social impacts would elevate their importance and make it easier to factor them in investment decisions.

A clear majority of respondents (85%) said assigning monetary values would elevate the importance of social impacts in transport appraisal and policy making. Decision making in terms of policy and investment at a high level tends to rely on appraisal of quantitative aspects and looking for the best 'value for money' which makes social impacts in their current form difficult to include. Assigning a monetary value not only allows social impacts to be included in this but also offers a figure useful for comparison and analysis and could further general understanding in this area.

However, issues and concerns were flagged by many consultees. It is very difficult to put a quantitative figure on such impacts, and although some work has been done in the area and new tools are being developed, there is still a long way to go. It is important not to reduce the numbers into 'meaningless figures' in the process and the possibility of margins of error needs to be accounted for. It is also important not to double count benefits and to have a theoretically robust methodology. There is also a debate about how these values should be weighted when using them in policy appraisal.

**(c) The social outcomes of coordinating transport and non-transport policies**

Finally, we asked stakeholders about their views on the coordination of transport and non-transport policies and whether this can help improve social outcomes. This is important as transport can help achieve a wide range of policy goals across sectors – according to the Urban Transport Group (PTEG 2015), transport can help achieve objectives relevant for up to 11 out of 24 government departments.

**Q6. Should transport and non-transport policies be coordinated to achieve better social outcomes? If so, how do you think this can be achieved and what impact could it have on the public accounts?**

- Transport and non-transport policies need to be better co-ordinated at all levels but most importantly at the local level where impacts and needs are better understood.
- A coordinated approach can have positive impacts on the public accounts.

Of all the respondents that answered this question, nearly all of them stated that there should be more co-ordination between non-transport and transport policies with the majority of those recognising that transport policies have large spill over effects in other policy areas. 'Transport is a means to an end' was one quote summarising this view, referring to the fact that transport leads to benefits in terms of health, employment and the environment.

It was largely recognised that although there would be benefits from co-ordinating policy, in practice it is very difficult to do due to poor communication, a lack of frameworks or guidance, and historical ways of working. Respondents commenting on the impact of better co-ordination on the public accounts stated that there is likely to be a positive impact of coordination on public spending through increasing tax receipts, decreasing unemployment and reduced spend on health, and a more efficient allocation of resources. Some went as far to say that the lack of coordination would cost money or transfer costs, for example if bus services were cut, saving the Department for Transport money, then there would be a higher demand on the health services resulting in higher costs to the Department of Health.



Some respondents stated that this level of coordination needed to be done at the local level by local authorities or city regions, other respondents stated that it needed to happen at the national level and a small proportion stated it should happen at all levels. There was no clear consensus amongst any type of body as to the level at which coordination should take place, and some suggested that central government should set the standard for coordinating policy, then feeding through to local authorities. Some consultees speculated that greater devolution may increase policy coordination due to the need to efficiently allocate decreasing budgets and may lead to greater understanding of needs and impacts of the local population.

A few examples of where there has been effective coordination were cited. For instance, in Yorkshire there has been dialogue between the community, education and transport sectors while in Surrey education, hospital and transport policies have been coordinated in the past. A couple of respondents referred to the Total Transport initiative which is seeking cross-sector solutions to deliver more efficient transport services. Some respondents stated that the coordination at a central level is very limited.

There were many suggestions on how best to achieve better coordination in policy areas with some of the following examples:

- A framework of best practice.
- Roundtables and secondments to share information and learning.
- The introduction of a national bus strategy to be used in conjunction with others.
- Further devolution of powers.

## **5.4 Conclusions from the stakeholder interviews**

Both the literature and the stakeholder interviews have provided important insights to understand the social impacts of buses. We have found the following common themes:

- There is a recognition that social benefits arising from changes to public transport provision are important. However these do not always influence investment decisions related to bus services.
- Understanding the social dimension of all impacts resulting from changes to bus services is key to estimating their true value. Sometimes social benefits may be hidden under other benefits.
- The different types of impacts classified as social in the literature show that bus services can impact on society through different mechanisms and channels as well as across different socio-demographic groups. This is often not captured in standard appraisals. More research would be beneficial.
- Some social impacts have an impact on the public accounts as shown by some reports produced by different government departments (HM Treasury CBA guide on local partnerships).

Overall there seems to be a desire for a more simplified and unified appraisal framework covering all the outcomes that buses can influence, including social impacts. This could help increase awareness of the benefits of bus services and identify areas of research and gaps in the evidence base, while ultimately influencing policy decisions.

# 6 Analytical framework

## 6.1 Introduction

In this section of the report we set out a framework for reviewing the social impacts of local bus services based on insight from the literature review and stakeholder interviews.

In this framework, we have adopted a broad definition of social impacts. We define these as any impact on the well-being, behaviour and preferences of society resulting from changes in transport provision, while also accounting for distributional impacts, as these are closely linked to important social impacts concepts such as social justice and equality.

Thus, we have taken into account the social dimension of other impacts not traditionally seen as social, building on the stakeholder views and the literature that highlighted the difficulty in separating social outcomes from economic or environmental impacts. For instance, employment effects, usually classified as economic, may lead to health impacts or impacts on education for both the individual and family members, which shows they can have a strong social dimension.

## 6.2 A framework to understand transport and social impacts

We present the full logic chain of social impacts resulting from a change to bus services in Figure 2, showing how an intervention leading to changes in bus services within a specific socio-economic context may lead to certain social outcomes and impacts.

It is important to note that there are also other elements determining the social impacts that result from bus-related interventions. These include personal characteristics of transport users, quality of non-transport services, and land-use patterns or urban characteristics, for instance, how far services are from each other and where people live. These are mentioned in some studies on the topic<sup>17</sup>.

<sup>17</sup> For example: Geurs et al 2009, who provide a framework where social impacts interact with land-use, personal and transport characteristics.

