

# The costs and benefits of concessionary bus travel for older and disabled people in Britain

September 2014

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## 1 Executive summary

### Introduction

Concessionary bus travel for older and disabled people is both popular and successful. Last year, the scheme delivered more than 1.2 billion trips to 12 million pass holders in Britain, improving access to essential services and increasing participation rates in activities that would otherwise not be possible.

### Economic, social and environmental benefits

The separate schemes that operate in England, Scotland and Wales are aimed at improving social inclusion amongst older and disabled people but there are significant 'spill-over' benefits to other groups and other policy areas. It is absolutely clear from the evidence assembled in this report that concessionary travel generates substantial economic, social and environmental benefits.

In helping to promote and deliver more efficient transport networks, the benefits of concessionary travel extend way beyond concessionary passengers themselves, to other passengers, other road users and the wider community, leading to improvements in economic productivity, social inclusion, environmental sustainability and public health.

### Value for money

Working with KPMG LLP and following the Department for Transport's guidance on economic appraisal, our analysis of the costs and benefits arising from concessionary travel for older and disabled people shows that the scheme delivers excellent value for money with each £1 spent generating at least £2.87 in benefits. Half of the benefits accrue directly and immediately to concessionary travellers themselves, around 20% of the benefits to other bus passengers and other road users from transport network improvements, and the rest to the wider community from wider economic and social impacts and in particular from improvements in health and wellbeing.

### Outlook

The number of concessionary journeys has remained relatively stable over the last five years with increases in the population of older people being offset by increases in the State Pension age in England. The fact that we are living longer however will mean that in the medium to longer term demand for concessionary travel is likely to increase. If we are to continue to realise the substantial benefits of the scheme, it is important that it is properly funded and that operators are properly reimbursed under the principle that they are 'no better and no worse off' as a result of the scheme.

## 2 Introduction

### 2.1 Overview

Concessionary bus travel for older and disabled people in Britain is both popular<sup>1</sup> and successful, with almost 12 million pass holders making more than 1.2 billion concessionary bus journeys in 2012/13.

The separate concessionary travel schemes that operate in England, Scotland and Wales are aimed at improving social inclusion but in practice deliver a range of benefits that go way beyond the immediate benefits to concessionary passengers themselves. These benefits include:

- enhanced bus service frequencies
- smart and integrated ticketing
- modal transfer from car to bus, with associated highway decongestion benefits, environmental improvements and accident savings
- wider economic impacts from increased levels of volunteering
- health and wellbeing benefits associated with more active lifestyles
- greater centralisation of social and health service provision.

As the number of older people living in Britain increases<sup>2</sup>, it will become increasingly important to make sure that the schemes are properly funded and that operators are properly reimbursed for carrying concessionary passengers.

It is the aim of this report to demonstrate the value of concessionary travel for older and disabled people so that the associated costs and benefits can be properly considered as part of future Spending Reviews.

The remainder of this section of the report provides a description of the different schemes, their objectives and popularity. It is followed by an appraisal of the value for money, supported by a series of more detailed appendices that consider:

- the benefits to concessionary travellers
- the benefits to other road users and the wider community
- the impact of concessionary travel on the wider economy
- the impact of concessionary travel on health and wellbeing.

### 2.2 Concessionary travel – entitlement and eligibility

Concessionary travel schemes for older people have existed in Great Britain for many years, with varying entitlements and eligibility criteria<sup>3</sup>. Table 1 provides a summary of the current schemes in England, Scotland and Wales.

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<sup>1</sup> Passenger Focus report that 94% of non-pass holders and 96% of pass holders support England-wide concessionary bus travel. Passenger Focus (2010) England wide concessionary bus travel: The passenger perspective

<sup>2</sup> Appendix A to this report provides an analysis of the impact of changing demographic profiles on the demand for concessionary travel.

<sup>3</sup> For a more detailed account of the evolution of the concessionary schemes and the statutory obligations, see Butcher, L. (2011) Buses: Concessionary fares, Commons Library Standard Note SN/BT/1499, accessed June 2014 from <http://www.parliament.uk/briefing-papers/SN01499>

**Table 1 – National concessionary bus travel schemes for older people in Great Britain**

	England	Scotland	Wales
<b>Entitlement</b>			
Free travel	✓	✓	✓
Local bus services	✓	✓	✓
Long distance scheduled bus services		✓	
Off-peak travel	✓	✓	✓
Peak travel		✓	✓
<b>Eligibility</b>			
60+		✓	✓
State Pension age for women	✓		

The English National Concessionary Travel Scheme provides free travel on local bus services anywhere in England, between 0930 and 2300 during weekdays and anytime during weekends and bank holidays. Eligibility for a pass for both men and women is based on the State Pension age for women, which is set to gradually increase from 60 in 2010 to 66 by 2020, and then to 67 between 2026 and 2028.

The scheme is administered at a local level by Travel Concession Authorities, some of which offer discretionary enhancements to the statutory scheme, such as free or discounted travel before 0930 or travel by other modes. In London, for example, Transport for London runs a separate scheme for all those who reach the age of 60 until they qualify for a 'Freedom Pass' and allow participants free unlimited travel on the majority of public transport in London.

Concessionary travel in Scotland is administered by Transport Scotland which provides those over the age of 60 with unlimited free travel on local buses and selected long distance bus services, and in Wales, the Welsh Assembly Government provides those over the age of 60 with free unlimited bus travel. As in England, local enhancements to statutory minimums are possible in Scotland and Wales.

## 2.3 Objectives of concessionary travel

The objectives for concessionary travel in England and Wales tend to be based around social inclusion and access to essential services with key policy documents noting benefits arising from:

- enabling 'elderly people, especially those on low incomes, to continue to use public transport and to use it more often, improving their access to a range of basic necessities such as health care and shops and reducing social isolation'<sup>4</sup>
- recognising 'the importance of public transport for older people and the role access to transport has to play tackling social exclusion and maintaining wellbeing'<sup>5</sup>
- achieving 'social inclusion benefits for older and disabled people by allowing them greater freedom to travel, for free, by local bus'<sup>6</sup>
- giving 'older and disabled people greater freedom and independence to visit family and friends and a lifeline to facilities both within and outside their local area'<sup>7</sup>.

<sup>4</sup> Department for the Environment, Transport and the Regions (1998) New Deal for Transport; Better for Everyone

<sup>5</sup> HM Treasury (2006) Budget 2005, HC 372, March 2005

<sup>6</sup> Department for Transport (2009) Regulatory Impact Assessment Concessionary Bus Travel

<sup>7</sup> Department for Transport (2012) Green light for buses

In Scotland, the objectives of concessionary travel for older and disabled people are more specific and are to:

- allow older and disabled people (especially those on low incomes) improved access to services, facilities and social networks by 'free' scheduled bus services, and so promote social inclusion
- improve health by promoting a more active lifestyle for the elderly and disabled
- remove the restrictions of the previous local off-peak concessionary fare scheme which produced differences in access to facilities in different areas of Scotland
- promote modal shift from private car to public transport
- maintain 'no better and no worse off' position for bus operators with standard reimbursement rate
- provide opportunity for improvements to public transport, e.g. assist development of multi-operator ticketing and use of improved Electronic Ticket Machine technology
- facilitate a more effective administration of the system with adoption of standard reimbursement rate and shift of operational responsibility from local authorities to Transport Scotland
- provide a stimulus to the introduction of smartcards<sup>8</sup>.

These objectives provide a useful guide to the scoping of the appraisal, extending beyond the immediate perceived benefit to concessionary passengers to include wider economic, environmental and social impacts.

## 2.4 Demand for concessionary travel

Concessionary travel schemes are clearly very popular, with a high take up of passes and high numbers of concessionary journeys being undertaken. Table 2 below shows key statistics for concessionary travel in London, England (excluding London), Scotland and Wales for 2012/13.

**Table 2 – Demand for concessionary travel schemes in Great Britain (2012/13)**

Key metric	London	England (excl London)	Scotland	Wales
Percentage of eligible pensioners with concessionary passes	96%	76%	87%	77%
Older and disabled concessionary bus journeys as a proportion of total bus journeys	14%	31%	35%	44%

Take-up of concessionary passes is high, with pass holding being influenced by household income, car ownership, the scope of the local scheme, and the availability of local bus services. Car owning households and those with higher incomes have lower propensities to hold a concessionary travel passes<sup>9</sup>, and those who live in areas with more generous entitlements and higher frequency bus services have higher levels of pass holding than those who live in areas with less generous entitlements and lower frequency services.

Older and disabled concessionary pass holders collectively make around 1.2 billion bus journeys, accounting for almost one in four of all journeys on local bus services. Table 3 shows that for Great Britain as a whole, the number of concessionary journeys has remained relatively stable over the last five years.

<sup>8</sup> <http://www.scotland.gov.uk/Topics/Transport/concessionary-fares/People>

<sup>9</sup> Humphrey, A. and Scott, A. (2012) older people's use of concessionary bus travel, Report by NatCen for Age UK, accessed in June 2014 at [http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/concessionary\\_bus\\_travel\\_2012.pdf?dtrk=true](http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/concessionary_bus_travel_2012.pdf?dtrk=true)

**Table 3 – Concessionary journeys by older and disabled people (million)**

Year	London	England (excl London)	Scotland	Wales	Great Britain
2008/09	301	712	153	51	1,217
2009/10	318	736	150	48	1,253
2010/11	314	738	145	48	1,244
2011/12	326	740	149	50	1,264
2012/13	318	709	146	48	1,221

Source: Department for Transport, Bus Statistics, Table BUS0105

## 2.5 Expenditure on concessionary travel

Operators are reimbursed for carrying concessionary traffic on the principle that they are 'no better and no worse off' as a result. Government expenditure on concessionary travel is therefore related to demand and the principles of operator reimbursement.

**Table 4 – Expenditure on bus concessionary travel (£ million, 2012/13 prices)**

Year	London	England (excl London)	Scotland	Wales	Great Britain
2008/09	198	816	198	75	1,287
2009/10	195	838	200	75	1,308
2010/11	198	844	182	73	1,297
2011/12	213	797	184	76	1,270
2012/13	222	792	188	NA	NA

Note: Estimates include expenditure on all types of concessionary bus travel, including schemes for young people. Estimates for England are taken from Department for Transport, Bus Statistics, Table BUS0501. Estimates for Scotland and Great Britain are taken from Scottish Transport Statistics No 32 2013 Edition, Table 2.9. Estimates for Wales are imputed from data in the rest of the table.

