

# Visions for a walking and cycling focussed urban transport system

**Corresponding author:** Miles Tight, Institute for Transport Studies, University of Leeds, Leeds LS2 9JT ([m.r.tight@its.leeds.ac.uk](mailto:m.r.tight@its.leeds.ac.uk)) Tel 0113 343 5350

**Co-authors:**

David Banister (Oxford University Centre for the Environment)  
Jemma Bowmaker (SURFACE Inclusive Design Research Centre, University of Salford)  
Jonathan Copas (School of Computing Science, University of East Anglia)  
Andy Day (School of Computing Science, University of East Anglia)  
David Drinkwater (School of Computing Science, University of East Anglia)  
Moshe Givoni (Oxford University Centre for the Environment)  
Astrid Guehnemann (Institute for Transport Studies, University of Leeds)  
Mary Lawler (Institute for Transport Studies, University of Leeds)  
James Macmillen (Oxford University Centre for the Environment)  
Andrew Miles (Centre for Research of Socio-Cultural Change, University of Manchester)  
Niamh Moore (Centre for Research of Socio-Cultural Change, University of Manchester)  
Rita Newton (SURFACE Inclusive Design Research Centre, University of Salford)  
Dong Ngoduy (Institute for Transport Studies, University of Leeds)  
Marcus Ormerod (SURFACE Inclusive Design Research Centre, University of Salford)  
Maria O'Sullivan (SURFACE Inclusive Design Research Centre, University of Salford)  
Paul Timms (Institute for Transport Studies, University of Leeds)  
David Watling (Institute for Transport Studies, University of Leeds)

## Abstract

This paper presents three alternative visions for the role of walking and cycling in urban areas for the year 2030. Each of these visions is based on the UK and represents a substantial change to the current situation and to what might be expected to happen if things continue as normal over the next 20 years. Each of the visions presents a view of a society where walking and cycling are considerably more important than is currently the case and where these modes cater for a much higher proportion of urban transport needs than now. The visions show a picture of urban environments where dependence on motor vehicles has been reduced, in two of the visions to very low levels.

Keywords: Walking, Cycling, Visioning, Futures, Sustainable, Transport

## 1. Background

This paper seeks to develop and evaluate three alternative visions for the year 2030 in which walking and cycling play a substantially more central role in urban transportation than is currently the case. The aim is to explore the extent to which these modes could replace our current dependence on motorised transport with a view to creating urban environments which are safer, more sociable and less environmentally damaging. The visions seek to go beyond just small scale incremental changes to the existing transport systems and to explore the potential for more radical change. The focus is on walking and cycling as these modes have a high potential to address (at least in part) many of the problems which currently blight our urban areas, including high numbers of road accidents involving motorised vehicles, traffic induced air pollution and associated health issues, noise, severance and the health issues associated with increasingly sedentary lifestyles – there are also substantial co-benefits.

In the UK and many other places walking and cycling are secondary modes of transport – the environment for these modes and level of provision of facilities is often poor; levels of risk of injury are generally higher than for motorised modes; perceptions are often negative, while the status associated with these modes is generally low; and the role that these modes

play in society and individuals lives has the potential to be substantially enhanced. Cycling and walking have a number of similarities – both involve the human body as a power system, they are exposed to the weather, both types of user are very vulnerable if involved in a collision with a motor vehicle and both are unlicensed. However, despite these similarities, the two modes are fundamentally different and have different roles and requirements. Cyclists typically cover greater distances than walkers and usually require a surfaced road. Walking is almost ubiquitous (so much so that it is sometimes not considered as a means of transport) and requires little training, while cycling is a less common activity, not popular as a mode with large proportions of the population and does require a degree of learning and confidence.

Cycling and walking are both widely recognised as environmentally friendly and healthy modes of transport and the potential for increasing levels is substantial (for example nearly two thirds of trips are under 8kms in length (42% under 3kms), and 25% of car trips are under 1.6kms), however, both have been in long term decline in Britain (DfT, 2007a). Cycle traffic declined from 23 to 5 billion passenger kilometres between 1952 and 2006, though there is some evidence of a slight increase since the late 1990s (DfT, 2007a). Between 1995/7 and 2006 the number of trips per person made by bicycle fell by around 20% and the average distance travelled by 9% (DfT 2007a). The proportion of people cycling to work in Britain fell from 3.8% in 1981 to 3.0% in 2006 (DfT, 2007a). Within Britain there is wide divergence in the use of cycling, with cities such as York, Cambridge and Oxford having much higher levels than the national average. In Britain walking accounted for 35% of all trips in 1975/76, but this fell to 24% in 2006 (DfT, 2007a). Despite this fall it is still an important mode of transport and in the UK it accounts for 80% of all trips under 1 mile (DfT, 2003). Whilst most people walk on a daily basis, the amount of walking is not equally distributed across the population, for example households without a car walk on average 65% further than those with a car.

