Overcoming the barriers to access for older people

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EXECUTIVE SUMMARY

The population of Great Britain is ageing as more people survive into old age. If the present trends continue, the proportion of people of working age will decrease and the proportion of older people will increase. It is likely that more of the older population will be employed, possibly part-time, possibly on a voluntary basis. This is one reason why it is important that older people can travel easily. Having worked for many years, older people who want to spend their time remaining active, enjoying life and contributing to society need to be able to travel without significant barriers to their movement. However, some older people have impairments that may reduce their ability to travel.

Older people make similar trips to those of younger people, but fewer commuting and business trips. As they become older, the average length of their trips decreases. Because some of them cease to hold a driving licence on health grounds, they tend to make fewer car driving trips, but more car passenger trips. They make many shopping and leisure trips, but would like to make even more. They are prevented from doing so by various barriers to travel. Making it easier for older people to travel would produce various benefits including improved quality of life and health, and would enable them to make an even larger contribution to society than they do at present. The barriers tend to be difficulties travelling to and from the stop or station for public transport and getting in and out of the vehicle for cars and trains. Older people living in rural areas without access to a car face serious difficulties reaching essential services.

As people age, their abilities to travel deteriorate, including their ability to walk, stand, see and hear. Some of them may have difficulty handling small objects or reaching out. They may need to access a toilet more frequently than younger people. Fewer of them than young people can access the internet and some may have lost the ability to drive. This does not mean that they should not travel, just that it is more difficult.

There is a lot of information about ways of overcoming the barriers to access for older people, but it is spread amongst many sources. The evidence is brought together in the report, including information about ways to overcome the barriers to walking, using wheelchairs, changing level, and using public transport, cars and mobility scooters. Ways of improving the journey experience for older people, including better information and improving the attitudes of others whilst travelling, are also considered.

The report is concluded by identifying examples of good practice and discussion about some of the outstanding accessibility issues that need to be addressed to make travelling by older people easier so that they can enjoy life and make a greater contribution to society.

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1 **INTRODUCTION**

An increasing proportion of the population in Great Britain is elderly. Older people make significant contributions to the economy and wellbeing of the country (WRVS, 2011). These could be increased by reducing the barriers that hinder travel for some of them which would enable them to make an even larger contribution (Mackett, 2014a). This paper is a review of the patterns of travel by older people, the journeys that they would like to make, but are unable to, the evidence on the barriers that prevent them from travelling more and discussion about ways of overcoming those barriers.

2 THE OLDER POPULATION IN BRITAIN

Table 1 shows the percentage of the population in various age groups in England and Wales from 1911 to 2011. It can be seen that the proportion of the population aged 65 and over was three times as large in 2011 as it was in 1911. Over the same period, the proportion of people aged 15 to 64 has stayed almost constant but many more were aged 40 or over in 2011 than in 1911, while the proportion aged 14 or under has almost halved. In summary, the population is ageing as more people survive into old age. This has important implications because, if these trends continue, the proportion of people of working age will decrease and the proportion of older people will increase. This is why the state pension age is being increased in this country. It also means that more of the older population will be working, possibly part-time, possibly on a voluntary basis. This is one reason why it is important that older people can travel easily. Having worked for many years, older people who want to spend their time remaining active, enjoying life and contributing to society in various ways, which also requires them to be able to travel without significant barriers to their movement.

Table 1 Population by broad age groups, 1911 - 2011, England and Wales (%)

	1911	**1921**	**1931**	**1941**	**1951**	**1961**	**1971**	**1981**	**1991**	**2001**	**2011**
0-14	30.6	27.7	23.8	23.0	22.1	23.0	23.7	20.5	19.0	18.8	17.6
15-39	41.8	40.0	40.4	37.7	35.0	32.9	32.6	36.3	36.2	34.5	33.2
40-64	22.3	26.2	28.3	30.1	31.8	32.3	30.3	28.2	28.9	30.8	32.7
65-89	5.2	6.0	7.4	9.2	10.9	11.8	13.1	14.7	15.5	15.3	15.7
90+	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.8

Source: Office for National Statistics (2012).

Some older people have disabilities that can make travel more difficult. Table 2 shows that there are similar numbers of people under and over the state pension age who have a disability, but a much higher proportion of older people have one. It

should be noted that, despite this, the majority of older people do not have a disability.

Table 2 Number of people in the United Kingdom by age and disability 2013 (in millions)

		Age		
		Under state pension age	**Over state pension age**	**All**
Disability	Without a disability	45.1 (72%)	7.0 (11%)	52.1 (83%)
	With a disability	5.4 (9%)	5.3 (8%)	10.7 (17%)
	Total	50.5 (80%)	12.3 (20%)	62.8 (100%)

Source: Office for National Statistics (2013a, b) and Department for Work and Pensions (2012).

The proportion of disabled people who are over the state pension age has increased slightly over time, probably due to increased longevity, as shown in Table 3. However, as shown in Table 4, up to the age of 75 fewer than half of the adults in each age cohort have a disability, but the proportion increases rapidly after that with 73% of the population aged 85 and over being classified as disabled according to the Equality Act (EA) 2010 definition. This defines a disabled person as someone who has a mental or physical impairment that has a substantial and long-term adverse effect on the person's ability to carry out normal day-to-day activities.

Table 3 Disabled people in Great Britain (figures are in millions)

	Adults of Working Age	**Adults of State Pension Age**	**All Adults**	**Children**	**All Ages**
2002/3	5.0	4.7	9.7	0.7	10.4
2003/4	4.9	4.6	9.5	0.7	10.1
2004/5	4.8	4.6	9.5	0.7	10.1
2005/6	5.2	4.9	10.1	0.7	10.8
2006/7	4.9	4.9	9.8	0.7	10.4
2007/8	4.8	5.0	9.8	0.8	10.6
2008/9	5.0	5.1	10.1	0.7	10.9
2009/10	5.1	5.1	10.2	0.8	11.0
2010/11	5.2	5.2	10.4	0.8	11.2

Source: Department of Work and Pensions (undated).

Another way of considering personal factors that may inhibit movement is to consider 'impairment'. In the Life Opportunities Survey (LOS) (Office for Disability Issues, 2011), a respondent is defined as having an impairment if they indicate the following:

- They experience either moderate, severe or complete difficulty within at least one area or physical or mental functioning, and
- Certain activities are limited in any way as a result. 'Activities' refer to different areas of physical or mental functioning, such as walking, climbing stairs or reading the newspaper.

It can be seen in Table 5 that impairment also increases with age. Comparing Tables 4 and 5, it can be seen that the two sets of figures are fairly similar but the percentage of the population with an impairment is slightly lower than the percentage classified as disabled for those aged 65 and over, but higher for all younger age groups.

Table 4 Disability status by age group, 2009/11

Age group	Percentage of EA disabled adults	Percentage of non-disabled adults
16 to 19	10	90
20 to 24	9	91
25 to 29	9	91
30 to 34	10	90
35 to 39	16	84
40 to 44	19	81
45 to 49	22	78
50 to 54	26	74
55 to 59	31	69
60 to 64	35	65
65 to 69	42	58
70 to 74	48	52
75 to 79	57	43
80 to 84	65	35
85 and over	73	27

Source: Table 5.1 in Office for Disability Issues (2011).

Table 5 Impairment status by age group, 2009/11

Age group	Percentage of adults with impairment	Percentage of adults without impairment
16 to 19	13	87
20 to 24	14	86
25 to 29	14	86
30 to 34	16	84
35 to 39	22	78
40 to 44	24	76
45 to 49	28	72
50 to 54	30	70
55 to 59	34	66
60 to 64	36	64
65 to 69	39	61
70 to 74	43	57
75 to 79	51	49
80 to 84	59	41
85 and over	70	30

Source: Table 4.2 in Office for Disability Issues (2011).

There is a range of disabilities, which will have different impacts on the ability to travel. Table 6 shows the percentages of adults of the state pension age and of working age with different types of impairment. It can be seen that greater percentages of adults above the state pension age have each of the disabilities, but the greatest differences are for 'mobility' and 'lifting and carrying'. 'Mobility' means the ability to move about, which is essential for travelling. 'Lifting and carrying' can be important for shopping trips. 'Manual dexterity' is required for manipulating coins, notes and credit cards for tickets machines for car parking and rail travel. 'Physical co-ordination' is necessary for many journeys. 'Communication' is required to talk to travel staff and to obtain information. Those with continence problems need to be confident that they will be able to access toilet facilities when they are travelling. 'Memory/concentration learning' is important for obtaining information about travelling and being able to recall it during the journey. 'Recognising when in danger' is important when travelling, for example, in crossing the street. The important point is that many of these impairments may affect the propensity of many older people to travel. Two further points need to be borne in mind: firstly, just because a person has some difficulty in making a journey, it does not mean that they should not be travelling or that they do not have a useful contribution to make when they arrive (Mackett, 2014a); and secondly, the definition of the impairments is subjective: many others may have some difficulty in travelling but they might not have regarded it as sufficiently critical to declare in the survey upon which these figures are based.

Table 6 Percentage of population groups with impairments, 2010/11 (prevalence)

Impairment	**State pension age adults**	**Working age adults**
Mobility	30	5
Lifting, carrying	28	5
Manual dexterity	12	3
Physical co-ordination	11	2
Communication	8	2
Continence	7	1
Memory/concentration learning	7	2
Recognising when in danger	2	1
Other	12	4

Source: Office for National Statistics (2013a, b) and Department for Work and Pensions (2012).

Table 7 shows impairments by type for various age groups. It can be seen that most of the conditions increase with age and that the three largest categories are 'Long-term pain', 'Chronic health conditions' and 'Mobility'. These are not independent and individuals may have more than one of these, for example, a chronic health condition that causes pain which may also cause mobility difficulties. Quite large numbers of those aged 75 or over have sight, hearing, dexterity, breathing or memory impairments relative to the other age groups, but none of these are over 16%, and the proportions of those aged 55-74 with these are all below 10%. From these figures it can be seen that the majority of older people have the physical and mental capability to travel, and so if they are not travelling as much as they would wish, it may be partly due to inadequacies in the transport system.

Table 7 Impairment types by age group, 2009/11

Type of impairment	Percentage of all adults	Percentage of those aged 16-34 years	Percentage of those aged 35-54 years	Percentage of those aged 55-74 years	Percentage of those aged 75 and over
Sight	3	1	2	4	11
Hearing	3	1	1	4	13
Speaking	1	1	1	1	2
Mobility	8	1	5	14	28
Dexterity	6	1	4	9	16
Long-term pain	18	6	17	25	33
Breathing	3	1	2	5	9
Learning	2	3	2	1	1
Intellectual	-	1	-	-	-
Behavioral	1	1	1	-	-
Memory	3	2	3	3	8
Mental health condition	4	3	4	4	2
Chronic health condition	13	5	10	19	30
Other impairment or health condition	1	1	1	1	1

Source: Table 4.3 in Office for Disability Issues (2011).

Table 8 shows how many people have mobility difficulties. Mobility status was identified from responses to the following question in the National Travel Survey (NTS):

> Do you have any disability or other long standing health problem that makes it difficult for you to do any of the following…
>
> - go out on foot?
> - use local buses?
> - get in or out of a car?
> - no difficulty with any of these.

These conditions are more directly related to travel than the categories in Tables 6 and 7. It can be seen that mobility difficulties increase with age. The majority of those aged 70 or over do not have mobility difficulties, and only a small proportion of those aged 60-69.

Table 8 Mobility difficulties by age: Great Britain, 2013

Mobility status	All aged 16+	16-49	50-59	60-69	70+
With a mobility difficulty	9	3	8	12	31
No mobility difficulty	91	97	92	88	69
Total	100	100	100	100	100

Source: Table NTS0622 in Department for Transport (2014a).

It has been shown that quite a large number of older people have a disability or impairment. It should be recognised that, in addition, many older people have some difficulty making journeys even though they may not be registered as disabled. They may not regard it as sufficiently significant to regard it as a mobility difficulty of the type shown in Table 8. For example, they may find walking a long way difficult, or standing for a long time, such as on a bus, tiring. They may need toilet facilities more often than younger people, have difficulty handling coins, or become muddled. These characteristics are less well-defined than disabilities such as being in a wheelchair or being registered blind. This means that it is more difficult to make changes to the environment or the provision of services to improve accessibility. It is also more difficult to obtain data about these less well-defined conditions. This, in turn, makes it more difficult to identify ways of overcoming the barriers to travel that the various conditions present. This paper will use the available data to present a picture of the barriers to movement for older people and ways of overcoming them that is as clear as possible, but it should be acknowledged that the evidence is not clear-cut.

3 TRAVEL BY OLDER PEOPLE

In this section, the travel patterns of older people will be considered. Table 9 shows the purposes for which people travel. It can be seen that people aged 50-59 and 60-69 make more trips than average, but those aged 70+ make fewer. Whilst there is a decrease in the number of trips made with age, the decrease from being aged 50-59 to being 60-69 is less than the decrease in the numbers of commuting and business trips. This implies that retirement brings a reduction in commuting trips when people cease to be employed or move from full-time to part-time work, but that they make more trips for other purposes. Those aged 60-69 make more shopping, personal business and leisure trips than the younger age group. Whilst the oldest age group make fewer trips overall, they make more shopping and personal business than average and those aged 50-59. Those aged 60-69 make some education escort trips but fewer than those aged 50-59: it is likely that few of these people are taking their own children to or from school, so these are probably grandparents taking grandchildren to and from school. Some of these trips are also made by those aged 70+. Older people aged 60-69 make almost as many other escort trips as the average population. These may be people taking friends and neighbours shopping or to the doctors, or they could be acting as drivers as part of voluntary work. It is also worth noting that, even though there is a large decrease in the number of commuting trips it is not zero even for those aged 70+, showing that many older people are still contributing directly to the economy through employment.

Table 9 Average number of trips (trip rates) per person by age and purpose: Great Britain, 2013

Purpose	All ages	50-59	60-69	70+
Commuting	145	231	85	11
Business	30	59	27	3
Education	64	1	-	-
Escort education	49	24	15	8
Shopping	180	220	287	278
Other escort	86	81	70	33
Personal business	89	100	129	132
Visit friends at private home	94	86	110	78
Visit friends elsewhere	44	47	59	46
Sport / entertainment	64	55	76	59
Holiday / day trip	38	40	48	34
Other including just walk	40	55	59	45
All purposes	923	999	965	726

Source: Table NTS0611 in Department for Transport (2014a).

Table 10 shows the average total distance travelled making trips for various purposes. It can be seen that the distance travelled decreases faster with age than the number of trips shown in Table 9, implying that people make shorter trips on average as they become older. The changes in distances largely reflect the changes in the number of trips, but illustrate that even the very elderly are still travelling, particularly for shopping, personal business and leisure. What is not clear from these figures is whether the reductions in travelling with age reflect a desire to travel less or because people are finding travel more difficult as they become older. If, as seems likely, it is mainly the latter, this raises the question as to the nature of the barriers. This will be explored later in this report.

Table 10 Average total distance in miles travelled per person by age and purpose: Great Britain, 2013

Purpose	All ages	50-59	60-69	70+
Commuting	1,279	2,033	699	68
Business	620	1,200	467	27
Education	227	15	4	-
Escort education	106	96	50	23
Shopping	769	991	1,254	1,094
Other escort	473	607	454	203
Personal business	446	567	698	571
Visit friends at private home	1,009	1,100	1,215	825
Visit friends elsewhere	286	312	390	287
Sport / entertainment	442	460	580	319
Holiday / day trip	880	1,041	1,144	762
Other including just walk	48	56	58	37
All purposes	6,584	8,479	7,014	4,215

Source: Table NTS0612 in Department for Transport (2014a).

Another way to consider travel patterns is to look as the mode of travel used, as shown in Table 11. It can be seen that car driving decreases with age, but that trips as a car passenger are higher for older people than those aged 50-59. This partly reflects the cessation of driving or a voluntary reduction, perhaps not driving trips that are found difficult such as at night, in bad weather or in city centres. Bus use increases with age above the age of 50, reflecting the availability of concessionary travel passes for people above the state pension age for women (currently 62) and, probably, the reduction in driving. Taxi and minicab usage increases from being aged 60-69 to being 70+, reflecting the convenience of this mode and, possibly, increasing difficulty using other modes. The number of trips walked decreases with age, but increases as a proportion of all trips made. Cycling decreases with age, possibly reflecting increasing physical difficulty using this mode and less willingness to travel on the road, paralleling the decline in driving. The number of rail trips declines from age 50-59 onwards, probably reflecting the decrease in commuting and business trips following retirement.

Table 11 Average number of trips per person by age and mode: Great Britain, 2013

Mode	All ages	50-59	60-69	70+
Walk	203	168	180	139
Bicycle	14	12	10	5
Car / van driver	380	587	513	309
Car / van passenger	210	140	166	161
Other private transport	10	10	9	8
Local and non-local buses	63	42	60	85
Rail	30	27	17	7
Taxi / minicab	10	10	8	10
Other public transport	3	2	2	2
All modes	923	999	965	726

Source: Table NTS0601 in Department for Transport (2014a).