Table 4 shows government expenditure on all types of concessionary bus travel, including schemes for young people. Since 2008/09 expenditure, with increases in London offset by material reductions elsewhere.

The statutory nature of concessionary travel schemes means that further reductions in local authority budgets may have knock-on implications for expenditure on socially necessary bus services, such as those running in sparsely populated areas.

## 2.6 Concessionary travel summary

Concessionary travel for older and disabled people is both popular and successful. The scheme is generally aimed at improving social inclusion but as we demonstrate later in this document there are significant 'spill-over' benefits from wider economic and social impacts. Demand for and expenditure on concessionary travel have remained relatively stable over the last five years but the fact that we are living longer will mean that demand is likely to increase in the medium to longer term. If we are to continue to realise the substantial benefits of concessionary travel, it is important that the scheme is properly funded and that operators are properly reimbursed for carrying concessionary traffic.

## 3 Value for money

### 3.1 Introduction

In this section of the report we provide a summary of our appraisal of the costs and benefits of concessionary bus travel for older and disabled people. Further details of the methodology, data and modelling assumptions are described in the appendices.

### 3.2 Methodology

Our analysis follows the Department for Transport's guidance on economic appraisal methodology.

It includes those costs and benefits that can be reliably measured and monetised, whilst acknowledging that there are other important economic and social impacts arising from concessionary travel that are difficult to measure but undoubtedly exist.

The analysis is based on publicly available information for the schemes operating in London, England excluding London, Scotland and Wales, using modelling assumptions either taken directly from the Department for Transport's published guidance or, as in the case of health related benefits, from an extensive international literature review.

### 3.3 Results

Working with KPMG LLP we estimate that each £1 of government expenditure on concessionary travel for older and disabled people generates at least £2.87 in benefits. This is broken down in Table 5 overleaf as follows:

- impacts for concessionary bus passengers
- impacts for other bus passengers and other road users
- wider economic impacts, especially those associated with volunteering
- physical health impacts.

As noted above, the appraisal includes only those costs and benefits that can be reliably measured and monetised. It is therefore important to note that the estimate of the benefits reported here do not include potential benefits from:

- social care and child care
- retail productivity
- cost savings on patient and community transport
- social inclusion and mental health.

**Table 5 – Impacts of concessionary bus travel for older and disabled people (2012/13)**

<b>Annual impacts for Great Britain</b>	<b>£ million, 2010 prices</b>
<b>(a) Impacts on concessionary bus passengers</b>	<b>£1,336</b>
<i>Free travel</i>	£1,073
<i>Service enhancements</i>	£72
<i>Smart and integrated ticketing</i>	£191
<b>(b) Impacts on other bus passengers and other road users</b>	<b>£573</b>
<i>Benefits to non-concessionary bus passengers from service enhancements</i>	£447
<i>Option and non-use values</i>	£17
<i>Benefits to other road users (decongestion)</i>	£139
<i>Environmental improvements (noise, local air quality, GHG)</i>	£14
<i>Accident reductions</i>	£21
<i>Indirect tax revenues from modal transfer (fuel duty)</i>	-£66
<i>Bus operator impacts</i>	£0
<b>(c) Wider economic impacts</b>	<b>£297</b>
<i>Voluntary work</i>	£297
<i>Social care and child care</i>	not estimated
<i>Retail productivity</i>	not estimated
<i>Patient, social services and community transport</i>	not estimated
<b>(d) Health and wellbeing impacts</b>	<b>£458</b>
<i>Physical health</i>	£458
<i>Social inclusion, mental health and wellbeing</i>	not estimated
<b>(e) Cost to Government</b>	<b>£927</b>
<i>Cost of reimbursing operators</i>	£1,057
<i>Administration costs</i>	£23
<i>Change in indirect taxes (VAT)</i>	-£152
<b>Total benefits (a + b + c + d)</b>	<b>£2,664</b>
<b>Total costs (e)</b>	<b>£927</b>
<b>Benefit cost ratio</b>	<b>2.87</b>

A short commentary on each of impacts is provided below with further details in the appendices.

### **(a) Impacts for concessionary bus passengers**

The benefits accruing to those older and disabled people who make use of their concessionary travel passes include:

- greater freedom to access services and activities
- service frequency enhancements arising from the additional capacity required to carry increased passenger numbers
- the added convenience of smart and integrated ticketing.

As might be expected, the biggest direct benefit to pass holders is in providing greater freedom to access shops, services and amenities, freedom to access healthcare and freedom to visit family and friends. The value of these freedoms is based on the number of concessionary journeys made and the fare saved – the value of ‘free travel’.

The next biggest direct impact to pass holders themselves comes from the enhanced service frequency brought about by the fact that operators need to provide additional capacity to carry the additional demand generated by the scheme. The enhanced service frequency leads to a reduction in passenger waiting times at bus stops which is valued using the Department for Transport’s recommended value of time.

The final direct benefit to pass holders comes from the added convenience travel brought about by smart and integrated travel. Our estimate of this benefit is based on Department for Transport research on the factors influencing passengers’ mode choice.

It is important to note that the overwhelming majority of these benefits go to those on low or moderate incomes and those without access to a car.

Further details on the estimation of benefits to concessionary passengers are included in [Appendix B](#).

### **(b) Impacts for other bus users and other road users**

The increased capacity and enhanced service frequency needed to carry the additional concessionary passengers is also of benefit to other bus passengers and other travellers. Using Department for Transport assumptions on the elasticity of bus service kilometres to passenger demand, we estimate that the provision of concessionary travel will lead to a 15% increase in the total number of passengers and a 10% increase in the number of bus kilometres. The reduced waiting time at bus stops for non-concessionary passengers is valued using Department for Transport recommended values of time.

In areas with very low service frequencies, the additional patronage generated by the concessionary scheme may mean that operators are able to deliver services which may otherwise be at risk. The value of the services extends beyond that placed on them by current users and includes non-users’ willingness-to-pay to preserve the option of using the service in the future – so-called ‘option’ and ‘non-use’ values.

Finally, evidence from the literature suggests that around a third of the journeys generated by the scheme would be made by car had the concession not been available. The corresponding reduction in car kilometres brings decongestion benefits to other road users, environmental improvements and a reduction in traffic related accidents. It also means that the Treasury will collect less indirect tax revenue from fuel duty. The value of these benefits has again been estimated using Department for Transport recommended methodologies.

Further details on the estimation of benefits to other bus passengers, other road users and the wider community are included in [Appendix C](#).

### **(c) Wider economic impacts**

As very few older and disabled people use their concessionary travel passes for business travel or commuting, the traditional wider economic impacts associated with improved transport connectivity,

such as labour market agglomeration, are less relevant to the estimation of the economic benefits of this scheme.

There are however other 'wider economic impacts' that should be included in the appraisal and in particular those benefits related to:

- formal and informal voluntary work
- social care and child care activities.

The magnitude of these benefits is potentially substantial, with the Royal Voluntary Service estimating that the value of older people participating in voluntary work, social care and child care is £10 billion, £34 billion and £3 billion respectively<sup>10</sup>.

Using 'shadow prices' for different types of voluntary work together with estimates of the amount of trip suppression and mode switching that might occur if the scheme were to be withdrawn, we have been able to appraise the potential impact of concessionary travel on voluntary work. It is important to note that this estimate does not include benefits from either social care or child care, some of which may not be possible without concessionary travel.

We have also not estimated the impacts of increased retail and the commercial activity on the high street and savings on patient, social services and community transport in our assessment as it is difficult to say whether they drive genuine productivity gains or whether they simply involve a redistribution of resources. If they do drive productivity and efficiency, our estimate of the benefits would underestimate the true value of the scheme.

Further details on the estimation of wider economic benefits are included in [Appendix D](#).

#### **(d) Health and wellbeing impacts**

There is an increasing awareness of the links between transport and health, and in particular the influence of our transport choices on physical activity. Initiatives that encourage the use of public transport increase levels of physical activity which in turn improve physical health. Furthermore, greater social interaction as a result of concessionary travellers 'getting out more' also has positive impacts on general well-being. This improves quality of life and provides a cost effective way to pursue public health objectives.

Based on an extensive review of the international literature we have been able to quantify and monetise the impact of increased levels of physical activity arising from concessionary travel but have not been able to quantify the impacts of concessionary travel on social inclusion, mental health and wellbeing.

Further details on the estimation of wider health and social benefits are included in [Appendix E](#).

#### **(e) Cost to Government**

The cost to Government includes the cost of reimbursing bus operators for carrying concessionary passengers and the cost of scheme administration by Travel Concession Authorities.

We note however that the cost of the scheme to the Government needs adjusting to take account of differences in indirect tax rates between buses which are 'zero vat rated' and other goods and services which attract an expenditure tax equal to 19% on average<sup>11</sup>.

If the scheme were to be withdrawn, those concessionary passengers who continue to use the bus would now need to buy a ticket, arguably diverting expenditure from other goods and services which attract an expenditure tax. So whilst the Government would save on reimbursing operators, they would also experience a reduction in indirect tax receipts as passengers switch their expenditure from taxed goods and services to untaxed bus services.

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<sup>10</sup> Royal Voluntary Service (2011) Gold Age Pensioners: Valuing the socio-economic contribution of older people in the UK – Accessed June 2014 from <http://www.royalvoluntaryservice.org.uk/our-impact/reports-and-reviews/gold-age-pensioners>

<sup>11</sup> WebTAG Databook, May 2014, Department for Transport

### 3.4 Summary of the appraisal

It is absolutely clear from the evidence assembled above that concessionary travel for older and disabled people generates substantial economic, social and environmental benefits.

In helping to deliver more efficient transport networks, the benefits of concessionary travel extend way beyond concessionary bus users themselves to include improvements in economic productivity, social inclusion, environmental sustainability and public health.

## 4 Conclusions

The analysis set out in this document quantifies the economic, social and environmental impacts of concessionary bus travel for older and disabled people following the Department for Transport's recommended approach to economic appraisal.