Internationally, the United States and Canada have even lower levels of cycling, with approximately 1% and 2% of urban trips being made by bicycle in these countries respectively. In contrast, much higher levels of cycling are apparent in some parts of Northern Europe, with 28% of urban trips in the Netherlands made by bicycle (Pucher and Dijkstra, 2003), perhaps partly as a result of provision of high quality facilities and recent initiatives to promote policies such as bike and ride (Martens, 2006). Bassett et al (2008) make a comparison of proportions of walking and cycling trips between various countries – the UK population makes around a quarter of trips by walk or cycle, compared to just over 30% in Denmark, Finland, Germany and Sweden and close to 50% in the Netherlands. In many European cities, walking and cycling account for over 50% of all trips, and most recently in the UK the Sustainable Travel Demonstration Towns (DfT, 2007b) have already recorded substantial increases in walking and cycling. However, formidable obstacles to walking remain such as low density sprawl generating long trip distances, narrow or non-existent footways, inadequate crossing facilities and the growth of motorised traffic.

Cycling in countries such as the Netherlands, Germany and Denmark is often perceived as a good example of what can be achieved in terms of quantity and status. However, it was not always the case (Pucher and Buehler, 2008), as levels of cycling fell considerably between 1950 to 1975 in all three countries. It was only through changes in transport and planning policy in the mid 1970s and beyond that the current success story was generated. Together these points illustrate that with thought about the future, planning, effort, appropriate investment and most of all desire, it is possible to bring about change and to achieve desirable objectives. The key is to understand what kinds of transport futures are desirable and meet the aims and objectives of society, whilst still retaining an essential degree of functionality and workability. Without the thinking to conceptualise and define different futures it is unlikely that anything other than incremental change will occur.

## 2. The Visions

Three visions or future scenarios for 2030 are imagined below. Two of these consider future circumstances where change from the present has been generated through choice and a desire on the part of society for alternatives to the current situation in our urban areas (perhaps driven in part by a recognition of the unsustainability of the current situation); the third has in part been forced upon society by external constraints, in this case a fuel crisis, so the vision represents one way in which society might choose to adapt to this circumstance. All the visions aim to create an environment where the quality of the experience is improved for those who already walk and cycle, but also an environment where substantially more people will walk and cycle. The context for all of these visions is the UK, though the generic ideas could be extended to other locations relatively easily.

The visions have been developed by a process of review, discussion amongst the members of the research team and extensive discussion with (largely UK) stakeholders and experts through a series of workshops, project Advisory Committee meetings and presentations. The visions have developed substantially from their initial form as a result of these inputs, though inevitably they do not represent a complete consensus amongst all those involved. The visions are intended not as definitive statements of how the future should be, rather as a stimulus to debate about what could be possible if there were desire or other good reasons for change. Without recognition of what it might be possible to achieve and a consideration of substantially different futures to now, it seems likely that future change will remain predominantly incremental.

The visions are all based around an imaginary urban area, which is illustrated in Figure 1. This area has characteristics which are easily recognisable and apparent in many UK urban areas and we have chosen to assume that it has a population equivalent to a medium sized city of around 250,000 people.

*Figure 1 about here.*

Each of the visions are presented partly in the form of a narrative which describes the more general features of these future urban areas and partly through a series of visualisations of how parts of the urban areas might look and how they might function in 2030. Five areas of the city have been chosen and are shown as they are in 2010 in Figure 2 and in each of the three visions for 2030 in Figures 3 to 5.

The areas are as follows:

- An older **Victorian Street** which would have been built initially for very different traffic requirements than is now the case and which has over the years adapted slowly to changing circumstance, not always successfully. It is very much constrained for space by the building line. On-road parking is the norm as the houses were designed before the need for parking was considered. The streetscape is cluttered and the mixed uses are difficult to accommodate. It is not an overly pleasant place to travel or live, and noise, safety and local air pollution are all issues.
- An **edge of town** location where the urban fabric meets open space. The city is bounded by a ring road, though beyond this there is now some development such as business parks and out of town shopping centres. Traffic on the ring road is heavy and pedestrian and bicycle access between the residential zones of the city and the facilities outside the ring road is difficult – most such access is by car for which the facilities have really been designed.
- A **suburban shopping area** containing mid-range shops and perhaps a small supermarket. An area with many competing uses – in part a through route for both traffic and pedestrians, in part a destination in its own right. It is an area which has

many problems, in particular safety issues for pedestrians, problems of parking and a complicated traffic mix, with public service vehicles and freight deliveries common.