Table 12 shows the average total distance travelled by each mode for the various age groups. The greater decrease in the distance travelled compared with the number of trips from the age 60-69 to 70+ for car/van driver and passenger reflects the growth with ageing in the number of short trips by this mode.

Table 13 shows the how mobility and age affect trip making. Those with a mobility difficulty aged between 16 and 69 make about 67% of the number of trips that those with no mobility difficulties make whereas those aged 70+ with a mobility difficulty make only about 54% of the trips made by people of the same age with no difficulty. This suggests that increasing age has more impact on the number of trips made by those with mobility difficulties than those without.

Table 12 Average total distance in miles travelled per person per year by age and mode: Great Britain, 2013

Mode	All ages	50-59	60-69	70+
Walk	187	166	162	112
Bicycle	49	53	33	10
Car / van driver	3,235	5,321	4,116	1,905
Car / van passenger	1,865	1,622	1,682	1,278
Other private transport	154	155	157	132
Local and non-local buses	331	211	332	529
Rail	650	780	447	199
Taxi / minicab	54	48	42	40
Other public transport	58	120	44	11
All modes	6,584	8,479	7,014	4,215

Source: Table NTS0605 in Department for Transport (2014a).

Table 13 Trips per person per year by age and mobility status: Great Britain, 2013

Mobility status	All aged 16+	16-49	50-59	60-69	70+
With a mobility difficulty	572	757	614	670	461
No mobility difficulty	977	979	1,035	1,003	846
All	942	974	999	965	726

Source: Table NTS0622 in Department for Transport (2014a).

As indicated above, older people make fewer bicycle trips than younger people. This can be seen in Table 14, which shows how cycling for men is fairly constant across the age groups 17-20 to 40-49 and then declines for older people. Women cycle much less than men. Their level of cycling is at a similar level from 21-29 to 50-59, and then drops even more steeply than it does for men.

Table 14 Bicycle trips by age and gender: Great Britain, 2011/13

Age group	Males	Females	Total
5-10	14	9	12
11-16	37	9	23
17-20	31	5	18
21-29	30	13	21
30-39	31	13	22
40-49	30	11	21
50-59	23	10	17
60+	14	4	8
All aged 5+	24	9	17

Source: Table NTS0609 in Department for Transport (2014a).

An issue related to travel by several modes is road accidents. Table 15 shows the numbers of adults aged 16+ who have been involved in a road accident in the previous 3 years and 12 months. It can be seen that the proportion involved in any road accident is constant through middle age and then decreases with age with those aged 60+ having the lowest rate of any age group. This may partly reflect

lower levels of travel, and that older people make more trips by bus than younger people and fewer by bicycle.

Table 15 Proportion of adults aged 16+ who have been involved in a road accident, 2013

	Any road accident		Injury accident	
	In last 3 years	In last 12 months	In last 3 years	In last 12 months
All adults (aged 16+)	12	6	4	2
16-19	8	4	4	1
20-24	15	7	7	3
25-29	15	7	5	2
30-39	15	7	5	2
40-49	15	7	5	2
50-59	13	6	4	2
60+	8	4	2	1

Source: Table NTS0623 in Department for Transport (2014a).

It has been shown in this section that the amount of travel decreases with age, but that older people, particularly those aged 60-69 make significant numbers of journeys. Older people tend to make shorter trips than younger people. Much of the decrease with age is due to the decrease in the numbers of commuting and business trips. They tend to make more shopping and personal business trips than younger people and about as many leisure trips. They make more bus and car passenger trips than younger people, but fewer car driving, rail and bicycle trips. Whilst the reasons for some of these changes are fairly clear, such as lifestyle changes associated with retirement and ceasing to commute, it is not clear whether the other changes are caused by barriers to movement which prevent older people enjoying their retirement and contributing to society. These issues will be explored in later sections of this report.

4 THE TRAVEL THAT OLDER PEOPLE WOULD LIKE TO DO

In the previous section the amount of travel by people of different ages was examined. It was found that older people made fewer trips than many younger people, but that they more shopping and leisure trips. Those aged 70 or over made considerably fewer trips. This raises the question about the type of trips that older people would like to make. Table 16 shows the type of activity that the 1445 respondents aged 60 or over in a household survey stated that they would like to do more of (Department for Transport, 2001). It can be seen that social activities are the most popular type activity of which they would like to do more, followed by shopping, with small percentages wanting more day centre visits, trips to the Post Office and the chance to visit others in hospitals. These reflect the types of activities older people tend to travel to, as indicated in Table 9. This suggests that there are some older people who are prevented from reaching the types of activities in which others participate.

Table 16 Types of activities of which older people would like to do more (figures are the percentages of respondents who would like to have done more)

Activity	**%**
Visit family	12
Visit friends' homes	10
Meet friends elsewhere	10
Leisure/sport	8
Other shopping	7
Food shopping	6
Day centre visit	2
Post Office	2
Visit others in hospital	1

Source: Table 5.3 in Department for Transport (2001).

In the same survey, the respondents were asked to identify up to four journeys they would make if they were offered a free, fully accessible door-to-door taxi service with driver assistance. This would probably be the most accessible form of travel that could be offered. In Table 17 shopping tops the list, followed by visiting family and friends. This suggests that shopping is the trip purpose to which transport provides the biggest barrier. This will be explored further in the next section.

Table 17 Types of trips desired by older people

Trip purpose mentioned by 2% or more of the sample	**%**
Food shopping	17
Shopping for other goods	9
Visit family	8
Visit friends at home	6
Go to GP	6
Meet-up with friends elsewhere	5
Out of town shopping	5
Go to place of interest	5
Go to hospital	4
Post office	3
Bank/building society	3

Source: Table 5.4 in Department for Transport (2001).

Another approach would be to examine whether older people are using some types of transport less than they would like. This information is not available by age group but is for people with EA disability status or impairment as shown in Tables 18 and 19. Whilst, as shown in Section 2, not all older people have a disability or impairment, it is likely that the figures for older people who use transport less than they would like would be similar to those for all EA disabled adults or adults with an impairment. Because there are many possible reasons why people do not use a mode of travel, for example cost or lack of availability, there will be people without disabilities or impairments who use some modes less than they wish. Table 18 shows the percentages of the populations with and without disabilities who use each mode less than they wish plus the differences between the two sets of numbers. For all modes, more people with disabilities use them less than they would like than people without

disabilities. The form of travel for which the greatest difference exists is motor vehicles which 14% fewer people with disabilities than people without disabilities use less than they would like. For all the other modes the difference is 6% or less, with local buses and long distance buses having the difference of 6% and the Underground the smallest difference at 3%.

Table 18 Modes of transport and desired frequency of use by EA disability status, 2009/11

Mode of transport	Percentage who have used transport less than they would like (EA disabled adults)	Percentage who have used transport less than they would like (non-disabled adults)	Difference
Motor vehicle	26	12	14
Local buses	18	12	6
Long distance trains	17	11	6
Local trains	16	11	5
Long distance buses	14	9	5
Taxis/minicabs	10	6	4
Underground	11	8	3

Note: The figures in the table are for adults aged 16 and over who have used each form of transport in the previous 12 months.
Source: Table 9.2 in Office for Disability Issues (2011).

Table 19 shows the equivalent for people with and without impairments. The figures are similar to those in Table 18.

Table 19 Modes of transport and desired frequency of use by impairment status, 2009/11

Mode of transport	Percentage who have used transport less than they would like (adults with impairment)	Percentage who have used transport less than they would like (adults without impairment)	Difference
Motor vehicle	25	12	13
Local trains	17	10	7
Long distance trains	18	11	7
Local buses	18	12	6
Long distance buses	15	9	6
Taxis/minicabs	10	5	5
Underground	11	7	4

Note: The figures in the table are for adults aged 16 and over who have used each form of transport in the previous 12 months.
Source: Table 9.3 in Office for Disability Issues (2011).

This section has shown that some older people are not travelling as much as they would wish. They would like to do more shopping and social trips which are the trips that are most popular with older people, suggesting that some older people are being prevented from making the trips that other older people are making.

5 THE BENEFITS OF GREATER MOBILITY FOR OLDER PEOPLE

In the previous section it was shown that older people would like to travel more. Doing so would improve their quality of life. This has been found by Gabriel and Browning (2004) who carried out 999 interviews with older people. The respondents said that being able to walk and being mobile enabled them to retain their independence, which was seen as an important element of a good quality of life and reduced their dependence on others. Choi et al. (2013) surveyed 1926 elderly women in Britain over a period of seven years. They found that regular physical activity, including walking and cycling, reduced the decline in health-related aspects of the quality of life.

In the White Paper entitled 'New Deal for Transport: Better for Everyone' (Department of the Environment, Transport and the Regions, 1998) it was proposed to introduce a national minimum standard for local authority concessionary fare schemes for elderly people to enable older people to use public transport more often and to reach a wider range of facilities such as shops and health care. The scheme, offering half price, off-peak, local bus travel to everybody over the state pension age was introduced in 2001. There have been a number of studies which have examined various aspects of the impact of the scheme (Mackett, 2014c), for example, by enabling older people to travel more, improving their quality of life. Andrews (2011) carried out surveys in SW England and found that 74% of respondents stated that having a pass had improved their quality of life. Rye and Mykura (2009) found 60% of their respondents in Edinburgh saying the same thing. Hirst and Harrop (2011) carried out a survey in Manchester and found that 74% of the respondents in their survey in Manchester said that their CTPs had enabled them to participate in new activities or visit new places, and that 35% of these newly generated trips were for leisure and social reasons including visits to family and friends.

Green et al. (2014) carried out 47 interviews with older people in London and (2014) found that the pass was experienced as life-enhancing by almost all the respondents in their survey. They also argue (Green et al, 2014) that the pass was a major and non-stigmatising defence against social isolation, particularly for those who live alone. In some cases, this meant enjoying the spectacle of interaction by others and seeing life going on. Jones et al. (2013), in their study of CTP holders in London, argue that the act of entitlement to a pass can influence feelings of wellbeing. Whitley and Prince (2005) carried out a two-year qualitative study using in-depth interviews, focus groups and participant observation in the Gospel Oak neighbourhood in North London. They found that many respondents remarked that the local transport system allowed them to visit family and friends, access appropriate services and to attend community activities, particularly those entitled to a Freedom Pass (the CTP scheme in London). Some of them praised the pass as it enabled them to maintain their social and economic involvement in society. Andrews (2011) found evidence of a

growth in ‘buspass tourism’ with many older people visiting new places as a result of having a CTP.

Another important element of mobility is being able to drive a car. In their literature review on the elderly and mobility Whelan et al. (2006) argue that driving represents a symbol of freedom, independence and self-reliance, and having some control of their life while poor mobility places a substantial burden on the individual, family, community and society. Musselwhite and Haddad (2010) have shown that giving up driving is linked to a reduction in quality of life. They found that mobility is important in meeting essential utilitarian needs, but also enhancing social networks and social interaction, providing independence, denoting status, and exercising cognitive skills. Musselwhite and Haddad (2010) examined the travel needs of older people by conducting focus groups with current older drivers and interviews with 57 older drivers and ex-drivers. They found that ceasing to drive caused many changes in travel behaviour, including anxiety about being able to go shopping, to hospital, and to attend doctors’ surgeries, with respondents mentioning feelings of depression and annoyance, particularly amongst those who gave up driving following advice from others or a driving incident. Isolation and exclusion from society were mentioned as resulting feelings.

The evidence cites above shows that making it easier for older people to travel produces various benefits, including improved quality of life and health. It may also help society by allowing older people to make a greater contribution. WRVS (2011) (now the Royal Voluntary Society) has commissioned a study to estimate the economic contribution of older people to society, through spending in shops, voluntary work, looking after grandchildren while their parents work, and through taxes on expenditure and employment. It can be argued that making it easier for older people to travel will enable them to make an even greater contribution (Mackett 2014a).

6 THE BARRIERS TO MOBILITY FOR OLDER PEOPLE

In this section the barriers that make travelling difficult for older people will be considered. Table 20 shows data from the Department for Transport (2001) survey of people over the age of 60 and indicates the type of trips that they would like to do more of, as shown in Table 16, and the principle barriers that prevent them from doing so. It can be seen that the barriers have been classified under three headings: direct transport/journey, mobility/sensory/health and non-transport. It should be acknowledged that the first two categories overlap: for example, if an elderly person has difficulty stepping on a high-floor bus that could be seen as a mobility barrier or a transport barrier since the vehicle is not appropriate for a person with that characteristic. Non-transport barriers are probably to do with the nature of the activity. It can be seen that transport barriers affect the three top answers of visiting and meeting friends and family. Most public transport systems tend to be radial, focusing on city and town centres, while the homes of family and friends are likely to be in the suburbs and other less accessible locations which may be difficult to reach from the home of the older person. In other words, the transport barrier may be the lack of transport or a complex journey. Mobility and similar barriers affect more older people than the other barriers for shopping and Post Office journeys many of which would

be in centres accessible by bus, suggesting that the difficulties lie in accessing buses. (The survey was carried out in 2000 before low-floor buses were so numerous). For leisure/sport and day centre visits the barriers are not on the journey and so probably lie at the destination.

Table 20 Barriers to activities for older people

	Would like to do more	Principle barrier		
	%	Direct transport/ journey %	Mobility/sensory /health %	Non-transport %
Visit family	12	**58**	18	24
Visit friends' homes	10	**46**	27	25
Meet friends elsewhere	10	**46**	21	33
Leisure/sport	8	15	24	**57**
Other shopping	7	37	**43**	21
Food shopping	6	33	**50**	16
Day centre visit	2	25	30	**45**
Post Office	2	40	**42**	19
Visit others in hospital	1	**65**	23	13

Source: Table 5.3 in Department for Transport (2001).
Note: the figures in bold indicate the barrier which affects the highest proportion of older people for that trip purpose.

Another way to consider barriers to access is to examine each mode. Table 21 shows the proportions of older people using each mode, the percentage who would have a difficulty and the reasons for the difficulties. The table is based on the same survey of older people as Table 20 which was carried out in 2000 which was before the introduction of the national concessionary travel scheme on buses and before low floor buses were so common. For all modes, except rail, accessibility is the main difficulty. For rail it is affordability. For most modes over half the sample would have a difficulty using the mode, with taxi as the mode which the largest proportion would have difficulty using, partly because of cost. Back in 2000 fewer taxis than now would be easy to access, particularly outside London.

Table 21 Proportion that have difficulty using current modes and reasons

	% using each mode	% that would have difficulty	Reasons for difficulties with current modes					
			Afforda-bility %	Availab-ility %	Accessi-bility %	Safety %	Journey %	Other %
Bus	37.6	56.9	8	12	38	4	18	20
Car passenger	33.5	53.0	5	29	38	1	8	19
Walk/cycle	19.7	41.9	-	-	40	6	16	38
Taxi	15.0	65.4	24	6	44	3	4	20
Train	3.5	53.1	33	6	8	-	32	21
Tram/tube	2.8	44.0	9	-	56	3	23	9
Door-to-door	2.5	60.9	7	13	36	13	5	27
Wheelchair/ shopmobility	1.5	64.3	-	8	65	-	6	22
Taxi subsidised	1.0	44.4	-	-	63	-	19	19
Total		56.4	10	16	40	3	12	19

Source: Table 5.5 in Department for Transport (2001).
Note: The percentages are proportions of total responses for each mode.
The categories are defined as follows:

- **Affordability**: cost of travel.
- **Availability**: personal mobility problems; not available/infrequent; rely on lift from family/friend.
- **Accessibility**: Personal mobility problems; temporary mobility problems; difficulties boarding/leaving vehicle; general health problems; hearing/speech impairment; weak sight; difficult to carry things; confusing to use; attitude of staff.
- **Safety**: Don't feel safe making journey, don't feel safe from accident.
- **Journey**: Too far away, difficult journey; journey is not comfortable; tiring journey; problems getting parking.
- **Other**: cost of activity; no one to participate with; not enough time; opening/closing times do not suit; friends/family too buy; need to look after dependents, home or pet; depends on weather; other.

Tables 22 to 33 are based on the Life Opportunities Survey, and mainly relate to people with impairments, rather than just older people. As Table 2 indicated, nearly half the adults with a disability are above the state pension age, and as implied in Tables 4 and 5 there is a very large overlap between people with disabilities and people with impairments. Tables 22 to 32 show both the percentages of adults with impairments and without impairments who perceive barriers because the latter may have difficulties such as affording the cost of travel or the lack of suitable travel facilities. The difference between the two is shown, and to reduce the amount of information displayed, barriers which have less than 5% difference between the percentage of adults with and without impairments and fewer than 10% of adults with impairments have been excluded in these tables because the barriers probably have little, if anything, to do with impairment.