The concessionary scheme delivers direct and targeted benefits to those who need them most. It improves access for older and disabled people to essential services and opens up participation in activities that would otherwise not be affordable.

The scheme also delivers economic, social and environmental benefits that go way beyond the immediate benefits to concessionary passengers themselves. These benefits are important to achieving a broad range of public policy goals and include wider economic impacts from increased levels of volunteering and social care, and health and wellbeing benefits associated with more active lifestyles.

By boosting demand and enhancing bus service quality, the concessionary scheme encourages modal transfer from car to bus, reducing traffic congestion, improving the environment and reducing the number of transport related accidents.

If we are to continue to realise the substantial benefits of concessionary travel for older and disabled people, it is important that it is properly funded and that operators are properly reimbursed under the principle that they are 'no better and no worse off' as a result of the scheme.

## 5 Appendix A – Demographic trends

### 5.1 Introduction

In this appendix we consider the impact of changing demographic profiles and eligibility criteria for concessionary travel could impact on the demand for concessionary travel. To simplify the analysis we assume that average trip rates remain as they are today and reimbursement costs increase in line with inflation.

### 5.2 Methodology

Population projections from the Office for National Statistics (ONS) were used in order to identify the potential number of eligible older people<sup>12</sup>. The data was provided at a disaggregated level by both age and location to identify the effects of changing the pension age. Where possible Travel Concession Authority (TCA) level analysis has been undertaken for England, while for Scotland and Wales, projections have been taken at a national level.

Currently, eligibility for the concessionary scheme is based on those men and women who meet the State Pension age for women. This is expected to rise gradually from 60 in 2010 to 66 in April 2020, and then to 67 between 2026 and 2028, and our projections take this into account. We do not assume any further rises in the State Pension age past this date in our analysis.

### 5.3 Population projections

England's population, overall, is set to grow by 16% from 2012 to 2037. The population over 60 is expected to grow from 12 million to over 18 million, an almost 50% increase. The proportion of those over 60 is expected to make up approximately 24% and 29% of the population by 2020 and 2037 respectively.

Given this demographic change, the gradual rise in pension age for England has an important dampening effect on the total number of people eligible for the scheme. For England, this number is expected to decline slightly from approximately 11.5 million today to 11.1 million by 2025, with the steepest decline coming in 2020. From 2020 onwards however, this is expected to increase to 13.5 million by 2037. The proportion of total population eligible for a pass therefore initially falls from 21% to 18% by 2020, but rises back to 22% by 2037.

Unlike in England, the minimum age of eligibility is not expected to rise in Scotland or Wales. As a result, we see a more regular increase in both the total number and total percentage of national population eligible for the scheme. The total number of those eligible for free travel will therefore rise from 1.2 million to 1.5 million by 2020 and 1.7 by 2037. In Wales, it is expected to rise from approximately 780,000 to 1 million by 2037.

The total eligible population for Great Britain, including those in London and on Merseyside who are above 60 but below the age at which the statutory provision is available, is presented in Figure A1. The local authorities in London and Merseyside offer concessionary travel to all those over 60 as a discretionary up-grade on the national statutory scheme that rises with the pension age.

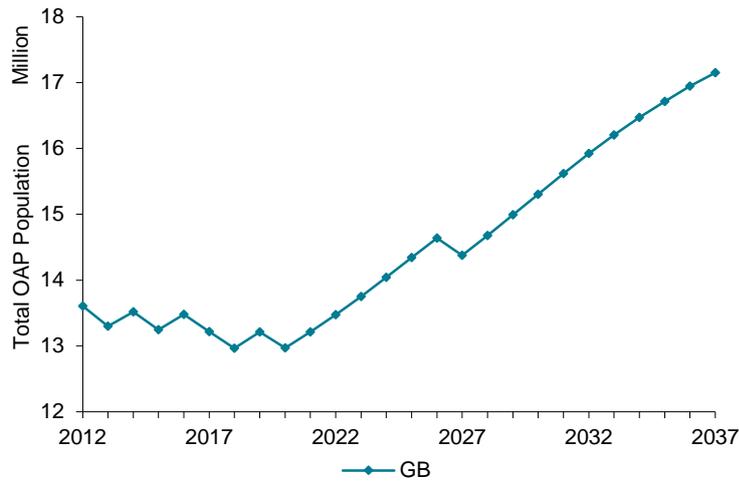
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<sup>12</sup> England: Office of National Statistics, Sub-National Population Projections for Local Authorities in England <http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Population+Projections#tab-data-tables>.

Scotland: <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-318453>.

Wales: <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-310118>.

**Figure A1 – Eligible population, including discretionary age enhancements**



The continuous increase in Scotland, Wales, London and Merseyside is offset by reductions in the rest of England as the state retirement age for women increases. For Great Britain as a whole, the number of older people eligible for concessionary travel remains relatively stable to 2022, increases steadily to 2027 when the pensionable age changes again and then continues to rise thereafter. The local picture however may be very different, with funding pressure likely to be more acute in areas that do not have plans to change the eligibility criteria over time.

## 6 Appendix B – Impacts on concessionary bus passengers

### 6.1 Introduction

This appendix shows the estimation of the direct benefits to concessionary bus travellers, including:

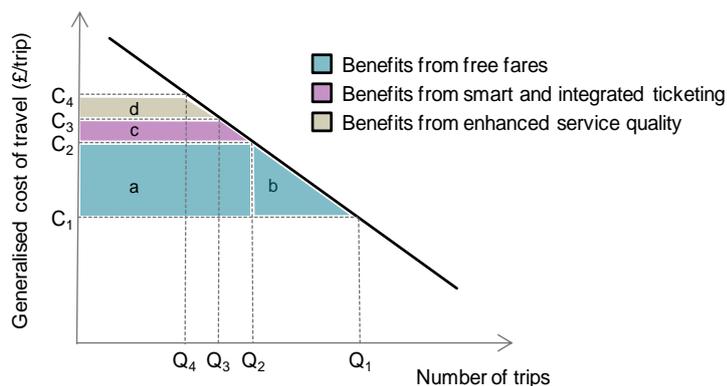
- the saving on the fare that they would have paid in the absence of the concessionary scheme
- the improvement in service quality brought about by the increased capacity and service frequency required to carry the passengers generated by the scheme
- the increased convenience associated with smart and integrated ticketing.

### 6.2 Methodology

In economic terms, the size of the benefits to concessionary passengers can be measured by comparing the generalised cost of travel with and without the concession.

Figure B1 shows the relationship between the demand for bus trips by concessionary passengers and the generalised cost of making the trip, where the generalised cost includes the monetary and non-monetary cost of making a journey.

**Figure B1 – Benefits to concessionary passengers**



With concessions, concessionary passengers demand  $Q_1$  trips at a generalised cost of travel equal to  $C_1$ .

If concessions were to be withdrawn, passengers would need to buy a ticket and the generalised cost would immediately increase to  $C_2$  and demand would fall to  $Q_2$ . This would lead to loss of benefit to passengers equal to areas 'a' plus 'b'.

At the same time, many passengers

would also lose the benefits associated with the convenience of smart and integrated ticketing. This will push the generalised cost up to  $C_3$ , resulting in a further reduction in demand to  $Q_3$ . The loss of economic benefit from the loss of smart and integrated ticketing is equal to area 'c'.

Finally, as a result of lower demand, operators may withdraw marginal services leading to a reduction in service supply. This increases the generalised cost of travel to  $C_4$ , reducing demand and economic benefits still further.

The direct benefits of concessionary travel to concessionary passengers can therefore be measured by the area 'a' plus 'b' plus 'c' plus 'd'.

**Table B1 – Concessionary demand (2012/13)**

	London	England (excl London)	Scotland	Wales
Concessionary journeys (million)	318	709	146	48
Generated journeys (million)	127	340	56	18
Non-generated journeys (million)	191	369	90	30

Table B1 shows the key assumptions on the demand for concessionary bus travel taken from published data from the Department for Transport, Transport Scotland and the Welsh Assembly Government.

The data is broken down into journeys that would be undertaken in the absence of free travel referred to as *non-generated journeys* ( $Q_2$  in Figure B1) and journeys that have been generated by free travel referred to as *generated journeys* ( $Q_1$  minus  $Q_2$  in Figure B1) based on the demand function included in the Department for Transport’s recommended approach to operator reimbursement.

### Free travel

The perceived benefits of free travel to concessionary passengers is estimated as:

$$\text{Perceived benefit of free travel} = \frac{1}{2}(C_2 - C_1)(Q_1 + Q_2)$$

Where  $(C_2 - C_1)$  is the average fare that concessionary passengers would have paid in the absence of the scheme. This is estimated at £1.18 per trip for Britain as a whole with variations across different geographies.

### Smart and integrated ticketing

In addition to free travel, concessionary passengers benefit from the convenience of smart and integrated ticketing relative to paying cash. This value is taken from Department for Transport (2009)<sup>13</sup> and applied to an estimate of the generalised cost of travel and a generalised cost elasticity of demand equal to -0.9.

### Service enhancements

The scheme increases demand for bus travel by around 15% and based on the Department for Transport’s estimate of the elasticity of vehicle kilometres to passenger demand, currently specified as 0.6, service kilometres are estimated to increase by 10%. This increase in service kilometres provide benefits to all bus passengers from reduced waiting times at bus stops. As is standard practice, this waiting time saving is valued at a rate equal to twice the Department for Transport’s guidance on the value of in-vehicle time for ‘leisure’ purposes (currently £6.04 per hour)<sup>14</sup>.

<sup>13</sup> Department for Transport (2009) The Role of Soft Measures in Influencing Patronage Growth and Modal Split in the Bus Market in England, available at: <http://assets.dft.gov.uk/publications/role-of-soft-factors-in-the-bus-market-in-england/report.pdf>

<sup>14</sup> Department for Transport (2014) TAG data book, May 2014

## 7 Appendix C – Impacts on other bus passengers, other road users and the wider community

### 7.1 Introduction

The provision of concessionary travel to older and disabled people generates 'spill-over' benefits to other bus passengers, other road users and the wider community. These 'positive externalities' include:

- benefits to other bus passengers who experience bus service enhancements
- benefits to other road users from improvements in traffic congestion, environmental quality and accidents
- 'option' and 'non-use' values for those who value the existence of bus services even though they may not use the services themselves.