- A more modern estate towards the edge of town (described here as **a 60s/70s estate**). This is essentially a residential estate, perhaps slightly run down and with the range of social problems which can characterise such areas. On the positive side there is a lot of space, as the estate was designed on a low density model, and hence, unlike the Victorian street, there is more room to construct a more walking and cycling friendly environment. The street scene shown has a large primary school on the left hand side of the road and hence some very time-constrained pedestrian issues at certain times of the day.
- A **suburban interchange**, in this case a rail station. This is an important link between the outer neighbourhoods of the city and the city centre. Access to and from the station on foot can be difficult due to conflicts with traffic. There are limited facilities at the station for bicycle parking.

*Figure 2 about here*

Each of these locations in the imaginary city of 2010 are not intended to be the best (in terms of their walkability and cyclability) – indeed there are many examples of such locations in UK urban areas where facilities for walking and cycling exist which are much better than those portrayed here. However, nor are these representations the worst of their kind in UK urban areas – indeed many might argue that there are many worse examples. If anything the examples shown perhaps fall just to the worst side of average.

Table 1 shows current GB mode split for urban areas based on trip stages (hence, these figures take some account of short walks undertaken at the start and end of public transport and car trips) and a proposed mode split for 2030 in each of 3 alternative futures.

*Table 1 about here.*

## **2.1. Vision One – European Best Practice**

This vision of the future represents a widespread implementation of current best practice towards more sustainable travel behaviour. Examples of elements of this vision already exist in many urban areas around the world. Cities such as Delft, Groningen, Copenhagen and Munster in Europe all display aspects on this vision, as do cities such as Portland in Oregon. This vision also reflects the best practice as proposed by documents such as the UK Manual for Streets (DfT, 2007b).

In this vision we foresee moderate increase in walking and considerable increases in cycling relative to the current low base. Public transport usage has also increased, whilst car use within the urban area has substantially declined (see Table 1). One of the principal controls on car use is through adjustments to the amount and price of parking for cars, though congestion remains a problem and the permeability of the urban areas for car travel is reduced. Controls on driver behaviour such as Intelligent Speed Adaptation (ISA) are generally in place resulting in slower traffic speeds and greater conformity to speed limits. Much of the restricted level of car travel is for trips which remain impractical for either walking, cycling or public transport and for those for which use of such modes would be difficult or impossible. Figure 3 shows the locations from Figure 2 as they may look in 2030 in the Vision 1 scenario (note that the buildings and physical dimensions of the streets remain essentially as in 2010).

*Figure 3 about here.*

The fundamental difference in Vision 1 from the current day is that best practices in terms of infrastructure and supporting measures for walking and cycling have been widely

implemented making these modes attractive choices to a much wider range of people than is currently the case. Safer bicycle paths and more pleasant pedestrian environments have meant that a higher proportion of trips are now made by these modes. Attention has also been given to a stricter land use policy to prevent further sprawl; with a real benefit that many people are within a short cycle ride of shops and other daily needs, though the fundamental structure of the urban area has remained largely the same as now. Walking and cycling are considered more important and central to good transport planning by those responsible for developing the urban transport system than at present, though not yet perceived as such universally by all sectors of society. There is increasing widespread recognition and understanding of the wider benefits of a greater focus on walking and cycling, including potential benefits in terms of reduced carbon emissions, improved local air pollution, reductions in noise, increased sociability of the urban environment and improvements in health. Attitudes of all road users towards walking and cycling have improved.

In this vision public transport links more effectively with walking and cycling (see Figure 3c and e) and provides the means for using these modes as part of longer journeys. In general public transport is substantially improved over the current situation in terms of key performance indicators such as reliability, comfort, convenience, cost and frequency. Interchange facilities between public transport and walking and cycling in improved.

The road hierarchy has become more transparent, particularly as it relates to walking and cycling. Specific spaces for these modes are the norm on all streets (see Figure 3 all images) and some differentiation has been made for fast and slow cycling. The networks for walking and cycling are more highly connected and legible than is the case at present. Online information on routes is widely available and waymarking and signposting are commonplace (see Figure 3d). Road safety has generally improved, though some accidents still occur. Legislation regulates between the different classes of road users in favour of non-motorized road users. Instinctively the notion that driving is a right, and only motor vehicles have a 'right to the road', has been changed by a very active public campaign targeting both safety as well as physical activity levels in the population. Park and ride (or cycle and ride) are provided on the perimeter of the urban area.