Table 22 shows the percentage of people with and without impairments who find barriers to using various modes of travel. It can be seen that the differences are fairly similar across the modes, ranging from 15% more people with impairments having difficulties with long-distance buses and local trains to a 10% difference for taxis and

minicabs. Long-distance buses and the Underground are the modes which present the greatest percentage of people with barriers. The specific barriers for each mode are considered in the Tables 23 to 29, which are in the same order as the ranking of the differences in Table 22. In each of these tables, the percentage of adults who have at least one barrier to using the mode is shown and then the percentage for whom a health condition, illness or impairment is a barrier and then the number for whom a disability is a barrier. In almost all cases the second is lower than the first, showing that people with impairments may find barriers other than those caused directly by their impairment, and the third is lower than the second, showing that there are people with impairments who do not have a disability but do have a health condition, illness or impairment that prevents them from travelling. It also illustrates how complex it is to sort out the nature of the personal characteristic that reduces people's ability to travel.

Table 22 Barriers to using modes of travel by impairment status showing the percentage of people who find at least one barrier to using the mode, 2009/11

Mode of travel	**Percentage of adults with impairment**	**Percentage of adults without impairment**	**Difference**
Long-distance buses	38	23	15
Local trains	31	16	15
Long distance trains	32	18	14
The Underground	36	23	13
Local buses	34	21	13
Motor vehicle	27	14	13
Taxis/minicabs	24	14	10

Note: Motor vehicle includes car, van, motorcycle or moped.
Source: Tables 9.4 to 9.10 in Office for Disability Issues (2011).

Table 23 shows the barriers to using long distance buses (or coaches) by impairment status. It can be seen that the two main specific barriers that affect people with an impairment are 'Anxiety/lack of confidence' and 'Difficulty getting in or out of the transport'. In Britain, coaches typically have three steps, often rather steep, which pose a serious challenge to many people, particularly those with mobility difficulties. Coaches also tend to have narrow aisles and seats that can be difficult to access and leave. It is likely that concern about these issues that cause some of the anxiety and lack of confidence. Interestingly there are two barriers which fewer of those with impairments are concerned about than those without impairments: first, delay and disruption to service and, second, being too busy/not enough time. This may reflect the fact that many of those with impairments, including older people, have fewer constraints on their time because they have ceased to be employed.

Table 23 Barriers to using long distance buses by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using long distance buses	38	23	15
A health condition, illness or impairment	32	4	28
A disability	20	1	19
Anxiety/lack of confidence	12	3	9
Difficulty getting in or out of the transport	11	2	9
Delay and disruption to service	7	12	-5
Too busy/not enough time	7	13	-6
Other reasons	19	34	-15

Note: 1. Respondents were asked to select all barriers that applied to them from the list of options provided. All respondents regardless of impairment status could select these response options.
2. Barriers which have less than 5% difference between the percentage of adults with and without impairments and fewer than 10% of adults with impairment have been excluded.
Source: Table 9.6 in Office for Disability Issues (2011).

The barriers to access to local trains are shown in Table 24. ‘Anxiety/lack of confidence’ and ‘Difficulty getting in or out of the transport’ are the top two barriers for those with an impairment other than their impairment or disability, as was the case for coaches. ‘Difficulty getting to stop or station’ and ‘Difficulty getting from stop or station to destination’ also affect more people with an impairment than those without. The barriers which affect more people without impairments than those without are ‘Cost’, ‘Too busy/not enough time’ and ‘Transport not available’. The last of these reflects the uneven spatial distribution of rail services. The other two barriers may be because more of those without impairments may be travelling to work which is often done in the peak hour when rail travel tends to be more expensive. Also those aged 60 and over and with disabilities can purchase railcards which give them a discount for off-peak rail travel. The need to travel to and from work by train during the peak by more of those without impairments than those with one may explain why ‘Too busy/not enough time’ is higher for the former.

Table 24 Barriers to using local trains by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using local trains	31	16	15
A health condition, illness or impairment	27	2	25
A disability	18	1	17
Difficulty getting in or out of the transport	10	2	8
Anxiety/lack of confidence	10	2	8
Difficulty getting to stop or station	15	11	4
Difficulty getting from stop or station to destination	12	8	4
Too busy/not enough time	4	9	-5
Other reasons	7	12	-5
Cost	31	37	-6
Transport unavailable	19	34	-15

Note: See notes 1 and 2 under Table 23.
Source: Table 9.8 Office for Disability Issues (2011).

The barriers to using long distance trains, shown in Table 25, are very similar to those for short distance trains. Another type of railway is the London Underground, metro system. As shown in Table 26, 'Anxiety and lack of confidence' is the only mode-specific barrier which affects more people with an impairment than those without which may reflect the potential difficulty in being able to negotiate the way through the system. 'Transport unavailable' reflects the fact that it only serves London and some of the surroundings areas.

Table 25 Barriers to using long distance trains by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using long distance trains	32	18	14
A health condition, illness or impairment	27	2	25
A disability	18	1	17
Anxiety/lack of confidence	10	2	8
Difficulty getting in or out of the transport	9	2	7
Difficulty getting to stop or station	11	7	4
Difficulty getting from stop or station to destination	10	6	4
Too busy/not enough time	5	10	-5
Cost	48	65	-17

Note: See notes 1 and 2 under Table 23.
Source: Table 9.9 in Office for Disability Issues (2011).

Table 26 Barriers to using the Underground by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using the Underground	36	23	13
A health condition, illness or impairment	14	1	13
A disability	9	-	9
Anxiety/lack of confidence	8	3	5
Transport unavailable	64	76	-12

Note: See notes 1 and 2 under Table 23.
Source: Table 9.7 in Office for Disability Issues (2011).

Local buses present more barriers to those with impairments relative to those without than any of the other modes being considered here, as shown in Table 27. This may reflect the fact that local buses are very commonly used by those with mobility difficulties to make local trips rather than because local buses are intrinsically less user friendly than other public transport modes for those with impairments. The barriers are similar to those for other public transport modes with the addition of ‘lack of help or assistance’ which may reflect the high usage of local buses mentioned above, plus the inability or unwillingness of bus drivers to provide assistance

required by those with impairments. Local bus is the mode for which there is the greater number of barriers for those without an impairment than with one. These reflect the concerns about time and delays seen for some other modes but also 'Cost' and 'Transport unavailability'. The former may be partly because, probably, more of those with an impairment have a concessionary bus pass giving free off-peak travel and the latter reflecting the poor level of service by bus in some parts of Britain, particularly in rural areas, and that those without impairments may tend to live in those areas more than those with them.

Table 27 Barriers to using local buses by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using local buses	34	21	13
A health condition, illness or impairment	31	2	29
A disability	23	1	22
Difficulty getting in or out of the transport	18	3	15
Anxiety/lack of confidence	12	2	10
Difficulty getting to stop or station	17	8	9
Difficulty getting from stop or station to destination	16	7	9
Lack of help or assistance	8	2	6
Delay and disruption to service	11	16	-5
Cost	21	28	-7
Too busy/not enough time	7	14	-7
Other reasons	15	25	-10
Transport unavailable	22	37	-15

Note: See notes 1 and 2 under Table 23.
Source: Table 9.5 in Office for Disability Issues (2011).

The barriers to using a motor vehicle are shown in Table 28. The main barrier for those with an impairment is 'Difficulty getting in or out of the vehicle' which does not affect any of those without an impairment. 'Cost' is an issue for many people, with and without an impairment, which affects slightly more of those with an impairment than without, possibly because more of the former may have low incomes. 'Parking problems' affect similar numbers of those with and without an impairment, slightly more of the former, perhaps because of problems with manual dexterity and reach accessing parking payment machines.

Table 28 Barriers to using a motor vehicle by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using a motor vehicle	27	14	13
A health condition, illness or impairment	30	3	27
A disability	18	1	19
Difficulty getting in or out of the vehicle	8	-	8
Cost	51	49	2
Parking problems	14	12	2
Too busy/not enough time	9	17	-8

Note: 1. Motor vehicle includes car, van, motorcycle or moped. Also see notes 1 and 2 under Table 23.
Source: Table 9.4 in Office for Disability Issues (2011).

Table 29 shows the barriers to using taxis. This is the mode presenting the fewest extra barriers to those with impairments compared to those without impairments but this is because 'Cost' is a barrier for so many people, with and without impairments. It may be the case that more of those without an impairment perceive a need to use a taxi as part of their working and social life.

Table 29 Barriers to using taxis/minicabs by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to using taxis/minicabs	24	14	10
A health condition, illness or impairment	13	-	13
A disability	9	-	9
Cost	79	90	-11

Note: See notes 1 and 2 under Table 23.
Source: Table 9.10 in Office for Disability Issues (2011).

The discussion above has illustrated how certain barriers affect more of those with impairments than those without. These tend to be getting to and from the stop or station, and anxiety or lack of confidence for public transport modes, and getting in and out of the vehicle for motor vehicles and trains.

Difficulties with transport may prevent those with impairments from taking part in some activities, as shown in Table 30. The percentages of adults with an impairment who have difficulties are fairly low, with a fairly consistent difference across the

activities compared with those who do not have an impairment, probably reflecting mobility and related issues that make it difficult for some of those with an impairment to participate in any activity outside the home. The three activities with the greatest difference are ‘Going to museums or historical places of interest’, ‘Health services’ and ‘Going to the library or archive’, followed by ‘Visiting friends’ and ‘Spending time with family’ which may well be in their homes. It may be noted that there are no activities for which those with impairments face fewer barriers than those without an impairment.

Table 30 Activities for which difficulties with transport are a barrier

Activity	**Percentage of adults with impairment**	**Percentage of adults without impairment**	**Difference**
Going to museums or historical places of interest	13	5	8
Health services	13	5	8
Going to the library or archive	11	3	8
Visiting friends	12	5	7
Spending time with family	11	4	7
Going to the theatre, cinema or other arts activity	10	4	6
Justice services	9	3	6
Going on holiday	8	2	6
Social services	7	1	6
Social contact	10	5	5
Benefits and pension services	8	3	5
Taking part in charitable or voluntary work	6	2	4
Culture, sports and leisure services	19	16	3
Playing sport	4	2	2
Tax services	1	1	0

Source: Tables 10.4 to 10.11, 11.5 and 14.4 to 14.9 in Office for Disability Issues (2011).

There may be barriers other than transport ones that prevent some people taking part in activities, as shown in Table 20. Table 31 shows the barriers to accessing buildings for those with and without impairments. 29% of adults with impairments have difficulties accessing buildings compared with 6% of adults without. Besides the direct barriers caused by their impairment or disability, there are a number of other more specific issues concerned with moving around and approaching the building, changing level and in reception areas. Interestingly there are a number of barriers which affect more people without impairments than those with them, including ‘Bathroom facilities’ and ‘Parking problems’, for which there may be special facilities for those with disabilities.

Table 31 Barriers to accessing buildings by impairment status, 2009/11

Barrier	Percentage of adults with impairment	Percentage of adults without impairment	Difference
At least one barrier to accessing buildings	29	6	23
A health condition, illness or impairment	39	5	34
A disability	32	..	32
Moving around the building (Stairs, doors, narrow corridors)	44	31	13
Approach areas (lack of ramps/handrails)	22	14	8
Footpath design and surfaces	15	8	7
Inadequate lifts or escalators	23	18	5
Difficulty with transport getting to the building	14	9	5
Reception areas (Inadequate desk height, seating, noise)	7	3	4
Attitudes of others	10	9	1
Inadequate ventilation	2	2	0
Seeing or understanding written information	11	12	-1
Parking problems	21	24	-3
Lack of help or assistance	13	16	-3
Difficulty finding the building	6	9	-3
Bathroom facilities (Location, layout, size)	17	23	-6
Other	10	21	-11

Source: Table 13.3 in Office for Disability Issues (2011).

These barriers to travel and buildings may prevent more people with impairments from participation in activities than those without them, as shown in Table 32. It can be seen that the activities with the largest difference for those with and without impairments are ‘Playing sport’, ‘Going to a museum or place of historical interest’, followed by ‘Going on holiday’ and ‘Going to the theatre, cinema or other arts activity’. The first is probably more to do with the characteristics of the activity rather than transport. In the other cases it is probably a mixture of transport and buildings.

Table 32 Adults aged 16 and over who reported having a participation restriction to at least one leisure activity by impairment status, 2009/11

Activity	Percentage of adults with impairment	Percentage of adults without impairment	Difference
Playing sport	72	54	18
Going to a museum or place of historical interest	68	58	13
Going on holiday	66	56	10
Going to the theatre, cinema or other arts activity	63	53	10
Visiting friends	47	39	8
Spending time with family	38	33	5
Going to the library or archive	47	43	4
Charitable or voluntary work	67	65	2

Source: Table 10.3 in Office for Disability Issues (2011).

Most of the barriers discussed above have been associated with the physical characteristics of the transport system and buildings, but in some cases anxiety and lack of confidence have been an issue. This may be partly due to the attitudes of other people. Table 33 shows the percentage of adults who reported discrimination due to a health condition, illness or impairment or a disability in the Life Opportunities Survey. The cases which are likely to occur during a journey are highlighted in the table. The largest of these is 'Strangers in the street' reported by 26% of the respondents, suggesting a need to educate the general public to be more considerate to others, but that is very difficult to do. This may be cultural, reflecting attitudes to strangers in Britain, and might be lower (or higher) in other countries (Mackett and Gim, 2010). The second category likely to be encountered in the course of a journey is 'Bus drivers'. They were identified in some consultation work in St Albans (Mackett, Titheridge and Achuthan, 2011) suggesting that they need more awareness training, especially to wait for an elderly person to sit down before the vehicle moves off. One category identified in the consultation work was people with visual impairment who cannot see when a bus is approaching and so cannot indicate that they want it to stop. The other two travel-related categories of 'Taxi driver' and 'Rail staff' also suggest the need for further training and awareness raising.

Table 33 Adults aged 16 and over reporting discrimination due to a health condition, illness or impairment or a disability

People responsible for discrimination	**Percentage of all adults**
Health staff	29
Strangers in the street	**26**
Employer	25
Friends or neighbours	14
Work colleagues	11
Family or relatives	11
Retail staff	11
Bus drivers	**9**
Police officers	5
Social workers	5
Teacher or lecturer	4
Taxi drivers	**3**
Care workers	2
Rail staff	**2**
Others	17
Sample size (=100%)	1,200

Source: Table 16.2 in Office for Disability Issues (2011).

In this section many of the barriers that prevent older people taking part in activities to the extent that they would like and that other people do have been examined. In the next section, the access issues for older people living in rural areas will be considered.

7 ACCESSIBILITY IN RURAL AREAS

Older people living in rural areas face particular difficulties in accessing facilities (Age UK, undated). This means that they may suffer from isolation more than older people living in urban areas (Age UK, 2012a).

Rural areas tend to be less dense than urban areas, so that destinations are spread more widely, so that residents have, in general, to travel further to reach opportunities. It also means that bus routes tend to be longer, serving fewer potential passengers per route kilometre, leading to higher operating costs and lower revenues. This means that there are relatively few bus routes in rural areas. Table 34 shows the average minimum time to reach various key services used by older people by a combination of public transport and walking and by car. In all cases the journey by public transport and walking takes longer in rural areas than urban areas, typically about twice as long. The differences by car are much smaller than for the other modes, with hospital and town centre having the largest differences. This suggests that having access to a car can largely overcome the poorer access from rural areas, but many older people have to give up using their car for health reasons leaving them dependent on public transport.

Table 34 Average minimum travel time to reach the nearest key services by mode of travel in rural and urban areas in England, 2013

		GP	Hospital	Food store	Town Centres
Public Transport / Walking	Urban	7	22	6	13
	Rural	12	40	10	25
Car	Urban	5	7	5	6
	Rural	5	12	5	10

Source: Department for Transport (2013e).

Those older people living in rural areas who can drive have to pay more for the fuel in their cars, as shown in Table 35. Fuel for cars is more expensive in rural areas than urban areas by nearly 2p a litre.

Table 35 Average annual prices (pence per litre) of diesel and unleaded petrol (July 2011 to June 2012), by settlement type in England

	Diesel	Unleaded petrol
Urban	141.1	135.2
Rural	143.0	137.1
England	141.7	135.7

Source: Department for Environment, Food & Rural Affairs (2012).

The differences for public transport between urban and rural areas partly reflect differences in the availability of buses, as indicated in Table 36. Bus availability is expressed as the percentage of households whose nearest bus stop is within 13 minutes walk and has a service at least once an hour. Over 90% of those living in an urban area meet these criteria. Two types of rural area are shown, rural towns and fringes and rural villages and hamlets. Over 80% of those living in former had access to a bus service in 2012, whereas fewer than half of those living in the latter did. In rural area access was better in 2012 than in 2002, but bus availability in the rural villages and hamlets it is still much lower than in urban areas.

Table 36 Bus availability, 2002 to 2009

	2002	2004	2006	2008	2010	2012
Urban	96	96	97	97	97	96
Rural town and fringe	75	82	80	85	84	86
Rural village and hamlet	38	42	42	46	40	49
England	90	91	91	91	92	91

Source: Department for Environment, Food & Rural Affairs (2013).

