

# Active Transport

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## 1 Key findings

### Active Transport in Cambridgeshire:

- Increasing levels of cycling and walking can reduce the risk of diseases such as cardiovascular disease, diabetes and dementia, with those that are most inactive benefiting the most.
- Half of work trips are walked or cycled in Cambridge City compared to one in seven in the rest of the county.
- Walking and cycling rates are lowest in those over 40 years of age in Cambridgeshire.
- There are over 18,000 car trips to work that are less than 2km, with over a third of these in Huntingdonshire.
- In Cambridge City, short work trips are less likely to be cycled:
  - In the outskirts.
  - In wards in the south and east of the city.
- In Fenland, very few short trips to work are cycled or walked even in town settings such as March and Wisbech.
- Traffic cordon data shows that walking is more common in the market towns and cycling more common in Cambridge City.
- Nearly 60% of primary school children walk to school, but only 35.3% of secondary school children do, though cycling is much less popular. Car trips still account for 26.4% of primary school trips and 10-15% of secondary school trips.

### Future focus on:

- Improving safety and perception of safety.
- Providing infrastructure that encourages active transport, such as creation of direct or shorter routes for cyclists and pedestrians.
- Encouraging a culture of active transport, understanding that the barriers are different for different populations.
- Further evaluation of local data and intelligence to enable targeting of initiatives.

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## 2 Introduction: What is active transport and why is it important?

### 2.1 What is active transport?

Active transport or travel is any means of getting from A to B that involves being physically active. Walking and cycling are the main forms of active travel. Using public transport can also contribute to our levels of physical activity, as people who take public transport are likely to walk further than car users – for example, by walking to and from bus stops. In the Transport and Health JSNA, active transport has been restricted to non-leisure or utilitarian walking and cycling including trips to work, trips to school and other non-leisure trips such as to the shops.

Active transport has an important role to play in improving health and wellbeing. There is a wealth of evidence showing that walking and cycling are effective ways of integrating, and increasing, levels of physical activity into everyday life for the majority of the population, at little personal or environmental cost. Active travel is a viable alternative to the many short journeys that are still made by car.

The UK has some of the lowest walking and cycling rates in Europe. About two thirds of journeys made in England are less than five miles, but more than half of these are made by car<sup>1</sup>. Whilst around 2% of trips in England are cycled, this figure is 26% in the Netherlands. Only around 10% of people walk to work across the UK. However, there are signs of improvement and the need for active travel has been recognised in several government documents and programmes such as the draft Cycling and Walking Delivery Plan (2015)<sup>2</sup>.

Walking and cycling have been described as near perfect exercise. It is a popular, familiar, convenient and free form of exercise that can be incorporated into everyday life and sustained into older age. It is also a carbon neutral mode of transport. Even walking at a moderate pace of three miles/hour expends sufficient energy to meet the definition of moderate intensity physical activity.

*“For most people, the easiest and most acceptable forms of physical activity are those that can be incorporated into everyday life...walking or cycling instead of travelling by car”*  
*(At Least Five A Week: the Chief Medical Officer’s report on physical activity, 2004)*

## 2.2 What are the health benefits of active transport?

### 2.2.1 Physical inactivity is high in the UK

Physical inactivity is the fourth leading risk factor for death worldwide<sup>3</sup>. We know that a lack of physical activity is harmful, contributing to an increased risk of diabetes, cardiovascular disease and cancer. World Health Organisation (WHO) figures show that physical inactivity accounts for an estimated 9% of premature mortality, more than 5.3 million of the 57 million deaths that occur worldwide each year<sup>4</sup>.

Physical activity levels are low in the UK. Turning the Tide of Inactivity, UKActive<sup>5</sup> highlighted that 12.5 million people in England failed to achieve 30 minutes of moderate intensity physical activity per week within a 28-day period during 2013 based on data from the Active People Survey<sup>6</sup>. This remains the case even though people could achieve that half an hour in 3 x 10-minute bites. In consequence, one in four of the adult population is classed as physically inactive falling into the Chief Medical Officer's (CMO) 'high risk' health category.

*1 in 4 of the adult population  
in the UK is classed as  
physically inactive*

Evidence shows that the most significant health and clinical benefits are gained by an inactive person currently doing no physical activity starting to do even a little<sup>13 16</sup>. The risk of a range of chronic conditions is cut even when this new activity falls short of the CMO's guidelines<sup>7</sup>.

Fitting physical activity into the working day can be difficult. Active travel to and from work is a good way for many people to get active and work towards the 30 minutes a day target.

### 2.2.2 Impact of physical activity, cycling and walking on mortality and burden of disease.

#### Mortality

Literature was systematically reviewed during the update of the WHO Health Tool for Walking and Cycling<sup>8</sup> to establish the impact on increasing walking and cause mortality. Different walking and cycling exposures were converted into a exposure: the MET (metabolic equivalent of task) to allow comparison within studies incorporation walking and cycling into one model. A meta-analysis was then carried cycling studies and 14 walking studies to determine the risk reduction in mortality given level of cycling/walking. The estimates recommended by the HEAT advisory relative risk reduction in all-cause mortality of 11% for every 168 minutes/week walked reduction in all-cause mortality for every 100 minutes/week cycled (

Table 1).

**Table 1: Summary of basic values of relative risk reduction for all-cause mortality used for HEAT**

Mode	Applicable age range	Relative risk	Volume	Benefits capped at
Walking	20-74 years	0.89 (CI 0.83–0.96)	168 minutes/week	30% (458 minutes)
Cycling	20-64 years	0.90 (CI 0.87–0.94)	100 minutes/week	45% (450 minutes)

CI: confidence interval.

Source: Health economic assessment tools (HEAT) for walking and cycling. Methods and user guide, 2014 update

However, there are weaknesses to these estimates as they emphasise the impact on mortality and do not include the impact of cycling on walking on burden of disease including the reduction in prevalence, treatment, hospital admissions, quality of life and disability caused by many long term conditions. In addition, these estimates should only be applied to populations <75 for walking and <65 for cycling, yet these older populations would still benefit from increased levels of activity.

#### Burden of disease and disease specific impact

The most obvious benefits of physical activity to health are the reductions in risk of obesity, cardiovascular disease and some cancers. In 2009, the Annual Report of the Chief Medical Officer<sup>9</sup> summarised the impact of becoming more active on several key diseases (Figure 1).

**Figure 1: Summary of impact of physical activity on the risk of common disease**

Disease	Effect of physical activity
Coronary heart disease	Moving to moderate activity could reduce risk by 10%
Stroke	Moderately active individuals have a 20% lower risk of stroke incidence or mortality
Type 2 diabetes	Active individuals have a 33–50% lower risk
Colon cancer	The most active individuals have a 40–50% lower risk
Breast cancer	More active women have a 30% lower risk
Osteoporosis	Being physically active reduces the risk of later hip fracture by up to 50%

Sources: Chief Medical Officer's report on physical activity and a range of published studies – full references listed at the end of this Report

Source: Department of Health, On the State of Public Health: Annual Report of the Chief Medical Officer England (2009)<sup>9</sup>

**Obesity:** There is increasing evidence of the link between adult obesity levels and travel behaviour, one indicator of which is that countries with the highest levels of active travel generally have the lowest obesity rates<sup>10</sup>.

**Cardiovascular disease (CVD):** A systematic review by Hamer and Chida (2008)<sup>11</sup> concluded that active commuting conferred around a 10% reduction in risk of cardiovascular outcomes in studies with 5-20 year follow-up periods.

**Diabetes:** People who are at least moderately active have a 30% to 40% lower risk of Type 2 diabetes<sup>12</sup>. Pucher et al (2010)<sup>13</sup> found that the higher the proportion of adults who walked or cycled to work, the lower the prevalence of diabetes.

*Health gains of higher walking and cycling are greatest for ischaemic heart disease, stroke and dementia*

**Mental ill health:** Regular physical activity reduces the risk of depression and has positive benefits for mental health including reduced anxiety, and enhanced mood and self-esteem<sup>14</sup>. Physical activity may improve at least some aspects of cognitive function that are important for tasks of daily living, and is also associated with a reduced risk of developing problems of cognitive impairment in old age<sup>15</sup>.

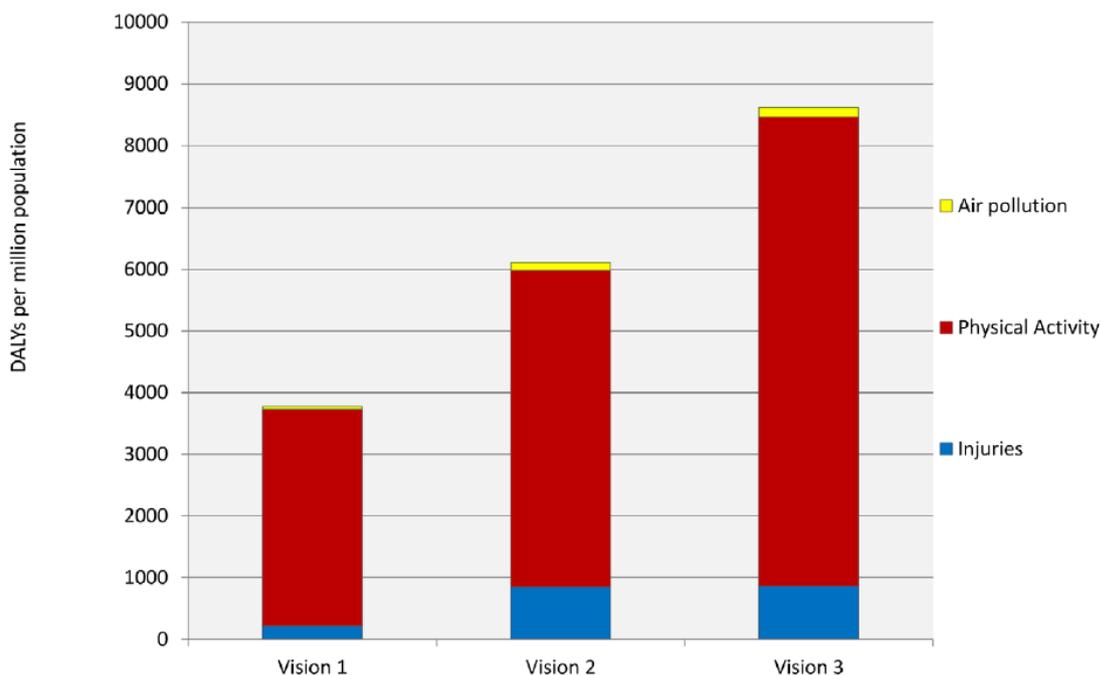
**Musculoskeletal health:** A physically active lifestyle offers benefits in a number of areas – improved bone and muscle strength, reduced risk of falls and fractures, protection against osteoarthritis and pain relief for those who do suffer the condition. The risk of hip fracture is lower in active people, reduced by up to 68% at the highest level of physical activity<sup>12</sup>. Various levels of walking are linked to a risk reduction of osteoarthritis ranging from 22% to 83%<sup>12</sup>.

The Integrated Transport and Health Impact Modelling Tool (ITHIM)<sup>16</sup> is more inclusive than the HEAT tool, estimating the impact of walking and cycling on the overall burden of disease expressed using disability adjusted life years (DALYs) which combine the number of years lost due to ill health, disability or early death.

The ITHIM tool incorporates the impact of physical activity on Type 2 diabetes, cardiovascular disease, breast cancer, colon cancer, dementia and depression<sup>16</sup>. The model was used to evaluate the health and environmental impacts of high walking and cycling transport scenarios for English and Welsh areas outside of London. Changes to baseline walking and cycling levels (individual mean walking time 12.5 minutes/day, cycling time 0.9 minutes/day) were estimated for similar levels as those seen in Dutch cities (Vision 1, mean walking time 14.1 minutes/day and cycling 6.4 minutes/day). Vision 2 and 3 assume even higher levels of walking and cycling and much greater use of public transport.

Health gains are mainly seen due to physical activity (Figure 2) with the greatest effect seen on ischaemic heart disease, stroke and dementia (Table 2). There is also a reduction in the health impact of air pollution due to fewer vehicles on the roads. Perhaps surprisingly, in these models, there is also a reduction in traffic injuries mainly due to the potential reduction in traffic speed associated with the traffic calming and speed controls associated with the visions<sup>16</sup>.

**Figure 2: Health gain for three modelled visions where there are high levels of walking and cycling. Vision 1 is similar to levels of walking and cycling in Dutch cities**



**Figure 3. Health gains by Vision and risk factor.** Disability Adjusted Life Years gained per million population under each of the three visions, broken down into the proportions attributable to improvements from air quality, increased physical activity and decreased road injuries. See Table 7 for full results.  
doi:10.1371/journal.pone.0051462.g003

Source: Woodcock 2013<sup>16</sup>

**Table 2: Health gains by disease category for three modelled visions of high cycling level. Vision 1 is similar to levels of walking and cycling in Dutch cities**

**Table 8.** Health gains by disease category.

Vision		Ischemic heart disease	Stroke	Dementia	Injuries	Diabetes	Depression	Breast cancer	Colon cancer	Hypertensive heart disease	Lung cancer	Respiratory diseases	Inflammatory heart disease
1	DALYs per million population	-1470	-758	-610	-228	-310	-154	-80	-99	-48	-10	-7	-1
	% of disease burden	-7.6%	-7.0%	-5.3%	-15.6%	-7.2%	-2.0%	-1.8%	-2.2%	-7.1%	-0.2%	0.0%	-0.1%
2	DALYs per million population	-2089	-1120	-954	-855	-439	-248	-120	-161	-70	-28	-19	-2
	% of disease burden	-10.8%	-10.3%	-8.3%	-58.5%	-10.2%	-3.3%	-2.7%	-3.6%	-10.4%	-0.4%	-0.1%	-0.2%
3	DALYs per million population	-2998	-1637	-1432	-867	-629	-451	-183	-246	-103	-34	-23	-3
	% of disease burden	-15.6%	-15.1%	-12.5%	-59.3%	-14.6%	-5.9%	-4.2%	-5.5%	-15.2%	-0.5%	-0.1%	-0.3%

doi:10.1371/journal.pone.0051462.t008

Source: Woodcock 2013

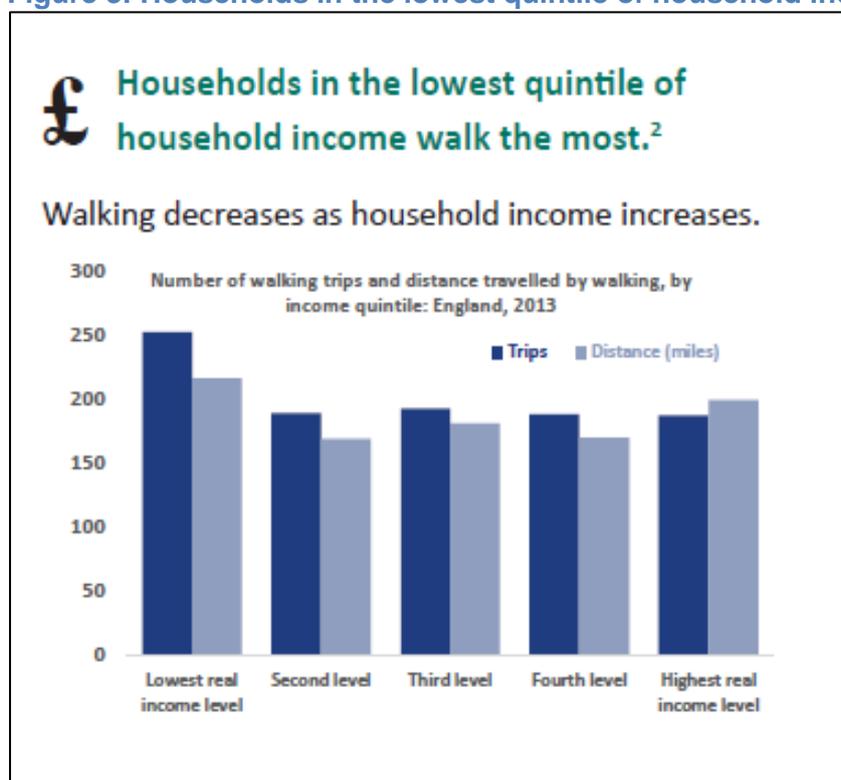
### Groups that benefit the most

**Those that are most inactive:** evidence shows that the most significant health and clinical benefits are gained by an inactive person currently doing no physical activity starting to do even a little, though the precise curve of the relationship is uncertain<sup>16</sup>. The risk of a range of chronic conditions is cut even when this new activity falls short of the CMO's guidelines<sup>12</sup>.

**Those living in areas of high deprivation:** areas with higher levels of deprivation tend to have lower levels of general physical activity<sup>17</sup>. Cycling proficiency is also linked to where people live, with those in more deprived neighbourhoods less likely to report being able to cycle<sup>18</sup>. It is, therefore, important that opportunities to be physically active are provided in disadvantaged areas which are safe and free or low cost<sup>19</sup>.

However, it is worth noting that those households in the lowest quintile for income walk the most, perhaps due to the lower access to more expensive forms of travel such as a car (Figure 3).

**Figure 3: Households in the lowest quintile of household income walk the most**



Source: National Travel Survey, 2013 (DfT)<sup>20</sup>

**Groups without a culture of active transport:** white adults are more likely than those from black and minority ethnic groups to say that they can cycle<sup>21</sup>.

**Older people:** walking levels tend to decrease in older age groups (Figure 4) with levels falling after the age of 40. Increased activity amongst this group has the most immediate benefits in terms of health and well-being, as well as aiding healthy ageing, lessening the risk of trips and falls, and increases the likelihood of independent living, bringing potential benefits to the NHS and social care provision.