### 7.2 Benefits to other bus passengers

The concessionary travel scheme increases the overall demand for bus travel by around 15% requiring a 10% increase in service capacity (see Appendix B for details). The improved service frequency brought about by the increased service capacity benefits other bus passengers who now have less time to wait for a bus. This external benefit is well documented and is known as the Mohring effect<sup>15</sup>.

### 7.3 Benefits to other road users

The provision of concessionary travel provides direct benefits to concessionary and other bus passengers, which in turn encourages modal transfer from car to public transport. This transfer helps to reduce highway congestion, reduces accidents and improves the environment.

Non-user benefits are calculated on principles set out in WebTAG unit 3.13.2. Whilst this unit is usually used for rail appraisal, we have adapted it for use in this context.

### 7.4 Benefits to the wider community

The Department for Transport's guidance on transport appraisal describes option values as 'the willingness-to-pay to preserve the option of using a transport service for trips not yet anticipated or currently undertaken by other modes, over and above the expected value of any such future use'.

These option values matter because a reduction in government support for concessionary travel will put pressure on marginal services, some of which may be withdrawn. Our analysis suggests that this amounts to a 10% reduction in vehicle kilometres, and this is included in the appraisal.

Where this reduction occurs on routes with existing low service frequency, the route may no longer continue to run. Those who live on that route will no longer have a service and therefore lose their option value.

The National Travel Survey shows 5% of households have bus services with 'very low frequencies'. If 10% of those services were withdrawn (pro-rata to the reduction in vehicle kilometres) then 0.5% of households would lose access to bus services unless local authorities were able to backfill the potential funding gap. In fact this figure is likely to be higher as the better patronised services will be

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<sup>15</sup> Mohring, H.(1972) Optimization and Scale Economies in Urban Bus Transportation, American Economic Review, 591-604.

more likely to survive such a funding reduction and a greater proportion of these less frequent services would be likely to be cut.

The option value is then equal to: the percentage of households with low frequency services (5%) x the reduction in vehicle kilometres (10%) x number of households in Britain (25.8 million) x household option and non-use value (£134 per year)<sup>16</sup>.

## 7.5 Operator profitability

European Regulation No 1370/2007 reinforces the principle that operators should be 'no better and no worse off' as a result of carrying concessionary passengers.<sup>17</sup>

For the purpose of this analysis, we have assumed that this principle holds and that the net impact of concessionary travel on operator profitability is zero. We note however that operator reimbursement is technically complex and contended.

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<sup>16</sup> Department for Transport (2014) WebTAG TAG Data Book, May 2014

<sup>17</sup> The Official Journal of the European Union, Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:315:0001:0013:EN:PDF>

## 8 Appendix D – Wider economic impacts

### 8.1 Introduction

The principal objective of the concessionary travel scheme is to improve social inclusion and access to services, but there is increasing recognition that the scheme enables economic and social activities that would otherwise not take place, including:

- Paid employment
- Retail spend
- Voluntary work
- Social care and childcare.

We look at each of these impacts in turn.

### 8.2 Paid employment

According to the latest data from the ONS, there are approximately 1 million people over the age of 65 in employment. This is approximately 10% of the total number of the population aged 65 and over. However NTS data also shows that only 3.85% of bus use by the over 65s are for commuting purposes. Therefore, the combined overall impact on paid employment as a result of the concessionary travel is expected to be quite low. Table D1 shows the main journey purpose for bus travel by older people.

**Table D1 – Journey purpose by bus for older people (2002-2012)**

Journey purpose	Percent
Shopping	54.19
Other personal business	16.72
Visit friends at private home	8.64
Entertain/ public activity	5.74
Visit friends elsewhere	5.58
Commuting	3.85
Day trip	2.78
Other (escorting others, participating sports, business, holiday...etc)	2.5

Source: NTS – Modal share of journeys by older people 2002-2010

This is in line with other findings on the concessionary bus scheme which notes that discretionary journeys make up the largest proportion of the increase in journeys associated with the scheme<sup>18</sup>. While shopping trips remain the most common reason why older people take the bus, approximately 35-40% of journeys are also undertaken for social reasons such as visiting friends. Results from a 2014 survey by Populus<sup>19</sup> of approximately 2,000 bus travellers in the UK also indicate that social activities (day trips for leisure, social events and hobbies, and visiting friends and family) make up almost 60% of the reasons why those over 65 travel by bus.

<sup>18</sup> Kelly, E (2011) A ticket to ride: Does free bus travel promote active ageing – available at <http://www.economics.utoronto.ca/index.php/index/research/downloadSeminarPaper/4163>

<sup>19</sup> Populus (2014) Health Benefits of Bus Travel Survey

### 8.3 Retail spend

There is evidence to show that social activities by older people include significant retail spending. According to the WRVS (now the Royal Voluntary Service or RVS)<sup>20</sup>, the value of spending by older people to the economy (i.e. including both direct spending at the multiplier effect) is £76 billion per year.

Identifying the net impact of the concessionary scheme on this direct spending is problematic as it requires identifying the spending impact in a counter-factual scenario where the scheme does not exist and there are no concessionary journeys. While we have relatively robust evidence to suggest how people may change their travel patterns in such a counter-factual, we do not know the relative difference in their spending patterns under such a scenario. It also requires us to understand whether the impact of the money spent having undertaken the travel is materially different from the *impact* of that same amount spent in the counter-factual scenario (i.e. being spent locally, invested or saved for future use, passed on to relatives).

However, there is anecdotal evidence to suggest that there is a difference in the type of spending in at least two important ways<sup>21</sup>.

First, providing a bus pass has resulted in older people substituting their car journeys for buses especially for journeys into city centres. When older people travel by car into urban centres, in addition to the costs of running and maintaining a car, they incur car parking charges, which partly cause them to spend less time in city centres. When car journeys are therefore substituted by bus journeys, older people spend more time in town and city centres. Spending more time in such urban centres result not only in greater retail spending on things like restaurants, cafes and cultural activity, but also leads to a greater level of activity and social interaction.

Second, survey evidence also suggests that the concession scheme provide more freedom to travel to different locations so as to do shopping more frequently, as well as to identify the best value locations to buy their items. Focus group surveys conducted by Andrews (2012)<sup>22</sup> points to an increasing willingness for older people to travel further distances in order to get the best deals, whereas without the scheme they would be limited to a narrower range of shops. Therefore, in addition to saving on the cost of travel, there is increasing likelihood that the scheme also allows older people to reduce their overall cost of living by giving them access to cheaper goods.

Therefore, while quantifying the effect on retail spend of the concessionary travel scheme is difficult, there is growing evidence that it is encouraging greater levels of overall activity and leisure spending, while also giving users of the scheme the opportunity to reduce their cost of living.

### 8.4 Voluntary work

A number of official government and private sources<sup>23</sup> note that the older population are significantly more likely to be involved in both formal and informal volunteering than other age groups. For example, research by VITA<sup>24</sup> of 477 organisations surveyed in 2007 suggested that those over 50 make up two thirds of the volunteer workforce, and provided 68% of the total number of hours volunteered, while almost a third of all volunteers were over 65 – with older workers found more in organisations working in social services, health and welfare rather than culture and recreation.

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<sup>20</sup> Royal Voluntary Service (2011) Gold Age Pensioners: Valuing the socio-economic contribution of older people in the UK – available at <http://www.royalvoluntaryservice.org.uk/our-impact/reports-and-reviews/gold-age-pensioners>

<sup>21</sup> As revealed by consultations with local authorities conducted as part of this project

<sup>22</sup> Andrews, G. (2011) Just the ticket? Exploring the contribution of free bus fares policy to quality of later life, available at [www2.uwe.ac.uk/faculties/FET/Research/cts/.../andrews\\_2012\\_thesis.pdf](http://www2.uwe.ac.uk/faculties/FET/Research/cts/.../andrews_2012_thesis.pdf)

<sup>23</sup> ONS (2005) Focus on older people, DCLG (2009) Citizenship survey 2008/9, Cabinet Office (2007) Helping out – A national survey of volunteering and charitable giving.

<sup>24</sup> VITA (2007) The indispensable backbone of voluntary action: measuring and valuing the contribution of older volunteers, available at [http://www.volunteering.org.uk/images/stories/Volunteering-England/Documents/VE-Info/R\\_The-indispensable-backbone-of-voluntary-action\\_.pdf](http://www.volunteering.org.uk/images/stories/Volunteering-England/Documents/VE-Info/R_The-indispensable-backbone-of-voluntary-action_.pdf).

Unlike with retail or leisure spending, it is more reasonable to expect that voluntary work may be directly affected if the opportunity for free travel is taken away. As charities rely heavily on volunteering, and travel costs can be significant for these organisations, free travel is undoubtedly a big saving for both the organisation and the individual.

The RVS's study has estimated the net economic impact of the older population in the voluntary sector. They show that the average older person spends approximately 100 hours per year in informal volunteering (such as going shopping for a friend, helping someone attend a social activity) and almost 55 hours a year in formal volunteering (such as fundraising, organising events, mentoring). They estimate the total value of such volunteering at £10 billion per year.<sup>25</sup>

Using the detailed breakdown of this calculation, estimates of the travel patterns of the over 65s from the National Travel Survey, as well as survey evidence of how older people are likely to react to the counter-factual scenario without the concessionary scheme, we estimate the indicative monetary value gained for Britain from volunteering benefits at over £279 million per year<sup>26</sup>. The methodology and assumptions used in estimating this value are set out below.

#### 8.4.1 Methodology for quantifying voluntary work benefits

Volunteering benefits are quantified using the research from RVS report<sup>27</sup>. The report uses survey evidence to identify the average annual hours per month of formal and informal volunteering, and using shadow prices for these activities, comes up with annual average value at 2010 prices.