Many older people use a Concessionary Travel Pass (CTP) which gives them free off-peak bus travel (Mackett, 2014b,c). Humphrey and Scott (2010) have looked at the variation in the CTP take-up rate in England by type of area and access to bus services. They found a much lower rate in rural areas than urban areas (Table 37). They carried out a multivariate analysis using a logistic regression analysis model to establish the factors that influence the take-up rate. They found that the urban-rural split was not statistically significant, suggesting that the difference shown in Table 37

is explained by the lower frequency of buses and greater average distance to bus stops in rural areas.

Table 37 CTP take-up rate by older people by type of area in England in 2010

Type of area	%
Urban	80
Rural	63
All	77

Source: Table 2.7 in Humphrey and Scott (2012).

Humphrey and Scott (2012) examined the effect of access to bus services on the frequency of CTP use. Table 38 shows the frequency of CTP use by type of area. In rural areas only 2% of passholders used their passes daily compared with 14% in urban areas. Another 41% of CTP pass holders in urban areas made weekly trips but not as often as daily, with only 26% of those in rural areas making trips with this frequency. However, the multivariate analysis that Humphrey and Scott (2012) carried out showed that the urban-rural split was not a statistically significant determinant of CTP usage, but that frequency of bus services and walking time to bus stops were. Only 2% of those with a frequency of less than one bus an hour used their passes daily compared to 20% of those who had access to a high frequency service. Conversely, 30% of those with access to a low frequency bus service used the bus less than once a year compared with 13% of those with a bus every quarter of an hour. Similarly only 3% of those with a long walk to the nearest bus stop used the bus on a daily basis compared to 13% living near to a bus stop. 38% of those living far from a bus stop used the bus less than once a year compared to 17% of those with good access. This suggests that access to frequent bus services is critical to the ability of older people living in rural areas without access to a car to reach essential services. The situation is likely to become worse as bus services are cut as part of the reduction of public expenditure (Age UK, 2012b).

Table 38 Frequency of CTP use by older people by type of area in England in 2010

Type of area	At least daily	Less than daily, up to weekly	Less than weekly, up to monthly	Less than monthly, up to annually	Less than annually
Urban	14	41	14	13	18
Rural	2	26	22	24	25
All	13	39	15	15	19

Source: Table 3.6 in Humphrey and Scott (2012).

8 THE INFLUENCE OF AGEING ON THE ABILITY TO TRAVEL

The ageing process leads to some physiological changes which can have consequence, as indicated in Table 39 taken from Millonig et al. (2012). Some of these are associated with disability rather than ageing as such, but, as shown in Section 2, a large proportion of older people have disabilities. Also, most of the literature refers to disabilities rather than ageing. As discussed above, many older people have conditions that make travelling more difficult even though they are not registered as disabled.

Table 39 Age-related changes

Organ/system	Age-related changes	Possible consequences of physiological age-related changes
Sense organs	Eyes: presbyopia, cataract. Ears: impaired high-frequency hearing. Decreased sense of touch.	Impairment of visual perception. Single spoken words are harder to distinguish and understand, especially with background noises.
Musculoskeletal system	Decreased skeletal muscles. Reduced flexibility of ligaments, muscles and sinews. Reduced mobility of joints.	Reduced flexibility and strength. Increased vulnerability to bone fracture.
Breathing/ pulmonary tract	Reduced pulmonary elasticity. Increasing stiffness of the thorax.	Impaired and less effective breathing. Reduced dioxygen partial pressure.

Source: Table 2-3 in Millonig et al. (2012).

Most journeys involve walking, for example to the bus stop or from the car park. About 4.6 million people in Britain have difficulty walking (Department of Transport and Transport Scotland, 2011). Table 6 above shows that 30% of people above the state pension age have mobility impairments compared with 5% of younger people, so it is likely that a large proportion of the 4.6 million are older people. (In this case 'mobility' refers explicitly to movement issues). This is consistent with evidence from Table 3.14 in Martin et al. (1988) which shows that 19.8% of those aged 60-74 and 49.6% of those aged 75 and over have locomotion difficulties compared with 3.1% of those aged 16-59. In Section 2.1 of the Inclusive Mobility Guidelines (Department for Transport, 2005), it says that approaching 70% of disabled people have locomotion difficulties and that those with walking difficulties outnumber people in wheelchairs by about 10:1.

Most journeys include an element of walking, so it is important to identify what information is available about the distance that older people are able to walk and whether people have difficulty moving along the pavement. In terms of the distance that people can walk, in Section 2.4 of 'Inclusive Mobility' (Department for Transport, 2005), it is stated that walking distances were researched in some detail in the late 1980s and, based on the findings from these studies, the following are recommended: 150 m for people in wheelchairs and those with visual impairment, 50 m for those who are mobility impaired and use a stick, and 100 m for the mobility impaired who do not use a walking aid. These figures are average measures with variation between individuals. Gradients, weather conditions, whether there are handrails etc., will also affect the distances people are able to walk. The Guidelines then mention US regulations which note that on distances over 100 feet (30m) disabled people are apt to rest frequently. These regulations suggest that to estimate travel times over longer distances, allowance should be made for two minutes rest time every 30 metres. The Guidelines then cite research based on a follow-up study to the London Area Travel Survey which found that, of all the people with a disability who were able to walk at all, approximately 30 per cent could manage no more than

50 metres without stopping or severe discomfort and a further 20 per cent could only manage between 50 and 200 metres.

'Improving Transport Accessibility for All' published by ECMT (2006), cites research by Leeds University (1989) on 'Ergonomic standards for disabled people in pedestrian areas: results from Leeds observation work 1988/89', which, on Page 55, suggests that 20% of ambulant disabled people using walking sticks were found to be able to manage to walk 180 m without a rest, and that quite large proportions of the ambulant disabled people could not manage more than 60 to 70 m without a rest.

Width may be an issue with older people who use walking aids. According to Section 2.2 of 'Inclusive Mobility' (Department for Transport, 2005), a person who does not use a walking aid can manage to walk along a passage way less than 700mm wide, but using a walking stick requires greater width than this: a minimum of 750mm. A person who uses two sticks, crutches or a walking frame needs a minimum of 900mm. According to Section 2.2 of 'Inclusive Mobility' (Department for Transport, 2005), a blind person using a long cane or with an assistance dog needs a width of 1100mm. A visually impaired person who is being guided needs a width of 1200mm.

Many journeys involve standing, for example whilst waiting at the bus stop or on the bus. According to Section 2.4 of 'Inclusive Mobility' (Department for Transport, 2005), standing is difficult and painful for some people, particularly those with arthritis, rheumatism and back problems. It says that in the follow-up study to the London Area Travel Survey, nine per cent of the survey respondents could stand for less than a minute without discomfort, 24 per cent could manage between one and five minutes and a further 22 per cent could stand for up to ten minutes.

Whilst most older people may have sufficient time for most their journeys, there may be occasions when they need to travel quickly, for example, when crossing the road at a signal controlled crossing. Banks et al. (2012), in the English Longitudinal Study of Ageing, measured the speed of walking for the sample and obtained the figures shown in Table 40. It can be seen that the mean walking speed decreases with age and that men walk slightly faster than women. The figures in Table 35 are consistent with the recommendations on speeds in the US report 'Improving pedestrian safety at unsignalized crossings', by Fitzpatrick et al. (2006) which contains a description of pedestrian characteristics in Chapter 2 of that report based on a review of the fifteen studies on walking speeds, plus findings from the field study in Chapter 7 of the report. They made the following recommendations on speeds:

- 0.9 m/s (3.0 ft/s) for older pedestrians;
- 1.1 m/s (3.5 ft/s) walking speed for the general population.

Table 40 Mean walking speed (m/s) by age and sex, 2010/11

	60-64	**65-69**	**70-74**	**75-79**	**80+**	**Total**
Men	0.99	0.97	0.90	0.82	0.70	0.90
Women	0.96	0.92	0.85	0.75	0.62	0.85

Source: Table H4a in Banks et al. (2012).

During some journeys it is necessary to change level, for example, by using steps. 'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 61 says that virtually all ambulant disabled people can manage a step height of 200 mm, but that

this should include both the vertical height and horizontal gap, so that the sum of the two should not exceed 200 mm, citing ‘Significant steps – Summary’, published by the Department of Transport in 2004.

About 800,000 people use a wheelchair (Department for Transport and Transport, 2011). Many of these are older people. As discussed above, ‘Improving Transport Accessibility for All’ (ECMT, 2006), cites research which found that only 40% of people in wheelchairs were to be able to manage to travel 180 m horizontally without a rest and in Inclusive Mobility (Department for Transport, 2005), a maximum horizontal distance of 150 m without a rest for people in wheelchairs is recommended in Section 2.4.

Table 7 showed that 16% of those aged 75 and over have a dexterity impairment compared with 1% of those aged 16-34. About ten million people in the UK have arthritis (Arthritis Care, 2014). Arthritis means inflammation of the joints and causes pain and difficulty moving around. Two of the most common forms of arthritis are osteoarthritis and rheumatoid arthritis. Although arthritis can affect people of any age, it is particularly common amongst older people. It can it can cause loss of strength and grip which in turn may make movement more difficult. It can affect the ability to handle coins and use ticket machines. According to Table 3.14 of Martin et al. (1988), 5.4% of those aged 60-74 and 14.9% of those aged 75 and over have difficult reaching compared with 0.9% of those aged 16-59.

In Table 7 above it was shown that 4% of those aged 55-74 and 11% of those aged 75 and over have sight impairment. In Table 3.14 in Martin et al. (1988) it says that 5.6% of those aged 60-74 and 26.2% of those aged 75 and over have difficulty seeing, compared with 0.9% of those aged 16-59. Around 2 million people in Britain have sight loss, even with glasses or contact lenses. Of these, one in five people aged 75 and over and one in two people aged 90 and over are living with sight loss (RNIB, 2014). About 5% of the two million are unable to use residual vision, even for colour contrast. Around 157,000 people are registered blind, about 17,000 use a white cane and 5,000 use a guide dog.

Hearing loss affects more than 10 million people in the UK (Action on Hearing Loss, 2013). It was shown in Table 7 that 4% of those aged 55-74 and 13% of those aged 75 and over have a hearing impairment. 11.0% of those aged 60-74 and 32.8% of those aged 75 and over have difficulty hearing compared with 1.7% of those aged 16-59, according to Table 3.14 in Martin et al. (1988). The Royal National Institute for Deaf People (RNID) has estimated that there are over eight million deaf or hard of hearing people in the UK of whom approaching 700,000 are severely or profoundly deaf according to Section 2.1 of ‘Inclusive Mobility’ (Department for Transport, 2005).

Around 23,000 people in the UK are deafblind and about 250,000 people have decreasing sight and hearing (Department for Transport and Transport Scotland, 2011). This may not only make travel more difficult, it may affect their ability to use the internet which is becoming increasingly important for making travel arrangements.

Around 1,000,000 people have communication impairments, for example speech impairment which may make communicating with bus drivers and ticket office staff difficult. About 1,400,000 people have learning difficulties which may hinder

understanding timetabling and ticketing information (Department for Transport and Transport Scotland, 2011). Not all of the numbers indicated here are elderly people, but given that over 16% of the population is aged 65 and over, and that many of the conditions are associated with increasing age, large numbers of older people do have these conditions that can make travelling difficult.

There are 835,000 people in the UK who have dementia of which about 795,000 are aged over 65, with the total number projected to increase to over one million by 2021 and over two million by 2051 (Alzheimer's Society, 2014). 35% of people with dementia only go out once a week or less and 10% leave their home once a month or less (Alzheimer's Society, 2013).

Because the internet has developed relatively recently older people will not have learnt to use computers at school. Some of them will have used the internet in the course of their work and it is likely that many of them will have retained their knowledge. However, there will be others who did not use computers in the course of their work: some of these may have learnt to use the internet in later life, but others will not have done so. Table 41 shows the use of internet and/or email by people aged 52 and over. It can be seen that usage declines with age, except that it increases from 52-54 to 55-59 for men. After the age of 54, usage is higher for men than women, with a more rapid decline for women, so that at the age of 80+ fewer than 10% of women use the internet and/or email compared with 27.9% of men. One factor that influences computer use is wealth, as indicated in Table 42. It can be seen that those on lower incomes are less likely to use the internet and/or email than wealthier people, and this may partly explain the relatively low usage by older people: they may not be able to afford a computer and broadband connection.

Table 41 Use of internet and/or email by age in 2010-11 and sex

	52-54	55-59	60-64	65-69	70-74	75-79	80+	Total
Men	78.4	81.6	75.9	61.8	47.0	45.3	27.9	62.9
Women	81.0	79.1	64.8	54.9	39.3	25.4	9.6	51.1

Source: Table S4a in Banks et al. (2012).

Table 42 Use of internet and/or email by wealth group and sex

	Lowest	2nd	3rd	4th	Highest	Total
Men	33.8	54.9	60.3	73.6	84.9	62.8
Women	29.0	42.9	49.8	61.5	74.9	50.7

Source: Table S4b in Banks et al. (2012).

It was shown in Table 6 that 7% of adults over the state pension age have incontinence problems which may affect their confidence to make journeys.

Having a licence to drive a car gives the holder the freedom to travel by car. Everyone who has passed the driving test continues to hold the licence until they are 70 at which point they have renew it (assuming it has not been removed because of driving offences). There is no requirement for a medical examination, but the applicant must confirm that they meet the eyesight requirement used in the driving test (Department for Transport, 2014b). As Table 43 shows, the level of licence holding increases with age to middle age and then declines. For men there is a decline after the age of 69, reflecting the need to renew the driving licence at the age

of 70. For women there is a decline after the age of 49 reflecting the fact that in the past, fewer women than men chose to learn to drive. There is a steeper decline after the age of 70 for women than for men. It is quite possible that some people below the age of 70 have ceased to drive but still hold a driving licence because there is no cost to continuing to hold a licence and no requirement to surrender it.

Table 43 Full car driving licence holders by age and gender: Great Britain, 2012

	17-20	21-29	30-39	40-49	50-59	60-69	70+	All aged 17+
Men	40	66	82	88	89	89	79	80
Women	32	64	75	81	75	70	42	66
All	36	65	78	85	82	79	58	73

The data cited in this section has shown that some older people have less ability to walk, stand, see, or hear than younger people. Some of them may have difficulty handling small objects or reaching out. They may need to access a toilet more frequently than some other people. Fewer of them can access the internet or drive a car than younger people. Many of their abilities decrease over time, as illustrated by the decrease in walking speed shown in Table 35. Some older people are registered as disabled because of one or more conditions, but others have decreasing abilities which are less severe but hinder their ability to travel. However, as shown in Section 4 above they would still like to travel. None of the factors discussed in this section mean that they should not be able to travel, just that it is more difficult. In the next section ways in which it can be made easier for older people to travel are discussed.

9 OVERCOMING THE BARRIERS TO ACCESS FOR OLDER PEOPLE

9.1 Overcoming the barriers to walking

9.1.1 Progressing along the pavement

Street furniture

One hindrance to the progress along the pavement by older people, particularly those who have deteriorating eyesight, is street furniture. It needs to be clearly marked so it can be seen easily and be located to allow sufficient space to pass it without difficulty, preferably by two people with walking aids passing in opposite directions at the same time.

In ‘ Inclusive Mobility’ (Department for Transport, 2005) in Section 3.7 on Page 14, it is suggested that where it is necessary to place lamps and signs on the pavement they should be placed close to the buildings, not more than 275 mm from the property line. Alternatively, if they are on the on the road side they should be at least 500 mm from the edge of the carriageway, or 600 mm if there is a severe camber or crossfall. It is recommended that bollards and other freestanding obstacles are at least 1000 mm tall, with waste bins at least 1300 mm tall with the opening about 1000 mm above ground level.

‘Improving Transport Accessibility for All’ published by ECMT (2006) says on Page 29 that footways should have a minimum width free from obstacles of at least 1500

mm, preferably 2000 mm. At bus stops the width should be at least 3000mm and in front of shops, 3500 mm. It says on Page 32 that temporary barriers around roadworks should be about 1 m above ground with a tapping rail. Temporary footways should be not less than 1200 mm wide and wherever possible, at least 1800 mm wide. It also says on Page 51 there should be a 2000 mm pedestrian footway clear of all obstacles.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph C1m, it is recommended that bollards should be a minimum of 1000 mm high, ideally of a colour that contrasts with the surroundings, with a prominent colour-contrasting top or band within the top 33% of at least 150 mm width. It also suggests that hazard protection should take the form of a barrier at a height of 1000 mm from ground level and a kerb, or other solid barrier, detectable by long-cane users, not more than 100 mm back from the front edge of the obstacle (Paragraph F1j). It is recommended that the top of litter bins is 1300 mm above ground level with the opening 750-900 mm above the ground (Paragraph F1k).