Cycling and walking have been boosted by a legal mandate for a proportion of yearly expenditure to be spent on making real improvements to each city's 'core network'. Local Authorities are now required to implement a 'core network' of cycling paths and quality walking spaces with legal minimum levels of provision (including parking) based upon density of population. To combat bicycle theft partnerships with shops and police have been expanded to provide marking and prevent selling of stolen bikes. Maintenance and enforcement of the cycle network and footpaths is also exemplary. Street clutter has been reduced to make movement through the urban area on foot as easy as possible and to ensure minimum standards for footway width.

Freight transport and deliveries are still largely undertaken by lorries and vans (though with a greater dependence within the urban area on electric vehicles). Significant advancements have taken place in home delivery systems and 'freight windows' for stock deliveries in city centres.

## **2.2. Vision Two – A car-free public transport orientated future**

In this vision there has been a substantive change in transport behaviour in urban areas, going well beyond the changes experienced in Vision 1 (see Table 1). Walking, cycling and public transport have increased considerably compared to Vision 1 and to the base case. There has been a dramatic reduction in car use so that it is now a minority mode. As well as changes in the transport system we envisage that this vision is only really achievable with

major changes in other aspects of society which have led to a willingness and acceptance of the need and desirability of the changes involved.

Figure 4 shows the same 5 locations as in Figures 2 and 3 and how they may look in 2030 under the Vision 2 scenario.

*Figure 4 about here*

In Vision 2 car use in urban areas is curtailed through government action and through the positive appeal of alternative modes of travel. Most people do not own or use a car (see Figure 4 all images). The principal private car users are those with mobility difficulties who cannot realistically use 'active' modes and a small number of people whose mode of transport needs to be prompt (doctors doing home visits may be an example). Where practicable all these car users make use of car pooling and integrate car use with the enhanced public transport network. Car design takes on board latest technological developments, for example to support automatic speed reduction and carbon emission reduction.

Walking and cycling are considerably more important modes both than in 2010 and in Vision 1 in 2030. These modes have undergone a radical change both in the volume of activity, in the enhanced way that they are perceived by society as a whole and in the level of provision. Thus, for example, most school children walk and cycle to school, whilst enhancing walking and cycling is a central concern for transport planners. Small scale technological developments have encouraged the increased take-up of walking, including: electronic navigation for people who benefit from additional support; pedometers and accelerometers available free from health centres; and careful use of surveillance. Technological developments that have increased take-up of cycling include electric bicycles and electronic navigation.

Public transport has been considerably enhanced to fulfil some of the transport needs previously fulfilled by the car (see Figure 4e). There is substantially more public transport than in Vision 1 and as in that vision there have been improvements in terms of key performance indicators such as frequency, convenience, reliability, safety, accessibility and comfort. Short trips in urban areas are undertaken on foot or bicycle with easy access to public transport interchanges. Longer trips within the urban areas are typically undertaken on public transport, although the walking and cycling enthusiast may choose these modes in lieu of public transport. Hence, public transport is taking on a role which had hitherto been fulfilled for many people by the car. Door to door public transport provides access to dial-a-ride systems (which have been significantly improved from present-day examples of dial-a-ride).

Land use patterns in urban areas have changed particularly to support the infrastructure for improved public transport, though in general this change has been slow and incremental. The road network is essentially similar to the Vision 1 although the distribution of space on the road network has changed with a greater focus on walking and cycling (see Figure 4 all images). Easily accessible transport interchanges are provided in neighbourhoods within close proximity to most residences and there is increased use of streets as social spaces for children and others.

Whilst there would inevitably be an increase in the number of public transport vehicles, it is in general expected that these would be segregated from the walking and cycling networks. However, within residential neighbourhoods smaller public transport vehicles will share road space with pedestrians and cyclists (see Figure 4a and d).

Freight is transported from distribution centres by a fleet of small electric vans which would be segregated from the walking / cycling network where possible.

The city is much more 'civilised', insofar as it operates on a model of greater sociability and accessibility, so for example neighbours assist with helping each other to move around, thus reducing isolation. Furthermore, there is respect for other passengers using public transport. Road safety is significantly improved – serious collisions between vehicles are extremely rare, and, when they do happen, involve vehicles travelling at relatively low speeds. Noise and pollution from traffic is reduced and levels of public health across the population are substantially greater than those in 2010.

### **2.3. Vision Three – A localised energy efficient future**

In this vision serious constraints on energy usage have rendered the traditional car virtually obsolete. Parallel developments in 'smart technology' have enabled walking and cycling to become the predominant modes of urban transport. This vision of the future represents a radical shift towards more sustainable travel behaviour. Walking and cycling (Human Powered/Assisted Vehicles (HPVs)) are the predominant modes of urban transit. Buses and trams accounting for only 15% of the modal share are restricted to segregated and direct routes to and from the urban core. The principal car users are those with mobility difficulties who cannot realistically use 'active' modes.