Taking the RVS findings, we estimate what percentage of these activities would not be undertaken in the absence of the concessionary scheme. We do this using by asking three specific questions:

- Is the volunteering activity likely to require transport? This is done by taking a conservative estimate of whether each of the activities outlined is likely to require transport. We take a binary approach here, by giving a score of 1 for those activities that require transport and 0 for not.
- What proportion of these travel journeys would be undertaken by bus? We estimate that volunteering journeys are likely to have the same distribution as total journeys by those in the 65+ age group. Therefore, we estimate that 7% of volunteering journeys would be undertaken by bus.
- What proportion of bus journeys would not be undertaken in the absence of the scheme? We take here the estimates based on estimates of trip generation and cross modal diversion factors<sup>28</sup>.

By combining these figures, we can estimate the total value of volunteering that would *not* be undertaken in the absence of the scheme. This is shown in table D2 below.

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<sup>25</sup> Royal Voluntary Service (2011) Gold Age Pensioners: Valuing the socio-economic contribution of older people in the UK – available at <http://www.royalvoluntaryservice.org.uk/our-impact/reports-and-reviews/gold-age-pensioners>

<sup>26</sup> Further details on how this is calculated are provided in Annex 2.

<sup>27</sup> Royal Voluntary Service (2011) Gold Age Pensioners: Valuing the socio-economic contribution of older people in the UK – available at <http://www.royalvoluntaryservice.org.uk/our-impact/reports-and-reviews/gold-age-pensioners>

<sup>28</sup> For a further discussion of this number see section 8.5.2 below

**Table D2 – Estimation of volunteering benefits enabled by concessionary travel**

Informal volunteering (older people)	Avg annual hours per month	Overall propensity	Annual hrs	Shadow price (£/hour) 2010 Prices	Annual average value £ 2010 prices	Would this volunteering require travel? (1=Yes, 0=No)	% of bus journeys as a % of total trips for this age group	% not undertaken due to policy being taken away	Value lost if concessions are removed (£2010 prices)
Go shopping for an elderly friend/neighbour/relative	4.3	27.30%	14.07	5.93	83.45	1	7%	35%	2.0
Go shopping with an elderly friend/neighbour/relative	3.8	19.60%	8.96	5.93	53.13	1	7%	35%	1.3
Collecting prescriptions	1.42	19.60%	3.35	5.93	19.85	1	7%	35%	0.48
Cleaning	3.05	10.30%	3.76	5.93	22.28	0	7%	35%	0.00
Gardening	3.47	12.60%	5.25	5.93	31.14	0	7%	35%	0.00
Practical household tasks	3.59	31.70%	13.64	5.93	80.91	0	7%	35%	0.00
Giving a lift (transporting)	3.66	30.20%	13.27	5.93	78.67	0	7%	35%	0.00
Helping someone attend a social activity	3.17	17.60%	6.69	5.93	39.69	1	7%	35%	0.96
Dog walking	5.38	7.00%	4.54	5.93	26.94	0	7%	35%	0.00
Advice/tutoring/mentoring/advocacy	3.37	22.60%	9.13	15.00	136.97	1	7%	35%	3.31
Befriending	4.27	42.80%	21.94	5.93	130.10	0	7%	35%	0.00
<b>Total</b>	<b>39.48</b>		<b>104.61</b>	<b>6.75</b>	<b>703.13</b>		<b>7%</b>	<b>35%</b>	<b>8.04</b>
Fundraising	3.33	10.00%	3.98	15.00	59.76	1	7%	35%	1.44
Organising events	5.63	6.70%	4.56	25.00	113.92	1	7%	35%	2.75
Attending committees	4.01	11.70%	5.64	25.00	141.11	1	7%	35%	3.41
Mentoring	4.34	5.00%	2.60	25.00	64.91	1	7%	35%	1.57
Providing education	3.36	4.70%	1.89	25.00	47.30	1	7%	35%	1.14
Administration	6.03	8.80%	6.37	15.00	95.49	1	7%	35%	2.31
Visiting elderly/disabled neighbours	5.13	15.20%	9.39	5.93	55.67	1	7%	35%	1.34
Transporting	3.7	11.10%	4.95	5.93	29.34	0	7%	35%	0.0
Befriending	4.21	17.60%	8.89	5.93	52.71	1	7%	35%	1.27
Practical help	2.39	8.50%	2.44	5.93	14.46	1	7%	35%	0.35
Campaigning	4.20	5.30%	2.66	15.00	39.91	1	7%	35%	0.96
Coaching	7.77	1.20%	1.09	15.00	16.41	1	7%	35%	0.40
<b>Total</b>	<b>54.10</b>		<b>54.46</b>	<b>15.31</b>	<b>730.99</b>		<b>7%</b>	<b>35%</b>	<b>16.94</b>
Sections of the table from RVS Report (Economic Annex)									Own analysis
<b>Total annual value of volunteering per person lost in the absence of ENCTS</b>									<b>£24.99</b>

We therefore estimate that on average, the annual value of the volunteering benefits that may be lost from the scheme is approximately £25 per person. Multiplying this by the total number of persons eligible for concessionary travel, we estimate that the total value for Great Britain to be £279 million.

## **8.5 Social care and childcare**

According to the RVS survey, older people contribute £34 billion in social care and £2.7 billion in childcare each year. These are an important indication to the value that older people provide to society, and it is likely that the presence of the scheme does affect the ability to generate these benefits but without additional information on the relationship between social care and transport it is not possible to reasonably monetise the value.

## **8.6 Wider economic impacts summary**

In addition to the direct user benefits, the concession scheme also has a number of wider economic benefits. As this age group is primarily composed of retired people, the impact on paid employment is however unlikely to be very strong. In terms of retail spending, the difficulty is in identifying whether the relative impact of spending is particularly different with and without bus travel. However, there is evidence to suggest that there is more active retail and leisure activity, which has important implications for health and wellbeing. There is also growing evidence to suggest that the scheme assists in buying cheaper goods and keeping costs of living low.

## 9 Appendix E – The impact of concessionary travel on behaviour and health

### 9.1 Introduction

There is increasing interest in the impact of travel behaviour on health and wellbeing and in particular on the impact of ‘active’ travel on physical health and the impact of social exclusion on mental health.

In this appendix, we explore the relationships between public transport use, physical activity levels and health with reference to four questions:

- How does free bus travel influence the number, type and frequency of journeys being made?
- Has the increased number of bus journeys resulted in older people being more active?
- Has this increased level of activity resulted in significant impact on the health and social inclusion?
- What is the value of the health and social inclusion benefits?

Whilst the causes of poor physical and mental health are complex, it is clear that individuals’ transport choices play an important role in determining activity levels and should be given greater prominence in transport planning and expenditure decisions by government.

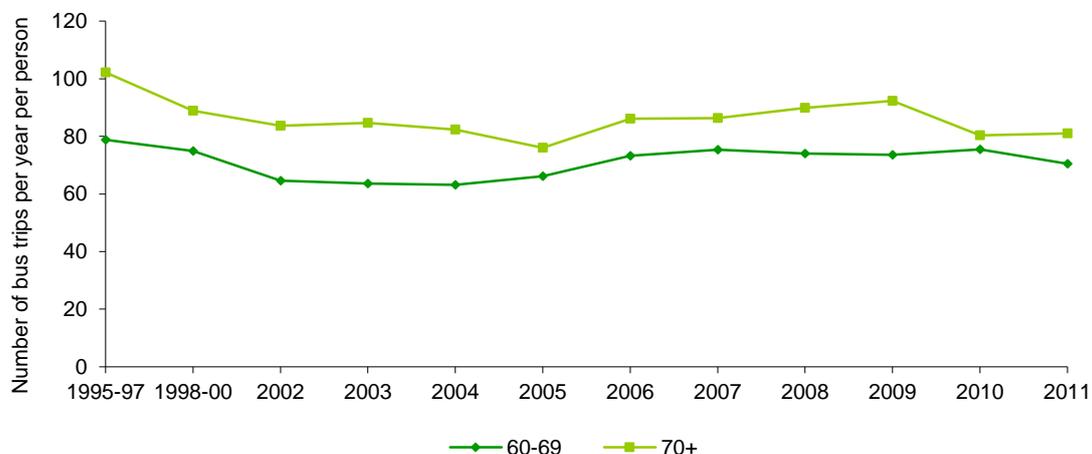
### 9.2 How does free bus travel influence the number, type and frequency of journeys being made?

Identifying the transport-related impacts of the national concessionary travel scheme is complicated by the fact that many parts of the country already had various forms of concessionary travel before the national free travel scheme was implemented in 2008. The Transport Act of 2000 introduced a statutory obligation on Local Authorities to provide a minimum half-fare concession to older people. This was increased to a full-fare discount that covered local travel in 2006, and the English National Concessionary Travel Scheme increased coverage to a national level in 2008. To complicate matters further, some Local Authorities provided local enhancements to the statutory minimum.

#### 9.2.1 Impact of the scheme on the number of journeys

Figure E1 below shows the trend in the average number of local and non-local bus trips per person per year for age groups over 60 in Great Britain.

**Figure E1 – Number of local and non-local bus trips per year by age group**



Source: Department for Transport, NTS table 0601

The chart shows the annual number of trips declining between the mid-1990s and the mid-2000s with annual trip rates increasing following the introduction of the free travel scheme in 2006.

Whilst this aggregate picture shows the impact of the national scheme in England, this value is dependent on local factors. We therefore need to consider the variation in the provision of local travel concessions to get a better understanding of the impact of free bus travel on behaviour. To that end, Kelly (2011) looked at travel statistics for people in areas that already provided free bus travel before 2006 and compared this with travel statistics for people in areas that provided half fare concessions.