**Figure 2 Theory of change on the social impacts of local bus services**

1. Context	2. Inputs	3. Outputs	4. Outcomes	5. Impacts	
<p>Social problems in the area</p> <p>Percentage of people and social groups at risk of social exclusion</p> <p>Barriers to the use of local bus services</p>	<p>Transport intervention</p>	<p>Change in accessibility for certain population groups</p> <p>Change in barriers to use buses</p>	<p>Change in trips and change in activities that people do:</p> <p>Increased/decreased participation in activities related to:</p> <ul style="list-style-type: none"> <li>— Health</li> <li>— Culture</li> <li>— Retail</li> <li>— Education</li> </ul> <p>Change in travel options.</p> <p>Assessment of threshold effects.</p>	<p><b>Benefits to individual (Short-term)</b></p> <ul style="list-style-type: none"> <li>— Direct impacts from change in trips and activities: health, employment, well-being, education, culture</li> <li>— Indirect impacts from changes in activities: interrelated impacts resulting from the change in activities</li> <li>— <i>Link to cross-departmental benefits</i></li> <li>— <i>Benefits depending on social group</i></li> </ul>	<p><b>Benefits to society (Long-term)</b></p> <p>Benefits to individuals feed into society through spill-over effects, resulting in benefits to the wider society. ('social multiplier effect')</p> <p>These include:</p> <ul style="list-style-type: none"> <li>— Social impacts such as environmental impacts, community well-being, reduced social exclusion, changes in deprivation, social connectedness</li> <li>— Fiscal impacts</li> <li>— Distributional impacts – social justice</li> </ul>
<p><b>Measures:</b></p> <ul style="list-style-type: none"> <li>— Deprivation indicators</li> <li>— Accessibility indicators</li> <li>— Risk of social exclusion indicators</li> <li>— Socio-economic statistics</li> </ul>	<p><b>Measures:</b></p> <ul style="list-style-type: none"> <li>— Investment in £</li> <li>— Details on the bus attributes affected by the transport intervention:                             <ul style="list-style-type: none"> <li>- Cost</li> <li>- Time</li> <li>- Quality</li> </ul> </li> </ul>	<p><b>Measures:</b></p> <p>Ex-post accessibility indicators:</p> <ul style="list-style-type: none"> <li>— Distance/time to services</li> <li>— Quality/information of bus services</li> </ul>	<p><b>Measures:</b></p> <ul style="list-style-type: none"> <li>— Change in trips</li> <li>— Change in behaviour and activities undertaken by bus users</li> <li>— Change in households with access to a bus service</li> </ul>	<p><b>Measures:</b></p> <p>Changes to: health, employment, education, culture, wellbeing, civic participation</p> <p>Option value related to the change in households with access to a bus service</p>	<p><b>Measures:</b></p> <ul style="list-style-type: none"> <li>— Deprivation indicators</li> <li>— Risk of social exclusion indicators</li> <li>— Socio-economic statistics</li> </ul>

Decision-makers can use this logic map either to decide whether to invest in a scheme or to evaluate the benefits of a scheme after it has been implemented. We discuss the elements of each stage in the logic map of social impacts below. The logic map draws on information gathered during the review of the literature and stakeholder consultation.

## Context

The first step when analysing the impact of a scheme is to set the scene and understand the needs of a place in terms of transport investment. This includes analysing how transport may be preventing certain population groups from accessing services and participating in social and economic activities. In addition to this, we need to analyse the socio-economic characteristics of the area to understand the types of services and activities that existing and potentially new transport users need to access.

A key concept for analysing transport needs is Transport Poverty<sup>18</sup>. A location that suffers from transport poverty is a place where the existing transport options do not allow people to access specific services, people, and activities as much as they would like to. This could be for example a student wishing to work in a bar at night, however not being able to do this as there is no night bus service and taxis are too expensive to make it worthwhile.

The Social Exclusion Unit report (2003) found the following transport related barriers to participating in the economic, political and social life of the community:

- Availability of transport services.
- Physical accessibility.
- High cost.
- Low quality.
- Safety and security concerns.

At a relatively basic level, if improving local bus services removes one or more of these barriers, accessibility will increase and social exclusion may potentially be reduced.

All these elements will determine the need for investment and determine the extent to which social benefits from investing in buses can be achieved.

We can use different measures to assess the transport needs of a place. Accessibility indicators are useful to determine the barriers to travelling, while economic and demographic statistics as well as deprivation indicators provide the socio-economic context.

## Inputs

The transport needs of an area will determine what type of investment is required. This corresponds to the inputs in our logic map. Bus investment can take the form of new bus infrastructure, such as priority measures, measures to tackle congestion and improving efficiency, bus stations or interchanges and new technology. Additionally, investment could also correspond to revenue support measures that allow more services to be operated or lower fares to be charged.

We can describe the inputs by providing a short description of the scheme and the amount of investment required.

## Outputs

The outputs of an investment correspond to the direct results that the investment can directly influence. They could also be seen as the direct objectives of the scheme. In the case of bus

<sup>18</sup> Sustrans 2015, 'Locked out, transport poverty in England'. This report describes current transport poverty problems in the UK. <http://www.sustrans.org.uk/sites/default/files/images/files/migrated-pdfs/Transport%20Poverty%20England%20FINAL%20web.pdf>

investments, the outputs will be related to the quality or quantity of the bus service operated. Outputs are normally realised immediately once the scheme is implemented.

We can measure these by analysing how transport metrics change after the implementation of the scheme, for instance lower journey times, improved frequency, lower fares, improved customer experience, improved physical accessibility, etc. The different barriers to travel listed by the Social Exclusion Unit (listed above) provide a useful starting list.

Overall, all these outputs will result in a change in accessibility and connectivity. It is important to understand how overall accessibility and connectivity changes after the scheme implementation, opening up new opportunities for people to participate in social and economic activities.

## Outcomes

Social outcomes correspond to how people change their behaviour in response to the outputs of a scheme, in this case, the change in quality or quantity of bus services. As bus services improve, people may decide to take trips that would have not taken before in order to get involved in new activities. These could range from visiting the doctor more often, taking a new part-time job or shopping. The outcomes of the scheme may take time to be realised as people adapt to changes in their transport options.

Measuring outcomes can be difficult as different external factors may influence how people behave. Here it is important to isolate the contribution of the change in bus service in changing people's behaviour.

We can measure the outcomes of a scheme by looking at travel demand data, including journey purpose. We can also look at data that reflects changes in participation rates such as unemployment, take up of training, retail shopping spend or rate of doctor appointments attended.

The availability of bus services determines to some extent which social and economic activities people can participate in. This leads to social outcomes and benefits. Measuring these outcomes is important to assess the effectiveness of providing certain types of services and the long-term impact of those.

An important measure of social outcomes resulting from improvements to bus services is the change in participation rates across social and economic activities by the people who start making new or additional trips after bus services are improved.

Although time savings and other benefits for existing bus users are important, the majority of social impacts are likely to come from increases in participation rates determined by new trips. While time benefits only affect existing bus users, new trips leading to people increasingly participating in economic and social activities can have an impact on other people and society as whole. Furthermore, they may also affect other activities that people may undertake in the future through knock-on effects.