*Figure 5 about here.*

In this vision supporting technological developments have enabled walking and cycling to become more convenient modes for a far greater proportion of the population than is currently the case in 2010. These technological developments exceed those in Vision 2, though their extent is somewhat limited by energy constraints where renewable sources of energy are not available. Examples include: 'neighbourhood electric vehicles (NEVs)'; electric bicycles; 'airport-style' moving walkways; covered / weatherproof walking and cycling networks; electronically-assisted bicycle security; and electronic navigation technology for cyclists, pedestrians and those who are partially-sighted (see Figure 5a, d and e).

Road safety has significantly improved; serious collisions between vehicles are extremely rare and, when they do happen, involve vehicles travelling at relatively low speeds (~20mph). As in Vision 2 the city is also much more 'civilised', insofar as it operates on a model of greater sociability and accessibility; traffic noise is almost non-existent and levels of public health are substantially greater than those in 2010. Moreover, private cars are no longer the status symbol they once were.

Land use has changed considerably from 2010 patterns. Local, neighbourhood facilities predominate at the expense of 'out of town' shopping centres (see Figure 5d). Residents living within the urban area can easily travel as a pedestrian or by bicycle for the majority of their trips. Individuals entering the city from surrounding areas, where required, are able to hire bicycles from 'mobility hubs' situated around the city boundary (see Figure 5b) and either cycle or walk into the urban core.

Freight is transported from distribution centres at the edge of the urban area to locations in the city through a mix of bicycle transportation and electric goods vehicles, supported by online delivery-booking technology and mobility hubs at the edges of the urban area.

## **3. Interrogation of the Visions**

In this section we interrogate the visions given above in Section 2 in order to dig deeper into exactly what is involved with each vision. Specifically, for each of Visions One, Two and Three, we ask a set of questions concerning: their desirability; their representation of change

for walking and cycling; and their representation of change in exogenous conditions. Whilst more attention will be paid to the descriptive narratives than the visualisations, the latter will be mentioned at appropriate times. Where phrases from Section 2 are used in this section they are given in quotation marks.

### **Are the visions desirable and, if so, in what respects?**

It is clear that, in contrast to traditional *forecasting techniques*, by which (current) trends are extrapolated to a future target year, the methodological approach described in Section 2 is based upon the creation of *desirable futures* (which will almost certainly involve trend-breaks). However, in saying this, a number of awkward questions arise. The most obvious such question concerns whether Vision Three is at all desirable, given that it involves a vision that has “in part been forced upon society by external constraints, in this case a fuel crisis”. A simple response to this question is that, given a (presumably) undesirable context, the response by society in terms of providing attractive walking and cycling facilities is desirable. However, this response immediately raises the issue of the dividing line between, on the one hand, walking and cycling aspects of the future, and, on the other hand, *exogenous aspects*. This issue will be further addressed below. For the present, it is sufficient to say that a clear dividing line (whilst attractive for conceptualisation) probably does not exist in reality.

A second awkward question with respect to desirability concerns the perspective from which something is judged to be desirable. Clearly, advocates of walking and cycling will find many of the aspects of the three visions desirable. However, it should not be assumed that all such advocates support all aspects of the visions. For example, some cycling enthusiasts might object to the fact that, in Vision One, the physical layout shown in the Victorian Street scene (Figure 3a) would require them to move relatively slowly (at least in residential areas). Furthermore, those who are not advocates of walking and cycling might find many of the aspects of the visions undesirable. This is particularly the case in Vision One, in which walking and cycling are “not yet perceived...by all sectors of society” as being “more important and central to good transport planning...than at present”. The narrative describes a number of restrictions are put on car use that some might find excessively coercive. In Vision Two, with its emphasis on underlying social change and rejection of (anti-social) individualism (“the city is much more ‘civilised’, insofar as it operates on a model of greater sociability and accessibility”), it is stated that such social change leads to “a willingness and acceptance of the need and desirability” of pedestrian and cyclist changes. However, there is clearly a (potential) difference as to what people might find desirable in the future and what people find desirable in the present day, and the purpose of the visions is to facilitate discussions in the present day: hence the desirability issue is more relevant to present day perspectives.