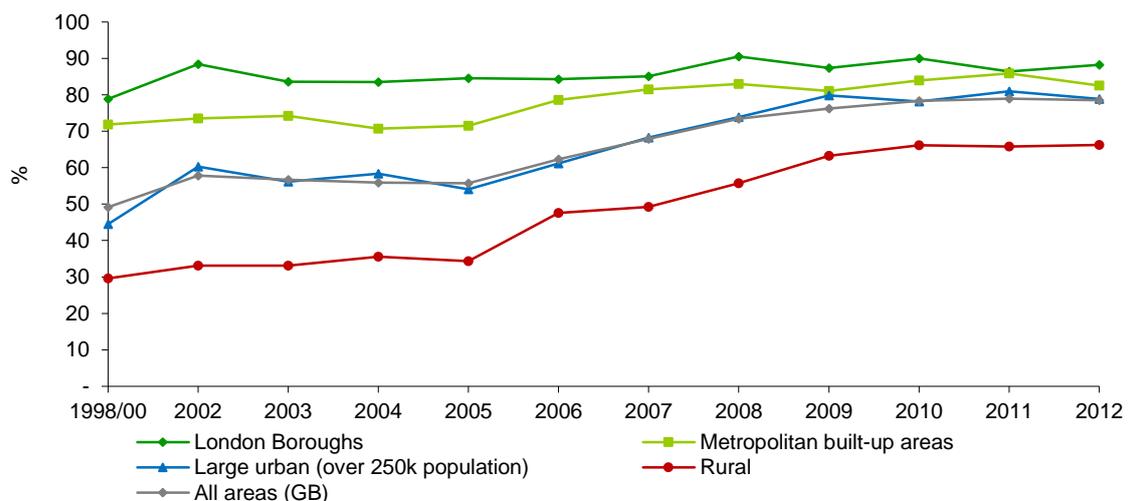
### Take up of concessionary travel passes

For those areas with pre-existing free travel schemes, Kelly found that the introduction of the national scheme led to an increase in the take-up of concessionary travel passes to almost 90%, albeit from an existing high base at approximately 80%.

For those areas without pre-existing free travel schemes, Kelly found that the impact of the national scheme was more dramatic with concessionary travel pass holding for those aged over 60 increasing from 45% in 2006 to more than 70% by 2009.

These findings are substantiated by Department for Transport statistics, which shows the national scheme to have had a greater impact on pass holding in non-metropolitan and rural areas which were less likely to have had free concessionary travel before 2006. This is shown in Figure E2 below.

**Figure E2 – Percentage take-up of concessionary passes by area type**



Source: Department for Transport, NTS table 0619

### Impact on bus patronage

Kelly's analysis also shows a significant impact of free travel on frequency of bus use, especially for those aged between 60 and 75. The results were particularly pronounced for those areas with higher population densities, implying that the effect is greater in areas with good bus networks.

Indeed, Department for Transport guidance<sup>29</sup> on reimbursing bus operators suggests that in the region of 50% of all concessionary bus travel by older people would not have been undertaken in the absence of the scheme.

<sup>29</sup> Department for Transport (2013) Concessionary travel for older and disabled people: guidance on reimbursing bus operators (England) – available at <http://assets.dft.gov.uk/publications/reimbursing-bus-operators-for-concessionary-travel/busoperators-2013-14.pdf>

### 9.2.2 Impact of the scheme on the type of journeys

While concessionary travel has clearly had a big impact on number of journeys undertaken, it is noted that cars still remain the predominant mode of travel for the over 60s. Table E1 shows that more than 75% of journey miles are made by cars either as drivers or as passengers, compared to approximately 9% by buses. This mode split presents further opportunities for mode transfer from car to bus, and potentially generating decongestion, environmental and accident savings.

**Table E1 – Travel patterns of the over 60s by mode**

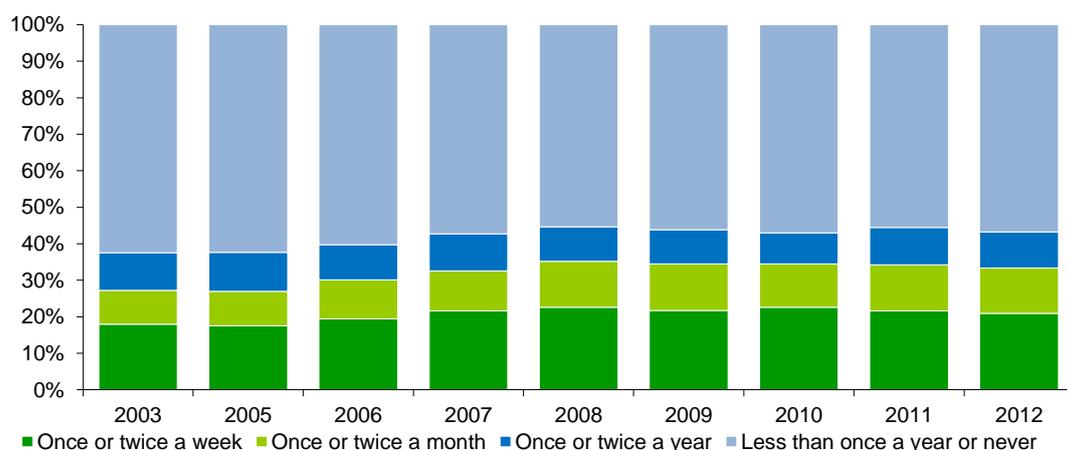
Age groups	Miles travelled per person % breakdown			Number of trips per person % breakdown		
	21-59	60-69	70+	21-59	60-69	70+
Walk	2%	2%	2%	20%	19%	18%
Bicycle	1%	1%	0%	2%	1%	1%
Car/van driver	59%	58%	45%	53%	54%	43%
Car/van passenger	18%	23%	32%	13%	17%	22%
Other private transport	1%	1%	3%	1%	1%	2%
Local and non-local buses	4%	7%	11%	5%	7%	11%
Rail	12%	6%	4%	4%	2%	1%
Taxi/minicab	1%	0%	1%	1%	1%	1%
Other public transport	1%	1%	2%	0%	0%	0%
<b>Distance and trips</b>	<b>8,145</b>	<b>7,289</b>	<b>4,322</b>	<b>1,037</b>	<b>987</b>	<b>733</b>

Source: Department for Transport, NTS table 0601

### 9.2.3 Impact of the scheme on the frequency of journeys

While the aggregate picture on average bus use per passenger is useful, it is also important to get an idea of the frequency of bus journeys made by older people.

**Figure E3 – Frequency of bus use by over 60s**



Source: Department for Transport, NTS table 0621

Figure E3 shows an increase in the frequency of bus use by the over 60s following the introduction of the national scheme, with the proportion of people using the bus at least once or twice a month rising

from 30% in 2003 to 36% in 2008. The figure also shows that 57% of those over 60 in 2012 use the bus less than once a year or never. When compared to the high take-up rates for concessionary travel passes, this implies that there are a number of older people who have the bus pass but who do not use it.

Table E2 shows the findings of an analysis of smartcard data for older and disabled concessionary pass holders in four districts in Lancashire over a five week period in 2009<sup>30</sup>. The analysis shows that 56% of pass holders did not use their pass in the study period with the remainder using their passes for around three trips per week on average. Whilst the take-up of passes is universally high, there are a smaller number of people who regularly use their passes.

**Table E2 – Frequency of trips for concessionary card holders in Lancashire**

	Pass holders	Trips		Trips/ week
Zero trips in 5 week period	49,387 (56.2%)			
Some trips in 5 weeks, but less than 1 on average	14,854 (16.9%)	39,139	(6.7%)	0.5
Average of more than 1 per week but less than 5	16,270 (18.5%)	211,193	(36.0%)	2.6
More than 5 per week but less than 15	6,787 (7.7%)	276,585	(47.1%)	8.2
More than 15 per week but less than 20	420 (0.5%)	35,983	(6.1%)	17.1
More than 20 per week	196 (0.2%)	24,225	(4.1%)	24.7
All Pass holders	87,914 (100.0%)	587,125	(100.0%)	1.3

Source: Last (2010)

### 9.3 Has the increased number of bus journeys resulted in older people being more active?

The relationship between concessionary bus travel and physical activity is complex and required an understanding of travellers' choices. In some circumstances, travellers may take the bus when previously they would have walked and in other circumstances, travellers may take the bus when previously they would have driven. Understanding these choices and how they are influenced by costs is central to the estimation of the level of physical activity required to make a journey.

#### 9.3.1 UK evidence

The Department for Transport's guidance<sup>31</sup> on the mechanism for reimbursing bus operators for carrying concessionary passengers includes a spreadsheet based tool to estimate the level of demand for bus services in the absence of the scheme. This spreadsheet tool incorporates various assumptions on passenger demand, which vary according to local market conditions, but typically it suggests that in the region of 40 to 50% of concessionary bus travel would not take place in the absence of the scheme.

<sup>30</sup> Last, A. (2010) Smartcard data on use of free concessionary travel by older and disabled bus passengers, available at <http://abstracts.aetransport.org/paper/index/id/3399/confid/16>

<sup>31</sup> Department for Transport (2013) Concessionary travel for older and disabled people: guidance on reimbursing bus operators (England) – available from <http://assets.dft.gov.uk/publications/reimbursing-bus-operators-for-concessionary-travel/busoperators-2013-14.pdf>

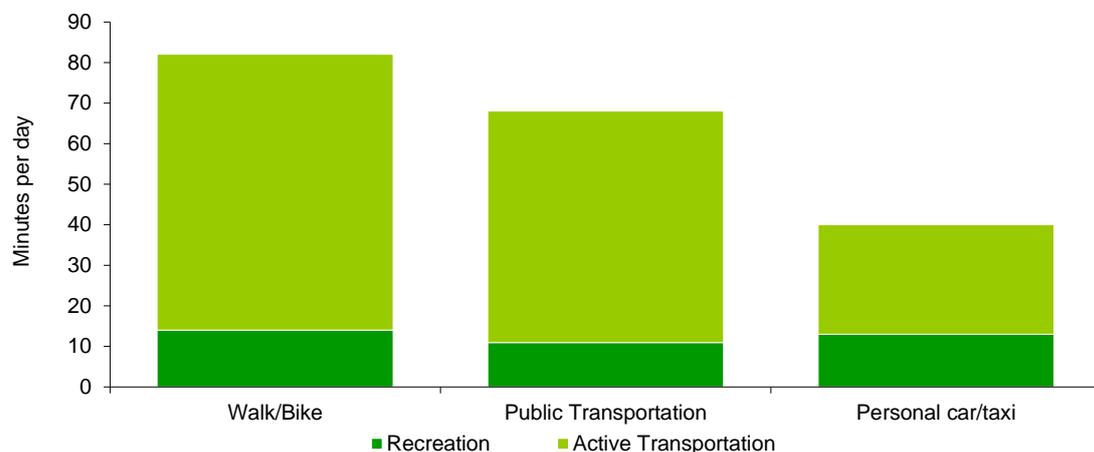
Based on work by Passenger Focus (2009)<sup>32</sup> and Andrews (2012)<sup>33</sup> we assume that of those trips that would no longer be made by bus in the absence of the scheme, 31% would divert to car, between 2 and 3% to walking and almost none to cycling.