For instance, a person who starts taking the bus for learning purposes might undertake another activity later where he or she applies the knowledge acquired during the first learning activity. Also, other people not using the bus may benefit from his/her knowledge. Thus, new trips leading to changes in people's behaviour are more likely to result in long-term wider benefits for bus and non-bus users.

The reasons to start taking the bus can be very different. Research undertaken by Mott MacDonald in 2013 and later incorporated into DfT's WebTAG guidance<sup>19</sup> shows the split of trips by journey purpose of newly generated trips. Based on a survey of bus users, they found that if bus services were not available, 17% of trips would not go ahead.

<sup>19</sup> WebTAG Units A1.3.16-18

However this proportion varies depending on the purpose of the trip. 60% of trips for social/recreational and 'going out and about' purposes would not go ahead if the bus services was not available, while 30% of shopping trips, 12% of trips to attend a GP or hospital appointment, 10% of education trips, and about 3% of commuting trips would be suppressed.

Thus, most of the trips generated by better bus services have a social purpose.

### Threshold effects

Significant improvements to bus services may lead to a step change in people's access to opportunities and services. Some respondents to our stakeholder consultation highlighted this and referred to it as 'threshold effects'. When these effects exist, benefits may be substantially higher than estimated through time savings, which tend to be more appropriate for appraising marginal improvements in services.

### Social impacts

Finally, the impacts of the scheme are the consequences of people's involvement in different economic and social activities. They represent the economic, social and environmental value that a change in people's behaviour has generated.

Here, we make a distinction between social impacts to individuals and society. Individual impacts do not require interaction with other people while impacts to society are the result of collective behaviour. This distinction is important as these impacts are relevant to different stages of the logic chain of social impacts. Changes to bus services may result first in individual impacts in the short-term, which then feed to society resulting in long-term impacts. These are shown in Figure 2 above.

As the impacts of the individual feed to society, they become harder to measure and harder to isolate. We discuss the challenges around estimating the true value of buses in the next section.

### Direct user impacts may lead to indirect impacts

Improvements to bus services may lead to indirect impacts and wider impacts to society. There are two mechanisms behind these impacts – wider impacts to the bus user and to people connected to him/her:

- **Indirect individual impacts.** For instance, a bus user gaining access to better education may also then learn about cultural activities or healthier life styles through those education services, thus also benefiting from positive impacts on its personal culture and health.
- **Social multiplier impacts:** Individual impacts contribute to wider community impacts through social multipliers<sup>20</sup>. The idea behind this is that the overall benefit to society is higher than the sum of the direct and indirect benefits to bus passengers. These benefits could arise for example from someone undertaking voluntary work or participating in an activity that requires a critical mass of participants to make it worthwhile.



Spill-over effects take place through social networks. These include face-to-face interaction through members of the same family, friends, or co-workers, as well as through other communication channels such as social media, which has gained a lot of relevance in social interactions over the last years. Better bus services may also facilitate these interactions.

<sup>20</sup> Social multiplier effects is a concept that has occasionally appeared in the economic literature in the past. For instance, it is mentioned in Glaeser et al (2002), where they describe these as the effect of social interactions on people's behaviour, through changes in incentives and information. The authors provide evidence for social multiplier effects, where the aggregate impact of policies to society is greater than the impact to individuals. This concept has not really been used in the transport field.

In addition to social multiplier effects, improved bus services may allow for a better provision of services through economies of scale, as facilities can be concentrated in one location with good access by public transport, offering a higher quality and wider range of services.

In the long-term, a chain of small scale social outcomes can lead to overall improved social inclusion and improved well-being of society, thus leading to wider social impacts<sup>21</sup>.

### **6.3 Implications for the econometric analysis**

Social evaluations of bus schemes are relatively scarce, especially those focusing on the logic of impacts.

Our framework presented in Figure 2 shows the mechanisms through which bus services lead to different social outcomes can therefore provide the basis for the future appraisal of bus schemes from a social perspective. This could improve our understanding of social impacts to inform future policy. Having a clear logic behind the impacts is vital to deal with the complexities explained above.

Long-term impacts resulting from changes to bus services are likely to be influenced by non-transport policies. Thus, there is an important distinction between direct outputs from individual policies and long-term outcomes and impacts from programmes of policies and investment.

Combining better accessibility to key services and better services or public policies, packages of transport and non-transport policies are naturally complementary. The key point from this is that a programme of transport and non-transport policies may contribute together to achieve certain social outcomes that individual policies in isolation would have not been able to achieve. These synergies need to be recognised within appraisals and policy making.

As benefits flow to society, they become harder to measure. One of the reasons for this is that they may interact with impacts from non-transport policies.

<sup>21</sup> According to Lucas (2012), 'The emphasis in practice is also still largely focused on improvements to the transport system and transport services, whereas, arguably far greater social benefits could be realised from more micro-level interventions which target the individual and/or the local community in which they carry out their activities' (p. 18)

# 7 Econometric analysis

## 7.1 Introduction

The analytical framework described in the previous section describes a ‘theory of change’ linking improvements to local bus services to improvements in connectivity, which in turn impact on households’ ability to participate in economic and social activities, which ultimately generate benefits to the individual and to society.

Although the narrative is relatively straightforward, measurement and quantification of the impacts presents challenges arising from data availability and data quality, and confounding interactions between the factors of interest.

In this work we have circumvented many of the problems associated with data availability and data quality by directly measuring the strength of the relationship between measures of public transport connectivity and social impacts as measured by the Department for Communities and Local Government’s Indices of Multiple Deprivation.

## 7.2 Measuring connectivity

The Department for Transport publishes spatially detailed data on transport connectivity<sup>22</sup>. The data measures journey times for access to key services/activities by cycle, car and public transport/walk. It is published annually and presented on a consistent basis for all local areas (neighbourhoods),<sup>23</sup> including estimates of connectivity to:

- Employment centres.
- Schools.
- GPs.
- Hospitals.
- Food stores.
- Town centres.

The data consists of theoretical journey times calculated by modelling journeys between known sets of origins and destinations, using information on the road network, traffic speeds and public transport timetables.

Given correlation between alternative measures of access we select four measures including access to employment centres, GPs, Hospitals and town centres, in areas where bus services are the only form of public transport.

Table 8 provides a summary of the key connectivity metrics by area type and Figure 3 shows geographical differences in terms of access to town centres. It is clear that there is substantial variation between areas and across key services/activities.

<sup>22</sup> Department for Transport (2015) Journey time statistics guidance, <https://www.gov.uk/government/publications/journey-time-statistics-guidance>

<sup>23</sup> Lower layer super output areas (LSOAs) are used for the collection and publication of small area statistics, and have a minimum size of 1,000 residents and 400 households, but average 1,500 residents.