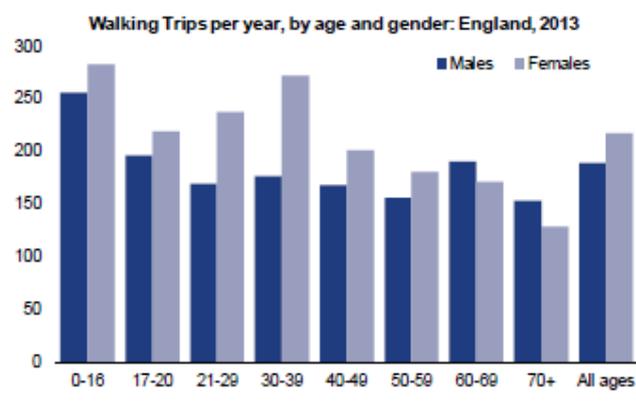
Engaging in physical activity carries very low health and safety risks for most older adults<sup>22</sup>. In contrast, the risk of poor health as a result of inactivity is very high<sup>23</sup>.

**Figure 4: Who does the most walking?**

### Who does the most walking?



**0-16 year olds make the most walking trips. When all ages are combined, females make more walking trips than males.<sup>2</sup>**



Source: National Travel Survey, 2013 (DfT)<sup>20</sup>

## 2.3 What factors affect walking and cycling levels?

Travel choice is influenced by both an individual's behaviour and the environment they live in, with home location often limiting available travel choices.

### 2.3.1 Environmental factors

A systematic review found that the distance was the most consistent environmental influence on walking behaviour<sup>24</sup> with a similar effect of distance seen for cycling<sup>25</sup>.

A systematic review suggested that compact neighbourhoods with easy access to local shops, services, and public transit stops via sidewalks and better street connectivity would help adult residents walk more for transport<sup>26</sup>. This has been echoed in recent research where walking for transport was associated with a supportive infrastructure, availability of local amenities and general environment quality whereas cycling for transport was associated with street connectivity<sup>27</sup>. A Cambridge-specific study showed that convenient cycle routes were found to predict uptake of cycling whilst pleasant routes predicted maintenance of walking to work<sup>28</sup>.

*A Cambridge study found that convenient cycle routes predicted uptake of cycling and pleasant routes predicted maintenance of walking to work*

It is worth noting that studies of these specific environmental factors have found somewhat inconsistent patterns of associations<sup>34, 35</sup>. Importantly, many of these environmental factors are related to the distance required to travel: for example, street layouts with high connectivity allow for more direct routes and, therefore, shorter distances between destinations.

Van Dyck et al (2012)<sup>29</sup> produced a 'cyclability' index which examined environmental factors such as: proximity to destinations, good cycling facilities, perceiving difficulties in parking near local shopping

areas, and perceived aesthetics on transport-related cycling across metropolitan areas in the USA, Australia and Belgium. The study found a consistent, positive correlation between transport-related cycling and the cyclability index with an increase of approximately 11% in transport-related cycling per unit increase.

However, studies carried out in The Netherlands, which has a well-established cycling infrastructure, found that non-cyclists did not see the environment as an important facilitator<sup>30</sup>. For example, traffic variables in route to work and estimated time to destination were not predictive of cycling to work. Perceived barriers for this group were mainly personal, suggesting that individual determinants outperform the role of environmental factors in areas with an established cycling infrastructure.

*A combination of distance and individual characteristics such as age, gender and access to a car are consistently the most important influences on walking and cycling)*

Much of this evidence is generalisable to Cambridge. In the Commuting and Health in a Cambridge Study<sup>31</sup> carried out by CEDAR, it was found that workplace car parking provision was a strong and consistent predictor of increased likelihood of unimodal car commuting<sup>32</sup> and decreased likelihood of incorporating walking or cycling into a longer car commuting journey and walking or cycling the entire journey (Panter 2011). People who reported it was pleasant to walk and convenient to cycle were more likely to report walking and cycling respectively<sup>28</sup>. Importantly, it was also found that those who perceived there were more convenient cycle paths and public transport were more likely to take up alternatives to the car and those who thought the opposite reported an increase in the number of car commuting trips<sup>28</sup>.

### 2.3.2 Individual characteristics and behaviours

Individual characteristics are also consistently associated with walking and cycling. Men are more likely to cycle and women are more likely to walk, and the likelihood of walking and (especially) cycling decreases with age<sup>33</sup>. However, in societies such as The Netherlands where cycling is common, there are few differences in cycling prevalence by age or gender<sup>34</sup>. People without access to a car also tend to spend more time walking and cycling<sup>35</sup>.

There is a socio-economic association with uptake of transport to work. Studies in inner Cambridge (higher levels of education than the rest of Cambridgeshire) and Hackney (inner London with high levels of deprivation and poor education) found those partaking in active transport were more educated than those using cars. Furthermore, ecological and economic awareness (knowledge that cycling is cheaper and better for the environment) seems to play an important role in predicting cycling whereas lack of interest was an important reason why participants are less likely to cycle for transport<sup>36,37,38</sup>.

Research looking into reasons people actively commute despite unfavourable conditions, highlighted the importance of behavioural factors such as finding strategies for coping with unsupportive conditions, knowledge of the locality and opportunities for alternative routes. Cycling experience and acquired confidence to cycle in heavy traffic seemed a predictor of maintenance of cycling in this subset of population. Other personal factors, which were relevant, included childcare arrangements, enjoyment and having more control over their journey time<sup>39</sup>.

A key finding by Ogilvie et al (2007)<sup>40</sup> was that interventions to promote walking which were tailored to individuals or households were more effective than non-personalised methods targeted to a larger population. This was even more prominent in areas with established infrastructure promoting the uptake of exercise.

As with environmental factors, the evidence concerning the importance of individual attitudes, perceived benefits, and social and cultural norms for walking and cycling is mixed. Many studies of these factors have used different techniques for assessing behaviours and their influences, which may explain conflicting findings and the difficulty in summarising their conclusions.

### **2.3.3 Safety and perception of safety**

Safety is relevant to the uptake of active transport. The safety of cycling routes and perceived safety of walking/cycling routes have been positively associated with the uptake of active transport, especially in the provision of children cycling to school. In particular, vehicle speed and its effect on perceived safety of walking/cycling routes have been investigated. The review of evidence for the National Institute for Health and Clinical Excellence (NICE) guidance on the built environment and physical activity suggests that traffic calming can lead to small self-reported and observed increases in walking and cycling both in the short and long term<sup>41</sup>.

British roads are now among the safest in the world, but cyclists and pedestrians remain particularly vulnerable road users. Aside from the effect that casualties have on individuals and their families, pedestrian and cyclist casualties are a significant burden on local health services. Furthermore, safety concerns are often cited as a reason why people do not cycle or, for example, allow children to walk to school meaning that they are missing the opportunity to do more physical activity and improve their health.

An Australian commissioned report on promoting safe walking and cycling by reducing traffic speed produced the pathway below (**Figure 5**), which illustrates the proposed relationships between vehicle speed and active travel<sup>42</sup>.

**Figure 5: Relationships between vehicle speed and active travel**<sup>42</sup>

This model proposes that reduced vehicle speed leads to overall increases in active travel (pathway 1) via reductions in actual and perceived risk of injuries and improved community facilities (pathways 2, 3, 4). Pathway 3 proposes that reduced speed will lower the risk of injury to pedestrians and cyclists, resulting in increased active travel behaviour. Pathway 4 proposes that perceived and actual safety contributes to increased active travel.

In contrast to the findings described above, evaluation of the impacts of construction of 20 mph (32 km/hr) zones in six towns in northern England, which were enforced using a range of engineering measures, found that overall; 20 mph zones had virtually no impact on walking and cycling patterns or street activity<sup>43</sup>. However, local residents were overwhelmingly in favour of the 20 mph zones, some residents stated that they would be willing to cycle or walk more, and there was an increase in the number of parents who said they were willing to allow their children to play in the streets.

Therefore, although 20 mph zones play a role in reducing traffic accidents,<sup>44</sup> there is less clear evidence regarding their impact on cycling and walking levels.

### 2.3.4 Commute of children to school

Whether children actively commute to school may be determined by parents' perception of safety of the mode of transport, lack of time in the morning and social factors such as no other children to walk with<sup>45</sup>.

Furthermore 'walk to school' interventions involving educational lessons and goal setting tasks aimed at eight to nine year olds have not shown to increase walking to school<sup>46</sup>, highlighting the importance in influencing parents' behaviour and perceptions.

**In summary, research indicates that the combination of distance and individual characteristics such as age, gender and access to a car are the most important consistent influences on walking and cycling behaviour.**

## 2.4 What are the key national policies on active transport

There are many policies that directly examine active transport as well as those that encourage physical activity. These are summarised in the Appendix. However, there are key policies that provide support for encouraging greater active transport in the population

### 2.4.1 NICE guidance

The National Institute for Clinical Excellence (NICE) provides Public Health guidance aimed at preventing disease and improving the health of the population. This guidance is aimed at Public Health practitioners, others with a role in Public Health in the NHS, local authority and the wider public, voluntary, community and private sectors.

#### **Walking and Cycling Briefing (LGB8, NICE, 2013)<sup>47</sup>**

This briefing, endorsed by the Department for Transport (DT), summarises NICE's recommendations for local authorities and partner organisations on walking and cycling. It is relevant to many areas of local authority work, including the development of local plans, core strategies and joint health and wellbeing strategies, including several areas highlighted in the Public Health Outcomes Framework. Among the key actions are:

- Ensuring there is a network of paths for walking and cycling between places locally.
- Reducing road danger and perception of danger.
- Ensuring other policies support walking and cycling.
- Using local data, communication and evaluation to develop programmes.
- Including practical support, information about options (including public transport links to support longer journeys), routes, cycle parking and individual support.
- Focus on key settings.

The guidance emphasises the importance of the needs of particular populations such as those with physical disabilities, frail older people and parents or carers with small children, as well as the importance of encouraging walking and cycling to school.

#### **Promoting and creating built or natural environments that encourage and support physical activity, (NICE, 2008)<sup>48</sup>**

NICE have produce Public Health guidance on the promotion and creation of physical environments that support increased levels of physical activity. The guidance is for NHS and other professionals who have a direct or indirect role in – and responsibility for – the built or natural environment. This includes those working in local authorities and the education, community, voluntary and private sectors. Its recommendations include many that are specific to walking and cycling:

- Involve all local communities and experts at all stages of the development to ensure the potential for physical activity is maximised.
- Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads.
- Plan and provide a comprehensive network of routes for walking, cycling and using other modes of transport involving physical activity.

- Ensure public open spaces and public paths can be reached on foot, by bicycle and using other modes of transport involving physical activity. They should also be accessible by public transport.
- Ensure public open spaces and public paths are maintained to a high standard. They should be safe, attractive and welcoming to everyone.
- Those involved with campus sites, including hospitals and universities, should ensure different parts of the site are linked by appropriate walking and cycling routes.
- Ensure new workplaces are linked to walking and cycling networks.

#### 2.4.2 Department for Transport guidance

The Department for Transport has recently released guidance aimed at increasing active transport.

##### **Investing in Cycling and Walking: the Economic Case for Action, March 2015<sup>49</sup>**

- Guidance aimed at summarising the economic evidence for active transport initiatives.
- Provides a methodology for demonstrating the economic case for a new cycling and walking proposal, with a step by step illustration.

##### **Cycling and Walking draft Delivery Plan (November 2014)<sup>2</sup> and Response (March 2015)**

- Sets out the UK Government's 10 year plan for encouraging walking and cycling.
- It includes an ambition to double cycling levels by 2025 and increase the percentage of school children aged five to 10 years walking to school to 55% by 2025.
- It is currently under consultation. It sets out the specific actions that need to be taken in order to achieve Government's vision. They are grouped into four broad themes; vision, leadership and ambition; funding; infrastructure and planning and safety and perceptions of safety.
- A recent consultation response has highlighted issues around specific funding, emphasis on walking and inclusion of population groups such as older people.

#### 2.4.3 Other National policies

Public Health England (PHE) is developing a national framework for the **Workplace Wellbeing Charter<sup>50</sup>**, a locally delivered award system to encourage employers to create a health enhancing workplace. Ways in which employers can promote staff physical activity include:

- Negotiating discount schemes to incentivise physical activity eg the cycle to work scheme.
- Providing cycle parking facilities; shower/changing facilities.
- Publicising the approved mileage for using cycles for business travel, and making it easier for employees to reclaim cycle hire costs used for business travel.

### 3 Local data: What do we know about levels of utilitarian active transport in Cambridgeshire?

#### 3.1 Getting to work

The 2011 Census survey<sup>51</sup> asked questions around peoples’ residence, place of work and travel to work method. These variables have been analysed to examine active transport patterns and differences across Cambridgeshire.

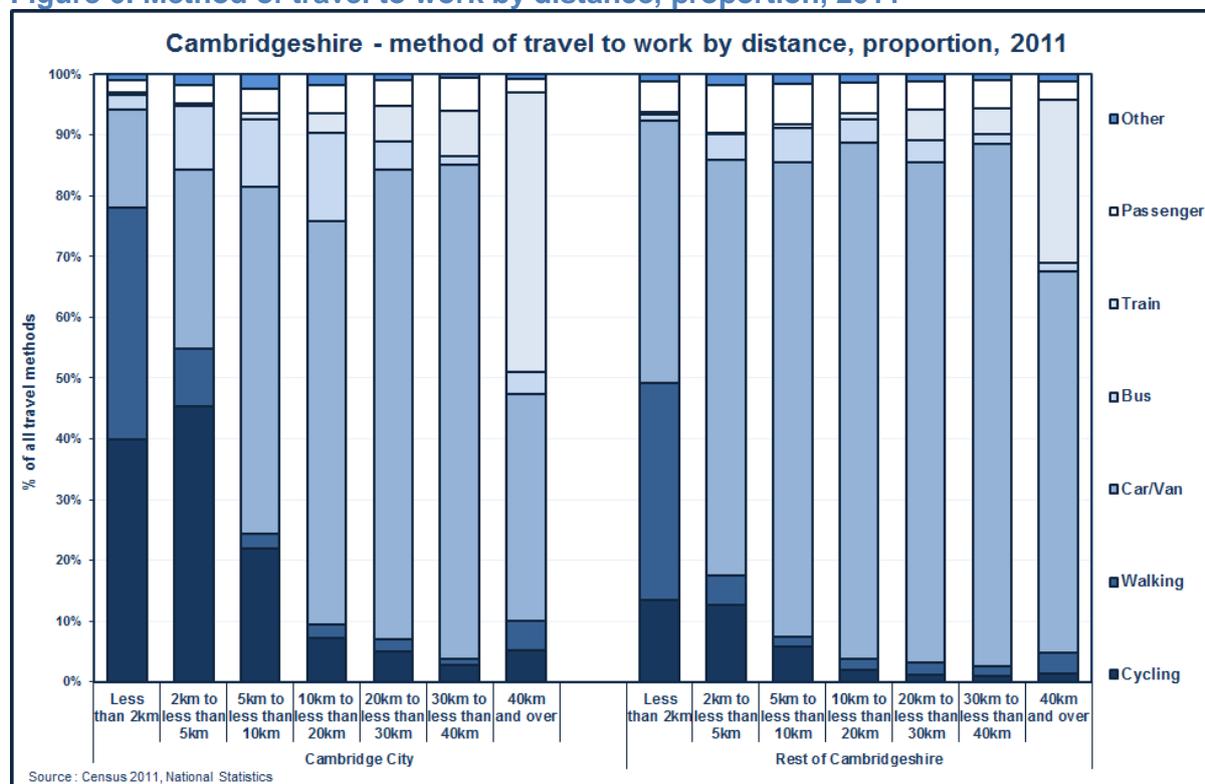
Cambridge City, due to its urban nature and transport infrastructure eg cycle paths, bus routes etc, has a noticeably different travel to work pattern than the rest of the county. For this reason, and as the other districts have a similar active transport pattern, the following analysis have been split into ‘Cambridge City’ and ‘Rest of Cambridgeshire’ ie East Cambridgeshire, Fenland, Huntingdonshire and South Cambridgeshire combined.

*Half of Cambridge City residents walk or cycle to work compared to 1 in 7 in the rest of Cambridgeshire (2011 Census Survey)*

##### 3.1.1 Distances travelled to work

In 2011, half of Cambridge City residents cycled or walked to work, compared to one in seven for the rest of the county. In general, the proportion of people who use active transport for work decreases with distance and most notably in those that walk, though cycling rates do not decline until the trip is longer than 5km (3.1 miles).