A final point about desirability concerns the related issues of choice and political control. Both Vision One and Vision Two “consider future circumstances where change from the present has been generated through choice and a desire on the part of society for alternatives to the current situation in our urban areas”. It is important to identify who exactly who is making this “choice”, what political mechanisms are used for people to participate in the process of choice-making, and whether these mechanisms implicitly or even explicitly exclude any members of society

### **Do the visions represent systems that are stable or are changing in terms of walking/cycling use and facilities? If the latter, what aspects of them are changing?**

The methodological approach of creating of (future) visions is very similar to the approach used in the creation of (future) utopia, a subject that has captured the imagination of a number of thinkers over more than two thousand years (an early example of a utopia being



the political organisation of society described by the Greek philosopher Plato). An important and continuing critique of many types of utopia is that they represent a future in which nothing is changing: for many people this represents a state of stagnation. An alternative to creating a fixed view of the future is to think of the future as a dynamic process, in which the representation of a specific future year is the representation of a particular stage in such a process. With respect to the three visions, various comments can be made. Firstly, the visualisations (shown in Figures 3, 4 and 54) are inevitably snap-shots of specific moments in time, and it is difficult to judge from these whether they represent a static picture or a stage in a (dynamic) process. To make such a judgement, it is necessary to analyse the narrative descriptions of the visions. This analysis greatly benefits by distinguishing between different aspects of the visions, with three broad categories of aspects being considered: technological; infrastructural (including both transport infrastructure and general urban form); and social (covering people's attitudes and behaviour, both individual and collective). With respect to the last of these categories, some degree of social change must occur at some point before 2030 (particularly in the case of Visions Two and Three): however, it is not clear from the narrative descriptions as to whether change is still taking place in 2030. However, with respect to technological and infrastructural aspects, the narratives throw more light on this issue. In general, Vision Three has a greater degree of both technological and land use change than Vision Two, which has a greater degree of change than Vision One. Given that technological and land use changes inevitably take place over a long time cycle, it can be concluded that Vision Three certainly represents a system in a process of dynamic change in 2030, and that the same can probably be said (though with less certainty) for Vision Two.

### **Do the visions imply any causal relationships?**

The answer to the previous question put the spotlight on the issue of change, and in particular change between the present day and 2030. Whilst it is beyond the scope of this paper to examine processes of such change in any detail, it can safely be asserted that, in order to understand change, it is important to understand the relationship between factors involved in change. In particular, it is useful to consider if any factors are *caused* by other factors. To initiate such thinking, we can examine the visions to see if it is implied that any factors are *causally dominant*. The first point to make here is that, in both Visions Two and Three, the exogenous scenarios have a strong causal impact on walking and cycling. This issue will be discussed further below. With respect to the transport sector, the main two *immediate* causal factors are: (i) walking and cycling becomes more attractive (as is well illustrated in the visualisations); and (ii) car use becomes more restricted, i.e. less attractive. In Vision Two, an extra driving factor is the substantial improvement in public transport "in terms of key indicators such as frequency, convenience, reliability, safety, accessibility and comfort" (though it should be noted that cheapness, for the traveller, is not included in this list of indicators). The question then arises as to whether any *secondary* factors are specified (or at least implied) which cause these transport factors to change. This issue is most directly tackled in the narrative for Vision Two in which it is stated "car use in urban areas is curtailed through government action" (and "through the positive appeal of alternative modes of travel"). This immediately raises a fundamental question as to whether strong government is essential for bringing about low energy futures, and in particular whether strong national government is necessary. This is the implication in Vision One, for which "cycling has been boosted by a legal mandate for a proportion of yearly expenditure to be spent on making real improvements to each city's 'core network'", implying that national government takes a strong role with respect to local government issues.

### **What is the role of the concept of *exogenous backgrounds* in this analysis?**

The question of exogenous backgrounds has already been raised above. Furthermore, it was indicated that, from the point of view of conceptualisation, there is an attraction in thinking of a strict division between an exogenous (future) background society and an

endogenous transport sector that operates against this background (and is, to an extent, causally determined by it). However, how *realistic* is this conceptualisation? The first point to note here is that the levels of mode share for walking and cycling in Visions Two and Three (shown in Table 1) are simply unbelievable unless strong (background) changes have taken place in society. It follows that changes in exogenous background cannot be ignored; though it should not be forgotten that Vision One also represents a radical change for the UK transport system. The question about realism is thus more concerned as to the realism of the (assumed) strict division between an exogenous background and an endogenous transport sector, and whether it is realistic to assume that exogenous factors have (only) one-way causal impacts on endogenous factors. Two points can be made here. Firstly, if it is believed that the transport sector has an important impact on society (as would be implied by the New Mobilities Paradigm (Sheller and Urry, 2006)), the division between exogenous and endogenous becomes more (conceptually) complex (though not necessarily less attractive). Secondly, in the case of the visions presented in this paper, these questions can probably only be fully resolved by examining the pathways that lead (from the present day) to the visions, and not by considering the visions themselves in isolation. As already stated, the consideration of pathways goes beyond the remit of the current paper. However, even without examining pathways, there are still useful insights that can be gained from further analysis of the exogenous backgrounds to the visions, and these insights are now presented.