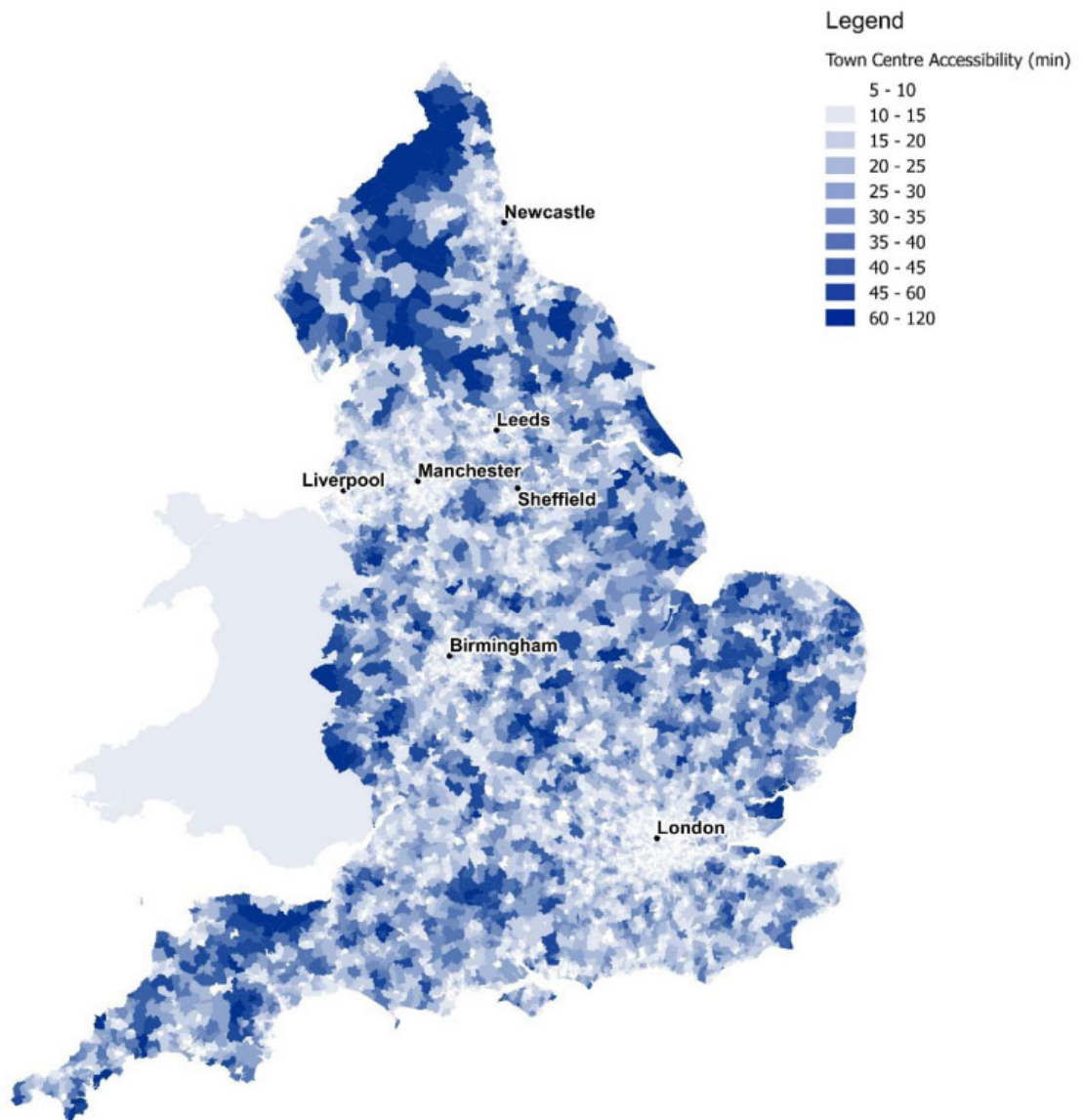


**Table 8 Average journey times to key services/activities by public transport**

Area type	PT/walk time to town centres (min)		PT/walk time to employment (min)		PT/walk time to GP (min)		PT/walk time to hospitals (min)	
	Average	Range	Average	Range	Average	Range	Average	Range
PTEs	13	5-63	8	5-23	7	5-19	22	5-79
Town/Cities	14	5-56	8	5-31	8	5-32	24	5-113
Rural	26	5-120	13	5-78	12	5-81	41	5-120

Source: KPMG analysis of Department for Transport journey time statistics.

**Figure 3 Town centre accessibility by public transport**



Source: KPMG analysis of Department for Transport journey time statistics

## 7.3 Measuring deprivation

The Department for Communities and Local Government constructs and publishes metrics on relative deprivation for local areas in England. The metrics reflect a mix of economic, environmental and social indicators. They are based on 38 separate measures, organised across seven distinct 'domains' of deprivation which are combined to calculate an overall score between 0 and 100 known as the Index of Multiple Deprivation (IMD). Table 11 provides details of the measures contributing to IMD scores. They are produced for 32,844 local neighbourhoods in England, each with a population of around 1,500 people, and are used to rank neighbourhoods from the most deprived to the least deprived.

Figure 4: Seven domains of deprivation



**Income** – The proportion of the population in an area experiencing deprivation related to low income.



**Employment** – Measures involuntary exclusion of the working age population from the labour market.



**Health and disability** – Measures premature death and the impairment of quality of life by poor health.



**Education Skills and Training** – Measures the extent of deprivation in terms of education, skills and training in an area.



**Barriers to housing and services** – Measures the physical and financial accessibility of housing and key local services (including GPs and convenience/supermarket stores).



**Living environment deprivation** – Measures the quality of individuals' immediate-surroundings both within and outside the home.