**Figure 6: Method of travel to work by distance, proportion, 2011**

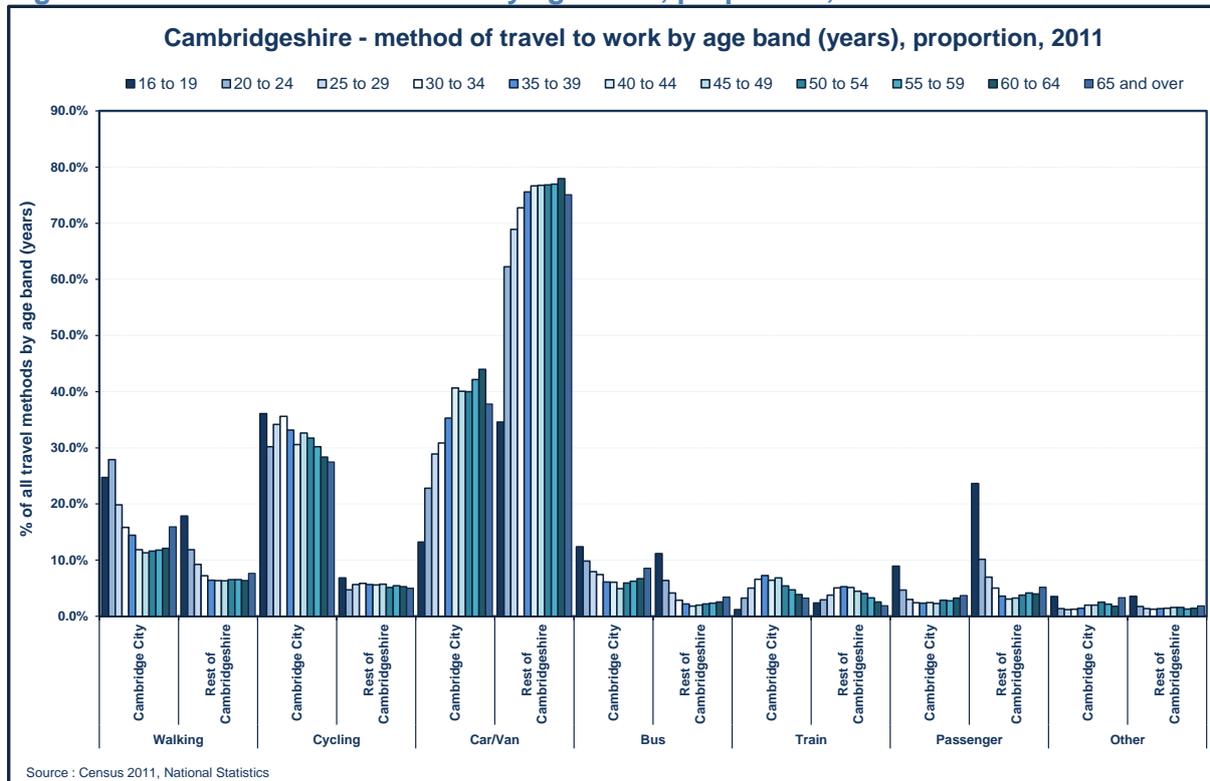


### 3.1.2 Impact of age and gender on walking and cycling in Cambridgeshire

The proportion of people that walk to work decreases with age although levels remain relatively constant after the age of 40 years. Cycling rates in Cambridge City are high up to a similar age, after which they begin to decline. However, cycling rates in the remainder of Cambridgeshire are fairly static across all age bands, with younger workers no more likely to cycle than older workers.

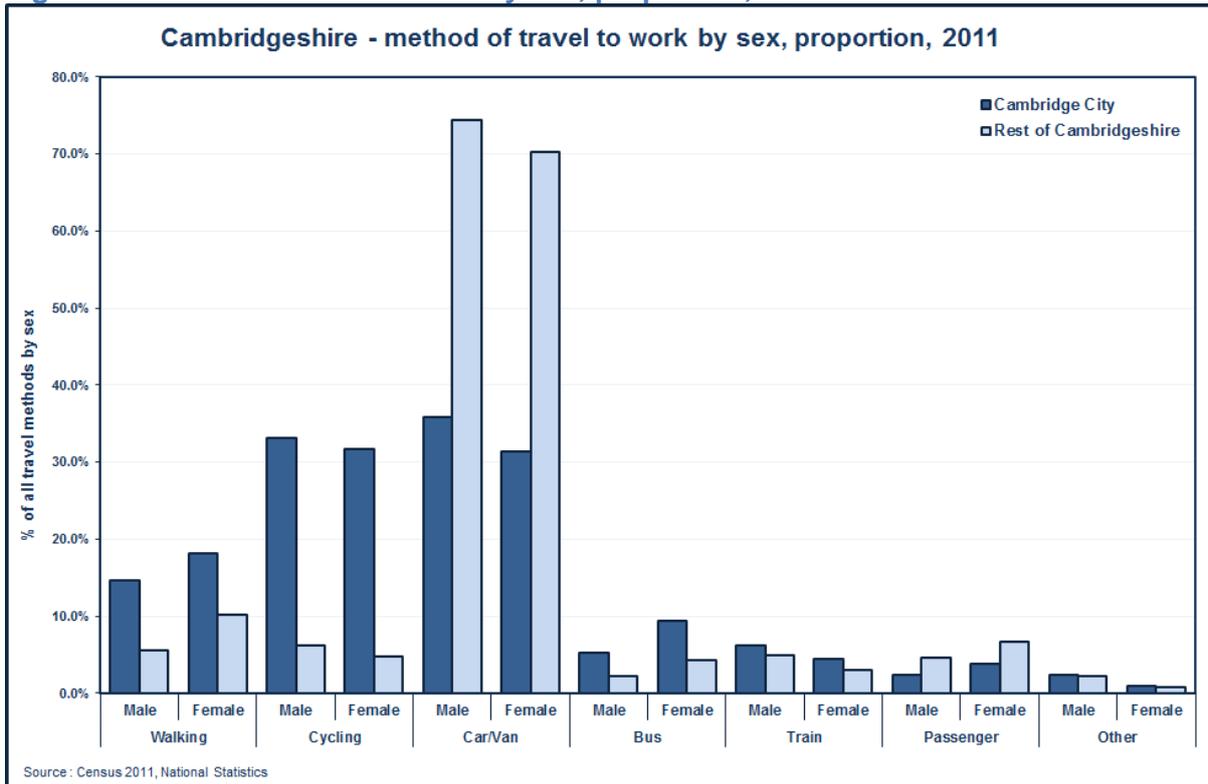
Car usage increases with age, with a notable increase between 16-19 years and 20-24 years, which ties in with the legal age limit for driving. Within the City bus usage decreases with age but increases again in people aged 50 years onwards. There is an apparent pattern of young people aged 16-19 years being passengers to get to work, and is most notable outside of Cambridge City. This is likely to be due to the rural nature of the majority of Cambridgeshire.

Figure 7: Method of travel to work by age band, proportion, 2011



Walking to work is higher in females than males across the county, with cycling being slightly higher in males than females. Women have higher bus usage and higher passenger proportions than males, most notably outside of Cambridge City.

Figure 8: Method of travel to work by sex, proportion, 2011



### 3.1.3 Short work trips eligible for modal shift

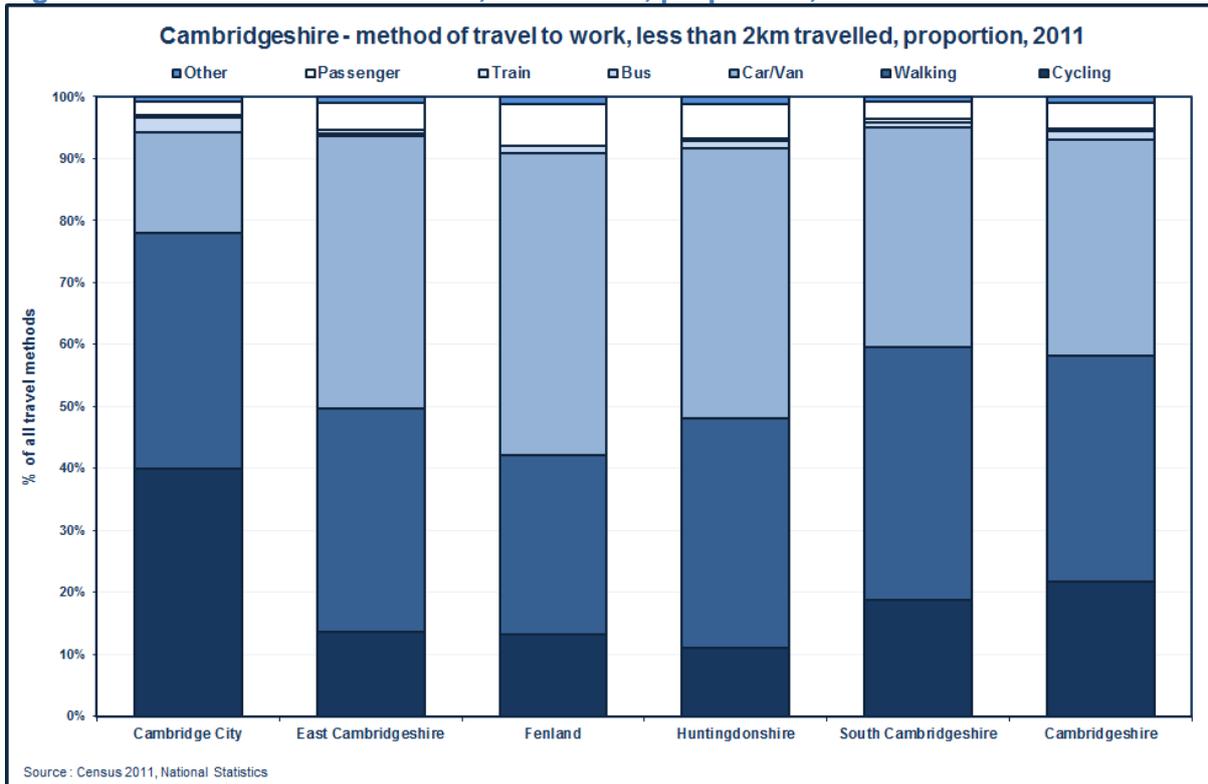
In order to identify areas that could be possible for modal shift from car to active transport ie walking or cycling it was decided to concentrate on journeys to work that were less than 2km (1.2 miles) from home.

The chart below shows that Fenland has the lowest proportion of people that use active transport to get to work within a distance of under 2km, with lower walking rates than most districts. Cycling rates are poorest in Huntingdonshire. Cambridge City has the highest active transport rate with nearly 80% of short work trips being walked or cycled. South Cambridgeshire has higher rates of both walking and cycling than the other non-city districts.

*Over half of very short work commutes are being driven in East Cambridgeshire, Fenland and Huntingdonshire.*

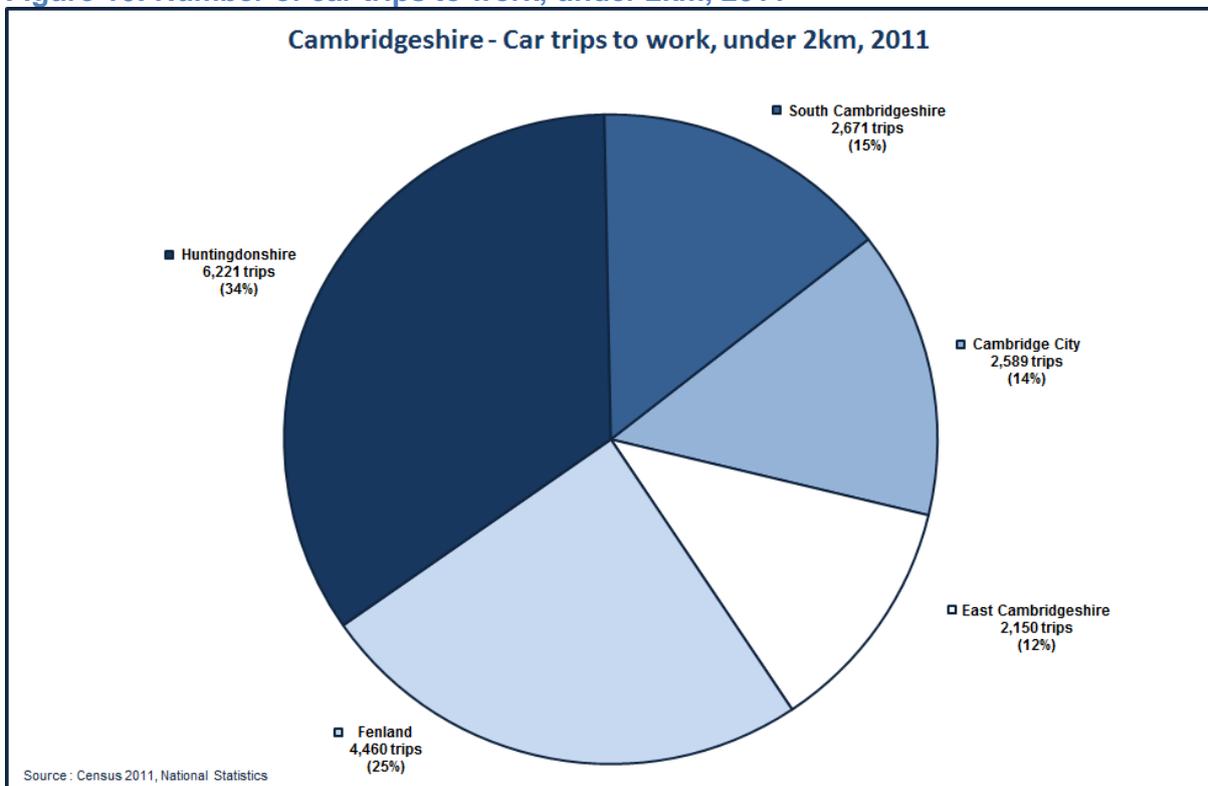
*There are over 18,000 car trips to work in Cambridgeshire that are shorter than 2km.*

Figure 9: Method of travel to work, under 2km, proportion, 2011



In 2011 there were just over 18,000 car trips to work that were within 2km of an employee’s usual residence, over a third of these were in Huntingdonshire, with a further quarter in Fenland.

Figure 10: Number of car trips to work, under 2km, 2011



### 3.1.4 Limitations of data source and methods

It is important to note that the 2011 Census is now relatively out of date in relation to local transport, as known transport initiatives, such as the guided busway and cycle routes have already been implemented and will have had an impact on travel choices. However, travel methods are less likely to have changed in rural areas.

It should also be noted that there are some 'oddities' in the data, such as there are a small proportion of people who responded that they worked 2km from home but travelled by underground. These will be people who live in Cambridgeshire, work in London but put the underground down as their main method of transport to work on their Census questionnaire. The numbers of people are relatively small and do not affect overall patterns for the county

### 3.1.5 Analysis of types of short work trips by the Centre of Diet and Activity Research (CEDAR)

The Centre for Diet and Activity Research (CEDAR) based in Cambridge have used micro-simulation on numerous variables from the 2011 Census to explore individual population level travel flows for Cambridge City and Fenland to Lower Super Output Area (LSOA).

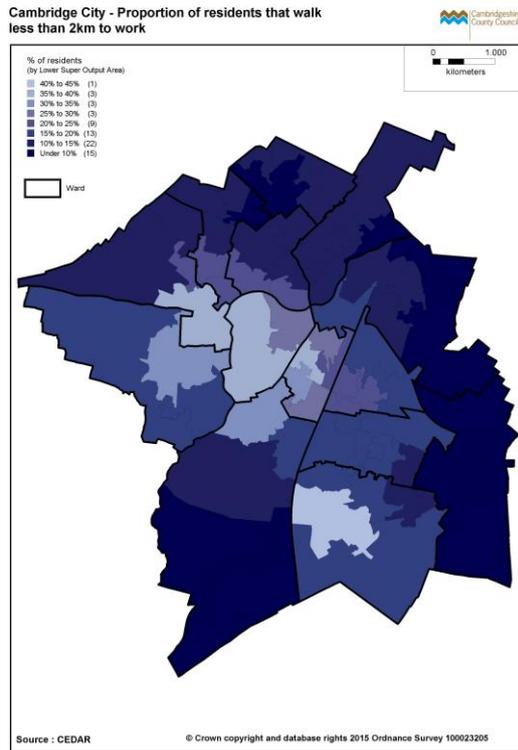
The following section examines the outputs from the micro-simulation within these two districts. The maps present the proportion (purple) of residents that walk, cycle or drive short trips to work (<2km/1.2 miles). Lighter colours represent a higher proportion carrying out beneficial activities eg more cycling, more walking, less driving.

Map 1 - Car numbers show the estimated numbers of short work car trips for each LSOA, darker colours indicating a higher numbers of trips. This provides an indicator of the potential number of trips that could be switched to walking or cycling.

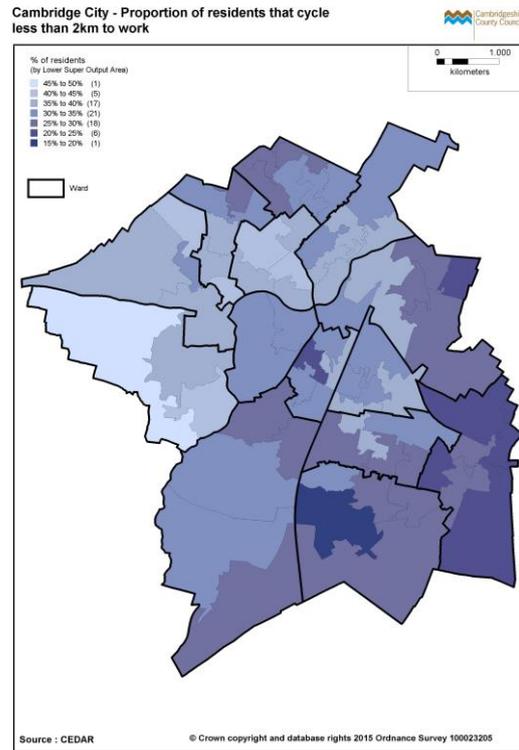
Data for the remaining districts within Cambridgeshire should be available from CEDAR later in the year.