**If the exogenous backgrounds are different to the present day, is this difference local or ‘global’ (national, continental or worldwide)? What is the relevance of this difference to walking and cycling?**

As has already been mentioned, the exogenous backgrounds of the three visions are summarised as: similarity to the present day (Vision One, though not in terms of the endogenous transport background which is quite different to all but a small number of locations in the UK); a high degree of social change (Vision Two); and a fuel crisis accompanied by a high level of technological development (Vision Three). It follows that the issue about *local* versus *global* dimensions of exogenous change is only relevant to Visions Two and Three. Taking Vision Three first, it is not actually spelt out in the narrative whether the fuel crisis is global or not. However, for the impact of the crisis to be as strong as it is (and for the world not to descend into continuing war over fuel resources) it must be assumed that the fuel crisis is global. Whether the high level of technological development is a global phenomenon, or restricted to a national/continental region, is underdetermined by the description. It is highly unlikely though for such development to exist purely on an individual city level. With respect to Vision Two, the characterisation of global versus local is also underdetermined by the narrative description, and a number of highly different variants are consistent with the vision. At one extreme, Vision Two can be seen as representing an isolated “civilised” city enclave which has changed in the midst of a world that has (in relative terms) stood still. At the other extreme, Vision Two can be seen as involving a future in which high levels of social change have occurred throughout the world. Many other possibilities (such as change limited to regional, national or EU level) lie between these extremes.

What difference does the global/local distinction make for walking and cycling? A first point to make here is that the visions only describe urban transport, with virtually no mention being made about what happens outside the city. Clearly the political relationship between a city and its periurban/rural surrounding areas will have a large impact on many issues concerned with walking and cycling in the city. For example, if the surrounding areas of a pedestrian/cyclist-friendly city enclave are seen as being car-friendly, what will be the demographic effect? One scenario could envisage that those in the surrounding areas that are favourable to walking and cycling will migrate to the city, whilst those city-dwellers who feel attached to their cars will move in the opposite direction. At first sight this might seem to

be an attractive solution. However, many boundary issues will inevitably arise, given that those living outside the city will presumably need to visit the city at some time, and those living in the city might wish to travel outside (which could be difficult without a car). Furthermore, a question arises as to whether the overall impact of this relocation might lead in fact to an increase in fuel use (aggregating the city and its surrounding areas). On the other hand, if periurban and rural areas become highly pedestrian/cyclist-oriented, what will this entail in terms of practical lifestyles in such areas?

#### **4. Conclusions**

This paper has set out a number of visions for the year 2030 which bring about a step change in the level of walking and cycling in UK urban areas. The visions are intended as a basis for discussion and to help promote thought about whether such futures are firstly possible (i.e. how would society have to change to make them happen and what kinds of activities which are currently possible would no longer be so) and desirable. Vision 1 is probably largely achievable without major changes to the way in which society works (indeed, the vision is based on circumstances which largely exist already in a number of continental European urban areas and elsewhere). Visions 2 and 3, if they were to happen, will require changes to society and to the attitudes and behaviour of people within society – there would need to be a willingness (or perhaps a need) to make such changes in order to bring the visions about. The benefits of such changes are potentially extensive – reduced local noise and air pollution, decrease in emissions of greenhouse gases, improved safety, better fitness levels of the population, as well as changes which are more difficult to quantify such as greater sociability of the urban environment, increased freedoms for children to use the environment and an overall improvement in urban quality of life. The urban areas described in visions 2 and 3 and the way in which those urban environments work will be very different to what exists in 2010.

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#### **References**

David R. Bassett, Jr., John Pucher, Ralph Buehler, Dixie L. Thompson, and Scott E. Crouter (2008) *Walking, Cycling, and Obesity Rates in Europe, North America, and Australia*. Journal of Physical Activity and Health, 2008, 5, 795-814

Department for Transport (2003) *Walking in GB*. Personal Travel Fact sheet 4 – January.

DfT, (2007a) *Transport Statistics Great Britain*: 2007 edition.

Department for Transport (2007b) *Manual for Streets*. Thomas Telford Publishing.

Martens, K. (2006) *Promoting bike-and-ride: the Dutch experience*. Transportation Research Part A: Policy and Practice, Volume 41(4), pp 326-338.

Pucher, J. and Buehler, R. (2008) *Making cycling irresistible: Lessons from the Netherlands, Denmark and Germany*. Transport Reviews, Volume 28(4), pp495-528.