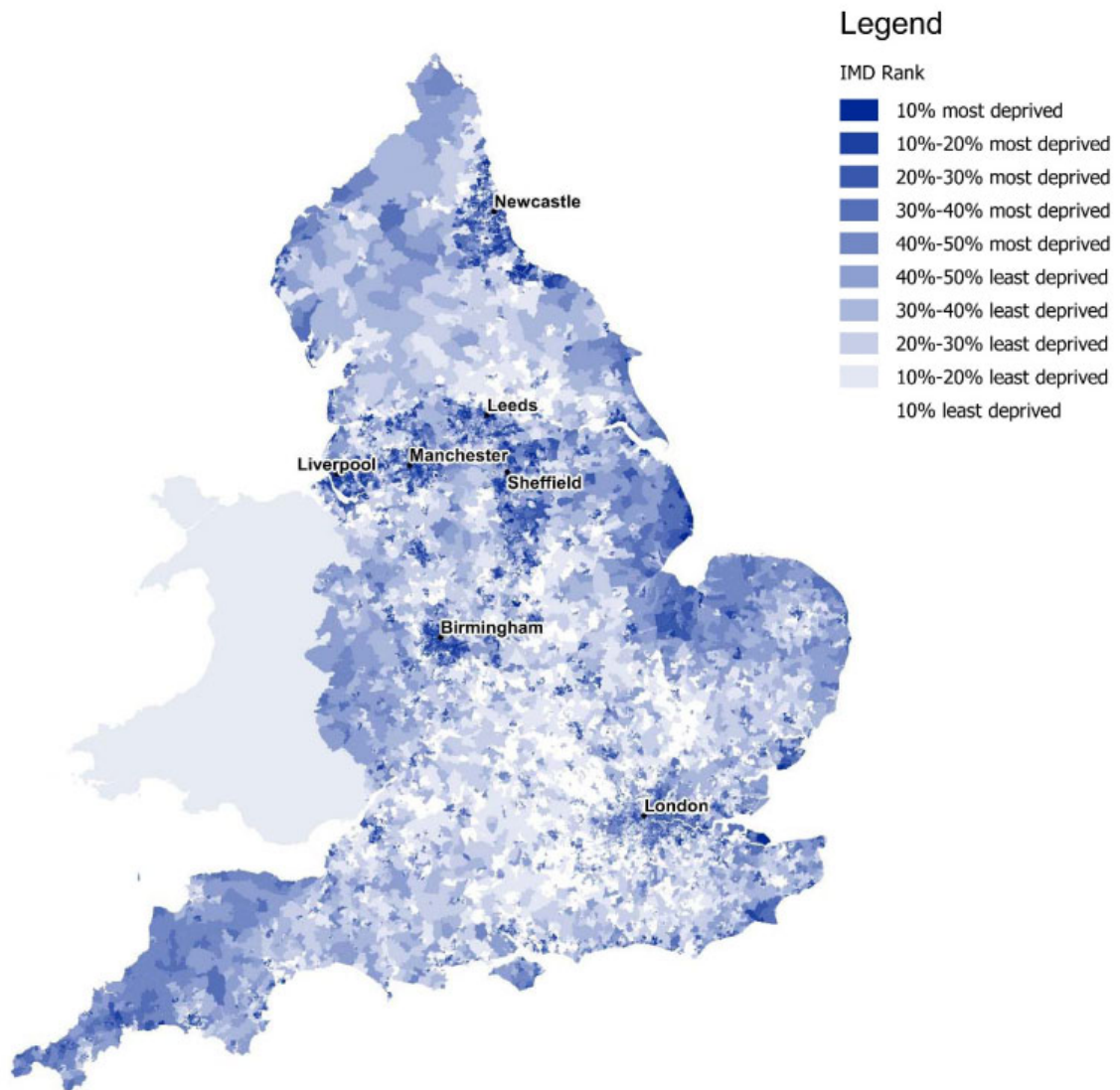


**Crime** – Measures the rate of recorded crime in an area for four major crime types.

The measure of deprivation used in the analysis was slightly adjusted from the published figures. As we are focusing on the link between transport accessibility and deprivation and for statistical purposes, we reworked the IMD score to only include six out of the seven original domains (listed in Figure 4) by removing the component of the barriers domain that related to access to services. This way we were able to isolate deprivation and accessibility separately and analyse their relationship.

It is important to note that these statistics are a measure of relative economic, social and environmental deprivation, not affluence, and to recognise that not every person in a highly deprived area will themselves be deprived. Likewise, there will be some deprived people living in the least deprived areas. Figure 5 shows the geographical distribution of IMD scores across England.

Figure 5 Index of Multiple Deprivation 2015 by neighbourhood



## 7.4 Analysis

Our analysis has considered the strength of the relationship between transport connectivity (described in Section 7.2) and levels of economic, social and environmental deprivation (described in Section 7.3) after taking account of other factors that influence levels of deprivation.

In technical terms, we have estimated a 'log-linear fixed effects' regression model using cross-sectional data for 14,514 local neighbourhoods in Towns and Cities (excluding London and Rural and Metropolitan areas<sup>24</sup>) England. The model specification is as follows:

<sup>24</sup> Rural areas were dropped as there is less dependence on, and concentration of, PT networks here. Metropolitan areas and London were excluded on the basis that there are other major forms of public transport co-existing in these areas which also have a bearing on the public transport accessibility measure. In other Towns and Cities the supplied public transport accessibility can be more safely attributed to being driven by bus services.

$$\text{IMD}_i = \alpha_k + \beta_1 \cdot \text{town\_time}_i + \beta_2 \cdot \text{empl\_time}_i + \beta_3 \cdot \text{hosp\_time}_i + \beta_4 \cdot \text{gp\_time}_i \\ + \delta_1 \cdot \text{Pop}_i + \delta_2 \cdot \text{Pop\_dens}_i + \delta_3 \cdot \text{NCA}_i + \sum \mu_k \cdot \text{ind\_struct}_{ki}$$

Where:

IMD	is the index of multiple deprivation
town_time	is journey time by bus to town centre
empl_time	is journey time by bus to nearest employment area
hosp_time	is journey time by bus to nearest hospital
gp_time	is journey time by bus to nearest GP
Pop	is population
Pop_dens	is population density
NCA	is proportion households without access to a car
ind_struct <sub>k</sub>	captures the prevailing industrial structure through a series of k dummies
$\alpha, \beta, \delta, \mu$	are parameter arrays

All continuous variables were specified as natural logarithms which means that the estimated parameters can be interpreted directly as elasticities.

The model specification has controlled for other factors likely to be important in influencing economic, social and environmental deprivation including:

- Population density to control for the possibility that areas with dense populations have better access to services and amenities than areas with less dense populations.
- Population to control for differences in social impacts based on population.
- Non-car ownership to control for the possibility that households without access to a car will not be able to access the same kinds of amenities and opportunities as those with a car.
- Prevailing industrial structure, including, retail, business services, professional service, public sector employment, service employment.

The model also made an allowance for unobserved, time-invariant local factors such as natural resources, local topology, the presence of large historical employers etc.

The estimated parameters for the preferred model specification are shown in Table 9. The results show that the model provides a relatively good explanation of variation in IMD levels between areas. The parameter estimated show that levels of deprivation in neighbourhoods:

- Reduce as public transport connectivity increases.
- Reduce with levels of car ownership.<sup>25</sup>
- Reduce with higher population and population density.