The 'Manual for Streets' (Department for Transport, 2007a) includes suggestions for ways of reducing clutter on the street (Paragraph 5.10.2 on Page 58):

- mounting streetlights onto buildings, or traffic signals onto lighting columns;
- locating service inspection boxes within buildings or boundary walls;
- specifying the location and orientation of inspection covers in the footway;
- ensuring that household bins and recycling containers can be stored off the footway;
- designing street furniture to be in keeping with its surroundings.

Width

'Town and infrastructure planning for safety and urban quality: state-of-the-art report', COST Action C6, published by the European Commission (2000) says on Page 22 that the minimum absolute width of footways varies from 1.4 m in France to 2.0 m in Norway and Switzerland, with a normal value ranging from 1.5 – 3.0 m in Finland to 2.0 – 4.0 m in Norway (no figures were given for Great Britain).

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph C1b, it is recommended that pavements provide a 2000 mm obstacle free clear passage. Where there is occasional narrowing of the footway, the restricted width should be not less than 1000 mm and extend for no more than 6000 mm (Paragraph C1c).

Height

The clearance below overheard obstructions can be important for older people because, as indicated in Table 7, quite large proportions of them have visual impairments. According to Section 2.2 of 'Inclusive Mobility' (Department for Transport, 2005), the unobstructed height above a pedestrian way is important, especially for visually impaired people: it says that this should be a minimum of 2300 mm except on sub-surface station platforms where it should be 3000 mm. Where a sign is suspended over a footway or pedestrian area, for example in a railway station a minimum clearance of 2100 mm is acceptable (2300 mm on cycleways). Where

trees overhang a footway it is advisable to cut them back to at least 3000 mm clear height to allow room for regrowth.

Crossfall
The crossfall of a pavement is the gradient across the path surface which allows water to flow towards the lower path edge. The equivalent term in the USA is 'cross slope'. Improving Transport Accessibility for All' (ECMT, 2006) says on Page 30 that gradients on crossfalls should be between 1.5 and 2.5%. In Paragraph 403 on Walking Surfaces of the American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines, published by the United States Access Board (2004) it says that the cross slope shall not be steeper than 1:48.

Pavements – tactile paving
Some people with limited or no vision use tactile paving to guide them along the pavement. The document 'Guidance on the use of tactile paving surfaces' (Department for Transport, 2007b) provides detailed guidance which is summarised in Section 4 of 'Inclusive Mobility' (Department for Transport, 2005) on 'Tactile paving surfaces'. At pedestrian crossings, the tactile pavement should take the form of flat-top blisters 5 mm high, 25 mm in diameter with a pitch of 64-67 mm, and be coloured red at controlled crossings and any colour except red at uncontrolled crossings. At controlled crossings where the dropped kerb is in the direct line of travel, the tactile pavement should be laid to a depth of 1200 mm. Where it is not in the direct line of travel it should be laid to a depth of 800 mm. At uncontrolled crossings close to junctions, the equivalent figures are 1200 mm and 400 mm respectively. When it is not near to a junction it should be laid to a depth of 800 mm.

Travelators
'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 49 that travelators, or moving pavements or moving walkways, should have a gradient of not more than 1 in 8 (12%). The recommended speed is 0.5 m/second. The width should be 1500 mm and the moving handrails should be colour contrasted with their surroundings and extend approximately 700 mm beyond the beginning of the walkway. A parallel passageway should be provided for those who cannot use the travelator, such as some people with walking aids or assistance dogs.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph V2.1 on national standards, it says that moving walkways should be designed in accordance with BS EN 115 on the 'Safety of escalators and moving walks: construction and installation (British Standards Institution, 1995).

9.1.2 Resting while walking

The limited distance that some older people can walk without a rest was discussed in Section 7 above. It is important to provide plenty of appropriately placed and designed seating at places where people may have to wait and along pedestrian routes. The 'Manual for Streets' (Department for Transport, 2007a) (Paragraph 6.3.33 on Page 70) says seating should be provided every 100 m to provide rest points and to encourage street activity. Seating should ideally be located where there is good natural surveillance. 'Improving Transport Accessibility for All' (ECMT, 2006)

also says (on Page 30) that seating should be provided every 100 m. As discussed above in Section 7, that report says on Page 55 that research by Leeds University (1989) found that 20% of ambulant disabled people using walking sticks could only manage to walk 180 m without a rest, and that quite large proportions of the ambulant disabled people could not manage more than 60 to 70 m without a rest and so recommends that seating should be provided every 50 to 60 metres. This report also recommends that seat heights should be about 450 to 480 mm (and not less than 420 mm), about 550 to 600 mm for flip-up seats and about 700 to 800 mm for perch-type seats. Arm rests should be provided at 200 mm above the seat.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph O1c, it is recommended that standard seats should be at about 450 from the floor, and in Paragraph O1g, that seats with standing rest bars (also known as horizontal perch rails) should be at a height of about 700 mm. Where arms are provided they should be at a height of 200 mm above the seat.

9.1.3 Crossing the road

Road crossings - design
There is guidance on the design of road crossings for pedestrians in:

- The Assessment of Pedestrian Crossings (Department for Transport, 1995a);
- The Design of Pedestrian Crossings (Department for Transport, 1995b);
- Puffin Crossings Good Practice Guide (Department for Transport, 2006).

Speed of walking
Crossing the road at a signalized crossing requires pedestrians, including older people, to cross before the lights change to let vehicles use the crossing. Whether or not a person can do this, depends upon a combination of the speed of walking and the time for which the traffic signal is green for pedestrians.

The figures in Table 35 imply that very elderly people require about 50% longer to cross the road than the general population, which means that, if the timings of pedestrian signal are based on the speed of walking of the general population, they will be inadequate for many older people.

Fitzpatrick et al. (2006) argue that, in addition to the time allowed for crossing the road at pedestrian crossings, allowance has to be made for the ‘start loss time’ which is the time lag for stepping onto the crossing after the ‘Walk’ signal begins. At signalized junctions at intersections in the USA they found mean values in the range 2.5 to 3.0 seconds, while at other signalized junctions the values found were in the range 1.0 to 1.5 seconds. The higher values at crossings at intersections reflected the fact that, in the USA, vehicles are permitted to turn right on red: even though they are required to give way to pedestrians, the latter may spend more time checking that it is safe to cross. In countries such at the UK when vehicles are not allowed to turn left on red, the shorter timings may be appropriate.

Pelican crossings in the UK have a Green Walking Figure to show when cars are being stopped by a red signal. The timings for the steady pedestrian green phase vary from 4 seconds for crossings up to 7.5 metres long up to 7 seconds for a

crossing over 12.5 metres long, followed by between 6 and 20 seconds of flashing Green Walking Figure according to the guidance on the design of traffic signals (Department for Transport, 1995b). The period can be extended by two seconds if many people with disabilities use a crossing. This means that for a crossing 7.5 metres long, the total green time could be as short as 10 seconds, implying a required walking speed of 0.75 m/s, which is above that for the very elderly, as shown in Table 35. This is confirmed by Asher et al. (2012).

Road crossings – dropped kerbs

Dropped kerbs are short slopes that link the road surface to the pavement surface at road crossing points so that those who find steps difficult or in wheelchairs can crossing the road more easily. It is recommended in Section 3.13 of 'Inclusive Mobility' (Department for Transport, 2005) on 'Dropped kerbs and raised crossings' that dropped kerbs (or raised road crossings) should be provided at all Zebra and controlled crossings, at side roads, access points to parking areas used by pedestrians, and every 100 m on longer side and residential roads. It is recommended that the dropped kerb should be flush with the carriageway, with a maximum gradient of 8% (1 in 12) on the direct approach and 9% (1 in 11) on the flared sides. It is also recommended that, if possible, there should be a level area, at least 900 mm wide along the rear side of the crossing to allow easy passage for people in wheelchairs who are not crossing the road, and that if a raised road crossing is being used to provide level crossing, it should be at least 2400 mm wide and level with the footway. In Section 3.12 of 'Inclusive Mobility' (Department for Transport, 2005) on 'Road crossings' it is advised that, where there are centre refuge islands, they should be at least 1200 mm wide, but, in order to cater for a wheelchair, they should be at least 1500 mm wide and preferably 2000 mm. If the island is part of a staggered crossing, there should be a clear width of 2000 mm between the guard rails to allow two wheelchairs to pass. It is recommended that the centre of the button in control units should be between 1000 mm and 1100 mm above the footway level.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph D5d, it is recommended that that drop kerbs at the pavement edge are not more that 2000 mm wide with a level area of at least 1000 mm on the pavement to the rear of the dropped kerb. If that is not possible, the dropped kerb should extend to the rear of the pavement. The gradient should be 1 in 20 unless site constraints make this impossible, in which case the recommended maximum is 1 in 12, preferably 1 in 15. It is recommended that all dropped kerbs are flush with the highway.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 31 that a dropped kerb should be at least 2000 mm wide.

The American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines, published by the United States Access Board (2004) on Page 168, in Paragraph 406 on 'Curb Ramps' (dropped kerbs), says curb ramps shall not be steeper than 1:20, with a landing at the top at least 36 inches (915 mm) long.

Road crossings – traffic islands
The American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (United States Access Board, 2004) says on Page 170, in Paragraph 406.7 on islands, says that raised islands in crossings shall be cut through, level with the street or have curb ramps (dropped kerbs) at both sides. Each curb ramp must have a level area 48 inches (1220 mm) long minimum by 36 inches (915 mm) wide minimum at the top of the curb ramp in the part of the island intersected by the crossing.

Road crossings – footbridges
Volume 2, Section 2, Part 8 of the Design Manual for Roads and Bridges (Highways Agency, 2013) outlines design criteria for footbridges.

9.1.4 Barriers to walking after dark

Lighting is discussed in Section 11 of 'Inclusive Mobility' (Department for Transport, 2005). It refers to BS 5489, the Code of Practice for Road Lighting (British Standards Institution, 2012), and says that average illuminance levels for road lighting should vary from 3.5 to 10 lux. The report presents figures for minimum acceptable levels for various situations, based on a number of sources, including British, Australian and Canadian guidelines. These range from 50 lux for station platforms and forecourts and underpasses to 250 lux for countertops, and 200 lux for steps and stairs at tread level, ramps at the top and bottom, landing areas of lifts, telephones, maps and displays, and the interactive areas of ticket machines.

The 'Manual for Streets' (Department for Transport, 2007a), in Paragraph 10.3.3 on Page 122, says that lighting may not be appropriate in all locations or contexts. However, if it is to be provided it should be of high quality. Lighting should generally be in accordance with BS EN 13201-2 on the performance of road lighting (British Standards Institution, 2003b). Information to help compliance with the requirements of BS EN 13201 is given in the Code of Practice for Road Lighting (British Standards Institution, 2012).

9.2 Overcoming the barriers to wheelchair use

Width
Width may be an issue for older people who use a wheelchair. According to Section 2.2 of 'Inclusive Mobility' (Department for Transport, 2005), a wheelchair user and an ambulant person side-by-side need 1500mm width. According to Section 2.3 of the Guidelines, the width of wheelchairs, with a maximum of 755 mm and a 95th percentile of slightly over 700mm at maximum (for powered chairs), does not make allowance for the elbows and hands of the people in wheelchairs. The ISO standard for wheelchairs (ISO 7193) notes that to propel a wheelchair manually needs a clearance of not less than 50mm, preferably 100mm, on both sides. According to Section 3.1 of 'Inclusive Mobility' (Department for Transport, 2005), on Page 3.1, a clear width of 2000 mm is required in order to allow two wheelchairs (Department for Transport, 2005), to pass. 1500 mm is required for a pedestrian and wheelchair user to pass one another. If there is an obstacle then the absolute minimum width is 1000 mm, with a maximum length of the restricted width being 6 metres. The

recommended minimum width of the pavement is 3000 mm at a bus stop and 3500 mm by shops.

The American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (United States Access Board, 2004) says in Paragraph 403 that an accessible route with a clear route of less than 60 inches (1525 mm) shall provide passing spaces at intervals of 200 feet (61 m) maximum.

Length

The only older people for whom length is an issue is probably those in wheelchairs. According to Section 2.3 of 'Inclusive Mobility' (Department for Transport, 2005), in a survey of wheelchair visitors to the 1999 Mobility Roadshow, the greatest length of a wheelchair are those of people in wheelchairs with leg supports (maximum 1545 mm) and electric scooters with a maximum of 1500. Conventionally seated people in wheelchairs do not occupy more than approximately 1250mm. However, if a wheelchair user has a personal assistant, their combined length will be typically 1750 mm.

Manoeuvring space

Like length, manoeuvring space is probably only an issue for those older people who are in a wheelchair. According to Section 2.3 of 'Inclusive Mobility' (Department for Transport, 2005) manoeuvring space is needed for a wheelchair to turn corners or turn around. Skilled users of manual wheelchairs can turn through 360º in a space no more than 1500 mm x 1500 mm, but this is insufficient for larger chairs, particularly outdoor electric wheelchairs (turning circle 2420 mm), electric pavement vehicles (turning circle 4350 mm) and for people in wheelchairs with extended leg rests. Within transport-related buildings, the following dimensions should be taken as the minima acceptable:

- Right angle turn (along corridor) 1200 mm x 1200 mm
- 180º turn (within corridor) 1600 mm (width) x 2000 mm (length)

Users of electric scooters and large electric chairs may need greater space than this for 180º turns, but the dimensions given (as minimum) will accommodate users of self-propelled wheelchairs and the majority of electrically powered wheelchairs.

Height

According to Section 2.3 of 'Inclusive Mobility' (Department for Transport, 2005), the overall mean height for all types of people in wheelchairs measured in a survey of wheelchair visitors to the 1999 Mobility Roadshow was 1243 mm, with a 5th percentile of 1076 mm, 95th percentile of 1374 mm and a maximum of just over 1450 mm. As with overall length, scooter users gave slightly greater figures, with a mean height of 1340 mm, 5th and 95th percentiles of 1202 mm and 1438 mm respectively and a maximum of 1502 mm.

According to Section 2.3 of the Inclusive Mobility Guidelines (Department for Transport, 2005), other basic measurements which are of importance when considering design standards to accommodate people in wheelchairs are:

- Eye height, which is around 120-130 mm below seated height giving a 5th-95th percentile range for people in wheelchairs from 960 mm to 1250 mm (1080mm to 1315 mm for scooter users)
- Knee height, 500 mm to 690 mm

- Seat height, 460 mm to 490mm
- Ankle height, manual people in wheelchairs 175 mm to 300 mm; electric people in wheelchairs 380 mm to 520 mm
- Height to bottom of foot support, 60 mm to 150 mm.

9.3 Overcoming the barriers to changing level

Stairs
The guidance about steps provided in 'Inclusive Mobility' (Department for Transport, 2005) is presented in the context of transport-related buildings, but it is generally applicable. In Section 8.4.1 on 'Steps and stairs' on Page 40 it says that a riser (vertical) height of 150 mm can be managed by most people, with 170 mm regarded as the maximum, and 100 mm as the minimum since shallow risers can cause problems for some people. The recommended depth of tread is 300 mm, which is about the length of a size 9 shoe. The minimum acceptable depth of tread is 250 mm. The edge of the step should be rounded, with a suggested radius of 6 mm. There should be no overhang because of the risk of tripping. The edge of the step should be in a contrasting colour, 55 mm deep on both tread and riser, to assist people with visual impairment.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 45 that the risers in steps should be between 100 and 150 mm high, with 130 mm preferred. Treads should be not less than 300 mm deep. The minimum width between hand rails should be 1200 mm. The maximum rise of a single flight of stairs should be 1200 mm. Rest area between flights of steps should be at least 1300 mm long, preferably 1500-1800 mm. There should be a minimum of three steps in each flight.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph D5d, it is recommended that staircases on main routes should have a width of 1600 mm between the handrails with a clear headroom of 2300 mm over the whole width of the staircase. In Section T2 it cites Paragraph 5.9.2 of British Standards Institution (2009) which says that the tread of the step plus twice the rise should be between 600 mm and 810 mm, with the rise in the range 150-180 mm and the depth of the tread 300-450 mm. It also says that, preferably, a step should not overlap with the one below, but if it does, the nosing should not project over the tread by more than 25 mm. It also says that the risers should not be open, and that no stepped access route should contain more than 20 risers, and as far as possible, the number of risers in successive flights should be uniform. It is recommended in Paragraph T2.a that there should be a minimum of three steps in each flight. If fewer than three steps are required it is recommended that a ramp is installed. Furthermore, it recommends that the nosing of each step should incorporate a permanently contrasting continuous material for the full width of the step on both the tread and the riser, with the material 50-65 mm wide on the tread and 30-55 mm wide on the riser.

Ramps
In Section 3.2 of Inclusive Mobility (Department for Transport, 2005) on 'Gradients' (Page 11) it states that an 8% gradient (1 in 12) is the maximum that should be used, because people in manual wheelchairs would find anything steeper very difficult. 5% (1 in 20) is regarded as a better maximum. The Guidelines also state that some

people in wheelchairs can manage a gradient of 10% (1 in 10) for very short distances of up to 1000 mm.