Taken together, these findings imply that concessionary travel is likely to increase the level of physical activity undertaken by older people. This conclusion was also reached by Coronini-Cronberg et al (2012)<sup>34</sup>, who found that having a free bus makes older people more likely to use active travel (walking and cycling) and buses, and to undertake regular walking than those who do not have these passes.

### 9.3.2 International evidence

This relationship between public transport and ‘active travel’ (defined as self-propelled mode of transport to get from one place to another, including walking and cycling) is the subject of a number of international case-studies.

**Figure E4 – Average daily transportation and recreation activity among New Yorkers who work outside the home**



Source: New York City Department of Health and Mental Hygiene (2011)

Figure E4 shows the results of a study of transport related activity levels in New York<sup>35</sup>. It shows that those who used public transport undertook more than twice as many minutes of moderate physical activity per day than those that used personal cars or taxis.

According to Besser and Dannenberg (2005)<sup>36</sup>, users of public transport in America spend a median of 19 minutes a day walking, which nearly achieves target of 22 daily minutes of moderate physical activity proposed by the US authorities, and almost a third exceeded 30 minutes. Wener and Evans (2007)<sup>37</sup> found that the average New York City train commuter walked about 9,500 steps per day,

<sup>32</sup> Passenger Focus (2009) England-Wide Concessionary Bus Travel: The Passenger Perspective

<sup>33</sup> Andrews, G. (2012) Just the ticket? Understanding the wide-ranging benefits of England's concessionary fares policy, Age UK, available from [http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/just\\_the\\_ticket\\_bus\\_pass\\_qualitative\\_report\\_2012.pdf?dtrk=true](http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/just_the_ticket_bus_pass_qualitative_report_2012.pdf?dtrk=true)

<sup>34</sup> Coronini-Cronberg, S., Millett, C., Laverty, A., and Webb, E. (2012) The impact of free older persons' bus pass on active travel and regular walking in England, *American Journal of Public Health*, 102, 2141-2148

<sup>35</sup> New York City Department of Health and Mental Hygiene (2011) Health Benefits of Active Transportation

in New York City, available at <http://www.nyc.gov/html/doh/downloads/pdf/survey/survey-2011active-transport.pdf>

<sup>36</sup> Besser, L.M. and Dannenberg, A.L. (2005) Walking to Public Transit: Steps to Help Meet Physical Activity Recommendations, *American Journal of Preventive Medicine*, Vol. 29, No. 4 ([www.acpm.org](http://www.acpm.org)); at [www.cdc.gov/healthyplaces/articles/besser\\_dannenberg.pdf](http://www.cdc.gov/healthyplaces/articles/besser_dannenberg.pdf)

<sup>37</sup> Wener, R. and Evans, G. (2007) A morning stroll. Levels of Physical Activity in Car and Mass Transit Commuting, *Environment and Behaviour*, 39(1): 62-74

roughly 2,000 or 30% more steps than the average car commuter. Lachapelle et al (2011)<sup>38</sup> also found that commuters who use public transport average five to ten more minutes of moderate-intensity physical activity than non-users of public transport. In an academic review of nine major studies that explored the links between public transport and health benefits<sup>39</sup>, Rissel et al (2012) found that there appear to be at least 8 minutes of additional physical activity associated with public transport use a day, with several studies reporting a range up to 12-15 minutes a day.

### 9.3.3 Summary

Department for Transport guidelines and academic research suggests that around 40-50% of concessionary journeys undertaken by bus are new journeys, implying that overall levels of physical activity has increased as a result of the scheme. This finding is confirmed by international evidence that shows a strong association between public transport use and increased level of physical activity.

## 9.4 Has this increased level of activity resulted in significant impact on the health and social inclusion?

### 9.4.1 Health impacts

According to a report by the Department of Health<sup>40</sup>, physical activity is important to older adults as it is to younger adults because it significantly promotes physical health and mental wellbeing. According to estimates by the World Health Organisation<sup>41</sup>, physical inactivity is the fourth-leading risk factor in global mortality, responsible for approximately 6% of deaths globally.

Recent studies show that even moderate levels of activity have significant health benefits. Wen et al (2011) show that even 15 minutes of moderate daily exercise is associated with a 12% decrease in all-cause mortality in persons older than 60 years.<sup>42</sup> Woodcock et al (2011)<sup>43</sup> found that reaching the recommended minimum level of physical activity compared with no activity led to a reduction in all-cause mortality by 19%, which rises to 24% if an hour a day is spent in physical activity. There is also evidence to suggest that take-up of a more active life-style even at later life can have significant benefits. According to Slattery et al (1988)<sup>44</sup>, adult men aged 45-84 years who exchanged an inactive adult lifestyle for a more active one over a period of 11-15 years reduced their risk of coronary heart disease.

There is now an increasing level of attention paid to the links between public transport and health outcomes. The literature review conducted as part of this study indicate that greater use of public transport is associated with both greater levels of activity and better health outcomes. Three studies,

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<sup>38</sup> Ugo Lachapelle, et al. (2011) Commuting by Public Transit and Physical Activity: Where You Live, Where You Work, and How You Get There, *Journal of Physical Activity and Health*, Vol. 8, Supplement 1, pp. S72-S82

<sup>39</sup> Rissel, C., Curac, N., Greenaway, M. and Bauman, A. (2012) Key health benefits associated with public transport: a rapid review, available at [https://www.saxinstitute.org.au/wp-content/uploads/05\\_Key-health-benefits-associated-with-public-transport.pdf](https://www.saxinstitute.org.au/wp-content/uploads/05_Key-health-benefits-associated-with-public-transport.pdf)

<sup>40</sup> Department of Health (2007) At least five a week Evidence on the impact of physical activity and its relationship to health. A report from the Chief Medical Officer – available at [http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_4080981.pdf](http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4080981.pdf)

<sup>41</sup> World Health Organization (2004) Global Health Risks: Selected figures and tables, available at [www.who.int/entity/healthinfo/global\\_burden\\_disease/global\\_health\\_risks\\_report\\_figures.ppt](http://www.who.int/entity/healthinfo/global_burden_disease/global_health_risks_report_figures.ppt)

<sup>42</sup> Wen et al. (2011) Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study, available at [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(11\)60749-6/fulltext#article\\_upsell](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(11)60749-6/fulltext#article_upsell).

<sup>43</sup> Woodcock, J., Franco, O.H., Orsini, N., and Roberts, I. 'Non-vigorous physical activity and all-cause mortality: systematic review and meta-analysis of cohort studies', *Int J Epidemiol* 2011, 40(1): 121-38, available at <http://www.ncbi.nlm.nih.gov/pubmed/20630992>

<sup>44</sup> Slattery, ML, Jacobs, Jr DR. Physical fitness and cardiovascular disease mortality. The USA Railroad Study. *American Journal of Epidemiology* 1988; 127: 571-580

with particular relation to the concessionary travel scheme are Kelly (2011), Coronini-Cronberg et al (2012)<sup>45</sup> and Webb et al (2013)<sup>46</sup>. Their key findings can be summarised below:

- The introduction of the concessionary travel scheme has primarily resulted in an increase in the number of discretionary trips and a clearly associated with a statistically significant increase in the amount of walking undertaken by older people.
- Free bus passes encourage the over-60s to be more physically active, whether they are poor or wealthy. The benefits for older people include better mobility, strength, lower risk of heart disease, falls and broken bones.
- Older people who use public transport are 25% less likely to being obese and 20% less likely of being abdominally obese than those who do not use public transport.

These studies are also corroborated by survey data by Populus (2014). In their survey, they asked respondents whether walking to the bus stop 'made them feel fitter and healthier' and 'makes them take regular exercise'.<sup>47</sup> Over 80% of those asked (including the over 65 cohort) agreed with these statements.

In addition to these findings from the UK, there are also important international studies that have highlighted the links between healthcare and greater use of public transport. Edwards (2014) study from the US estimates health savings of between 8-14% from a switch from cars to public transport, while links between reduced obesity and public transport usage have been established from Atlanta, New York and southern Sweden.

#### 9.4.2 Social inclusion and participation

In addition to health benefits the concessionary travel scheme is likely to generate wider social benefits over and above the cost of free travel. The benefits of social inclusion includes improvements in mental and physical health. For example, Age UK has undertaken research that shows those isolated from friends and family being at a 26% higher death risk over a seven year period<sup>48</sup>.

Lower levels of contact with social networks and loneliness have also been found to be associated with an increased risk of cognitive decline and dementia, while frequent emotional support and social activity appear to reduce the risk of cognitive decline<sup>49</sup>. Another study found that older adults who have poor social support reported the highest level of depressive symptoms, while seniors embedded in diverse social networks are less likely to report depression<sup>50</sup>.

Research by the former Social Exclusion Unit<sup>51</sup> outlined Transport to be one of the key factors that affect social exclusion among the elderly, especially as car ownership starts to decline as people age. While exclusion is a difficult concept to quantify, using data from the English Longitudinal Study of Ageing (ELSA), Kelly (2011) finds that self-reporting of 'very easy access' to GPs and Post-Offices has increased with the introduction of concession scheme, with a 6.1% increase in the probability of reporting very easy access to the Post Office and 3.9% for GPs.<sup>52</sup>

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<sup>45</sup> Coronini-Cronberg, S., Millett, C., Laverty, A., and Webb, E (2012) The impact of free older persons' bus pass on active travel and regular walking in England, *American Journal of Public Health*, 102, 2141-2148.

<sup>46</sup> Webb, E., Netuveli, N. and Millett, C. (2012) Free bus passes, use of public transport and obesity among older people in England, *Journal of Epidemiology and Community Health*, 66, 176-180, available from <http://jech.bmj.com/content/66/2/176.long>.

<sup>47</sup> Populus (2014) Health Benefits of Bus Travel Survey, Greener Journeys

<sup>48</sup> AgeUK (2013) Beat social isolation and live longer, available at <http://www.ageuk.org.uk/latest-news/archive/beat-social-isolation-and-live-longer>.