The results also show that areas with a relatively high concentration of business, professional services, public sector or, to a lesser degree, service sector employment were associated with areas with lower levels of deprivation.

<sup>25</sup> One concern is that the strong results for car availability may be due to the influence of deprivation on car availability rather than of car availability on deprivation, i.e. that car availability might be a measure itself of deprivation rather than a causal factor. To examine this we instrumented for non-car availability using historic measures of non-car availability from the 1991 UK census which could not be affected by current levels of deprivation.

**Table 9: Econometric results**

	Parameter	t-statistic <sup>26</sup>
Pop	(0.113)	(5.1)
pop_dens	(0.0289)	(6.9)
Town_time	0.198	20.6
Hosp_time	0.0584	8.6
Gp_time	0.0587	4.6
Retail	0.0218	2.3
Business services	(0.124)	(9.1)
Professional service	(0.193)	(12.8)
Public services	(0.122)	(10.0)
Service sector	(0.0588)	(5.6)
NCA	1.177	133.5
Constant	4.963	28.4
<hr/>		
R-squared (within)	0.730	
R-squared (overall)	0.751	
Groups (FE Constants)	281	
Observations	14,514	

The estimated parameters for connectivity measures can be interpreted as the ‘elasticity of deprivation’ to small changes in journey times. So for example, a 10% improvement in connectivity by bus to town centres in a neighbourhood within a given local authority district would be associated with a 2% improvement in the IMD score, all else equal. If we compound the effect of the elasticities for travel to town, hospital and GPs, we have an elasticity of 0.34. This elasticity implies a 10% improvement in connectivity by bus in a neighbourhood within a given local authority district would be associated with 3.6% improvement in the IMD score, all else equal<sup>27</sup>.

Although the econometric analysis alone does not prove causation, the interpretation of the results in the context of the conclusions from the literature review and stakeholder engagement do indicate that bus accessibility may have important economic, social and environmental impacts.

Further details of the econometric analysis are included in an associated report by the Institute for Transport Studies at the University of Leeds<sup>28</sup>.

## 7.5 Discussion of the results

The results of the econometric analysis show that, all else equal, a 10% improvement in connectivity by local bus services is associated with a 3.6% improvement in economic, social and environmental deprivation as measured by the Department for Local Government and Communities’ Index of Multiple Deprivation.

<sup>26</sup> This was done in STATA using robust standard errors which allow the fitting of a model with heteroscedastic residuals. This enables the model to deal with small issues in the data such as heteroscedasticity and lack of normality.

<sup>27</sup> Using the constant elasticity formulation, a 10% decrease on an elasticity of 0.34 is calculated as  $0.9^{0.34}$  which is a 3.6% increase.

<sup>28</sup> Johnson, D.H. (2016) Value of Local Bus Services to Society: Econometric Analysis. University of Leeds

To put this in context, Table 10 provides an illustration of what a 3.6% improvement in IMD scores means for the key economic, social and environment metrics for the most deprived 10% of neighbourhoods in English towns and cities, the least deprived 10%, and the average value across all such neighbourhoods. We have produced these figures by comparing average indicators across employment, income, skills and health for the most deprived 10%, least deprived 10% and an average 10% of the areas included in the analysis.

**Table 10 Economic and social impacts associated with a 3.6% improvement in IMD scores**

		Most deprived neighbourhoods	Least deprived neighbourhoods	Mean over all neighbourhoods
	<b>Total population</b>	<b>2,246,950</b>	<b>1,983,367</b>	<b>2,276,823</b>
<b>Percentage change</b>	Employment deprivation	-2.7%	-1.3%	-2.7%
	Income deprivation	-2.8%	-1.6%	-2.9%
	Post 16 education	+0.7%	+0.3%	+0.7%
	Entry to higher education	+0.1%	+0.1%	+0.1%
	Adult skills	+1.4%	+0.7%	+1.2%
	Years of potential life lost	-0.9%	-0.3%	-0.7%
<b>Absolute change</b>	Reduction in unemployment (jobs)	9,909	571	4,240
	Reduction in income deprived (number of individuals)	22,647	1,079	9,404
	Reduction in those with no adult skills (number of individuals)	7,313	1,245	4,247
	Years of potential life lost (years)	-2,596	-471	-1,641

- Notes:
- Employment deprivation measures the proportion of the working-age population in an area involuntarily excluded from the labour market.
  - Income deprivation measures the proportion of the population experiencing deprivation relating to low income, including both those people that are out-of-work, and those that are in work but who have low earnings.
  - Post 16 education indicator measures the proportion of young people not staying on in school or non-advanced education above age 16
  - Entry to higher education indicator measures the proportion of young people aged under 21 not entering higher education
  - Adult skills indicator is the proportion of working-age adults with no or low qualifications combined with the proportion of the working-age population who cannot speak English or cannot speak English 'well'.
  - Years of potential life lost, defined as death before the age of 75 from any cause.

In taking a holistic view of the relationship between local bus service connectivity and economic, social and environmental deprivation, we can begin to understand the wider social implications of transport policy and investment decisions.

Whilst frequent and reliable local bus services are not an end in themselves they do enable individuals take employment, participate in education and take better care of themselves – activities which are clearly important to individual and community well-being.

# 8 Implications for policy and appraisal

## 8.1 Introduction

There are clear, empirical links between the local bus service connectivity, participation in economic and social activities and economic, social and environmental deprivation.

It is therefore imperative that the appraisal of policy interventions and investment decisions take account of all of the economic, social and environmental impacts so that the benefits of bus services can be properly accounted for in transport appraisal and policy decision making.

## 8.2 The true value of local bus services

The Treasury's Green Book sets out best practice on the appraisal of government policies, programmes and projects, accounting for the costs and benefits that are attributable to the intervention. The recommended approach builds on the theory of welfare economics taking account of costs and benefits to consumers and producers as well as external impacts to those not directly involved in the production or consumption of the good or service. It also considers the cost to government arising from a change in government expenditure and taxes. The approach seeks to quantify in financial terms as many of the costs and benefits as possible.