The American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (United States Access Board, 2004) on Page 154, in Paragraph 402 on Accessible Routes, says that walking surfaces must have running slopes not steeper than 1:20, but ramps and curb ramps (dropped kerbs) may be steeper.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 29 that gradients should not be more than 5%. If they at greater than this, level areas, preferably 1500 mm -1800 mm long should be incorporated at intervals of 10 m.

The American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (United States Access Board, 2004) on Page 164, in Paragraph 405 on 'Ramps', says that new ramps shall have a running slope not steeper than 1:12. In existing buildings slopes of greater than 1:12 are permitted, but slopes greater than 1:8 are prohibited. If the slope is steeper than 1:10 but not steeper than 1:8 the maximum permitted rise is 3 inches (75 mm). If the slope is steeper than 1:12 but not steeper than 1:10, the maximum permitted rise is 6 inches (150 mm). The cross slope of a ramp shall not be steeper than 1:48. The clear width of a ramp run, and where handrails are provided, between the handrails, shall be 36 inches (915 mm) minimum.

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph S1.2 on national standards, it is suggested that, where the change in level is less than 300 mm, a ramp may be the only way of avoiding a single step, since it recommends that the provision of isolated single steps should be avoided (Paragraph T2.11). British Standard BS 8300 on the design of buildings and their approaches to meet the needs of disabled people gives guidance on the gradient of ramps (British Standards Institution, 2009). It is suggested that a ramp should have the lowest practical gradient. Where a ramp has a gradient of 1:20 or steeper there is maximum recommended gradient for a given length, as shown in Table 44.

Table 44 Maximum gradient for a given length of ramp

Length of ramp in metres	10	9	8	7	6	5	4	3	2
Maximum gradient	1:20	1:19	1:18	1:17	1:16	1:15	1:14	1:13	1:12

Source: Paragraph S1.4 in British Standards Institution (2009).

British Standards Institution (2009) also says that if a series of flight ramps rise more than 2 metres then an alternative means of access such as a lift should be provided. The minimum width of a ramp should be 1600 mm, but a width of 1800 mm would permit two wheelchairs to pass each other (Paragraphs S1.7, S1.9 and S1.11). Any intermediate landings in a series of ramps should be at least 1500 mm long, clear of any obstruction (Paragraph S1.13).

Escalators

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Section V1 on national standards, it says that

escalators shall be in accordance with BS EN 115 on the 'Safety of escalators and moving walks: construction and installation' (British Standards Institution, 1995). The guidance in Section V1 of the code of practice on the design of accessible railway stations (Department for Transport and Transport Scotland, 2011), recommends that the angle of inclination for escalators should be 30-35 degrees and the width is 580-1100 mm. The recommended tread depths on escalators are 380 mm. Escalator handrails should have disks which are colour contrasted to indicate that the handrails are moving.

According to Section 8.4.4 of 'Inclusive Mobility' (Department for Transport, 2005), the recommended angle of inclination of an escalator is 30° to 35°, and the maximum recommended speed is 0.75 m per second, but where volumes of passengers are fairly low, a slower speed, down to 0.5 m per second, is suggested. The recommended minimum width of an escalator is 580 mm, and the maximum 1100 mm. The maximum recommended step height is 240 mm, or 210 mm if it is to be used as an emergency exit when stationary. It may be noted that this is considerably higher than the maximum step height on a fixed staircase of 170 mm. The recommended height of the moving handhold is between 900 mm and 1100 mm, with it extending at least 300 mm beyond the ends of the escalator. It must be recognised that they cannot be used by people in wheelchairs and some people with assistance dogs, so a lift should be provided as well.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 48 that escalators should have a width of between 600 and 1100 mm, with step heights of a maximum of 240 mm or 210 mm if the escalator will be used as an emergency exit when stationary. The steps should form level areas at the top and bottom of 2000 mm and 1600 mm respectively and there should be a clear space of at least 2.5 m at both ends of the escalator. The moving handrail should be between 900 mm and 1100 mm above the nose of the steps. The recommended running speed of an escalator is 0.5 m per second, except where there is a very substantial change in levels, in which case it can be increased to 0.65 m/second.

Lifts

In the code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Section R1 on European standards, it says that lifts should be designed in accordance with EN 81-70:2003 (British Standards Institution, 2003a).

The minimum size of a lift that is suitable for use by everybody is one large enough to accommodate a person in a wheelchair. According to Section 8.4.5 of 'Inclusive mobility' (Department for Transport, 2005) on 'Lifts' (Page 45), the minimum size of a lift that can accommodate one wheelchair user is 1000 mm wide by 1250 mm deep. In order to accommodate an accompanying person as well, a lift needs to be a minimum of 1100 mm deep by 1400 mm wide. In order to allow a wheelchair to be rotated and to accommodate several other passengers, a lift needs to be 2000 mm wide and 1400 mm deep.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 46 that lifts should be a minimum of 1000 mm wide by 1250 mm deep (to accommodate one wheelchair) up to 2000 mm wide by 1400 mm deep (to accommodate one

wheelchair plus other passengers). In fact, the minimum depth ought to be 1400 mm (preferably 1500 – 1800 mm) and the minimum width 1400 mm, but preferably 2000 mm. The minimum door width should be 900 mm where there are facing doors and 1100 mm where there is a single door. The height of the door should be 2100 mm. The internal height of the lift should be 2300 mm. There should be sufficient space for a turning circle of 1700 mm outside the door (minimum 1500 mm). The call buttons inside and outside the lift should be between 850 mm and 1200 mm from the floor.

9.4 Overcoming the barriers to travelling by bus

Ability to stand to wait
Whilst travelling is mainly about movement, there are times when it is necessary to stand, such as waiting for, or travelling on, buses. The information about the design of seating in Section 7.1.2 is relevant here.

Bus shelters
According to Section 6.1.2 of 'Inclusive Mobility' (Department for Transport, 2005), bus shelters should be provided where there is space to do so. Where possible, there should be a clear obstacle-free footway width around a bus shelter of 2000 mm, preferably 3000 mm. If this is not possible, a clear footway width of 1500 mm is regarded as acceptable, with an absolute minimum of 1000 mm over a limited distance. There is guidance on the space required to manoeuvre a wheelchair into and within a bus shelter and on and off a bus using a ramp. Seating at bus stops should be at a height of about 580 mm according to Section 6.1.4 of 'Inclusive mobility' (Department for Transport, 2005).

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 59 that bus shelters are useful, but should allow those inside to see the approaching bus or tram. They should be lit or situated in a well-lit area. Seating should be provided – ideally some at a conventional height of 450 mm and some perch seating at 700 to 800 mm. Timetable information should be provided at a height of between 1000 mm and 1700 mm, and should make use of symbols and illustrations to help those with learning difficulties.

Bus stops
According to Section 6 of 'Inclusive Mobility' (Department for Transport, 2005), in residential areas, nobody should have to walk more than 400 metres to a bus stop, but the gradient should be taken into account. It is also suggested that bus services provided with elderly and disabled people in mind should have bus stops every 200 metres. Transport for London (2014a) says that the ideal spacing for bus stops is approximately 300 metres to 400metres, but may need to be closer in town centres and residential areas.

The issue of raised bus boarding areas is considered in Section 6.1.1 of 'Inclusive Mobility' (Department for Transport, 2005) in terms of size, height and gradients. There are two conventional types of bus boarder: full width and half width. A full width boarder juts out into the carriageway far enough for the bus to avoid parked vehicles, that is by approximately 1800 mm. The length of the boarder will depend on the type of bus using the stop and whether or not a shelter is provided. For a

conventional single entry/exit bus where there is no shelter, a length of 3000 mm is recommended. For buses with two doors, the recommended minimum length of the boarder is 9000 mm. A half width boarder, which juts out by between 500 mm and 1500 mm, is a compromise design that can be used where a full width boarder would unduly delay other traffic or place the bus in or too close to the opposing traffic stream. Detailed information about design of bus boarders is given in Transport for London (2014a).

An alternative form of boarder is an angled boarder: wedge shaped from up to 2000 mm into the carriageway and tapering back to the original kerb line over the length of the bus stop cage. This design is similar to the shallow saw tooth layout used in some bus stations. Standard kerb heights range from 125 mm to 140 mm; above this it is recommended that specialized bus stop kerbs should be used (e.g. Marshalls, Charcon, Lafarge Redland) which can give heights up to 220mm. It also says that research by Greater Manchester Passenger Transport Executive suggests that a height of 160 mm gives the best compromise between ease of access and reduced damage to the bus. A higher kerb may be appropriate where there is a segregated bus system or at places where the vehicle is guided into the stop. Where a raised bus boarding area is provided, care should be taken to keep the transition gradients to acceptable levels (1 in 20 preferably, 1 in 12 maximum). Tactile warning surfaces should not be used on raised bus boarders.

Raised 'Kassel' type kerbs can be used to help facilitate access to buses according to Paragraph E1.g of Department of Transport and Transport Scotland (2011).

Bus vehicle design

The Public Service Vehicles Accessibility Regulations (PSVAR) 2000 have required new full size single deck buses over 7.5 tonnes and double deck buses to be fully accessible to disabled people, including wheelchair users, since 31 December 2000. All full size single deck buses over 7.5 tonnes will be fully accessible from 1 January 2016, and all double deck buses from 1 January 2017. All buses weighing up to 7.5 tonnes will be fully accessible from 1 January 2015 and coaches from 1 January 2020. Since 31 December 2000, new buses weighing up to 7.5 tonnes and coaches have had improved access for ambulant and sensory impaired passengers and, from 1 January 2005, new buses weighing up to 7.5 tonnes have had to be wheelchair accessible. Full accessibility includes having low-floor boarding devices, spaces for wheelchair users, highlighting of steps, handrails for visually impaired people and priority seating (House of Commons Transport Committee, 2013a).

99% of buses in London had a PSVAR certificate or low floor access by 2011/12 compared with 93% in English metropolitan areas and 81% in English non-metropolitan areas, giving an overall average of 89% in England, an increase from the 86% in 2010/11. In London, all buses are low floor vehicles, all and access to all trams is step free (Papworth Trust, 2012).

PSVAR 2000 requires buses to have spaces for wheelchair users, highlighting of steps, handrails for visually impaired people and priority seating (House of Commons Transport Committee, 2013a). This report makes the point that there can be difficulties caused by other passengers occupying the wheelchair space. These are

often parents with children in buggies. Bus operators are required to ensure that passengers aware of the priority of wheelchairs in a space.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 61 says that virtually all ambulant disabled people can manage a step height of 200 mm, but that this should include both the vertical height and horizontal gap, so that the sum of the two should not exceed 200 mm, citing 'Significant steps – Summary', published by the Department of Transport in 2004. Citing evidence for the design of South Yorkshire Supertram (Fowkes et al, 1999) it is suggested that the maximum horizontal gap possible for people in wheelchairs should be 45 mm and the maximum vertical gap should be 20 mm.

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 75 that, for ambulant people, any interior steps in buses should be between 120 mm and 200 mm and all at the same height. Gangway width should be a minimum of 450 mm, preferably 550 mm, up to a height of 900 mm above the floor, increasing to a width of 550 mm at a height of 1400 mm above the floor. Handrails should be at intervals of no more than 1050 mm apart down the length of the bus. Bell pushes should be within reach of a seated passenger (1200 – 1400 mm above the floor). Priority seating should have a minimum clear space of 650 mm (720 mm is recommended by VDV in Germany). To assist people in wheelchairs, the minimum gangway width from the entrance to the wheelchair space should be 750 mm, preferably 800 mm or more. The wheelchair space, clearly marked as such, with a flat surface without obstacles and with minimum dimensions of 1300 mm by 750 mm as well as space to manoeuvre. It is regarded as safer for people in wheelchairs if there is a back rest, from 350 mm to 1400 mm in height, 300 mm width against which the wheelchair can rest. There should be a horizontal rail at a height of 850 – 1000 mm to one side of the space and a bell push within easy reach.

On–bus information
In 2011, 22% of buses in the UK had next stop visual information and 19% next stop audio information (Department of Transport, 2012a).

Fares
A significant policy in the United Kingdom is the policy of offering everybody who reaches the state pension age for women a concessionary travel pass (CTP) allowing free off-peak bus travel often with some locally-funded extensions such as travel in the morning peak or local rail travel. 9 million passes were issued in England on the grounds of age in 2011/12 compared with 0.75 million on the grounds of disability (Department for Transport, 2012b) . One third of the bus trips in England are now made free because of concessionary travel passes (CTPs).

Nearly 80% of those eligible for a CTP on the grounds of age have one (Department for Transport, 2014a). This has increased from 58% in 2002 when the statutory scheme requiring local authorities to offer a minimum of half-price local bus travel was introduced. The take up rate is highest in London where the scheme includes travel on both buses and the London Underground at all times and some rail lines. Generally, the take-up rate decreases with the size of urban area and from urban to rural. Over recent years, older people have increased their frequency of bus use. Prior to the introduction of free local bus travel nationally in 2006, about 30% of

those aged 60 or over used the bus at least once a week. This rose to 40% in 2010. Conversely, the proportion that never travel on a bus fell from about 46% to 32%, suggesting that offering CTPs has induced some older people who did not travel by bus to do so.

Bus companies are compensated for the lost revenue and the resulting extra costs of carrying pass holders. Currently this costs the British taxpayer over £1 billion a year (Department for Transport, 2013a). In England this is equivalent to £92 for each pass, with each pass being used for 109 trips on average. Because the total is a significant volume of expenditure, questions are being asked whether this is a good use of public money. However, while the direct costs to the public sector are quite explicit, the scale of the benefits generated by the scheme is much less evident. The evidence on the impacts of the scheme for older people and people with disabilities has been reviewed (Mackett, 2013, Mackett, 2014c). Overall, it seems that the scheme has been successful in that it meets the objectives set for the scheme in the 1998 Transport White Paper and the 2005 and 2006 Budget speeches (Mackett 2014b).

Alternatives to bus services

Even though all older people in Britain are entitled to free travel on buses, this does not mean that they will necessarily have a local bus service. In 2012 only 61% of households in rural areas lived within 13 minutes walk and have a service at least once an hour compared with 99% of those living in London and 98% of those in metropolitan areas (Department for Transport, 2013a). This is reflected in the differences in the numbers of bus trips made each year by concessionary pass holders: 227 per head a year in London, 132 in English metropolitan areas and 70 in English non-metropolitan areas (Department for Transport, 2013a).

In some rural areas there are few buses, so having a concessionary travel pass is of little value. Some local authorities offer taxi vouchers as an alternative to concessionary travel passes. For example, Cheshire West and Chester Council (2014) offers taxi vouchers to the value of £72 to permanent residents of the area who live in specified rural areas, do not hold a current UK driving licence or do not have access to a vehicle, and are eligible for a concessionary bus pass on the grounds of age or disability who wish to exchange their bus pass for taxi vouchers. Vouchers can be used in full or part payment of a taxi journey licensed by Cheshire West and Chester Council who have agreed to participate in the taxi voucher scheme or approved Cheshire West and Chester community transport services.

In some places the population density is too low to make conventional bus services viable. In these areas, community transport often has a useful role to play. This is transport, often using minibuses, with volunteer drivers which provide a service to meet a community need. Funding comes from the fares paid and sometimes from local authorities. The Rural Social Enterprise Programme (RSEP) has funded eight rural community transport organisations (CTOs) to employ development managers with the express aim of significantly increasing the percentage of their income derived from securing public service contracts (Community Transport Association, 2011).

Volunteer drivers using their own cars are another type of community scheme. For example, the Volunteer Driving Service operated by the Retired Senior Volunteer Programme (RSVP) North East uses older drivers to offer transport to people who need to attend health appointments and collect repeat prescriptions. There are similar schemes all over the country (Community Service Volunteers, 2007). There are schemes that provide flexible demand responsive bus and taxi services, for example in Devon and Wiltshire. The Fare Car scheme in Devon (Devon County Council, 2014) is provided by taxis but allows passengers to book and pay separately but share the advertised timetabled journeys. The fare charged is slightly above the normal bus fare for the distance travelled. The Concessionary Travel Pass cannot be used on the service, which means that older people have to pay the full fare. The Connect2Wiltshire (2013) scheme is similar to the scheme in Devon and is provided by seven taxi operators in various parts of the county. The Commission for Integrated Transport (2008) uses the term 'TaxiPlus' to describe this type of scheme and has suggested that more of these schemes should be set up in rural areas, supplemented by other schemes such as car sharing and car clubs.

In areas with low levels of bus service, more flexible ways of providing local public transport are required. This could be a combination of buses, community transport, taxis and volunteer drivers. The various schemes scheme could be extended, with suitable funding, to provide a range of transport services, particularly in rural areas. The difficulty with this proposal is that bus and taxi drivers may not be willing to work in co-operation with volunteer minibus and car drivers. The system would need to be organised by local authorities, who would need more powers to plan transport services, so that local transport authorities outside London have similar powers to those that Transport for London has. There is scope for local transport brokers to provide information and advice about travel opportunities to older people, either on-line or by telephone.