<sup>49</sup> Baber, B. et al (2010) Physical, social and cognitive activities in the prevention of dementia: a review of the literature. Report to the CSIRO, P-Health Flagship,.

<sup>50</sup> Warburton, J and Lui, CW, (2007) Social isolation and loneliness in older people: A literature review, 2007, p 19.

<sup>51</sup> Social Exclusion Unit, Making the connections: final report on transport and social exclusion, available at at: <http://www.sepho.org.uk/viewResource.aspx?id=6261>

<sup>52</sup> Kelly, E. (2011) Ticket to ride: does free bus travel promote active ageing?

### 9.4.3 Access to essential services

Access to health services is also a benefit that has been mentioned in both the literature survey and our consultations. However, quantifying its impact is difficult. As mentioned above, Kelly's finding does show a marginal increase in the number of respondents who have found GPs being more accessible being associated with an increase in bus journeys among older people. The NTS survey does not specifically categorise medical trips as a journey purpose.

However, the Populus survey shows that almost a quarter of bus journeys undertaken by over 65 population is for getting to medical appointments. Further evidence of how important concessionary travel is for medical treatment comes from the many local transit authorities that provide additional concessions before 9.30am justified specifically on ensuring older people can make early morning appointments at hospitals. Missed GP appointments cost the NHS in excess of £163 million a year<sup>53</sup>, and it is likely that the concessionary travel scheme can play a role in keeping these costs low.

Without concessionary travel, the frequency of visits to GPs may decrease which may have additional costs in terms of early prevention and treatment. An alternative may be increased usage of more expensive services such as dial-a-ride, or even an increase in calls to use the ambulance service for cases that may not require a visit to an Accident and Emergency hospital department.

## 9.5 Valuing the health benefits

The following steps are undertaken in order to value the health benefits of the scheme.

### 9.5.1 Identify the amount of walking undertaken on bus journeys

All journeys involve an element of physical activity, and public transport journeys often involve more walking than journeys by car (e.g. to the bus stop/train stop and back). There are two main components to this analysis: the total amount of walking that is undertaken as part of an average bus journey and the difference in walking between bus and car journeys. Data for this come from analysis by David Lewis of Mindlab International, which used pedometer data from almost 500 journeys in the UK<sup>54</sup>.

The findings from this research indicate that the average bus journey involves almost 1.3km of walking, more than two and half times more than journeys by cars (i.e. 0.52km). We therefore calculate that the amount of walking *not done* through switching to cars to be 0.78km per journey (i.e. 1.3 – 0.52).

### 9.5.2 What would happen without the concessionary travel scheme

Data for this comes from a number of studies. The DfT re-imburement guidelines for example estimate an approximately 50% 'generation' factor – i.e. approximately half of the journeys currently undertaken by older people are being undertaken due to the scheme being in place. The DfT also estimate a diversion factor of 31% to cars. Similar results are obtained from Andrews et al (2011)<sup>55</sup> as well as by surveys by Passenger Focus<sup>56</sup>, which report diversion factors of 35%.

Combining the total number of concessionary bus journeys by older people (1.26 billion) with the above figures give a total of approximately 218 million return journeys that would *not* be made if the scheme was not available, and 98 million journeys per year switched to cars.

<sup>53</sup> NHS (2014) NHS England using technology to beat cost of missed appointments, available at <http://www.england.nhs.uk/2014/03/05/missed-appts/>.

<sup>54</sup> Available at <http://www.greenerjourneys.com/2011/09/why-taking-the-bus-is-good-for-your-health/>

<sup>55</sup> Andrews, G., Parkhurst, G., Shaw, J. and Susilo, Y. (2011) The Grey Escape: How and why are older people really using their free bus pass?, available at [http://www2.uwe.ac.uk/faculties/FET/Research/cts/projects/reports/utsq2011\\_andrews\\_et\\_al.pdf](http://www2.uwe.ac.uk/faculties/FET/Research/cts/projects/reports/utsq2011_andrews_et_al.pdf)

<sup>56</sup> Passenger Focus (2009) England-Wide Concessionary Bus Travel: The Passenger Perspective

By multiplying walk per journey and walking not done by switching to cars, we can now estimate the total distance *not* walked in the absence of the scheme.

### 9.5.3 Identify the health benefits per kilometre of walking

As outlined in above, there is a wealth of evidence to show the considerable health benefits of walking and physical exercise. The most commonly identified methodology for monetising these benefits relate to evaluation of new transport infrastructure that directly result in active transport modes – i.e. building of walkways or bike paths. The methodology outlined by the DfT in Webtag Unit A4.1<sup>57</sup>, while applicable to such infrastructure based schemes, is not directly relevant or applicable to the concessionary travel scheme. This is because no new infrastructure is being built and it is difficult to estimate the number of ‘new’ active users of the scheme.

We therefore require a figure for the healthcare benefits per distance walked. This is provided by the New Zealand Transport Authority<sup>58</sup>. Based on an extensive literature review of the healthcare benefits<sup>59</sup>, the evaluation methodology recommends monetisation of health benefits of NZ\$ 2.60 per passenger km walked for projects that encourage physical activity for 2008. In 2013, the latest iteration of the manual (as of July 2013) recommends an uplift factor of 1.1 from the 2008, thereby resulting in a NZ\$ 2.9 for 2013. We use the GBP to NZ\$ exchange rate for July 2013 of 1.9 to come up with a benefit of £1.52 per passenger km walked.

By multiplying this monetised value with the distance *not* walked if the scheme were taken away (£1.52 x 320 million), we estimate a 2013 figure of £486 million. We use the HMT GDP deflator to express this in 2010 figures of £458 million per year.

### 9.5.4 Potential limitations of the approach

As outlined above, the approach outlined above is a broad-based approach, intended to provide an indication of the magnitude of benefits that can occur from the concessionary travel scheme. There are however a number of limitations of the approach that must be noted.

First and foremost, the analysis is based on survey data, both on the counter-factual and the walking distance per journey. As more data are collected, especially from smart cards, GPS data from mobile phones or using mobile signal data, we may be able to get better estimates of the total activity levels that are associated with different types of travel.

Second, health benefits from physical activity have decreasing marginal rate of return. In other words, the additional benefit from physical activity to an individual, especially in terms of reducing the risk of mortality, would be reduced as an individual increases their level of activity. Conversely, there may also be a minimum level of exercise that is required before there is incidence of health benefits. In the quantification of health benefits, this is sometimes dealt with by putting an upper limit on the per person benefit that can be achieved.

With our approach adopted above, we do not make any assumptions about how the additional km travelled (and therefore walked) is distributed between older bus passengers. If these km walked are very skewed and distributed among a very small group of individuals who are already quite active, our estimate may overstate the true benefits. At the same time, if there is additional walking by those who are already physically inactive, this may result in greater benefits. Survey data from older passengers may help in estimating this further, but we currently do not have the evidence to go into this level of granularity.

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<sup>57</sup> Available from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/275364/webtag-tag-unit-a4-1-social-impact-appraisal.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/275364/webtag-tag-unit-a4-1-social-impact-appraisal.pdf)

<sup>58</sup> LTNZ (2006) Economic Evaluation Manual, Land Transport New Zealand ([www.landtransport.govt.nz](http://www.landtransport.govt.nz)); at [www.landtransport.govt.nz/funding/manuals.html](http://www.landtransport.govt.nz/funding/manuals.html).

<sup>59</sup> Genter et al (2008) Valuing the health benefits of active transport modes (2008) available from <http://www.bikeweek.org.nz/resources/research/reports/359/docs/359.pdf>

However, given the high percentage of older people who are obese or overweight, and given the evidence outlined from academic research on the observed reduction in obesity and those who own concession passes, the evidence does point towards a positive effect on health benefits from the scheme.

Third, there are concerns over the conversion of a health benefit from New Zealand to the United Kingdom, especially using market exchange rates. This criticism is however more defensible for a number of reasons. Firstly, the PPP conversion rate and market exchange rate between the two countries are very similar<sup>60</sup>, and both countries spend approximately similar proportion of their national income on health. Second, the causes of overall mortality between the countries are also very similar, and therefore the valuation of the impact of health impacts from inactivity is also likely to be similar.

## 9.6 Summary of the behavioural impacts and health benefits

Identifying the health and social inclusion benefits of the concession travel scheme is a complex task. It involves untangling a number of relationships such as that between free bus travel and its alternatives, between public transport and activity, and ultimately public transport and health and social exclusion outcomes.

Therefore, a simple predictive statement such as increasing the take-up of public transport will cause a reduction in obesity and other health benefits is difficult to make. In fact, according to the UK Government office for Science<sup>61</sup> causal factors for obesity are complex. They can range from social, psychological, economic, food, activity, infrastructure, developmental, biological and medical categories. Therefore, identifying the singular role played by free public bus provision to generate wider social benefits is difficult.

Despite these limitations, there appear to be good academic evidence to suggest that even modest levels of physical activity can have significant long-term benefits for health and wellbeing. There is also an increasing body of evidence to suggest a positive association between public transport use and increased physical activity. In particular, a number of academic studies have pointed towards a strong association between the concessionary travel scheme and both positive levels of physical activity and positive health outcomes. The theoretical basis for health benefits from the scheme is therefore very sound.

Using publicly available sources and established official quantification metrics, we estimate the total health benefits from the scheme at approximately £458 million a year. Estimating the impact of any one policy instrument in healthcare is however complicated, and this should be regarded as a broad-based indicative measure of the magnitude of benefits that we experience.

In terms of social inclusion and access to services, there is academic evidence that the scheme has improved this for older people. In addition to physical health benefits, there is also evidence to suggest that there are direct mental health benefits from a higher degree of social interaction. Survey evidence also shows the importance of the scheme in helping older people access medical services. This may also assist in reducing wastage in the NHS, particularly from missed appointments and/or use of more expensive modes of transport as well as the costs of late diagnosis.

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<sup>60</sup> See for example <http://stats.oecd.org/Index.aspx?DataSetCode=CPL>

<sup>61</sup> Foresight (2<sup>nd</sup> Edition), Tackling Obesities – Future Choices – Project Report, available at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/287937/07-1184x-tackling-obesities-future-choices-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/287937/07-1184x-tackling-obesities-future-choices-report.pdf)