**Table 11 Appraisal Summary Table Impacts**

Category of impact	Impacts that are typically monetised	Impacts that can be monetised but are not reported in the BCR	Impacts that it is currently not feasible or practical to monetise
<b>Economy</b>	<ul style="list-style-type: none"> <li>— Business users and private sector providers (including revenues)</li> </ul>	<ul style="list-style-type: none"> <li>— Reliability impact on business users</li> <li>— Regeneration</li> <li>— Wider Impacts</li> </ul>	
<b>Environment</b>	<ul style="list-style-type: none"> <li>— Noise</li> <li>— Air quality</li> <li>— Greenhouse gases</li> </ul>	<ul style="list-style-type: none"> <li>— Landscape</li> </ul>	<ul style="list-style-type: none"> <li>— Townscape</li> <li>— Historic Environment</li> <li>— Biodiversity</li> <li>— Water environment</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>— Commuting and other users</li> <li>— Accidents</li> <li>— Physical activity</li> <li>— Journey quality</li> </ul>	<ul style="list-style-type: none"> <li>— Reliability impact on commuting and other users</li> <li>— Option and non-use values</li> </ul>	<ul style="list-style-type: none"> <li>— Security</li> <li>— Access to services</li> <li>— Affordability</li> <li>— Severance</li> </ul>
<b>Public Accounts</b>	<ul style="list-style-type: none"> <li>— Cost to broad transport budget</li> <li>— Indirect tax revenues</li> </ul>		

Table 11 provides a summary of the economic, social and environmental impacts currently accounted for under the Department for Transport's advice on transport appraisal. For the majority of interventions involving incremental changes to services estimates of the monetary value of the direct impacts to transport users and producers will capture the majority of costs and benefits. Where interventions are more substantial, resulting in changes to activity patterns or access to essential services, other types of costs and benefits are likely to play a more important role in the appraisal.

There is flexibility in the appraisal framework to take account of wider economic impacts generated by increased and better employment opportunities. There is however less flexibility to account for wider social impacts and in particular those associated with:

- Voluntary work.
- Access to education.
- Health and well-being.

These impacts may have strong multiplier effects, which when combined with employment impacts will have an impact on economic, social and environmental deprivation and the public accounts.

### **8.3 Valuing social benefits**

The challenge we face when valuing the social benefits, as with other costs and benefits, is to make sure that what we measure is attributable to the intervention and is additional rather than simply a transfer from elsewhere.

It is easy to think of examples of where frequent and reliable local bus services enable participation in voluntary work or participation in further and higher education, and training. It is also easy to think about the positive physical and mental well-being impacts gained by older and disabled people enjoying a more active lifestyle made possible through concessionary travel on frequent and reliable local bus services. The challenge is in assigning a value to the contribution that local bus services have on making these activities possible.

Table 12 describes potential sources of evidence on these impacts, drawing on published evidence, developed in part by New Economy Manchester.

New Economy Manchester has developed and continued to refine a Cost Benefit Analysis (CBA) model that can identify the fiscal, economic, and social value of project outcomes, and specify which public agency sees this benefit.

Government agencies are using this model to rethink whether activities previously funded and delivered by one agency can be better funded and delivered by partnerships. Topics upon which the model has been applied include support for troubled families, health and social care provision and redesigns of the criminal justice system. However, this tool is increasingly used for other purposes, including the appraisal of transport investments.

The methodology has been developed with assistance from the Technical Advisory Group which is a joint group of analysts from Central Government and Greater Manchester. Their input has ensured that the methodology is robust and takes account of the most up to date research. The methodology is published here and has also now been included as supplementary guidance to the HM Treasury Green Book.

The benefits shown in Table 12 are additional to those measured following Department for Transport appraisal guidance.



**Table 12 Additional social benefits valued – Calculation inputs**

Social impact	Description	Beneficiary	Source of value and evidence	Inputs/Value
<b>Well-being impact from using public transport</b>	Benefit from improved psychological well-being from using public transport as opposed to car	Bus users	University of East Anglia research on commuting and happiness (2014)	The research found a 0.195 improvement on a 36-point scale, equivalent to approx. 0.5%, for commuters switching from car to public transport.
			HM Treasury/New Economy Manchester (2014)	Value of £3,609 of emotional wellbeing per person (2015/16 prices)
			National Travel Survey 2014	19% of bus trips are for commuting purposes
<b>Well-being impact from reduced commuting time</b>	Benefit from improved psychological well-being from reduced commuting time	Bus users	ONS research on commuting and well-being (2014)	A 10 minute increase in commuting time (one way) is associated with approximately 0.02 points decrease on average in life satisfaction, happiness and the sense that one's activities are worthwhile
			HM Treasury/New Economy Manchester (2014)	Value of £3,609 of emotional wellbeing per person (2015/16 prices)
			National Travel Survey 2014	19% of bus trips are for commuting purposes
<b>Health fiscal savings from employment</b>	On average, people in employment generate less fiscal spend on health, thus leading to savings to the public accounts.	HM Treasury	HM Treasury/New Economy Manchester (2014)	Value of £596 per person (2015/16 prices)
			Institute of Transport Studies 2014	Elasticity of -0.023 of employment to journey times. We have used this to estimate the number of new jobs.
<b>Fiscal benefits from education</b>	As people achieve further educational levels, their contribution in terms of income tax, national insurance contributions and VAT payments increases.	HM Treasury	HM Treasury/New Economy Manchester (2014)	Average value of £978 across qualifications per person gaining a new qualification (2015/16 prices)
<b>Volunteering contributions</b> <sup>29</sup>	Economic and social contributions from regular volunteering activities from people over 16 years old.	Economy/society	Royal Society of Volunteering (2010)	Evidence on the shadow price and annual hours spent on different volunteering activities. <sup>30</sup>

<sup>29</sup> Volunteering contributions were previously included in the BSOG analysis.

<sup>30</sup> Please see Greener Journeys analysis on the economic benefits of concessionary travel or more details on the methodology and data used to estimate volunteering impacts. <http://www.greenerjourneys.com/wp-content/uploads/2014/09/Concessionary-travel-costs-and-benefits-September-2014.pdf>

## 8.4 Estimating the true value of local bus services

In Table 13 we present an analysis of the true value of local bus services in England, considering the economic, social and environmental benefits delivered for each £1 of government expenditure on services delivered via the Bus Service Operators' Grant<sup>31</sup>. In this case BSOG represents general expenditure on bus services aimed at providing a more attractive service to the customer.