Another type of service is Dial-a-Ride, which provides free door-to-door transport service for disabled people who cannot use conventional public transport. The service is provided by minibuses, taxis, people carriers or cars. The services have to be booked in advance, typically the day prior to travel. The service in London has been operating for over thirty years (Transport for London, 2014f). One of the grounds for eligibility for the scheme in London is being aged 85 or over. The other grounds are based on various aspects of disability or eligibility for various benefits.

9.5 Overcoming the barriers to travelling by taxi

In 2013, there were 78,000 licensed taxis in England and Wales. 45,300 (58%) are wheelchair accessible with assistance from the driver. In London, all black cabs are wheelchair accessible (Department for Transport, 2013b).

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 80, citing 'The determination of accessible taxi requirements' by Richardson and Yelding (2004), that an accessible taxi should have doorways through which a wheelchair passenger can enter with a minimum height of 1595 mm and width of 850 mm, a step height of 100 mm and ramps of no more than 1000 m length, giving a gradient of no more than 75 (approximately 1 in 14), ideally 5% (1 in 20). The minimum unobstructed space for a wheelchair passenger in a side entry taxi should be 1300 mm wide by

1340 mm long. The minimum roof height should be 1625 mm. All taxis should have a powered swivel seat, to help, for example, those with arthritis. Seat heights should be in the range 430 mm to 460 mm.

The Equality Act 2010 includes provisions to ensure that guide dogs are transported by taxis and private hire vehicles (Department for Transport, 2012a).

The Law Commission (2014) has reviewed the legal framework relating to taxis and private hire vehicles in England and Wales. It has recommended that licensing authorities should have the power to introduce a duty on taxis to stop when hailed, to help address the problem that some drivers choose not to stop to pick up some passengers, for example those with visible disabilities, which would include some older people. It has also recommended that licensing authorities should be required to review accessibility needs in their area every three years, and take accessibility issues into account when installing taxi ranks. It has also recommended that there should be powers to require large operators to meet quotas of numbers of accessible vehicles.

Further, in order to help address the lack of accessible vehicles, we
While taxis can provide a means of travel for some people with serious mobility impairments, they can be expensive to use. The London Taxicard scheme provides subsidised travel in licensed taxis and private hire vehicles to London residents with serious mobility impairments or who are severely sight impaired (London Councils, 2014). The cost of travel is shared between the user and the London Borough in which they live. The number of subsidised trips allowed in a year (or in a month) and the level of subsidy per trip varies between London Boroughs.

9.6 Overcoming the barriers to travel by rail

Much of the information in Section 7.5 on the barriers to travelling by bus also applies to travelling by rail.

Access at stations
The EU Rail Passenger Rights Regulation (1371/2007) came into force in December 2009 and includes the rights of people with reduced mobility (Department for Transport, 2012). The document ‘Accessible Train Station Design for Disabled People: A Code of Practice’ published by the Department for Transport and Transport Scotland (2011) is an extremely comprehensive document giving guidance on ways to make railway stations accessible, including compliance with EU standards for stations on the part of the rail network in Great Britain that constitutes part of the Trans-European Network (TEN) plus new trains and stations. It says that operators must comply with the document ‘Design of buildings and their approaches to meet the needs of disabled people’ (British Standards Institution, 2009).

All licensed train and station operators are required to produce a Disabled Person’s Protection Policy (DPPP) which explains how operators will make ‘reasonable adjustments’ to allow disabled people to access their services. The ‘reasonable adjustments’ include a requirement for train operator responsible for an inaccessible station at the start or end of a rail journey to provide a free accessible taxi to or from the nearest accessible station. There appears to be a lack of public awareness of the

requirement for rail operators to provide taxis under these circumstances (House of Commons Transport Committee, 2013a).

'Passenger assist' is a scheme in which passengers with disabilities who would like assistance (National Rail, 2014b), for example:

- Those with a mobility or other disability that makes getting on and off trains difficult;
- Wheelchair users (on most services, the passenger will need to use a boarding ramp and, on some services to reserve a wheelchair space on the train);
- Mobility scooter users (there are restrictions on different train operators which would have to be checked, a boarding ramp will be required and a reservation for the space onboard);
- Those with a sight impairment who need guiding around a station or help boarding and alighting from the train;
- Have difficulty walking long distances – at some stations a station wheelchair can be provided or, at some larger stations, access to an electric buggy.

The scheme, operated by ATOC (Association of Train Operators), was introduced in 2011, replacing the previous scheme ('Assisted Passenger Reservation System').

The Access for All programme launched by the Department for Transport in 2005 means that, by the end of the programme in 2015, accessible routes will have been provided at 154 stations with minor improvements at over 1000 other stations. This means that at least 75% of rail journeys will start or end at a fully accessible station. About 2000 stations have Customer Information Systems in place. On the London Underground 66 out of the 270 stations are step free from street to platform level (Department for Transport, 2012a).

Rail vehicle design

New rail vehicles have been subject to mandatory accessibility standards since the introduction of the Rail Vehicle Accessibility Regulations (RVAR) in 1998 (House of Commons Transport Committee, 2013a). By May 2012, 41% of rail vehicles were fully accessible (Department for Transport, 2012a). All rail passenger vehicles have to be accessible by 1 January 2020.

Audio-visual information is provided on the 41% of rail vehicles that are fully accessible, plus many others (Department of Transport, 2012a). By 2020 all rail vehicles will have audio-visual information that shows the destination and next stop information, plus updates on diversions, delays of over 20 minutes and emergency information.

Fares

People aged 60 or over are eligible to buy a Senior Railcard for £30 a year. This entitles the holder to a saving of 1/3 on Standard and First Class rail fares throughout Great Britain. The only restriction is for travel during the morning peak period, Monday to Friday (not including Public Holidays) when journeys are made wholly within the London and South East Network Railcard area (National Rail, 2014a).

A trial has been carried out by the train operator First Great Western on two lines under which holders of a concessionary travel pass for buses can obtain the same

discounted fares as holders of the Senior Railcard without the necessity of purchasing the railcard (Department for Transport, 2014c). Because scheme only applied to journeys on the two lines, the report is not very conclusive, but suggests that revenue has been generated. The scheme was popular with those using it. Introducing it nationwide would mean that the train operating companies would lose the annual fees, but would have a much larger passenger base eligible for the discount which might well bring in sufficient extra revenue from ticket sales to offset the loss of the revenue from the sale of the railcards.

Ticket machines

Ticket machines can be difficult to use. The code of practice on accessible stations (Department for Transport and Transport Scotland, 2011) says, in Paragraph N2i, that ticket machines should have adequate colour contrast on the coin, credit card and change/ticket slots so that visually impaired passengers can see them. Some people with visual impairments have difficulties using machines without tactile or audio feedback (House of Commons Transport Committee, 2013). People with learning difficulties may find the volume of information on some ticket machines confusing and people with dyslexia may find ticket machines difficult to understand, particularly if there is no speech-to-text option.

According to Section 2.3 of 'Inclusive Mobility' (Department for Transport, 2005) the height of the buttons or handles which wheelchair users have to reach is also important. As a general rule, any features that are intended for use by people in wheelchairs, such as push buttons, switches, coin slots etc., should be no less than 750 mm and no more than 1200 mm above ground level. By leaning forward or sideways it is possible for a wheelchair user to reach beyond this range. Some people in wheelchairs find it difficult or impossible to lean forward: if practicable, the distance forward, measured at chest height, should be no more than 500 mm; 600 mm should be the absolute maximum. The Guidelines state that US data suggests an absolute range for sideways reach height from 230 mm to 1370 mm but that placing controls or other features towards the extremes of this range should be avoided if at all possible. 'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 54 that the operating elements of ticket machines should be more than 1200 mm from the ground, with operating buttons 19-20 mm in diameter. The code of practice on the design of train stations for disabled people (Department for Transport and Transport Scotland, 2011) says, in Paragraph N2.1 that the European standard is that the tactile contact area on a ticket vending machine at a station, including the keyboard, the payment and the ticket vending areas, should be at a height of between 700 mm and 1200 mm. It also says, in Paragraph N2b that operating buttons should be at least 20 mm in diameter and protrude sufficiently for use by those who rely on palm pressure.

9.7 Overcoming the barriers to travelling by car

The Blue Badge scheme provides parking concessions (parking without charge or time limit in otherwise restricted on-street environments such as parking meters and pay-and-display and on yellow lines for up to three hours) to those with severe mobility problems, including the inability to walk, only being able to walk with severe discomfort, and being blind. The estimated number of valid Blue Badges holders in Great Britain on 31 March 2011 was 2.56 million (Papworth Trust, 2012). The

estimated number of new applications for Blue Badges decreased from 418,000 to 395,000 between 2009/10 and 2010/11 (Papworth Trust, 2012). Drivers with DVLA listed medical conditions formed approximately 6% of the 34 million licensed drivers (Papworth Trust, 2012).

According to Section 5.1 of 'Inclusive Mobility' (Department for Transport, 2005) , spaces for Blue Badge holders should be located within 50 metres of the facilities served by the car park or ramped (preferably with a gradient of less than 5 per cent), and under cover if possible, in off-street car parks for the public. 'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 37 that car parking spaces for disabled drivers should allow space to transfer from the chair into the car and so be about 3.6 m wide compared with 2.4 m for a standard bay.

The code of practice on accessible train stations (Department for Transport and Transport Scotland, 2011), in Paragraph D1.2 on European standards includes standards that say that disabled parking spaces should be as close as feasible to an accessible entrance, with a maximum distance of 50 metres (Section D2) and a minimum number of spaces designated for disabled motorists of 5% of the total capacity of the car park, and if they are all occupied for more than 10% of the car park's operating hours, consideration should be given to increasing their number (Section D3). In Section D4 it is stated that designated spaces should be 4800 mm long plus a 1200 mm safety zone to accommodate rear hoists, by 3600 mm wide to accommodate transfer from the car to a wheelchair, and that designated on-street parking must be 6600 mm long by 3600 mm wide.

Similar criteria apply to the design of ticket machines for car parks as those for the design of machines selling railway tickets.

9.8 Overcoming the barriers to travelling by mobility scooters

Many older people use mobility scooters. There are two types of mobility scooter (Department for Transport, 2013c):

- Class 2 invalid carriages - these cannot be used on the road (except where there is no pavement or when crossing the road) have a maximum speed of 4mph and a maximum weight of 113.4kg. These scooters do not need to be registered and do not need a tax disc.
- Class 3 invalid carriages - these can be used on the road, have a maximum speed of 4mph off the road, and 8mph on the road and a maximum weight of 150kg. They need to display a 'nil value' tax disc and be registered with DVLA. Class 3 invalid carriages need the following features:
    - a maximum unladen weight of 150 kilograms
    - a maximum width of 0.85 metres
    - a device to limit its speed to 4mph
    - a maximum speed of 8mph
    - an efficient braking system
    - front and rear lights and reflectors
    - direction indicators able to operate as a hazard warning signal
    - an audible horn
    - a rear view mirror
    - an amber flashing light if it is used on a dual carriageway

All mobility scooters and powered wheelchairs can legally travel at a maximum of 4mph on footpaths or in pedestrian areas. All normal parking restrictions apply to mobility scooters. There is no legal eyesight requirement to drive mobility scooters. Insurance is not required. According to a survey carried out for the Department for Transport (2010) the majority of respondents believed that people who want to use a mobility scooter should have training before starting to use one (78%), that they should take a test before being allowed to use one (53%), that they should take an eye test before starting to use one (81%) and that mobility scooter users should have insurance like motorists do (61%).

The House of Commons Transport Committee (2013a) has expressed a concern about the fact that some bus operators do not allow mobility scooters onto buses. The Department for Transport has expressed the view that it is for individual operators to decide whether to carry them because they have knowledge about their vehicles and local conditions (House of Commons Transport Committee, 2013b).

The Department for Transport is considering reforms to the use of mobility scooters on the road and the training of users (Department for Transport, 2012a). It has also commissioned research into a kite marking scheme for the carriage of mobility scooters on public transport.

9.9 Improving the journey experience of older people

9.9.1 Providing information prior to travelling

Travel information prior to travel can be obtained in writing, by telephone or from the internet.

Improving Transport Accessibility for All' (ECMT, 2006) says on Page 16 that timetables and brochures should be in a minimum font of 14pt, preferably 19pt, with good contrast between the colours used for the text and the background, with a clear font such as Helvetica, Airport, Futura or Folio.

Various websites provide information prior to travel. This is of limited use for some older people, as fewer than half of those over the age of 70 have access to the internet, as shown in Table 36. Information on some websites may not be accessible to some people with poor eyesight. People with learning difficulties may have difficulty understanding route maps, fares, charging arrangements and signage (House of Commons Transport Committee, 2013). People with mental health conditions may be affected by the complexity of information, particularly if it involves several transport operators.

Transport Direct, the journey planner was launched by the Department for Transport in 2004 included some accessible journey planning capability. It had more than 160 million requests. It was closed down in September 2014 because it was felt that there were enough other providers which provided similar services (Department of Transport, 2014d). None of these provide nationwide accessible journey planning. In London the journey planner provided by Transport for London (2014e) allows users to request public transport journeys with level access from the street to the platform

or from the street to the train, bus, etc. or to specify that they can use escalators but not stairs or can use stairs but not escalators, or to indicate a maximum walking time or whether their walking speed is fast, average or slow.

9.9.2 Providing information while travelling

The code of practice on the design of accessible stations (Department for Transport and Transport Scotland, 2011) say that designers should use the following formula to determine the height of characters on signs:

Character height (mm) = reading distance (mm) / 100.

These figures are based on someone who is eligible for registration as partially sighted. The suggested fonts are Helvetica, Arial, Rail Alphabet, Brunel, New Johnston and Airport (Paragraph K3c). The code of practice also says that a mixture of upper and lower case letters should be used because often words, particularly place names, are recognised by the general shape of the words (Paragraph K3 g). It also suggests that embossed signs are essential for people with no sight and that characters on tactile signs should be raised by 1-1.5 mm, have a stroke width of 1.5 to 2 mm and a height of at least 15 mm, with a maximum of 60 mm. the height range should be between 1400 mm and 1700 mm from the floor with a maximum stretching distance of 500 mm.

One way to access travel information whilst travelling is to use an ‘app’ on a smart phone (House of Commons Transport Committee, 2013), but the cost of smart phones, the difficulty that some older people have using them and poor reception in some areas means that this is not a likely to be a satisfactory substitute for the provision of audio-visual information on bus stops, stations, buses and trains in the near future.

9.9.3 Providing toilet facilities

It was shown in Table 6 that 7% of adults over the state pension age have continence problems. The code of practice for the design of accessible stations (Department for Transport and Transport Scotland, 2011) says, in Paragraph P2.6, that a well-designed toilet, as well as being accessible to people in wheelchairs, should be easy to use by a wide range of other people, including those who cannot bend, those with limited strength, impaired balance, impaired vision and those who make involuntary movements. ‘Improving Transport Accessibility for All’ (ECMT, 2006) says on Page 58 that toilets should have a door with a clear width of 925 mm. The overall size of a cubicle depends on whether it has a corner or central WC. The former allows the transfer of a wheelchair user from either side and so needs to have a width of 2800 mm by 2200 mm length. A corner layout requires less space: 1500 mm width by 2200 mm length. The lavatory seat height should be 480 mm, with firm support rails on the transfer side. Wash basins should have a height of 720-740 mm (maximum 800 mm) and hand dryers and soap dispensers should be at a height of approximately 850 mm. Section 9.6 of ‘Inclusive Mobility’ (Department for Transport, 2005) gives guidance on the detailed design of toilets. Neither report offers guidance on the number of toilets required and their location.

The code of practice for the design of accessible stations (Department for Transport and Transport Scotland, 2011), in Paragraph P5.1, it says that the internal

dimensions of an accessible toilet must be at least 1500 mm wide and 2200 mm deep, so that there is space for powered scooters. There has to be a clear turning space of 1500 mm by 1500 mm. In Paragraph P4.2 it says that, if a wheelchair accessible toilet has an inward swinging door, then there needs to be a clear minimum space of 700 mm by 1100 mm. It says that the centre line of the toilet pan must be 500 mm from the side wall and the rim must be 480 mm above the floor (Paragraph P5.3), and that the top surface of a WC seat should be at a height of 480 mm above the floor level (Paragraph P6.4).

Transport for London (2014d) issues a map showing which London Underground stations have toilet facilities including accessible toilets.

The Changing Places Consortium (2013) has launched a campaign on behalf of those people who cannot use standard accessible toilets, including people with profound and multiple learning disabilities and their carers. Changing Places toilets need to be publicly accessible with enough space and the right equipment, including a height adjustable changing bench and a hoist.

9.9.4 Providing refreshment facilities

'Improving Transport Accessibility for All' (ECMT, 2006), says on Page 58 that gangways and spaces between tables should allow wheelchair access: 1300 mm, if possible. Tables should along adequate leg room – about 700 mm high, 500 mm deep and 600 mm wide. This means a table-top height of about 730 mm.