**Map 1: Proportions of people that walk, cycle and use car for work within 2km, Cambridge City, 2011.**

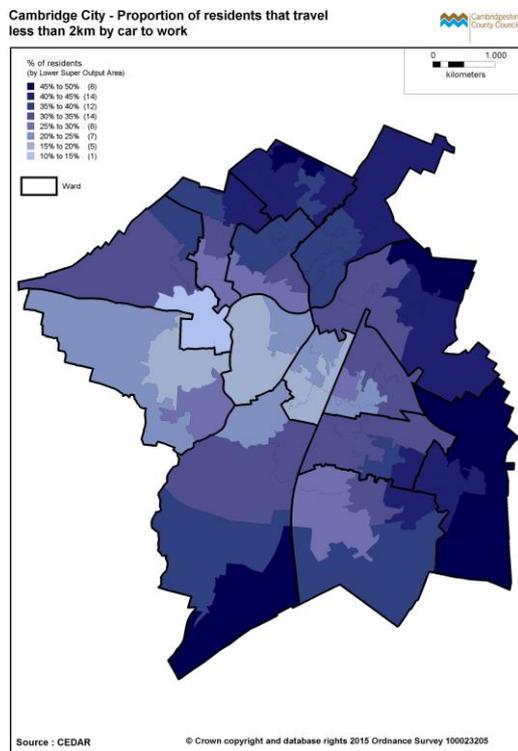
- Walking – proportion



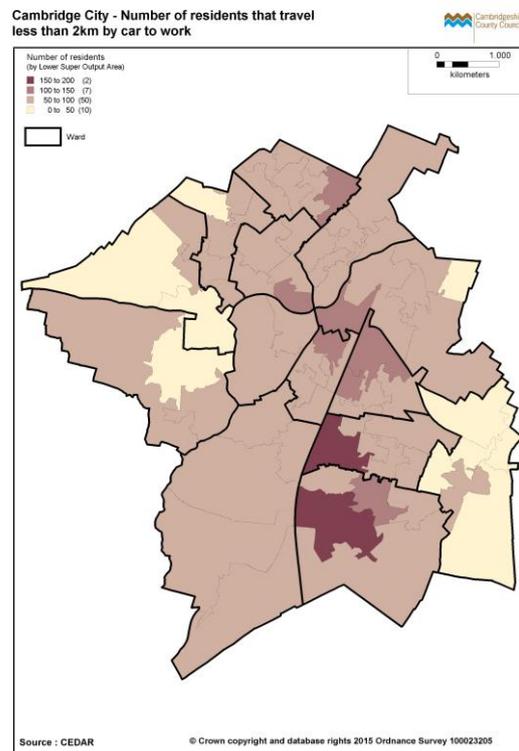
- Cycling – proportion



- Car – proportion



- Car – numbers



Source: Ullrich A and Woodcock J, CEDAR<sup>52</sup>

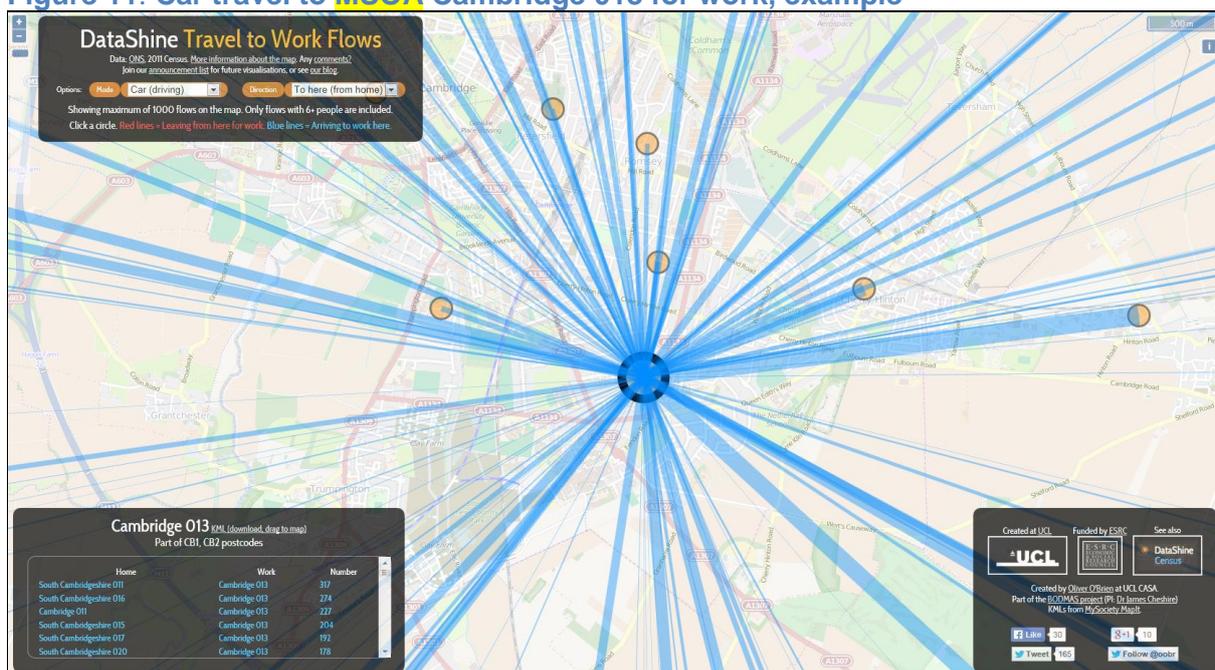
## Cambridge City

As can be seen in the maps above, people within the centre of Cambridge City are more likely to walk to work if it is within 2km than those on the outer edge of the City, despite the journey length being similar. People on the south/south-east side of the City have lower proportions of people that cycle less than 2km to work than those on the north-west.

The higher proportions of people who use their cars to get to work within 2km are greatest on the outer edge of the city, from the north to the south running clockwise. There are a couple of areas, namely within Queen Edith's and Coleridge, where it is estimated there are higher numbers of short distance car commuters. These are potential geographical areas that could be explored further for modal shift from car usage to active transport.

The following link allows users to examine transport flows into and out of an area by type of travel method – <https://commute.datashine.org.uk>. The example below shows the car travel inflows into MSOA Cambridge 013, where Cambridge University NHS Foundation Trust is located (Queen Edith's area). The thicker lines present greater numbers. As can be seen there are considerable numbers of car commuters travelling to MSOA 013 from within and around the City, noticeably Cherry Hinton and Fulbourn. A wider view of the data shows that there are high numbers of commuters to the area from Royston, Haverhill, Linton, Cambourne, Duxford etc.

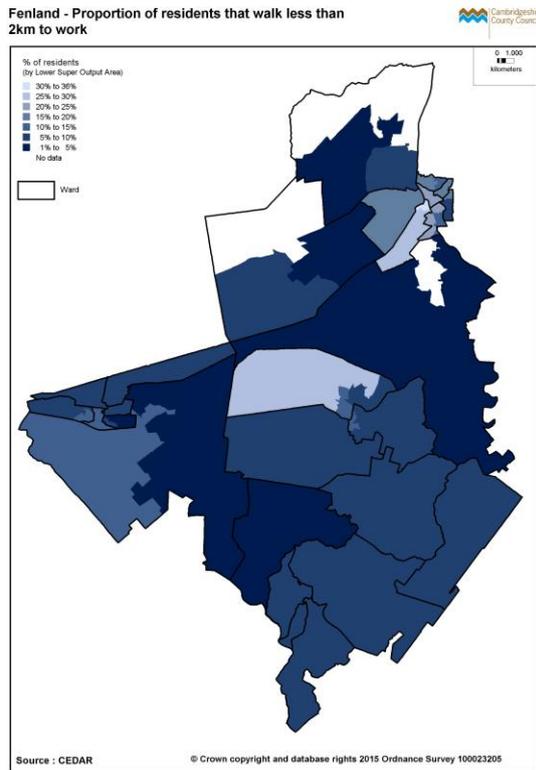
Figure 11: Car travel to MSOA Cambridge 013 for work, example



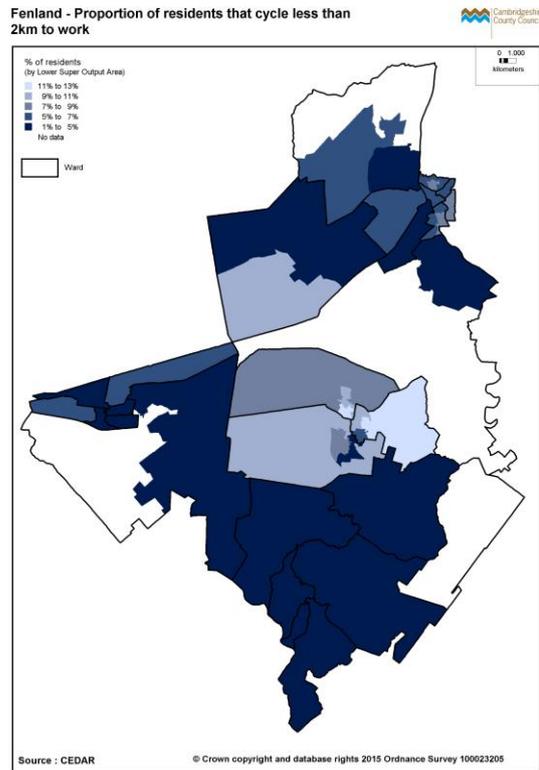
Source: DataShine

**Map 2: Proportions of people that walk, cycle and use car for work within 2km, Fenland, 2011.**

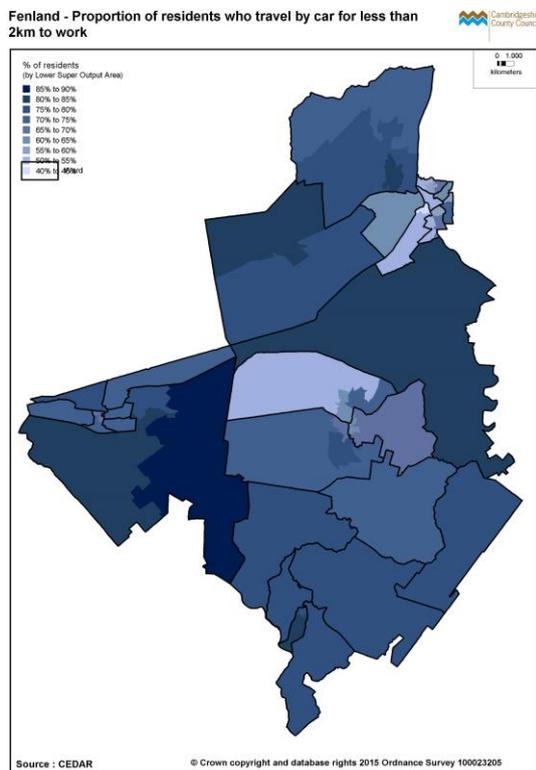
- Walking – proportion



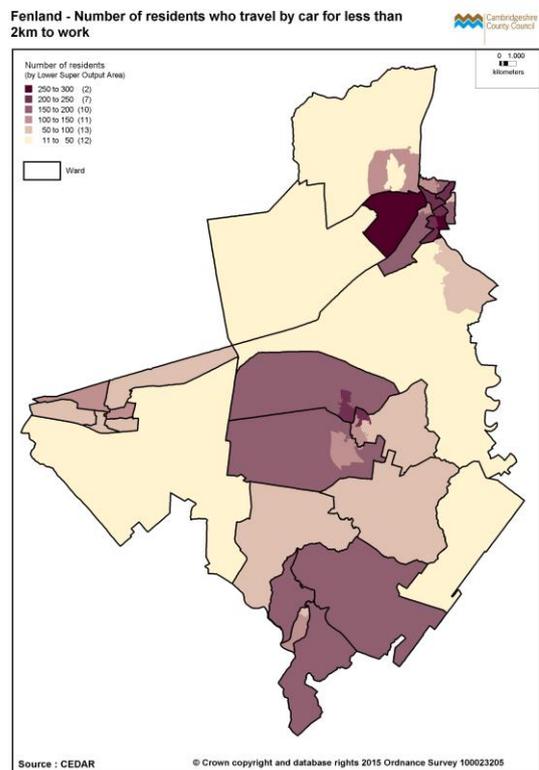
- Cycling – proportion



- Car – proportion



- Car – numbers



Source: Ullrich A and Woodcock J, CEDAR<sup>53</sup>

### **Fenland**

The proportion of people who walk or cycle to work within 2km of their home address varies greatly across the district and generally follows the pattern of rurality ie the proportion of those walking and cycling in and around Wisbech and March are better than in rural areas. However, the proportion of people walking or cycling short work trips is still very low in Wisbech and March, despite being a town setting where this is more possible.

The proportion of people who use their cars for short distance commuting is relatively high across the district, with higher actual numbers to the west of Wisbech.

## **3.2 Getting to school**

Until recently Cambridgeshire County Council collected data, as part of the National Indicator dataset, relating to pupils' travel method to school as part of the annual school census<sup>54</sup>. Methods of school census data collection have now changed but consistent data for 2007 to 2012 are available and help to establish a trend. In 2014, 59.5% of primary school children and 35.3% of secondary school children walked to school. Cycling rates are lower with 6.7% of primary and 15.5% of secondary school children cycling to school.

### **3.2.1 Mode of travel to primary school**

Overall, there has been an increase in the proportion of primary school aged children that walk to school and a slight increase in those that cycle. However, in 2012 over a quarter of primary school children were still driven to school, even though proportions have declined over the last few years.

### **3.2.2 Mode of travel to secondary school in Cambridgeshire**

Over a third of secondary students in Cambridgeshire walk to school, with approximately 15% cycling. There has been a general increase in the number of secondary students cycling to school with a corresponding decrease in car use, though 10-15% of trips to school are still by car.

There is an unexpected increase in walking and car use in 2012, with a corresponding decrease in 2013. This time period is also when more academies started submitting data, and so this may be why there are differences in data submission or transport policies.

Figure 12: Trend in method of travel to primary school

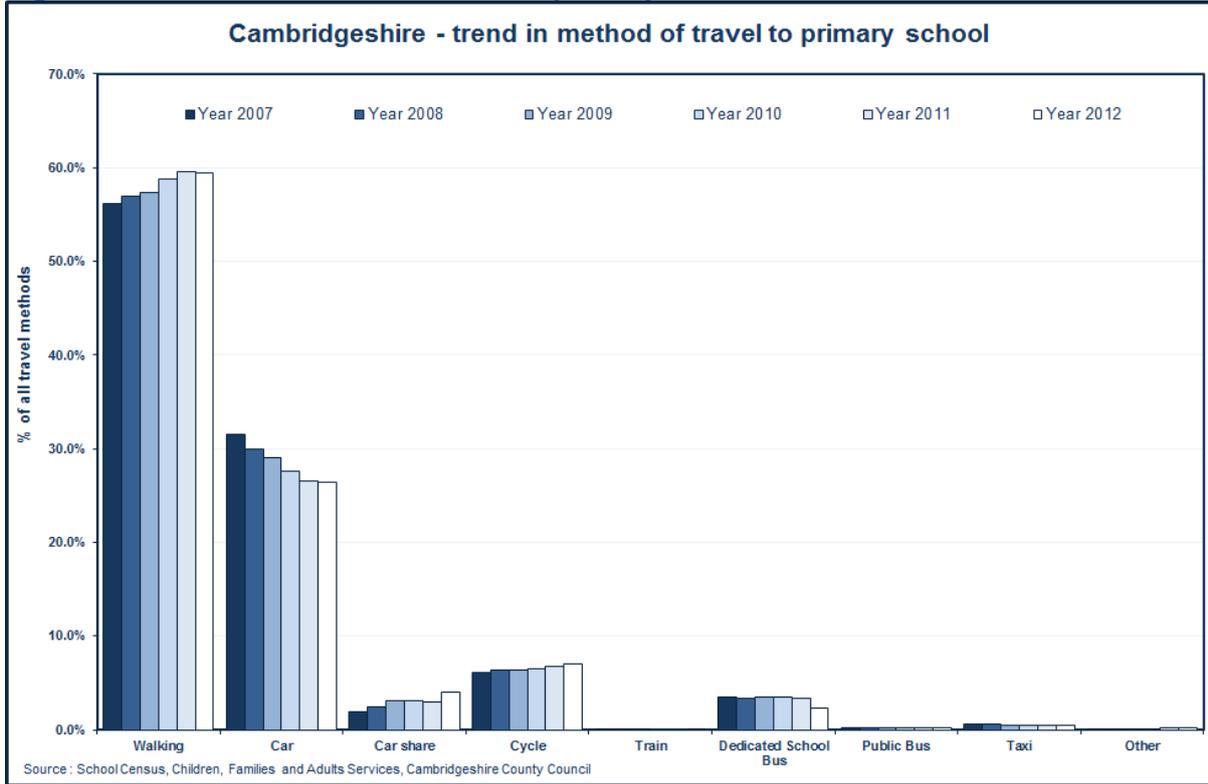
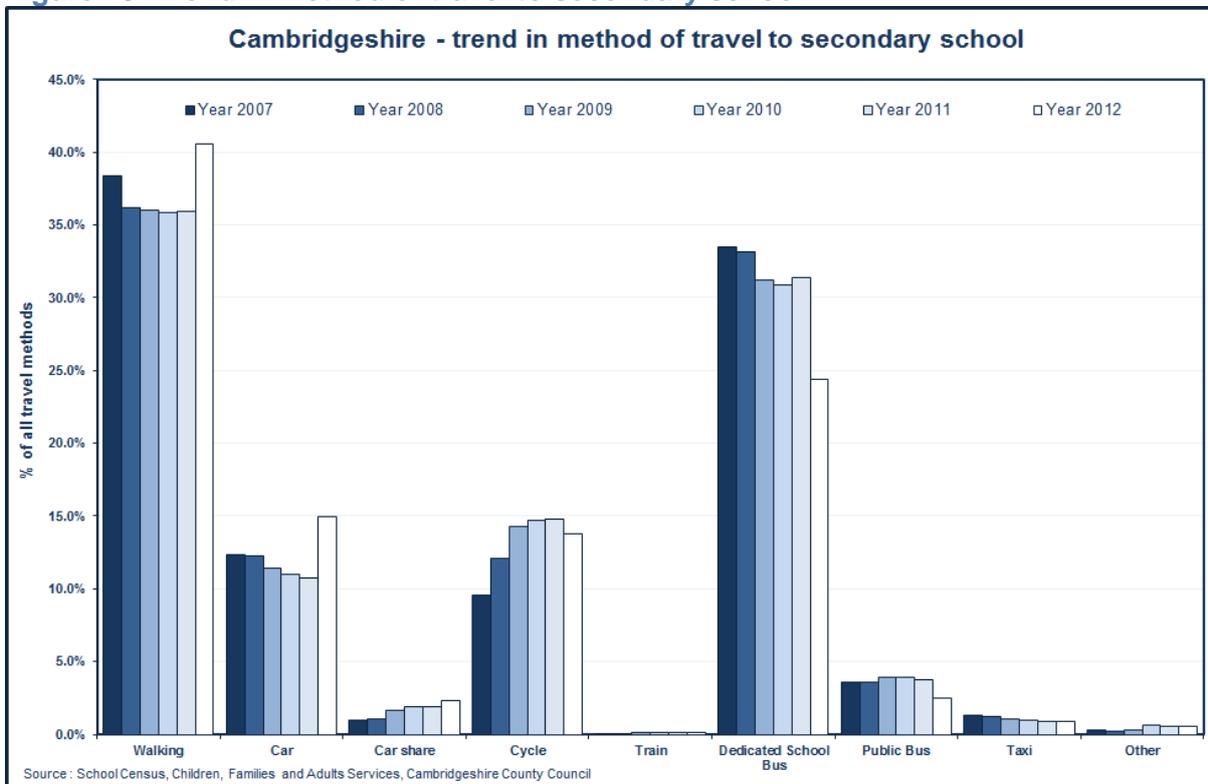


Figure 13: Trend in method of travel to secondary school



### 3.3 Other trips

The Active People Survey<sup>1</sup> measures the participation of adults in sport and recreation (16 and over) interviewed by a randomly sampled telephone questionnaire. Approximately 500 interviews are undertaken per district per year, which is relatively small and need to be taken into account when examining the tables below.