Pucher, J. and Dijkstra, L. (2000) *Making Walking and Cycling Safer: Lessons from Europe*, Transportation Quarterly, Volume 54(3), PP 25-50.

Sheller, M and Urry, J. (2006) *The new mobilities paradigm*. Environment and Planning A Vol 38, pp 207-226.

Table 1: Approximate mode split (trip stages) for the current situation and the 3 2030 visions.

	Current situation (2006) <sup>1</sup>	2030 Vision 1	2030 Vision 2	2030 Vision 3
Walk	28%	32%	37%	40%
Cycle	1%	13%	23%	40%
Public Transport	12%	25%	35%	15%
Car	59%	30%	5%	5%

<sup>1</sup> – source: National Travel Survey, 2006.

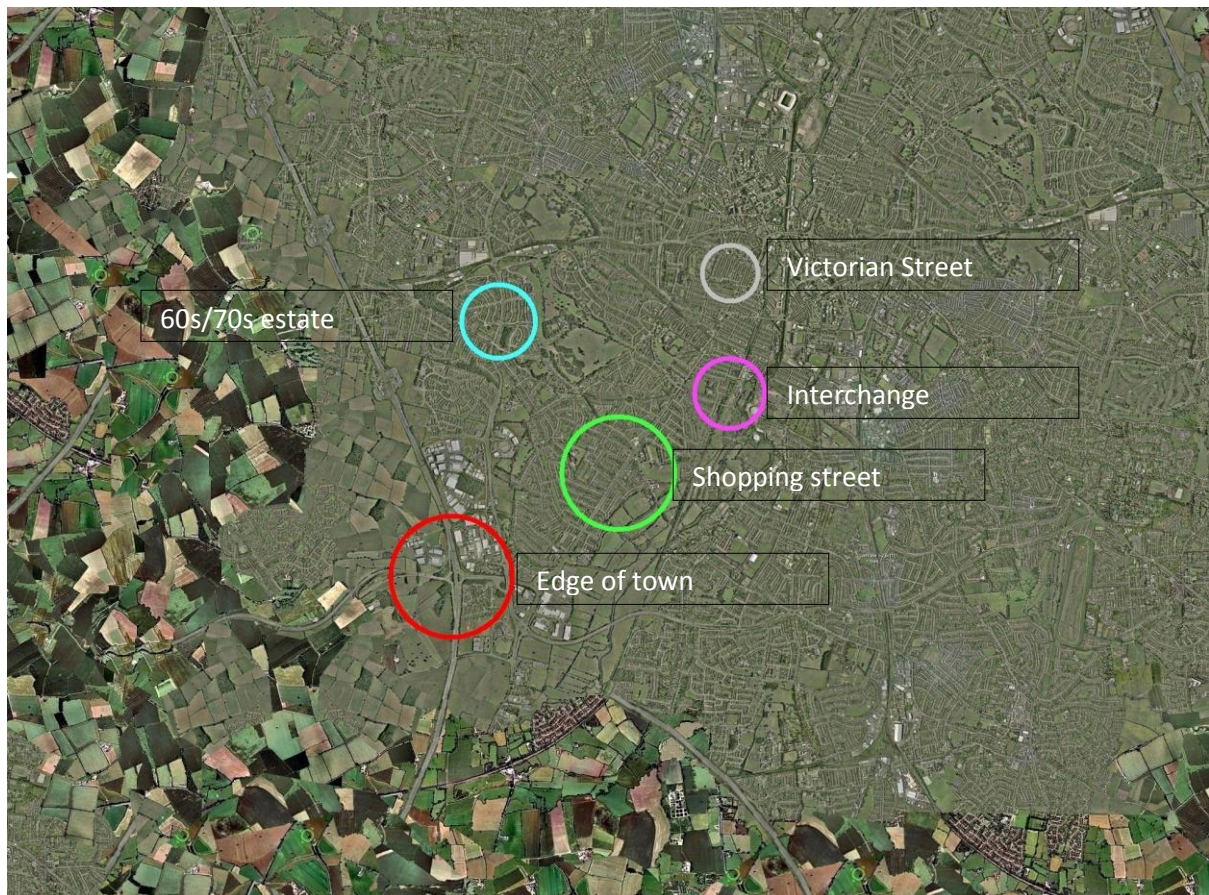


Figure 1: Mock-up of hypothetical urban area (coloured circles show locations of different areas of the urban area).





Figure 2: Five different locations in the urban area of 2010



Figure 3: Five urban locations as they might appear in Vision 1 in 2030.





Figure 4: Five urban locations as they might appear in Vision 2 in 2030.



Figure 5: Five urban locations as they might appear in Vision 3 in 2030.