9.9.5 Improving the attitudes of transport staff and the public towards older travellers

People with disabilities, can face harassment on public transport (Equality and Human Rights Commission, 2011). The main cause of the issues that arise seems to be competition for the limited number of accessible spaces on vehicles. Reporting levels of disability-related harassment appear to be low, with only 60 disability-related crimes reported to the British Transport Police in the three years 2007-09 (Department for Transport, 2012a). The Department for Transport (2012a) is working on improving the collection and sharing of data on harassment, working out the best way to report incidents, and refining the practicalities of collating information on high risk areas and how risk can be reduced. It is also working with the Traffic Commissioners and operators to develop the scope of a Code of Practice aimed at developing respect for all passengers and staff on the bus network Department for Transport (2012a).

It has been reported that 87% of blind people with a guide dogs had been left on a bus because a driver had forgotten to tell them that they were at their stop and 27% had had a bus driver refuse to tell them when they were at their destination (House of Commons Transport Committee, 2013).

Older people may need assistance from staff, for example, because they cannot hear or see very well or because they have difficulty handling coins or passes. Driver training can help to make drivers more aware of the needs of those have difficulty travelling by bus. There is a strong case for better driver training, to help not only

passengers, but to give drivers greater job satisfaction and as good practice by operating companies (Chartered Institute of Logistics and Transport, undated).

Some older people have disabilities that are not visible. A scheme to make drivers aware of hidden disabilities is the Travel Support, Safer Journey or Journey Assistance Card. These are cards issued by bus operators that indicate the needs of specific passengers containing messages such as 'Please be patient: I have difficulty speaking', 'Please wait for me to sit down in case I fall' or 'Please scan my pass for me'. The card can be shown discretely to the driver. Cards issued by one bus operator can be used on buses provided by other operators. The scheme is being supported by the Confederation of Passenger Transport (2014) which provides model examples of the card for operators to issue. Some cards such as that issued by Blackpool Transport (2014) have various pre-printed messages while the scheme in London (Transport for London, 2014b) has a blank space for the user to write in his or her specific message to the driver.

Since September 2008, all professional bus and coach drivers have been required to hold a Certificate of Professional Competence as a requirement of the EU. They are required to carry out 35 hours of training every five years, but there are no formal requirements on the content of the training (House of Commons Transport Committee, 2013a). The Department for Transport (2012) has supported the development of a disability module extending the Certificate of Professional Competence for bus driver training and a disability equality awareness module for accredited training courses for taxi drivers. Disability equality awareness training is incorporated into all GOSkills NVQ programmes for bus drivers.

Local licensing authorities can require taxi and private hire drivers to undertake disability awareness training. Drivers can opt to undertake training for their own benefit (House of Commons Transport Committee 2013b). The Law Commission (2014) in its review of the legal framework relating to taxis and private hire vehicles has recommended that disability awareness training is made mandatory for all taxi and private hire drivers.

9.10 Travel training

Some older people who have disabilities may lack the confidence to travel. Travel training such as the Travel Mentoring Service operated by Transport for London (2014c) provides guidance and support to use public transport. Advice about planning accessible routes can be given over the telephone or a mentor can accompany a traveller for their first few trips to give them the confidence to become an independent traveller.

9.11 Overcoming the barriers to access to buildings

'Improving Transport Accessibility for All' (ECMT, 2006) says on Page 43 that doors to buildings should be 1200 mm wide. With double doors, each should be a minimum of 800 mm, preferably a little wider (830-900 mm). Ramps should have a gradient of about 1 in 20 and be no steeper than 1 in 12. The ramp should be at least 2000 mm wide.

The code of practice for the design of train stations (Department of Transport and Transport Scotland, 2011), in the description of European standards, says, in Paragraph G1.4, that doors and entrances should have free headroom of 2100 mm. In Paragraph G1.6 it says that the force required to open or close a manual door should not exceed 25 newtons, and in Paragraph G1.7, that the door should be provided with horizontal push bars, extending across the full width of the door, on both sides of the door.

9.12 Age friendly cities

A more holistic approach can be taken by developing age friendly cities. The World Health Organisation (WHO) (2007) has set up the WHO Global Network of Age-friendly Cities and Communities and produced a report entitled 'Global Age-friendly Cities: A Guide'. There are already a number of cities which have made some progress towards being age friendly, notably the twelve members of UK Age-friendly Cities Network co-ordinated through the Beth Johnson Foundation (2014). However, there needs to be a major investment in making cities more age friendly in order to maximize the contribution of older people to the economy and society more generally. An age-friendly city encourages active ageing by improving the opportunities for shopping, socialising, working and volunteering in order to enhance the quality of life as people age. In practical terms, an age-friendly city has structures and services which are accessible to and inclusive of older people with their varying needs and capacities. These could include the following:

- Improved access to buses, taxis and trains
- Better travel and other information in a variety of age-friendly formats
- Improved street environment with more seating, better street lighting and removal of unnecessary obstructions from streets
- Certification schemes for age-friendly businesses
- More accessible toilets.

A particular aspect of age friendly cities could be to include dementia friendly facilities, building on the work in York funded by the Joseph Rowntree Foundation (Crampton et al., 2012)) which would benefit the 835,000 people in the UK have who dementia, most of whom are elderly.

9.13 Further developments

Transport for Everyone: an action plan to improve accessibility for all (Department for Transport, 2012a) is an action plan to increase accessibility for those with disabilities. It includes some figures to illustrate why action is required and lists various actions that are being undertaken or are under consideration, indicating who is taking the lead and the date of delivery, under three headings: 'Improving physical accessibility', 'Providing better information for the disabled passenger' and 'Improving attitudes and behaviour towards disabled passengers'.

The House of Commons Transport Committee (2013) has recommended that the Department for Transport develops and publishes a methodology for the quantitative assessment of the benefits brought by improving accessibility for people with disabilities.

10 GOOD PRACTICE IN OVERCOMING THE BARRIERS TO ACCESS FOR OLDER PEOPLE

10.1 Walking

Mandl et al. (2013) have identified the following list of examples of good practice for walking and cycling for older people.

Good urban design

The report mentions cities in the Netherlands and Germany e.g. Vauban in Germany where cultural centres and shopping facilities have been designed into residential areas, and Groningen in the Netherlands which has the largest car-free pedestrianized centre in Europe. Another example is Jvyäskylä in Finland. Other examples are 'limited access' such as Stellwerk 60 in Cologne and Waterwijk in Amsterdam.

Improved walking facilities for older people

The suggested best practice examples include:

- walkways with wide pavements;
- stopping places, with recessed seating away from traffic and passing pedestrians;
- well-designed stopping places, which encourage older people to engage in social activities, and provide incentives for walking;
- well-designed weather shelters, that protect older people from the wind and rain; and
- optimising on local landscape features, to provide e.g. shelter from the sun.

Effective pedestrian crossings

The suggested best practice to make pedestrian crossings safer for older people are:

- equip crossings with traffic lights wherever possible;
- provide signage for pedestrians to look out for traffic (e.g. 'look right');
- providing an audible warning signal, with additional road lighting;
- adjust signal cycles to allow for the slower walking speeds of the elderly, if detectors are not used; and
- reduce the speed of approaching traffic, e.g. through humps or other markers.

The report mentions a 'passenger sender' device being tested in The Netherlands which provides a means to double the pedestrian green time, activating an acoustic signal and preventing conflicting traffic movements. It says the best practice in pedestrian signals in the UK is the Puffin Crossing.

Walking promotion and information provision

The following examples are given in the report:

- Integrated walking programme in Southville and Bedminster in Bristol, UK.
- In Brighton, the two universities (Brighton and Sussex) provide local older residents with student 'buddies' from the Health and Social Sciences Schools.
- Providing pedometers can encourage older people to walk as part of an established walking programme.
- Development of 'audit kits' to be used to identify suitable walking routes for older adults.

10.2 Cycling

Cycling streets

There is an example in Münster in Germany

Bike sharing

There are schemes such as the Vélib scheme in Paris, and the schemes in London, Washington DC and Montreal.

Bicycle parking

Sanyo has installed two solar parking lots incorporating solar panels and lithium-ion battery systems and 100 electric hybrid vehicles in Setagaya in Tokyo, Japan.

Cycling promotion and information provision

Examples cited in the report are:

- Cycle skills training for senior citizens in The Netherlands and Belgium;
- Guided cycling tours in Denmark, e.g. in Odense;
- Training courses on skills and use of new media in Germany e.g. in Munich;
- Being and staying mobile in Switzerland – multimodal mobility training for older people in Thun covering walking, cycling and public transport;
- Mobile and safe in old age: cycling for all stages of life in Graz in Austria;
- TC Cycle Champions in England;
- AustCycle provides cycling awareness and skills programme in Australia.

10.3 Public transport

McDonald et al. (2012) have identified the following examples of accessible public transport in Europe:

- Accessible demand responsive public transport service, e.g. Achterhoek in The Netherlands
- Accessible metro systems e.g. Athens in Greece
- Accessible light rail system in Dublin, Ireland
- Accessible buses, e.g. barrier free in in Austria, low floor in Budapest Hungary, new design standards in Grenoble in France
- Accessible bus terminal in Espoo in Finland
- Mobility training e.g. in Berlin
- Navigation systems in railway stations, e.g. the new Berlin main railway station
- Retractable vehicle ramps, on trams e.g. in Berlin
- People mover to access platforms in railway stations e.g. Berlin Hbf
- Waiting room for people with impaired hearing in Dusseldorf, Germany
- Driver training in Espoo in Finland
- Accessible emergency and information pillars at regional railway stations in Hamburg, Germany
- Taxicard to provide subsidised taxis in London
- Guidance system for the local transport system for visually impaired people in Munich in Germany
- Speaking bus stop in Münster in Germany
- Personal electronic navigation system in the Metro in Paris
- Midibus service to guarantee accessibility to medical facilities in Prague in the Czech Republic

- Ultra low-floor tram in Vienna in Austria

There are many other examples of good practice in Britain and elsewhere.

11 CONCLUSIONS

This reported has shown that the growing population of older people in Britain face many barriers to access. They already make many trips, often for shopping and leisure, but also to work and provide childcare for grandchildren. They would like to travel more, particularly to visit friends and family, but there are barriers. Many of these result from the interaction of the characteristics of the older person and the nature of the transport system. Some older people have disabilities that make traveling difficult. Others have difficulty travelling about even though they are not registered as disabled. This may result from a number of characteristics that may make walking far, standing for long periods, handling coins or understanding timetables difficult. These may arise from general deterioration in their faculties. None of this means that they should not be able to travel in order to enjoy life or contribute further to society. Many of the barriers are associated with the physical characteristics of the transport system and buildings, but anxiety and lack of confidence are also important issues. The attitudes of others, both strangers in the street and transport staff, can cause problems in the form of discrimination, perhaps giving preference to younger, more able-bodied people, who might be perceived as being less bother to assist.

This report has examined the evidence about the capabilities of older people and suggested ways of overcoming the barriers to movement. There is not a huge amount of evidence about the capabilities of older people, probably because it is difficult and time-consuming to collect valid data. There are a number of documents containing guidelines about designing the transport systern to assist those with mobility difficulties but many of them contain little or no evidence – they are simply statements which may be largely correct, but without evidence they do not form a sound basis for stimulating debate about the travel needs of older people and ways of meeting them.

There are examples that seem to be good practice around the world, but very few of them seem to have been evaluated. It might be argued that if it is ‘good’ then similar methods can be used elsewhere, but there may be better or more cost-effective ways to achieve the same end. Clear evidence on what works under what circumstances, who it assists, and what it costs, are needed. The development a methodology for the quantitative assessment of the benefits brought by improving accessibility for people with disabilities as suggested by the House of Commons Transport Committee (2013) would be a good starting point. Making it easier for older people to travel would bring economic benefits to the country (Mackett, 2014a). By bringing together some of the existing evidence it may be possible to identify where the gaps are. For example, many of the guidelines seem to refer to movement on the street and relate to physical disabilities. There are issues such as overcoming anxiety about travel, tackling discrimination, and helping those with mental disabilities that seem to be largely overlooked, probably because they are much harder than, for example, specifying the angle of a ramp. There are other cases

where the emphasis is on the detail rather than the bigger picture. For example, there are guidelines on the dimensions of a W.C. but no specification of how public conveniences are needed in an urban area or where they should be located.

There are various implications of the evidence summarised in this document:

- **Design and engineering improvements:** It is clear from Section 8 of this report that there are many detailed design recommendations available, such as the height of seats and the angle of ramps. There are standards for some areas put forward by the British Standards Institution, and detailed design criteria for making stations accessible (Department for Transport and Transport Scotland, 2011). However, these are very partial. The Inclusive Mobility Guidelines (Department for Transport, 2005) cover many of the topics, but there are gaps and there is a lack of evidence to support much of the guidance. It is intended that the Guidelines will be updated, but the scope of the document needs to be broadened, by including more strategic issues such as the number and location of facilities as well as their detailed design. There is also a need for a much broader evidence base upon which the guidance can be based. There is also a need for cost information to be included so that priorities can be determined within budgets. The recommendation by the House of Commons Transport Committee (2013) that the Department for Transport develops and publishes a methodology for the quantitative assessment of the benefits brought by improving accessibility for people with disabilities would help in this process. Some work on the amount of improved accessibility that can be obtained for various amounts of funding exists such as that by Mackett et al. (2008, 2010). It is likely that increasing accessibility for older people will increase their contribution to the national economy as well as improving their quality of life (Mackett, 2014a).
- **Attitudes:** People with disabilities suffer from discrimination, as illustrated in Table 33. Many of these will be older people. Some of the discrimination is caused by the attitudes of bus drivers. Bus drivers receive training which has helped to improve their attitudes. But, there is quite a high level of turnover in some parts of the bus industry, partly because the jobs are seen as unattractive in some areas because of the hours worked starting in the early morning, into the late evening, at weekends and overnight in some places. The difficulty of recruiting drivers means that standards may be lower than desirable in some places. Driver training needs to be extended to make it more comprehensive to increase bus drivers' understanding of the issues that older people face, probably by involving more older people in the training process. A more difficult problem is the issue of other travellers: there are many places where seats are designated for use by people who have difficulty standing, for example on buses and the London Underground. However, this relies on other passengers being prepared to vacate these seats: many do so, but others do not. There needs to be a campaign, possibly backed up with legislation, to ensure that those who need to sit down are able to do so.
- **Extending the Concessionary Travel Pass scheme:** The Concessionary Travel Pass scheme allows older people to travel by bus, but there are weaknesses in the system. For example, many older people need to visit hospital for appointments in the morning before their passes are valid for the whole journey. In London and some other areas the pass can be used at all times of day. It would be useful if the validity of the pass were extended to the

whole day across the country. It is seems unlikely that this would cause significant problems in other areas where this does not exist as a local concession. It would probably not increase the cost of the scheme by very much because it seems likely that most of the trips that would be made using the pass before 9.30 am would probably have been made later in the day anyway. It would be useful to carry out further research into whether allowing use of the pass to obtain discounted rail tickets in the same way as the Senior Railcard would generate sufficient extra revenue to offset the loss of revenue from the sale of the railcards. If this were found to be the case, the extension of the Concessionary Travel Pass scheme to provide discounted rail travel should be introduced.

- **The availability of public transport:** The availability of public transport varies widely across the country, from comprehensive in London to non-existent in some rural areas. This can lead to the irony of older people having a pass to use buses free of charge, but no local buses to travel on. More flexible ways of providing local public transport are required especially in rural areas. This could be a combination of buses, community transport, taxis and volunteer drivers. As discussed above, the owners of private hire vehicles can use their vehicles to provide local bus services and taxi vouchers are offered to people eligible to hold a concessionary travel pass who have no means of making local trips in some areas. Another way of extending local transport provision is through volunteer drivers. The various schemes scheme could be extended, with suitable funding, to provide a range of transport services, particularly in rural areas. The difficulty with this proposal is that bus and taxi drivers may not be willing to work in co-operation with volunteer minibus and car drivers. There is probably scope for local transport brokers to provide information and advice about travel opportunities, either on-line or by telephone.
- **The organisation of public transport:** The provision of public transport mainly by the private sector means that commercial criteria dominate decisions about the provision of public transport. There are mechanisms for public funding to be used to provide services that are deemed to be in the public interest, but this still leads to very uneven provision of services. The system would need to be organised by local authorities, who need more powers to plan transport services. The system of bus organisation in London with the service operated as franchise contracts allows much more scope for management in the public interest than the system outside London. It would be useful if the licensing of taxis were transferred to county councils and other local transport authorities so that they can be coordinated with local bus services and community transport services.

Progress is being made to improve access for older people in Britain. Local buses are a good example, with low-floor buses and the concessionary bus scheme offering free off-peak travel, but many of the less tangible issues are not being faced up to. With a growing population of older people with a great deal to offer society, it is essential to improve access to help them realise the full potential of what they can offer to society.

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