The Department of Transport produce annual walking and cycling statistics for both recreational and utilitarian purposes from the survey. This section presents data relating to utilitarian active transport, which is classed as using walking or cycling active transport to get from place to place, for example, commuting or going to the shops. The data therefore provides a wider viewpoint than the 2011 Census data on trips to work.

Cycling as a mode of transport to work is noticeably high in Cambridgeshire, especially within the City. At the time of the Census 2011, almost a fifth of adults in Cambridge City reported cycling to work (any distance).

The Active People Survey data shows that Cambridgeshire has a significantly high proportion of residents that cycle at least five times a week for non-recreational purposes compared to England (Table 3).

- Over a tenth of Cambridge City residents cycle five times a week for utility purposes, with nearly a quarter cycling at least three times per week.
- A fifth of Cambridgeshire residents cycle at least once a month for utility purposes, although this is heavily influenced by rates of cycling in Cambridge City. In non-City districts between 7.6% and 15.6% of residents cycle at least once a month for utility purposes.
- In this survey, East Cambridgeshire had the lowest rates of cycling for utility purposes.

The proportion of Cambridgeshire residents that walk for at least 10 minutes for utility purposes is similar to the England average, in terms of number of days completed per week. Cambridge City has noticeably high proportions of residents who walk once, three times and five times a week for utility purposes. All the other districts have lower proportions.

**Table 3: Proportion of residents who cycle (any length) for utility purposes by frequency, 2012/13**

District	Sample size	Cycle at least			
		1 x per month	1 x per week	3 x per week	5 x per week
Cambridge	498	52.6	36.8	24.5	10.9
East Cambridgeshire	498	7.6	3.4	0.9	0.2
Fenland	501	12.0	6.9	3.9	2.1
Huntingdonshire	500	9.7	7.0	3.0	1.2
South Cambridgeshire	501	15.6	9.1	5.4	2.1
Cambridgeshire	2,498	20.1	15.5	10.2	5.8
England	162,781	6.5	4.5	2.6	1.5

Source: Department of Transport, Active People Survey

**Table 4: Proportion of residents who walk (for at least 10 minutes) for utility purposes by frequency, 2012/13**

District	Sample size	Walk at least			
		1 x per month	1 x per week	3 x per week	5 x per week
Cambridge	480	75.4	62.7	39.7	27.9
East Cambridgeshire	488	49.1	37.8	25.0	17.0
Fenland	487	51.6	43.2	26.1	17.6
Huntingdonshire	490	55.0	43.4	28.2	17.6
South Cambridgeshire	487	57.2	48.7	28.1	18.5
Cambridgeshire	2,432	58.4	47.8	29.8	19.8
England	158,256	57.2	47.4	30.2	20.2

Source: Department of Transport, Active People Survey<sup>69</sup>

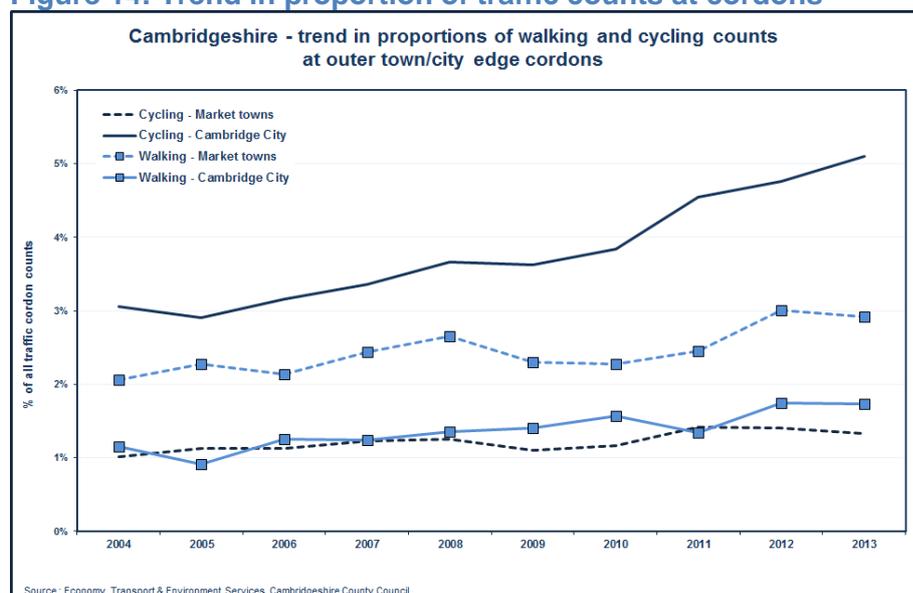
### 3.4 Trends over time from Cambridgeshire Traffic Cordons

Every year, around November time, traffic counts are undertaken in various cordon sites on the outer edges of Cambridge City and market towns across the county involving a count of the travellers passing the cordon point.

As can be seen in the chart below (Figure 14), the proportion of people who cycled through the cordons has increased year on year in Cambridgeshire, whilst there has also been a slight increase seen in the market towns. Walking has increased in both area types, and is noticeably higher in the market towns than in Cambridge City.

Some fluctuation in these numbers is expected, even if counted under identical conditions. Factors such as road works, weather and unusual events cause greater changes in travel patterns and so the data should be assessed for the full 10 years rather than placing reliance on the number for an individual year.

**Figure 14: Trend in proportion of traffic counts at cordons**



### 3.5 Road safety in Cambridgeshire

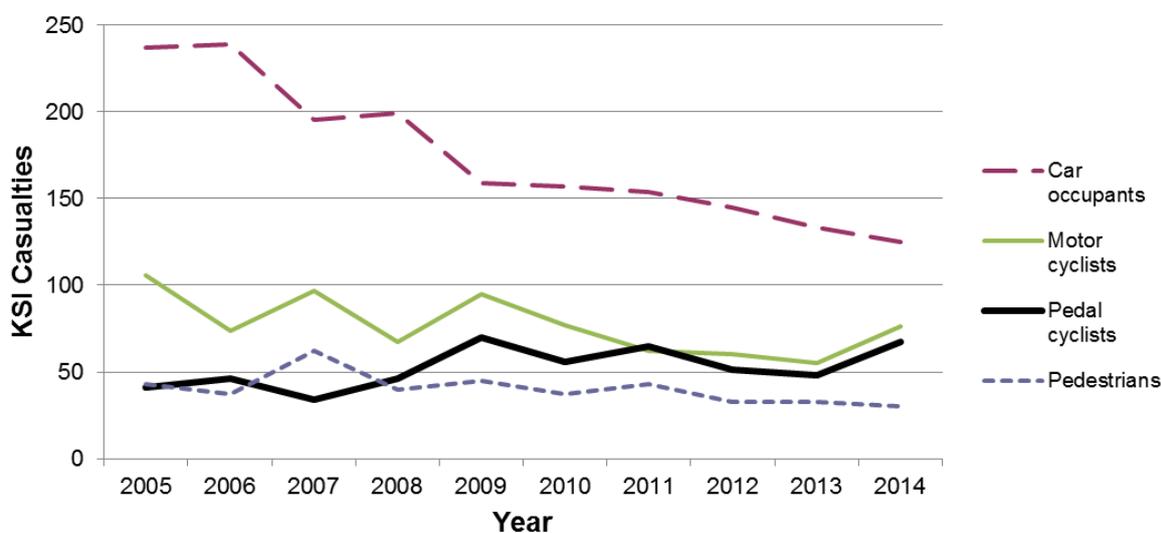
The Pedal, Cyclist and Motorcyclist Casualties Report<sup>55</sup>, presented to Cambridgeshire County Council Highways and Community Infrastructure Committee in March 2015, highlighted an increase in pedal cyclists and motorcyclists killed or seriously injured (KSI) casualties in 2014. It should be noted that road accidents are random events, and the figures can fluctuate from one year to the next, but, over the longer-term, pedal cyclists are the only category to exhibit an increase (Figure 15).

Data from Cambridgeshire County Council's 26 automatic pedal cycle traffic counters show an increase of 12% in the level of cycling in 2014 compared with 2013. This gives an estimated increase of just under 50% in cycling since 2004/05, compared with an increase of 31% in pedal cyclist KSI casualties over the same time period. These figures indicate that the risk to an individual cyclist has reduced over the past ten years, and that the increase in cyclist casualties is due to an increase in the number of cyclists.

The majority (83%) of pedal cyclist KSI casualties in Cambridgeshire occur on urban roads, with 50% of all pedal cyclist KSI casualties being on urban roads in Cambridge City. The number of pedal cyclists killed or seriously injured on rural roads is small, with an annual average of two across Cambridge and Fenland.

Most pedal cyclist fatal or serious casualties in Cambridgeshire (92%) are the result of collisions with motor vehicles.

**Figure 15: KSI Casualty Trends for Cambridgeshire: 2005 to 2014.**



Source: Economy, Transport & Environment Services, Cambridgeshire County Council<sup>55</sup>

## **4 Local views**

Local views were sought to further identify issues and needs in relation to active travel in particular market towns and surrounding areas in Cambridgeshire. Local views were explored in consultation with a representative group of stakeholders, both during one-to-one meetings and at stakeholder events; through analysis of local surveys and analysis of resident consultations informing local strategies.

### **4.1 Local issues identified during stakeholder engagement activities**

During the stakeholder workshops several local themes were identified in relation to walking and cycling.

#### **4.1.1 Main barriers to walking and cycling**

A number of consistent barriers to active travel were raised by stakeholders representing district and communities across Cambridgeshire. Main barriers were safety (and perception of safety); lighting; equitable access; cultural barriers and disability.

#### **4.1.2 Direct routes**

Many stakeholders emphasised that the routes employed for walking and cycling were often not the most direct route and often took longer and were less convenient. It was also noted that if routes offered options more direct than roads, that this would incentivise people to select active modes of travel and not use their cars.

#### **4.1.3 Intelligence and local data**

A lack of local information acted as a major barrier to planners and commissioners with regard to design and infrastructure. In addition, residents highlighted that local walkways and cycleways were often not known to them and information regarding routes and maps would further incentivise active travel.

#### **4.1.4 Sustainability and scalability**

A number of initiatives (particularly third sector) are not designed to promote sustainability, thus the potential of the initiative is short-lived and not realised. In addition, few schemes are followed up long enough to demonstrate true effects.

#### **4.1.5 Targeted interventions**

Stakeholders emphasised the need for more targeted interventions eg currently more men cycle than women.

#### **4.1.6 Incentives**

Opportunities for active travel incentives in collaboration with employers and industry have not been explored and could act as strong levers to support modal shift.

#### **4.1.7 Evaluation**

Appropriate and robust evaluation of interventions is needed, particularly with regard to potential health outcomes.

## 4.2 Local Surveys

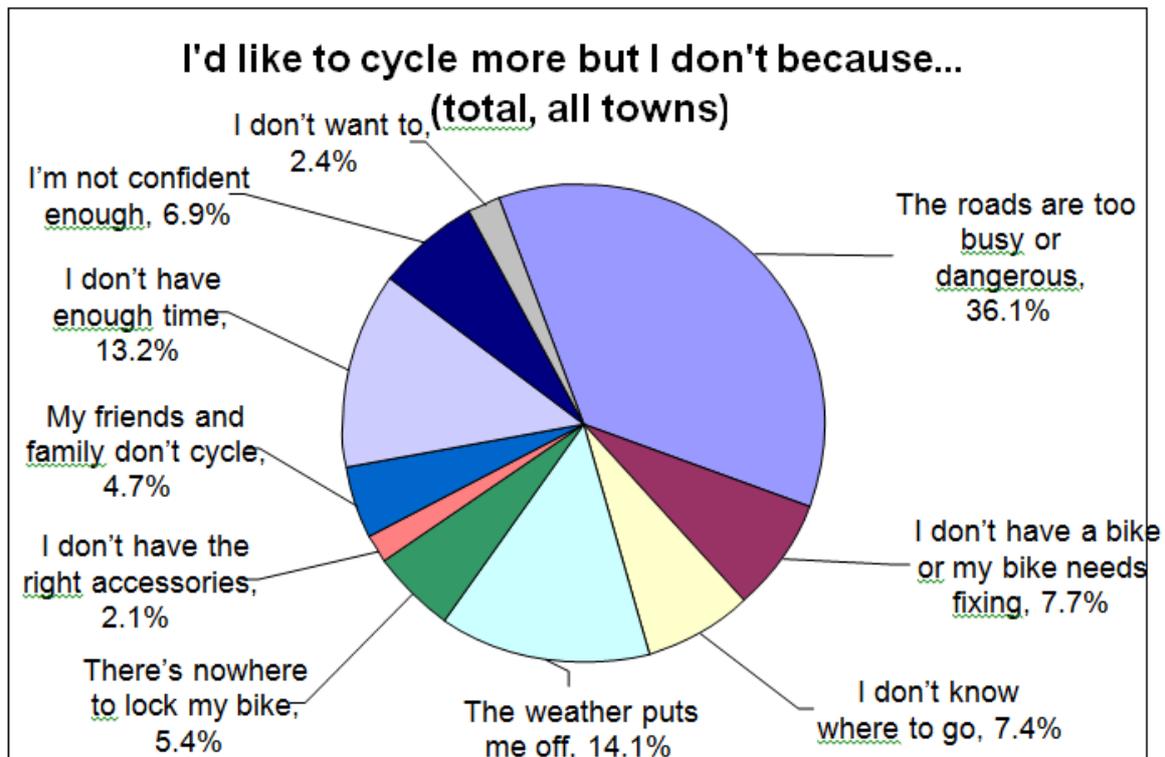
### Cambridgeshire Festival of Cycling 2013<sup>56</sup>

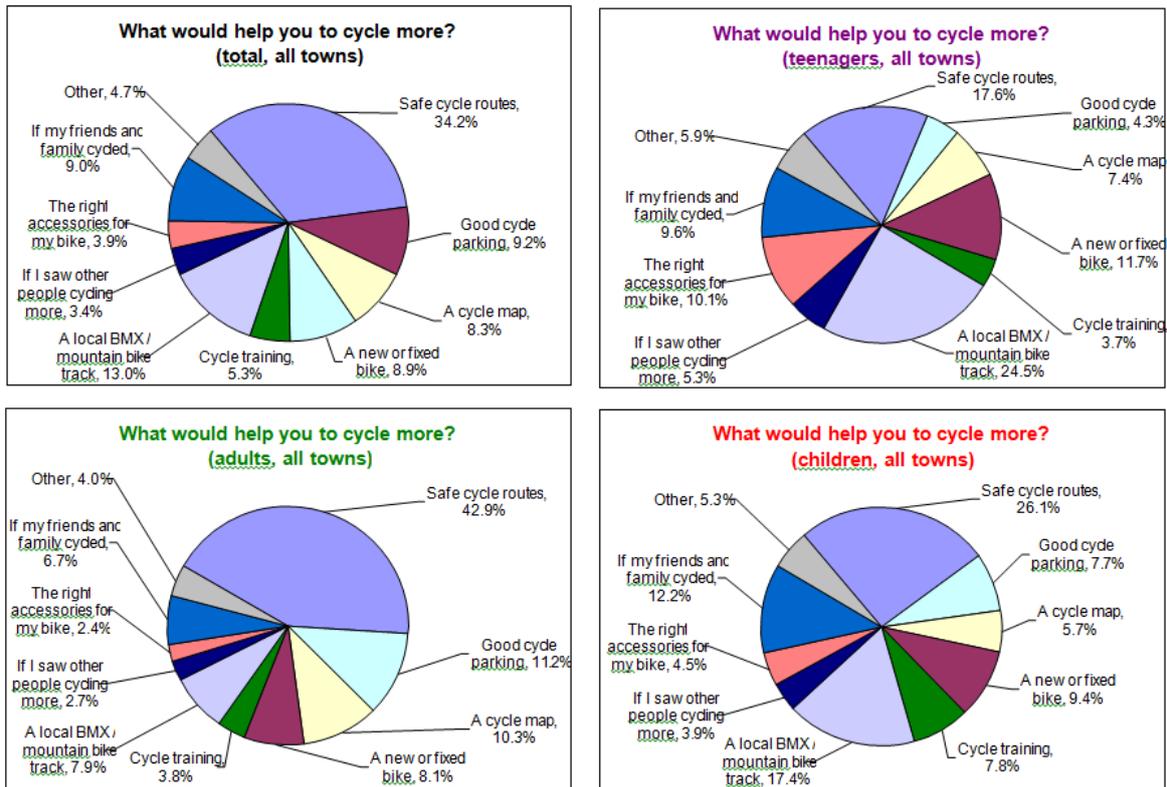
From April to June 2013, Cambridgeshire County Council's cycling team took the Cambridgeshire Festival of Cycling to 10 market towns around the county. As part of the event, data was collected on cycling in each town through registration forms, comments slips and a feedback wall. In total, 1994 people attended the ten events, which were held in March, Wisbech, Whittlesey, Ramsey, St Neots, Soham, Huntingdon, Chatteris, St Ives and Ely. The audience was self-selecting, but highlighted some of the attitudes around cycling in these towns.