**Table 13 True value of local bus service per £1 of state expenditure**

	Value in £ (2015/16 prices)
<b>Economic benefits</b>	<b>£0.41</b>
User benefits – business trips	£0.03
Bus operator impacts	£(0.03)
Indirect tax revenues from modal transfer (fuel duty)	£(0.11)
Economic impacts – additional taxes from employment	£0.37
Health fiscal savings from increased employment ( <b>new</b> )	£0.02
Post 16 education fiscal savings ( <b>new</b> )	£0.13
<b>Environmental benefits</b>	<b>£0.26</b>
Benefits to other road users (decongestion)	£0.20
Environmental improvements (noise, local air quality, GHG)	£0.02
Accident reductions	£0.04
<b>Social benefits</b>	<b>£2.95</b>
User benefits – commuting and other trips	£2.15
Option and non-use values	£0.07
Health and wellbeing – active travel ( <b>new</b> )	£0.35
Volunteering/Third sector benefits ( <b>new</b> )	£0.36
Psychological wellbeing ( <b>new</b> )	£0.02
<b>Net costs to government</b>	<b>£1.00</b>
Change in BSOG	£1.45
Change in concessionary fares	£(0.45)
<b>Benefit-Cost Ratio</b>	<b>£3.62</b>

In the main, the analysis follows Department for Transport guidance on transport appraisal but includes new estimates of wider impacts including benefits associated with voluntary activity, health and wellbeing and fiscal savings from education which add a further £0.88 to the total benefits. These wider social impacts increase the total benefits from investing in local bus services by more than a third to £3.62 per £1 spent.

Although these results get us one step closer to the true value of buses, we recognise that they may not fully capture wider social benefits. These benefits are hard to isolate and quantify, and more research and evaluation is required to incorporate these into the appraisal of bus schemes.

<sup>31</sup> Further details on the methodology behind these calculations are included in Greener Journeys (2014) Costs and benefits of the Bus Service Operators Grant, <http://www.greenerjourneys.com/wp-content/uploads/2014/10/BSOG-Analysis-Report.pdf>

# 9 Conclusions

## 9.1 Building successful and sustainable communities

Creating successful and sustainable communities involves the advancement of well-chosen economic, social and environmental objectives. The three objectives however are so intrinsically linked to each other that pursuing one without reference to the others could be counter-productive.

This is especially true for transport policy and investment decisions which require a balanced approach to delivering economic prosperity, supporting social wellbeing and protecting the natural environment.

In this report we have presented new evidence on the significance of local bus services connectivity to achieving economic, social and environmental objectives. The work takes a holistic view of the impact that local bus services have on the ability of households to participate in economic and social activities and ultimately on levels of economic, social and environmental deprivation.

The analysis shows that areas with better local bus services are more likely to have lower levels of deprivation.

## 9.2 Stakeholder views

We interviewed 18 organisations on the wider social impacts of local bus services including central government departments, local authorities, charities and transport groups. The interviews provided the following important insights:

- There is widespread recognition that social benefits arising from changes to the public transport provision are important.
- Understanding the social dimension of all impacts resulting from changes to local bus service provision is key to estimating their true value. Sometimes social benefits may not be direct and may be hidden behind other impacts.
- Some social impacts also have an impact on the public accounts in addition to providing benefits to individuals and communities.
- Many of impacts classified as social are not captured in traditional appraisals of transport investment and policy interventions. This may result in sub-optimal decisions on policy and investment.

Overall there seems to be a desire for a simple appraisal framework covering all outcomes that local bus services can influence.

## 9.3 Areas with better bus services have lower levels of deprivation

The analytical framework described in Section 6 sets out a clear theory of change linking local bus service connectivity to improvements in accessibility, which in turn impact on households' ability to participate in economic and social activities, which generate benefits to the individual and society.

Although this narrative is relatively straightforward, measurement and quantification of the impacts presents challenges arising from data availability and data quality, and confounding interactions between the factors of interest.

In this work we circumvent many of the problems associated with data availability and data quality by adopting a 'reduced form' analysis that considers the strength of the relationship between measures of accessibility by local public transport and social impacts as measured by indices of deprivation.

This new econometric analysis shows a statistically significant association between local bus service connectivity and deprivation, with a 10% improvement in local bus services connectivity associated with a 3.6% reduction in deprivation after controlling for other local factors.

If we then compare key socio-economic metrics associated with a 3.6% improvement in the IMD score there are material improvements in employment, material reductions in people claiming benefits, increases in people over the age of 16 staying on education and improvements in health.

These results provide a useful interpretation of the econometric analysis by showing specifically which improvements in social outcomes are associated with better transport connectivity. They also provide an indication of how participation rates in employment and education may evolve in the long run as a result of improved access to these services.

## 9.4 Implications for transport policy and investment

The econometric analysis developed as part of this study demonstrates the significance of local bus service connectivity to levels of economic, social and environmental deprivation. The analysis shows a strong association between bus service connectivity and DCLG's Index of Multiple Deprivation, which when combined with what we know about the relationship between local bus service connectivity and participation in economic and social activities provides powerful evidence on the importance of connecting people and places for individual and community well-being.

This new econometric evidence prompts reasonable questions to be asked about the scope of traditional transport appraisal methods which may not take of all of the important social impacts arising from participation in employment, education, health and community based activities. Many of these activities are likely to have a value to society that is over and above the value to the individual. By not accounting for these *social multiplier impacts* in the appraisal, we risk under-estimating the true value of local bus services.

It is easy to think of examples of where frequent and reliable local bus services enable participation in voluntary work or participation in further and higher education and training. It is also easy to think about the positive physical and mental well-being impacts gained by older and disabled people enjoying a more active lifestyle made possible through concessionary travel on local bus services. The challenge is in assigning a value to the contribution that local bus services have on making these activities possible.

To illustrate the magnitude of the benefits arising from wider social impacts we have developed a cost benefit analysis of the Bus Service Operators Grant which aims to help to improve bus service levels and keep bus fares low. The analysis shows that including wider social benefits arising from providing access to community based activities can add more than a third to the Benefit Cost ratio for local bus services, increasing the value from £3 of benefit for every £1 spent to £4 of benefit for every £1 spent. This may indicate that not all social benefits are currently captured and quantified in transport appraisals and that further development in this area is required to produce robust assessments of transport interventions. This is particularly important for the appraisal of bus services, which have a stronger social dimension than other modes of transport.

The key point from this is that a programme of transport and non-transport policies may contribute together to achieve certain social outcomes that individual policies in isolation would have not been able to achieve. These synergies are particularly relevant for local bus services which carry a greater share of socially orientated relative to other modes, and they need to be explicitly recognised within appraisals and policy making.

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## Contact us

**Gerard Whelan**  
Director, Corporate Finance

E [gerard.whelan@kpmg.co.uk](mailto:gerard.whelan@kpmg.co.uk)

**Adriana Moreno-Pelayo**  
Assistant Manager, Corporate Finance

E [adriana.moreno@kpmg.co.uk](mailto:adriana.moreno@kpmg.co.uk)

[www.kpmg.com](http://www.kpmg.com)

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