From the events there were some clear headlines:

- 88% of people said they would like to cycle more than they currently do.
- People would like to cycle more but they do not because the roads are too busy or too dangerous, the weather puts them off or they do not have enough time (Figure 16).
- Safe cycle routes were consistently cited as helping people to cycle more.
- The statement which best sums up people's view of cycling is that "it's a healthy activity and good for fitness".

**Figure 16 Barriers to cycling and responses to "What would help you cycle more?" from those during the Festival of Cycling 2013.**

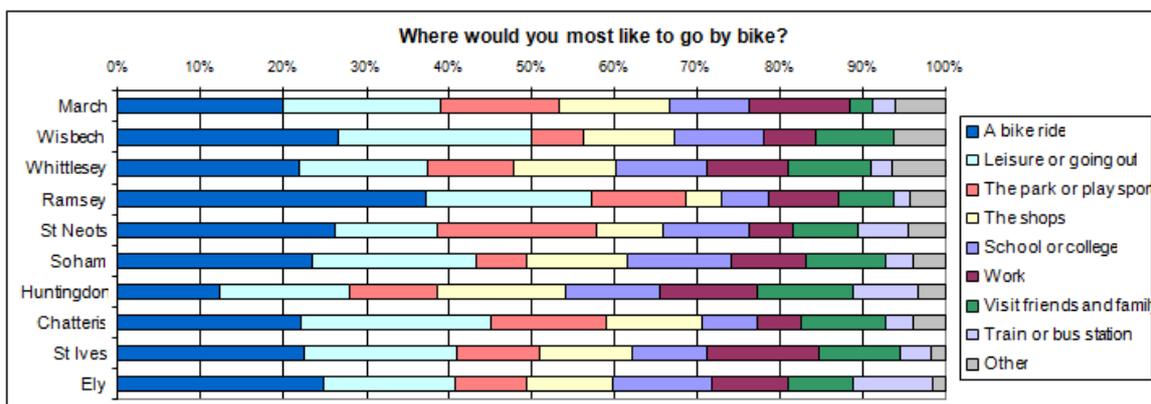




Source: Cambridgeshire County Council: Cambridgeshire Festival of Cycling 2013: Final Report

Where people wanted to go by bike, this varied according to town with only small proportions wanting to go to work or the bus/train station (Figure 17). Further data for individual towns is available,<sup>57</sup> with only a few of the responses highlighted in Section 4.3.

Figure 17 Responses to “Where you would most like to go by bike?” for all towns



Source: Cambridgeshire County Council: Cambridgeshire Festival of Cycling 2013: Final Report

### 4.3 Local Strategies

Local Transport Plans and Market Town Strategies include a compilation of local views on active travel. Together with local stakeholders and District Council colleagues, local views were explored and the main issues detailed below.

### 4.3.1 Cambridge City and South Cambridgeshire

Main barriers to walking and cycling identified in the Transport Strategy for Cambridge City and South Cambridgeshire<sup>58</sup> include the following:

- Safety and perception of safety (of cyclists, pedestrians and drivers).
- Parking and security.
- Lack of awareness.
- Training.
- Lack of dedicated routes/links between major cities.
- Pedestrian/cyclist/driver conflict.
- Distance/access to local facilities/services.
- Lack of routes/access to frequently used services and facilities.
- Quality of walking/cycling environment.

### 4.3.2 Chatteris<sup>59</sup>

Although a recent survey indicated that the majority of residents rated the experience of walking and cycling within the town as good, a number of local issues and barriers to active travel were also highlighted:

- Levels of HGV traffic are high, making the environment less appealing to cyclists and pedestrians.
- No designated cycle paths.
- The pedestrian environment in some areas is inadequate, with a need for enhanced footpaths and crossing facilities while number of streets lack safe footways.
- The town centre is not considered to be a pleasant environment for walking or cycling.
- Lack of safe cycling routes through the town, particularly to Mepal Outdoor Centre.

### 4.3.3 Ely<sup>60</sup>

The physical characteristics of Ely favour active travel within the City. However, a number of issues have been raised by local residents which limit the uptake of walking and cycling:

- The routes in the centre are well-signed, but signage is scarce as you move further out of the centre and into the surrounding villages.
- Low modal share of cycling and walking despite the compact nature of the City, and its relatively flat topography.
- Lack of a joined up cycle network and cycle infrastructure.
- Limited cycle parking in key locations.

### 4.3.4 Huntingdon and Godmanchester<sup>61</sup>

Pedestrian and cycle networks in Huntingdon and Godmanchester have benefitted from recent investment in new cycle routes and enhanced safety measures. However, with over a third of car journeys under 2km taking place in this region, it is clear that a number of barriers to active travel still exist:

- As a key strategic link, the High Street offers connections for pedestrians and cyclists to Godmanchester, Brampton and wards in the north of Huntingdon, including The Stukeleys. However, there are currently limitations on cycling in the High Street and this has been a significant area of local concern.

- A number of main roads currently inhibit access for cyclists and pedestrians.
- Certain developments which, in fact, have high quality linkages to services are let down by poor signage and are not well maintained.
- Currently, most of the town's residential developments are situated to the north of the historic centre, while certain key amenities, such as Hinchingsbrooke Hospital, the railway station and the bus station are located to the south and west of the centre. Consequently, routes within the ring road are used as through routes, as alternatives are off-putting.

Huntingdon had the lowest attendance of all at the Cambridgeshire Festival for Cycling 2013. Most people had driven to the event in Huntingdon, with only a quarter cycling and one in six walking, yet the home postcodes collected showed two-thirds of attendees lived in Huntingdon itself or less than three miles away.

Specific comments provided at the festival highlighted residents' need for good infrastructure and bike security:

- Re-doing Thicket path – excellent work, extend it right through Huntingdon town centre.
- RAF Wyton – need cycle path road at Mere Way (by 1km) is really dangerous.
- There is no cycle route from Huntingdon town to business parks towards Stukeley.
- More/better cycle paths. Tie up with clubs. MTB/BMX skills area.
- Improve cycleways. Safer parking for bikes & kit.
- Better off-road cycle routes.
- Clearer signage on High Street, ideally be able to cycle through.
- Godmanchester School – no cycle racks at the children's centre.
- Improve bike shelters and security (crime risk).

#### 4.3.5 March<sup>62</sup>

Analysis of local data has identified lower levels of walking in and around the market town. A number of issues have been raised which could potentially increase uptake of active travel in March:

- Currently many locations within the town where a lack of footpath provision and lighting deters or hinders people from walking.
- The quality and quantity of paths leading into the countryside could also be improved.
- Patterns of cycling are clearly fragmented with good uptake in some parts of the town but not in others.
- Signage for existing cycle routes could be improved.
- Lack of information relating to cycling in the town – there is no published material such as a cycle map promoting the town's cycle routes.

#### 4.3.6 St Neots<sup>63</sup>

During stakeholder and public consultation on transport issue in St Neots a number of issues, pertaining to a more general theme around safety, were raised:

- Even though St Neots has a low level of crime, there is a perception that pedestrians are vulnerable and this is contributing to the general preference for car use.
- Cycling is considered to be dangerous, with people feeling safer in their cars.
- Current cycle paths do not form a wholly coherent network through the town.
- Lack of cycle racks in key locations across town.

#### 4.3.7 Ramsey<sup>64</sup>

Ramsey itself is topographically well suited to cycling as it is flat, being situated in the Fens, and very compact. However, current provision for pedestrians and cyclists is inadequate and major concerns of personal safety with regards to road accidents and crime have been raised by local residents:

- Even in areas of low crime, there is still a strong perception that these activities are more dangerous than car use.
- Pedestrian facilities, including footpaths, in the centre of the town are poor.
- Narrow streets and on-street parking also make cycling difficult and increase the feeling of danger, particularly for young people travelling to school.
- A large proportion of the local population are employed as shift workers often having to travel at night or during hours of darkness, during which issues regarding safety of environment and quality of infrastructure were raised.

#### 4.3.8 Whittlesey<sup>65</sup>

The topography of Whittlesey means that it is well suited to encouraging more cycling and walking in the town, yet rates of cycling and walking are not high. There is much demand for additional walking and cycling routes, however, the following main barriers have been highlighted:

- The A605 is a particular barrier to cycling due to the volume and nature of traffic using it. Therefore, existing routes within the town are signposted along quieter routes which often do not offer cyclists the most direct route.
- Lack of cycle parking.
- The dominance of the A605 through the centre of the town also acts as a barrier towards the amount of walking within Whittlesey and the surrounding villages, despite there being three pedestrian crossings along the built-up stretch of the road. As there are a number of schools close to the A605, these issues are particularly relevant to children (and their parents) who wish to access those schools, and who find the A605 traffic issues and the narrow pavements along it to be a barrier to walking/cycling to school.

### 4.3.9 Wisbech

The topography of Wisbech is well suited to walking and cycling but movement is hindered by barriers created by the road network, including the volume and nature of the traffic in the town:

- Certain parts of the road network in the town are intimidating for cyclists to use.
- Walking and cycling routes are considered incoherent and are perceived by many as unsafe.
- A lack of recreational cycle routes to the town centre discourages the development of a cycling culture in the area.
- A number of stakeholders identified the lack of cycling routes linking the residential areas to the north and the industrial areas to the south of the town as an issue, particularly for access to employment and leisure facilities.
- There is also a longstanding flooding problem, in particular areas and near some of the crossings, which discourages walking and cycling at many times of the year.

## 5 Addressing local needs: What can we do to increase levels of walking and cycling in Cambridgeshire?

### 5.1 Evidence around broader environmental interventions

Systematic review evidence<sup>66</sup> supports interventions to promote walking; including interventions tailored to people's needs targeted at the most sedentary or at those most motivated to change, and delivered either at the level of the individual (brief advice, supported use of pedometers, telecommunications) or household (individualised marketing) or through group based approaches.

NICE Public Health guidance<sup>67</sup> identifies that changing the built environment (such as through traffic calming, construction of trails and cycle networks, road closures, road user charging, safe routes to school) has the potential to influence walking and cycling behaviour.

Furthermore, evidence demonstrating the importance of accessible green spaces and linked health benefits derived from such access has been published. For example, the fifth year Measure of Enjoyment of the Natural Environment (MENE)<sup>68</sup> results published by Natural England show the highest number of people since the survey started making visits to the outdoors:

*"It's not just about telling people to do more exercise because it is good for them, it is about giving them the opportunity to be active in ways which fit into their everyday lives and which suits their interests."*

- 96% of people agree or strongly agree that having green spaces close to where they live is important.
- Visiting the natural environment for health or exercise accounted for an estimated 1.3 billion visits to the natural environment between March 2013 and February 2014.
- Respondents to the survey also agreed that being outdoors made them feel 'calm and relaxed' and the proportion agreeing that a visit was 'refreshing and revitalising' was at its highest in the most recent survey.

### 5.2 Evidence around effectiveness of walking and cycling interventions

The UKCRC Centre for Diet and Activity Research (CEDAR) and the Behaviour and Health Research Unit (BHRU), Institute of Public Health, University of Cambridge submitted a summary of the evidence around travel-mode choice interventions to the House of Lords Science and Technology Select Committee in 2011<sup>69</sup>:

- Infrastructure
  - Improvements to infrastructure do have clear potential to encourage modal shift if they reduce barriers, such as perception of danger, or if they provide a more direct, convenient or pleasant route.
  - Specific pieces of infrastructure may not be sufficient to result in substantial changes to walking and cycling rates.
  - Access to an environment that supports physical activity is **"necessary but not sufficient"**.

- Travel mode choice
  - A range of approaches have been reviewed, including:
    - Motivational programmes, improvements to cycling infrastructure, and multifaceted community-wide programmes involving a variety of elements such as education, cycle training and travel planning.
    - Cycle routes, end of trip facilities, integration with public transport, promotional and educational activities and changes to traffic laws.
    - 'Organisational travel plan' interventions.
  - However, there is limited evidence from well-designed studies to indicate the effectiveness of these interventions to change travel mode share in the population with few studies reporting statistical significance or having appropriate control groups.

Incentives and disincentives may also play a role in encouraging modal shift. Commuters offered either public transportation benefits, showers, lockers, or bike parking, but no free car parking, are more likely to either ride public transportation, walk, or cycle to work. The inclusion of free car parking in benefit packages alongside benefits for public transportation, walking, and cycling, seems to offset the effect of these incentives. Therefore, benefits for active transport seem to work best when car parking is not free<sup>70</sup>.

**It is therefore most likely that multifaceted approaches involving changes to cycling and walking environment coupled with individual advice and support may be the most effective.**

### 5.3 What are the cost benefits of active transport?

The volume of literature, especially on Cost Benefit Analysis of interventions, to promote routine walking and cycling has grown in the past decade or so. Much of the benefit is derived from reductions in premature deaths with large consequent savings in terms of health and knock-on benefits to the economy.

#### 5.3.1 Costs of physical inactivity

Illness as an outcome of physical inactivity has been conservatively calculated to directly cost the NHS up to £1.0 billion per annum (2006-07 prices). Indirect costs have been estimated as £8.2 billion per annum<sup>7</sup>.

Using the ITHIM model structure, Jarrett, Woodcock et al. (2012)<sup>71</sup> estimated the NHS costs that could be averted by a large shift towards active travel in England and Wales. A shift in walking from 0.6 km/day to 1.6 km/day, and in cycling from 0.4 km/day to 3.4 km/day (similar to current levels in Copenhagen) could result in changes in numbers of incident cases (Table 5) and therefore the costs (Figure 18) of treating eight health conditions related to physical activity. The study estimated that over 20 years, the expenditure averted would be over £17 billion.

**Table 5 Estimates of incidence of disease and road traffic injury in 2010 and subsequent yearly effect of active travel.**

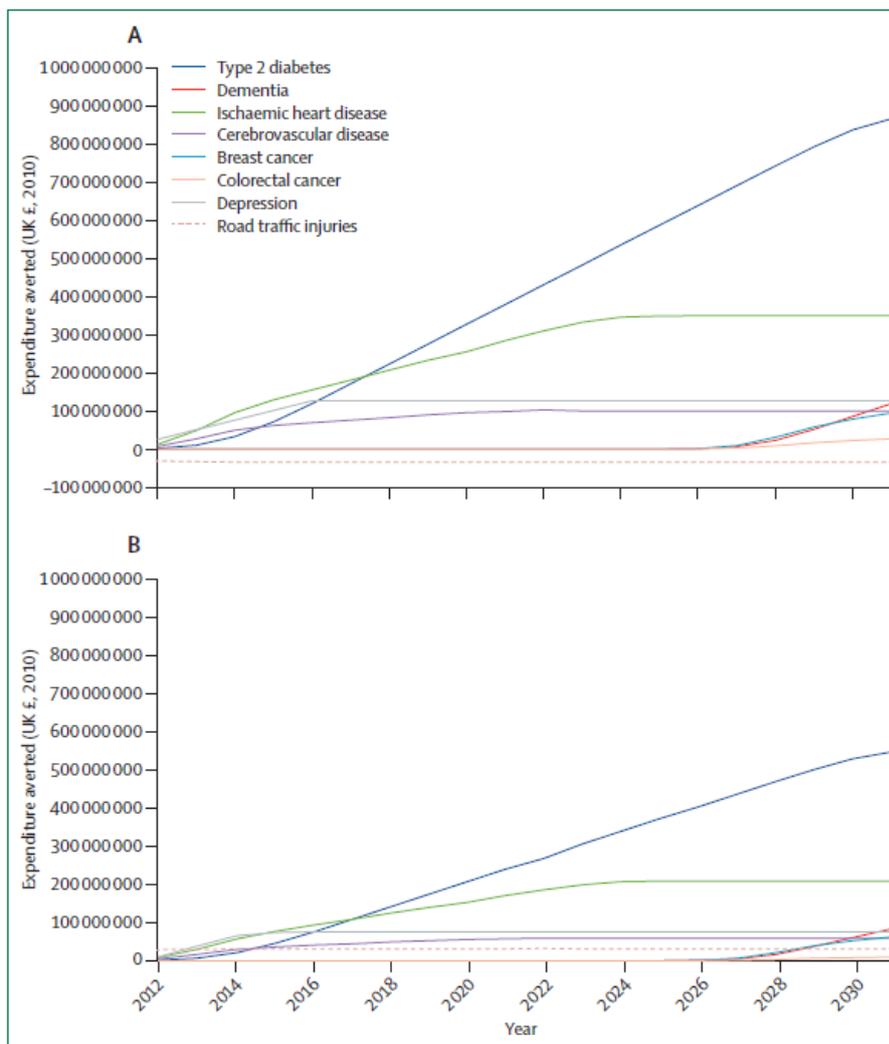
	Incidence per 100 000 population	Incident cases in urban England and Wales	Source	Relative risk reduction from 2.5 h per week moderate physical activity*	Yearly change in incident cases at full effect*	Estimated time to achievement of 50% of effect
Type 2 diabetes	348	158 183	Gonzalez et al <sup>13</sup>	-0.19	-11.5%	3.2 years <sup>21</sup>
Dementia	480	218 043	Matthews et al <sup>14</sup>	-0.11	-6.5%	17 years <sup>22</sup>
Cerebrovascular disease	181	82 232	British Heart Foundation <sup>15</sup>	-0.23	-10.8%	2 years
Breast cancer	78	35 528	Cancer Research UK <sup>16</sup>	-0.13	-11.6%	17 years <sup>22</sup>
Colorectal cancer	65	35 538	Cancer Research UK <sup>16</sup>	-0.08	-5%	17 years <sup>22</sup>
Depression	2993	1 359 942	Singleton et al <sup>17</sup>	-0.07	-4.1%	2 years
Ischaemic heart disease	382	173 572	Scarborough et al <sup>15</sup>	-0.23	-10.5%	2 years
Road traffic injuries	480	12 500	STATS 19, Transport statistics for Great Britain <sup>18</sup>	N/A†	21%	0 years

\*Data are from Woodcock and colleagues.†Data for road traffic injuries were calculated by a different method.

Table 3: Incidence of disease and road traffic injury in 2010, and subsequent yearly effect of active travel

Source: Jarrett 2012<sup>71</sup>

**Figure 18: Predicted yearly NHS expenditure averted with increase active travel.**



**Figure 1: Potential yearly National Health Service expenditure averted by year and health outcome from increased active travel scenario (A) and shorter distances scenario (B)**

Source: Jarrett 2012<sup>71</sup>

Scenario B is a sensitivity analysis that shows the impact of changing travel patterns to shorter distances with a shift from a car to active travel.

Looking at wider costs, the Department for Culture, Media and Sport<sup>72</sup> estimated in 2002 that a 10% increase in physical activity in adults would benefit England, both directly and indirectly, by at least £500 million per year and would save approximately 6000 lives. UKActive has estimated that a 1% reduction in inactivity could save £1.2 billion over five years<sup>73</sup>.

Physical activity programmes at work have been found to reduce absenteeism by up to 20%: physically active workers take 27% fewer sick days. In England, the costs of lost productivity from sickness absence and premature death have been estimated at £6.5 billion per year<sup>73</sup>.

### 5.3.2 Costs of physical inactivity in Cambridgeshire

In 2013, the British Heart Foundation Health Promotion Research Group at Oxford University<sup>74</sup> prepared estimates of the primary and secondary care costs attributable to physical inactivity for Primary Care Trusts (now known as Clinical Commissioning Groups) across England. The results based upon 2009/10 data show that physical inactivity cost Primary Care Trusts in England more than £900 million. The total costs for Cambridgeshire broken down by disease amounts to £9,496,520 (Table 6).

Although the current populations differ slightly in terms of the new commissioning groups, the 2009/10 Cambridgeshire PCT data (Table 6) are useful as an indication for the potential costs of physical inactivity in Cambridgeshire.

**Table 6: Total estimated cost of Physical Inactivity for the former Cambridgeshire PCT area, 2009-10**

	Cancer lower GI	Cancer breast	Diabetes	CHD	Cerebrovascular disease	Total Expenditure
Cambs PCT	£626,560	£636,240	£2,248,200	£4,945,000	£1,040,520	£9,496,520

Source: British Heart Foundation Health Promotion Research Group, Oxford University<sup>74</sup>

Investment in infrastructure or behaviour change programmes which enable increased activity levels amongst local communities through cycling and walking is likely to provide low cost, high-value options providing benefits for individual health.

### 5.3.3 Health Economic Assessment Tool (HEAT) and Transport Appraisal Guidance (WebTAG) for evaluating local interventions

The World Health Organization (WHO) coordinated the development of the Health Economic Assessment Tool (HEAT)<sup>75</sup>. HEAT is an on-line tool that facilitates the calculation of these benefits, through reduced total mortality from increases in cycling and walking. HEAT illustrates that investment in walking and cycling can generate large financial returns through better health.

HEAT is incorporated within the Department for Transport's (DfT) Transport Analysis Guidance (WebTAG), which is under current review to ensure that it reflects the most current evidence of mortality and morbidity benefits of active transport. WebTAG also recommends assessment of some of the wider benefits beyond physical activity including:

- Absenteeism
- Journey quality
- Road safety
- Environment
- Decongestion
- Time saving impact.

These practical tools can help provide an economic assessment of the health effects from cycling and walking initiatives. It is worth noting that HEAT only assesses health benefits of those <65 years for cycling and <75 years for walking, although older populations would also benefit.

### 5.3.4 Benefit cost ratios for interventions

A desktop literature review of studies assessing benefit cost ratios for active travel found a mean benefit to cost ratio for all schemes of 6.28:1 and, for the 13 studies based in the UK alone, the unweighted average was 5.62:1<sup>76</sup>.

A more recent report by the DfT<sup>77</sup> aims to highlight key studies that are relevant for the UK context and cover the main issues for local authority. In terms of value for money, the DfT values 'very highly' any scheme which return more than £4 for every £1 invested. Nearly all the highlighted studies show a benefit cost ratio above this threshold (Table 7).

Initiatives that Cambridgeshire are involved in include the Local Sustainable Transport Fund<sup>78</sup> and the Cycling Ambition Grant (Greater Cambridge)<sup>79</sup>. Both of these have shown good benefit cost ratios based on business case assessments.

**Table 7 Summary of Benefit Cost Ratios for cycling and walking initiatives**

<b>Table 2.1: Summary of BCRs discussed</b>		
	<b>BCR</b>	<b>Comment</b>
Sustainable Travel Towns	4.5:1	Decongestion benefits only
Cycling Demonstration Towns	2.59:1	Adult health benefits only
Local Sustainable Transport Fund [ex ante appraisal]	5.1:1	Based on 12 large schemes business cases
Cycling Ambition Grants [ex ante appraisal]	5.5:1	Based on business cases for 12 funded schemes
Linking Communities Fund	10:1	Based on eight representative schemes
Literature Review	5.6:1	Average BCR for UK case studies, overall average 6.3:1
Transport for London Cycling Vision [ex ante appraisal]	2.9:1	Very large programme - conservative BCR
Living Streets	0.1-37:1	Only subset of benefits monetised

Source: *Investing in Cycling and Walking: the Economic Case for Action, Department for Transport, March 2015*<sup>80</sup>

However, a recent paper<sup>81</sup>, identified that the transport approach to economic appraisal and evaluation often subordinates the health benefits that may comprise a large proportion of the total benefit effect. Items in the wider evaluation process such as costs of construction and maintenance, depreciation of infrastructure costs and external costs often obscure the health benefits.

## 5.4 Building on our current assets and identifying gaps

### 5.4.1 Key local initiatives and strategy developments

Over the last 20 years, many improvements and additions have been made to infrastructure for cyclists and pedestrians across Cambridgeshire. Early infrastructure provision often took the form of shared use paths or relatively narrow on-road lanes.

In recent years, safer, more attractive infrastructure has been provided including high profile projects such as Willow Bridge in St Neots (the longest foot and cycle-bridge in the country), Riverside Bridge in Cambridge and the wide cycle track alongside the Busway. Other innovations include advanced green signals at junctions, the City Council's 20 mph projects, wider newly surfaced on-road lanes and a move to segregated cycle lanes such as those currently under construction at Hills Road and Huntingdon Road, Cambridge.

As the number of cyclists continues to increase, safety for cyclists, especially in busy urban areas of Cambridge, will need to look at more radical changes in infrastructure. Reallocation of road space,

severing routes for motorised traffic, introducing separate traffic signal stages for cyclists and/or creation of traffic free zones to allow better and safer access for cyclists and pedestrians may be amongst the best available options. This thinking accords with the Transport Strategy for Cambridge and South Cambridgeshire and the transformational objectives of City Deal.

The forward programme of cycling infrastructure is particularly ambitious and includes The Chisholm Trail, an off road, traffic-free, direct route extending across the City linking the two railway stations. There are also plans to provide further segregated cycling provision on busier roads and to improve junctions.

### **A number of local initiatives (**

Table 8) have also aimed to increase levels of walking and cycling across the County.

Several market towns have published transport strategies which outline plans to improve walking and cycling at a local level. A summary has been included below to highlight ongoing work, demonstrate promising local solutions and identify areas where further works could build on existing initiatives.

#### **Huntingdon and Godmanchester<sup>82</sup>**

Huntingdonshire has potential for successful modal shift as there is already a network of appropriate paths which need joining up. The following improvements have been prioritised:

- Improve signage in the town centre and raise awareness of permitted cycle routes.
- Review of current restrictions on cycling, particularly in the High Street.
- Increase levels of high quality cycle parking provision at key destinations including, among others, within both Huntingdon and Godmanchester centres, the railway station, at Hinchingsbrooke, and at other key hubs.
- Ensure facilities for cyclists at key employment sites are provided.
- Plans for a series of strong radial routes which connect the town centre with outlying wards.
- Infrastructure developments will be targeted at 'missing links', under-served desire-lines and safety improvements.

#### **March<sup>83</sup>**

The recent experience of the successful Cambridge Cycle Town programme has shown that even in areas with high cycle usage, given the right conditions the amount of people cycling can increase further. Therefore, with the cycling culture and infrastructure that is already in existence in March, there is an opportunity to build on this solid foundation to further increase the number of people cycling in the town. The local transport strategy has prioritised the provision of a more comprehensive network of cycle routes that connect the key areas of the town and outskirt areas.

**Table 8 Key local initiatives aimed to increase walking and cycling in Cambridgeshire**

Target Group	Initiative	Description
<b>Schools</b>	Safer Routes to School	Safer Routes to School is a County Council initiative that aims to create a safe, healthy environment so that children and young people can travel to and from school by cycling and walking.
	School Travel Plans	Developed in consultation with teachers, parents, pupils and governors, with the aim of decreasing car use and enabling more children to walk and cycle to school.
	Walk School: Beat the Streets	Walking competition between four primary schools in Cambridge: Bewick Bridge, Great and Little Shelford, The Bellbird and The Grove. The competition aims to encourage pupils to walk, cycle or scoot more to and from school. Pupils receive a Beat the Street fob, tap it on a box to make the box beep and flash and record their journey. The winning school receives money to donate to a charity of their choice.
	Bike It	An initiative delivered by the UK's leading sustainable transport charity, Sustrans. The aim of 'Bike It' is to help schools create a pro-cycling culture and ultimately reduce car use and increase sustainable journeys.
<b>Children</b>	Bikeability	Initiative designed to give the next generation the skills and confidence to ride their bikes on today's roads. There are three Bikeability levels, with each level designed to help improve children's cycling skills, no matter what they know already. Levels 1, 2 and 3 take trainees on a journey from the basics of balance and control, all the way through to planning and making a journey by themselves on busier roads.
<b>Parents</b>	Walk Buggy	A Department of Health funded project based in Children's Centres. The focus is to encourage and enable young parents to experience the benefits of walking and 'pushing' their children, starting with children at a very young age. This could develop a family culture of being physically active using facilities and green spaces which are safe, locally accessible and affordable, offering social networking and play opportunities.
<b>Employees</b>	Travel for Work/ Cambridgeshire (TfC)	TfC runs a free annual travel survey of how TfC member employers travel to work, as well as one-off surveys throughout the year. This allows TfC organisations to monitor, or benchmark, their staff travel patterns. Survey results help in targeting successful travel initiatives and appropriate actions within a travel plan.
<b>Community-wide</b>	Guided Busway	The Guided Busway provides a dedicated traffic-free route for buses, cyclists and pedestrians between St Ives, Cambridge and Trumpington and opened in August 2011. The route includes two sections of guided operation, a bus-only road and other places with on-street operation in conventional bus lanes. New park and ride sites have been built at Longstanton and at St Ives, with a tarmac cycle track/bridleway alongside some sections of the route.
	Cycling Projects Team	The Cycling Projects team run a number of events through the summer at which materials, such as cycle maps, are handed out. The cycle maps contain panels with road safety information on them.

**St Neots<sup>84</sup>**

The local transport strategy for St Neots aims to provide a cohesive, interlinked web of facilities throughout the town and nearest villages:

- Improvement of walk and cycle paths – includes limited work such as signing and road markings, and more major work.
- Publication of cycle and pedestrian maps in local magazines (also received by surrounding villages) and on the Town Council website and be made available at the Tourist Information Centre.

During stakeholder and public consultation the lack of cycle racks in the town was considered to be a barrier to cycle use, therefore, the provision of cycle racks is included in this strategy. The locations are those that were most often suggested during the public consultation.

**Ramsey<sup>85</sup>**

In response to local consultation, the local transport strategy proposes to improve a number of routes for cyclists and pedestrians which will enhance their safety and provide faster routes to main destinations. This will involve a combination of on and off road paths forming a network around the town.

**5.5 Next steps: What could we do to address active transport needs?**

Making an alternative “active” travel choice for some or all of a journey is a cost-efficient and convenient way to introduce a level of physical activity into everyday routines. A number of interventions and initiatives are available, however, the most successful options need to align with local needs, take into account local cultures and be co-produced with community members.

Once data and local views had been collected, a second stakeholder event was held to discuss key findings and co-produce potential next steps. Stakeholders identified three priority principles during the event: safety, infrastructure and culture.

During the stakeholder event and throughout the JSNA consultation process of the JSNA a fundamental concept was highlighted: to ensure success of active travel interventions we need to move away from categorising modes of travel ie motorists, cyclists and pedestrians and focus rather on the *interplay* of these modes of transport.

It was emphasised that by separating modes of travel, environments that promoted safe and efficient transport for all could not be achieved and that a culture of cars versus cycles would continue. This culture of one mode of transport working against another needs to be addressed and changed to create respectful travel environments.

*“Policy and strategy should badge the population as one, and not segregate into cyclists, walkers, and drivers for example. We all have to ‘get around’ and all use different modes of transport. This should also be incorporated into promotional messages e.g. We want everyone to do 20mins physical activity a day, and active travel is an easier way of achieving this”*

At the event, it was emphasised that an initial focus modal shift on densely populated towns and cities may be a preferred starting point. This could be achieved by targeting achievable wins eg car parking on edges of villages, rather than building large cycle paths in very rural areas. Further emphasis was placed on targeting the least active thereby helping to reduce health inequalities – in addition, the health gains for the least active are in relative terms greater than for those who are more physically active.

Potential next steps are outlined below – building on high quality evidence, local need and solutions and incorporating existing assets.

### 5.5.1 Safety and perceptions of safety

This principle applied across modes of transport and included issues around immediate environments of cycle and walkways with a specific focus around appropriate lighting, as well as issues of community safety and crime. Key findings local solutions could include:

- Introducing more 20 mph zones and other design and traffic management measures to encourage walking and cycling on non-residential streets, including high streets, community hubs and the main routes leading to them.
- Enforcement action to tackle anti-social pavement behaviour such as pavement parking and pavement cycling.
- Working with communities to understand local safety issues eg travel to work during hours of darkness was highlighted for Fenland. Potential solutions could include employer-funded community transport initiatives.

### 5.5.2 Infrastructure

Extensive research has been carried out into environmental factors that impact cycling (see section 2.3.1), which have already influenced policies and Public Health advice. The Government's Planning Policy Framework for Health (2012)<sup>86</sup> and the National Institute for Health and Clinical Excellence (NICE)<sup>87</sup> have recommended that local planning authorities should ensure that health and wellbeing are considered in local and neighbourhood planning decision making and that changes in the built environment should 'support physically active modes of transport' respectively (see section 2.4.1).

A cross-sector commitment is required to provide the right physical environment for people, so embracing physical activity becomes a natural part of their daily life.

Key local solutions could include:

- Influencing local planning decisions in favour of active environments.
  - Embedding excellent cycling and walking infrastructure into all communities, so that people feel safe and able to walk and cycle.
  - Introduce measures that reduce the distance by bicycle by increasing continuity of routes and allowing cyclists and pedestrians to access routes that motorised vehicles cannot.
- Targeted and effective use of existing resources.
- Ensure other policies support walking and cycling.

- Ensuring that active transport is more convenient (eg stairways at the front of work, lifts to the rear).
- Limiting car parking.

### 5.5.3 Culture

Different types of provision for walking and cycling are appropriate for different local environments and inevitably dependent on space and cost. It is important to recognise and tackle the different barriers that prevent people being active, taking into account social and economic inequalities, age and disability and understanding the cultures of those who will benefit the most. For instance, Lithuanians in Fenland have a very different relationship and perception of cycling to the white middle class of Cambridge City.

Fenland clearly has the biggest potential impact, especially on health and cost benefits, but is also likely to be the biggest challenge.

Key local solutions could include:

- Leadership/champions.
- Focus on short journeys of 20 minutes or less, which would still provide health benefits.
- Championing good quality street and pavement maintenance to encourage walking and cycling.
- Traffic-free city centre days.
- Promote active travel choices by local authorities engaging communities in mapping safe cycling and walking networks, publishing and promoting these widely, and identifying priorities for continuous improvement in both infrastructure and access.
- Joining up with employers to encourage walking and cycling to work.
- NHS and Clinical Commissioning Groups (CCG) can directly support **LTP** objectives to get more walking and cycling in a number of ways:
  - 78% of people consult their GP at least once during the year: many will not be active enough. It is an opportunity to directly engage with people to encourage more active travel in their daily lives.
  - NHS staff, contractors and patients generate a lot of local trips. Making NHS sites easy for cyclists and pedestrians to access can help people rely less on their cars and get more active.

### 5.5.4 Further local data and intelligence

The following options for improved provision of information to inform design and infrastructure decisions within a local context include:

- Data maps of levels of commuter modes of transport within the whole of Cambridgeshire overlaying with key variables such as socioeconomic status, levels of physical activity, key infrastructure.
- Identification of neighbourhoods or groups with high levels of physical inactivity where intervention would bring most health benefits.

- Audits of local street environments with residents to identify practical improvements to the walking environment.
- Provision of local specific information on walking and cycling options.

## 6 References

- <sup>1</sup> Department for Transport, *Active Travel Strategy*. 2010. Available at [http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCIQFjAA&url=http%3A%2F%2Fwww.apho.org.uk%2Fresource%2Fview.aspx%3FRID%3D90297&ei=BqonVZaaDomXaoaSgbAJ&usg=AFQjCNEdmqqrWdpmZn9d9\\_UrDZ8CGZDimw&bvm=bv.90491159,d.d2s](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCIQFjAA&url=http%3A%2F%2Fwww.apho.org.uk%2Fresource%2Fview.aspx%3FRID%3D90297&ei=BqonVZaaDomXaoaSgbAJ&usg=AFQjCNEdmqqrWdpmZn9d9_UrDZ8CGZDimw&bvm=bv.90491159,d.d2s)
- <sup>2</sup> Department for Transport, *Draft Cycling and Walking Delivery Plan*. 2015. Available at <https://www.gov.uk/government/consultations/cycling-delivery-plan-informal-consultation>
- <sup>3</sup> World Health Organisation, *Global Recommendations for Physical Health*. 2010. Available at [http://www.who.int/dietphysicalactivity/factsheet\\_recommendations/en/](http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/)
- <sup>4</sup> World Health Organisation, *Global Health Risks*. 2009. Available at [http://www.who.int/healthinfo/global\\_burden\\_disease/global\\_health\\_risks/en/](http://www.who.int/healthinfo/global_burden_disease/global_health_risks/en/)
- <sup>5</sup> UKActive, *Turning the Tide of Inactivity*. 2014. Available at <http://www.ukactive.com/turningthetide/>
- <sup>6</sup> Sport England, *Active People Survey*. 2013. Available at <http://www.sportengland.org/research/about-our-research/what-is-the-active-people-survey/>
- <sup>7</sup> Department of Health, *Start Active, Stay Active*. 2011. Available at <https://www.gov.uk/government/publications/start-active-stay-active-a-report-on-physical-activity-from-the-four-home-countries-chief-medical-officers>.
- <sup>8</sup> World Health Organization, Health economic assessment tools (HEAT) for walking and cycling. Methods and user guide, 2014. Available at <http://www.euro.who.int/en/health-topics/environment-and-health/Transport-and-health/publications/2011/health-economic-assessment-tools-heat-for-walking-and-for-cycling.-methodology-and-user-guide.-economic-assessment-of-transport-infrastructure-and-policies.-2014-update>
- <sup>9</sup> Department of Health, *On the State of Public Health: Annual report of the Chief Medical Officer (England)*. 2009. Available at [http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Aboutus/MinistersandDepartmentLeaders/ChiefMedicalOfficer/DH\\_077333](http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Aboutus/MinistersandDepartmentLeaders/ChiefMedicalOfficer/DH_077333)
- <sup>10</sup> Department of Health, *Value for Money: An economic Assessment of Investment in Walking and Cycling*. 2010. Available at <http://www.apho.org.uk/resource/item.aspx?RID=91553>
- <sup>11</sup> Hamer, M., & Chida, Y, *Active commuting and cardiovascular risk: a meta-analytic review*. Preventative Medicine, 2008;46(1):9-13.
- <sup>12</sup> Department of Health, *Start Active, Stay Active*. 2011. Available at <https://www.gov.uk/government/publications/start-active-stay-active-a-report-on-physical-activity-from-the-four-home-countries-chief-medical-officers>.
- <sup>13</sup> Pucher, J., et al, *Walking and Cycling to Health: A Comparative Analysis of City, State, and International Data*, American Journal of Public Health, 2013; 100(10): 1986–1992.
- <sup>14</sup> Sharma, A., Madaan, V., & Petty, F.D, *Exercise for Mental Health*, Primary Care Companion Journal Clinical Psychiatry, 2006; 8(2): 106.
- <sup>15</sup> Colcombe S, Kramer AF. *Fitness effects on the cognitive function of older adults: a meta-analytic study*, Psychological Science, 2003; 14: 125-130.
- <sup>16</sup> Woodcock J, Givoni M, Morgan AS. *Health impact modelling of active travel visions for England and Wales using an Integrated Transport and Health Impact Modelling Tool (ITHIM)*. PLoS One 8. 2013. doi:10.1371/journal.pone.0051462.
- <sup>17</sup> UKActive, *Turning the Tide of Inactivity*. 2014. Available at <http://www.ukactive.com/turningthetide/>
- <sup>18</sup> Department for Culture, Media and Sport, *Taking part 2011/12 quarter 3: statistical release*, 2012. Available at <https://www.gov.uk/government/statistics/taking-part-2011-12-quarter-3-statistical-release>
- <sup>19</sup> Department of Health, *Health Survey for England*, 2004. Available at <http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/publicationsandstatistics/publishedsurvey/healthsurveyforengland/healthsurveyresults/index.htm>
- <sup>20</sup> Department for Transport, *National Travel Survey*, 2013. Available at <https://www.gov.uk/government/collections/national-travel-survey-statistics>
- <sup>21</sup> Department for Culture, Media and Sport, *Taking part 2011/12 quarter 3: statistical release*, 2012. Available at <https://www.gov.uk/government/statistics/taking-part-2011-12-quarter-3-statistical-release>
- <sup>22</sup> Hamer M., et al, *Taking Up Physical Activity in Later Life and Healthy Ageing: the English Longitudinal study of Ageing*. British Journal of Sports Medicine, 2013; 48:239-243 doi:10.1136/bjsports-2013-092993.
- <sup>23</sup> British Heart Foundation National Centre for Physical Activity and Health. *Physical activity for older adults (65 + years) Evidence Briefing*, 2012. Available at <http://www.bhfactive.org.uk/older-adults/index.html>

- <sup>24</sup> Saelens B, Handy S, *Built Environment Correlates of Walking: A Review*. Medicine and Science in Sports and Exercise. 2008;40(7S):S550-S66.
- <sup>25</sup> Panter, J.R, Jones, A.P., van Sluijs, E.M. Griffin, S.J, *Attitudes, social support and environmental perceptions as predictors of active commuting behaviour in schoolchildren*. Journal of Epidemiology and Community Health, 2010;**64**:41-48.
- <sup>26</sup> T Sugiyama, E Leslie, B Giles-Corti, N Owen, *Associations of neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships?* J Epidemiol Community Health, 2008;**62**:e9 doi:10.1136/jech.2007.064287.
- <sup>27</sup> Adams, E, J., et al, *Correlates of walking and cycling for transport and recreation: factor structure, reliability and behavioural associations of the perceptions of the environment in the neighbourhood scale (PENS)*, International Journal of Behavioral Nutrition and Physical Activity, 2013, **10**:87 doi:10.1186/1479-5868-10-87.
- <sup>28</sup> Panter, J., Griffin, S, & Ogilvie, D, *Active commuting and perceptions of the route environment: A longitudinal analysis*, Prev Med, 2014; **67**: 134–140.
- <sup>29</sup> Van Dyck et al, *Perceived neighborhood environmental attributes associated with adults' transport-related walking and cycling: Findings from the USA, Australia and Belgium*, International Journal of Behavioral Nutrition and Physical Activity, 2012, **9**:70 doi:10.1186/1479-5868-9-70.
- <sup>30</sup> de Geus, B., De Bourdeaudhuij, I., Jannes, C., Meeusen, R, *Psychosocial and environmental factors associated with cycling for transport among a working population*. Health Education Research, 2008; **23** (4), 697-708.
- <sup>31</sup> Commuting and Health in Cambridge website <http://www.cedar.iph.cam.ac.uk/research/directory/cahic/>
- <sup>32</sup> Goodman, A., et al, *Healthy travel and the socio-economic structure of car commuting in Cambridge, UK: A mixed-methods analysis*, Social Science Medicine, 2012; **74**(12): 1929–1938.
- <sup>33</sup> Department for Transport, *Local Area Walking and Cycling Statistics*, 2011/12. Available at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/306778/walking-and-cycling-statistics-release.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/306778/walking-and-cycling-statistics-release.pdf)
- <sup>34</sup> Pucher, J. and Dijkstra, L. *Promoting safe walking and cycling to improve public health: Lessons from the Netherlands and Germany*, American Journal of Public Health, 2003, Vol. 93 (9): 1509–16.
- <sup>35</sup> Department for Transport, *Smarter Choices: Changing the Way we Travel*, 2005. Available at <https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel>
- <sup>36</sup> ESRC, *Cycling Cultures Project*, 2010. Available at <http://www.cyclingcultures.org.uk/project.html>
- <sup>37</sup> Goodman, A., Panter, J., Sharp, S.J. and Ogilvie, D, *Effectiveness and equity impacts of town-wide cycling initiatives in England: a longitudinal, controlled natural experimental study*. Social Science and Medicine, 2013; **97**, pp. 228-37.
- <sup>38</sup> Panter et al. *Incorporating walking or cycling into car journeys to and from work: The role of individual, workplace and environmental characteristics*, Preventative Medicine, 2013 Mar; **56**(3-4): 211–217.
- <sup>39</sup> Guell et al, *Walking and cycling to work despite reporting an unsupportive environment: insights from a mixed-method exploration of counterintuitive findings*, BMC Public Health 2013, **13**:497.
- <sup>40</sup> Ogilvie, D et al, *Interventions to Promote Walking: systematic review*, BMJ, 2007 Jun 9; **334**(7605): 1204.
- <sup>41</sup> NICE, *Promoting and creating built or natural environments that encourage and support physical activity*, 2008. Available at <https://www.nice.org.uk/guidance/ph8>
- <sup>42</sup> Garrard J. *Safe speed: promoting safe walking and cycling by reducing traffic speed*. Australia: Commissioned by the Safe Speed Interest Group – The Heart Foundation, the City of Port Phillip and the City of Yarra, 2008.
- <sup>43</sup> Grundy C, Steinbach R, Edwards P, Wilkinson P and Green J. (2008) *20 mph Zones and Road Safety in London: A report to the London Road Safety Unit*. London: LSHTM.
- <sup>44</sup> ROSPA, *20 mph Zones and Speed Limits*, 2012. Available at <http://www.rospa.com/rospaweb/docs/advice-services/road-safety/drivers/20-mph-zone-factsheet.pdf>
- <sup>45</sup> Jo Salmon, Louisa Salmon, David A. Crawford, Clare Hume, and Anna Timperio, *Associations Among Individual, Social, and Environmental Barriers and Children's Walking or Cycling to School*. American Journal of Health Promotion, 2007: November/December 2007, Vol. 22, No. 2, pp. 107-113.
- <sup>46</sup> David McMinn et al, *Predicting active school travel: The role of planned behavior and habit strength*, International Journal of Behavioural Nutrition and Physical Activity, 2012;2012; **9**: 65.
- <sup>47</sup> NICE, *Walking and Cycling Briefing: LGB8*, 2013. Available at <https://www.nice.org.uk/advice/lgb8>

- <sup>48</sup> NICE, *Promoting and creating built or natural environments that encourage and support physical activity*, 2008. Available at <https://www.nice.org.uk/guidance/ph8>
- <sup>49</sup> Department for Transport, *Investing in Cycling and Walking: the Economic Case for Action*, 2015. Available at <https://www.gov.uk/government/publications/cycling-and-walking-the-economic-case-for-action>
- <sup>50</sup> Public Health England, *Workplace Wellbeing Charter*, 2015. Available at <http://www.wellbeingcharter.org.uk/index.php>
- <sup>51</sup> Office for National Statistics, *National Census*, 2011. Available at [http://www.ons.gov.uk/ons/guide-method/census/2011/index.html?utm\\_source=twitterfeed&utm\\_medium=twitter](http://www.ons.gov.uk/ons/guide-method/census/2011/index.html?utm_source=twitterfeed&utm_medium=twitter)
- <sup>52</sup> Data provided by Ulrich A and Woodcock J, Centre for Dietary and Activity Research (CEDAR), University of Cambridge
- <sup>53</sup> Data provided by Ulrich A and Woodcock J, Centre for Dietary and Activity Research (CEDAR), University of Cambridge
- <sup>54</sup> Department for Education, *Annual School Census*, 2014. Available at <https://www.gov.uk/government/collections/school-census>
- <sup>55</sup> Highways and Infrastructure Committee, *Pedal, Cyclist and Motorcyclist Casualties report*, 2015. Available at <http://www2.cambridgeshire.gov.uk/CommitteeMinutes/Committees/Meeting.aspx?meetingID=897>
- <sup>56</sup> Cambridgeshire County Council, *Cambridgeshire Festival of Cycling 2013: Final Report*, 2014.
- <sup>57</sup> Cambridgeshire County Council: *Cambridgeshire Festival of Cycling 2013: Final Report*, 2014
- <sup>58</sup> *Transport Strategy for Cambridge and South Cambridgeshire*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>59</sup> *Chatteris Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>60</sup> *Ely Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>61</sup> *Huntingdon and Godmanchester Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>62</sup> *March Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>63</sup> *St Neots Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>64</sup> *Ramsey Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>65</sup> *Whittlesey Market Town Strategy*. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>66</sup> Ogilvie D., Foster C. E., Rothnie H., Cavill N., Hamilton V., Fitzsimons C. F., & Mutrie N, *Interventions to promote walking: Systematic review*. *British Medical Journal*, 2007;334, 1204.
- <sup>67</sup> National Institute for Health and Clinical Excellence. *Promoting and creating built or natural environments that encourage and support physical activity*, 2008. Available at <https://www.nice.org.uk/guidance/ph8>
- <sup>68</sup> Natural England, *Measure of Enjoyment of the Natural Environment (MENE)*, 2014. Available at <https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results>
- <sup>69</sup> [http://www.esrc.ac.uk/\\_images/cedar-bhru-submission-to-behavior-change-travel-mode-choice\\_tcm8-19572.pdf](http://www.esrc.ac.uk/_images/cedar-bhru-submission-to-behavior-change-travel-mode-choice_tcm8-19572.pdf)
- <sup>70</sup> Hamre, A., Buehler, R. *Commuter Mode Choice and Free Car Parking, Public Transportation Benefits, Showers/Lockers, and Bike Parking at Work: Evidence from the Washington, DC Region*, *Journal of Public Transportation*, 2014; Vol. 17, No.2, pp. 67-91.
- <sup>71</sup> Jarrett, J., et al, *Effect of increasing active travel in urban England and Wales on costs to the National Health Service*, *Lancet*, 2012 Jun 9;379(9832):2198-205. doi: 10.1016/S0140-6736(12)60766-1.
- <sup>72</sup> Department for Culture, Media and Sport, *Game plan: a strategy for delivering government's sport and physical activity objectives*. London: Cabinet Office, 2002.
- <sup>73</sup> UKActive, *Turning the Tide of Activity*, 2014. Available at <http://www.ukactive.com/policy-insight/turning-the-tide-of-inactivity>
- <sup>74</sup> British Heart Foundation Health Promotion Research Group at Oxford University, *PCT Table Final*, 2013. Available at <https://www.sportengland.org/our-work/local-work/health/>
- <sup>75</sup> World Health Organisation Regional Office for Europe, *Health economic assessment tools (HEAT) for walking and for cycling: Methods and user guide*, 2014 update.
- <sup>76</sup> Department for Transport, *Claiming the Health Dividend*, 2014. Available at <https://www.gov.uk/government/publications/economic-case-for-active-travel-the-health-benefits>
- <sup>77</sup> Department for Transport, *Investing in Cycling and Walking: the Economic Case for Action*, 2015. Available at <https://www.gov.uk/government/publications/cycling-and-walking-the-economic-case-for-action>

- 
- <sup>78</sup> Local Sustainable Transport Fund: Cambridgeshire, 2012. Available at [http://www.cambridgeshire.gov.uk/info/20051/transport\\_projects/521/local\\_sustainable\\_transport\\_fund](http://www.cambridgeshire.gov.uk/info/20051/transport_projects/521/local_sustainable_transport_fund)
- <sup>79</sup> Cycle City Ambition Grant: Greater Cambridge, 2015. Available at [http://www.cambridgeshire.gov.uk/info/20006/travel\\_roads\\_and\\_parking/68/transport\\_funding\\_bids\\_and\\_studies](http://www.cambridgeshire.gov.uk/info/20006/travel_roads_and_parking/68/transport_funding_bids_and_studies)
- <sup>80</sup> Department for Transport, *Investing in Cycling and Walking: the Economic Case for Action*, 2015. Available at <https://www.gov.uk/government/publications/cycling-and-walking-the-economic-case-for-action>
- <sup>81</sup> Pearce, D.W. and Nash, C.A. *The Social Appraisal of Projects – A Text in Cost-Benefit Analysis*. Macmillan, 1981.
- <sup>82</sup> Huntingdon and Godmanchester Market Town Strategy. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>83</sup> March Town Strategy. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>84</sup> St Neots Town Strategy. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>85</sup> Ramsey Town Strategy. Available at <http://www.cambridgeshire.gov.uk/market-town>
- <sup>86</sup> Department for Communities and Local Government, *Planning Policy Framework for Health*, 2012. Available at <https://www.gov.uk/government/policies/making-the-planning-system-work-more-efficiently-and-effectively/supporting-pages/national-planning-policy-framework>
- <sup>87</sup> National Institute for Health and Clinical Excellence, *Walking and Cycling: PH41*, 2012. Available at <http://www.nice.org.uk/guidance/ph41>