BENEFITS OF INVESTING IN CYCLING

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Executive summary

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Investing in cycling will generate benefits for the whole country, not just those using a bike to get around. Eleven benefits are summarised here which can help solve a series of health, social and economic problems. This report shows how investing in cycling is good for our transport systems as a whole, for local economies, for social inclusion, and for public health.

Creating a cycling revolution in the UK requires sustained investment. In European countries with high cycling levels, levels of investment are also substantially higher than in the UK. The All-Party Parliamentary Cycling Inquiry has recommended a minimum of £10 annually per person, rising to £20, which would begin to approach the spending levels seen in high-cycling countries.

Investing in cycling will enable transport authorities to start putting in place the infrastructure we need to ensure people of all ages and abilities can choose to cycle for short everyday trips. As well as making cycle journeys more pleasant, safer and faster, it sends the signal that cycling is a normal way to travel. This is important because the perception of cycling as a marginal and minority mode is off-putting to many people.

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How more cycling can transform the country

Getting more people on bikes would help to tackle numerous societal issues and the benefits would be felt by everyone – even if they do not cycle.

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When the 2008 Health Survey for England measured physical activity objectively, rather than just asking people, only one in 20 adults achieved the minimum recommended 150 weekly minutes of at least moderate intensity exercise. This is making us sick, and costing us money.

Many scientific studies have found that regular physical activity reduces the risk of major killers including heart disease, stroke, breast cancer, colon cancer, and the growing problems of diabetes and dementia. This includes studies which specifically found cyclists on average lived longer than non-cyclists.

Cycling is a good form of physical activity. Regular utility cycling, such as riding to work, builds exercise into busy everyday life. Cycling for 30 minutes each way to and from work is enough to achieve the higher recommended target of 300 minutes per week.

In London, the extra physical activity provided by more cycling and walking could prevent thousands of premature deaths every year. There are also potentially big health care savings. If people in urban England and Wales cycled and walked as much as people in Copenhagen, the NHS could save around £17 billion within twenty years.

Changes to the built environment are key to increasing population physical activity. A study evaluating new motor-traffic free walking and cycling routes shows that after two years people living nearer the routes are getting more physical activity. The National Institute of Health and Care Excellence recommends giving those using active travel modes the highest priority when developing or maintaining streets and roads.
**Cycle trips, unlike motorised vehicles trips, don’t generate air or noise pollution**

Shifting 10% of short urban trips outside London from car to cycle could save over 100 premature deaths from air pollution related illnesses annually.

Before the 1956 Clean Air Act, coal fires were a major cause of urban air pollution, peaking in London’s 1952 Great Smog, now estimated to have killed 12,0001. Our coal stoves have virtually gone. Now transport is the overwhelming source of urban air and noise pollution2.

Urban air pollution is associated with deaths from heart disease and lung cancer3. It has been estimated to kill 1.3 million a year globally4. Noise pollution is damaging too. A Canadian study found people in the noisiest 10% of areas experienced 22% more deaths from heart disease than those in the quietest 10% of areas5.

Moving motorised trips to cycling can improve the health of local people by cutting air pollution6. Shifting 10% of short urban trips from car to cycle, in English and Welsh urban areas outside London, could save over 100 premature deaths annually7.

This could particularly benefit child health, because the most polluted areas are those where families with young children live8.

Being physically active in a polluted environment means breathing in more pollution. However, for an individual, the air pollution impact of shifting from car to cycle is quite small9 and depends on the environment10. Routes separating cyclists from motorised traffic help11. A US study found that installing a cycle track protected by car parking reduced cyclists’ exposure to ultrafine particulate matter, compared with an on-road cycle lane12. Such infrastructure may also benefit pedestrians as distance from motor traffic is associated with lower pollution exposure13.

More cycling can make everyone safer. When Woodcock et al13 modelled the effects of three urban scenarios involving more cycling and walking, they found an overall reduction in injuries.

Mode shift from car trips to cycling or walking has two contradictory effects on injury. Firstly, an individual who switches from car to cycling or walking may see some increase in their own injury risk2. But by no longer using a motor vehicle, they are posing less threat to others3. While some injury modelling approaches only consider the first point, Woodcock et al’s model includes both.

With a big enough shift away from car trips, the societal trade-off becomes positive and we start to see reductions in overall road deaths and injuries. Woodcock et al found this in all their scenarios, but especially in the two where change was more substantial, with greater reductions in car trips and total travel distances.

For these two scenarios, deaths and serious injuries on the roads approximately halved, meaning over 500 premature deaths avoided each year (in urban England and Wales outside London).

While motor vehicles are the major threat, bicycles do cause some pedestrian injuries. However, encouraging evidence from New York and California, where cycling is growing, shows this already low figure falling further4. One reason could be that where cycle infrastructure is improved, cyclists are less likely to ride on the pavement and come into conflict with pedestrians5.

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1 Davies et al 2002
2 Vlachokostas et al 2012
3 de Hartog et al 2010
4 Haines and Dora 2012
5 Gan et al 2012
6 Lindsay et al 2011
7 Woodcock 2014
8 Mitchell and Doring 2000
9 Woodcock et al 2014
10 Rabl and de Nazelle 2012
11 Jarjour et al 2013
12 Kendrick et al 2011
13 Kaur et al 2005
14 Tuckel et al 2014
5 NITC 2014
Investing in cycling will mean cycling is safer and feels safer

If cycling was as safe in the UK as in The Netherlands we would see around 80 fewer cycle deaths each year.

Many are put off cycling because of safety fears, but in the UK, most cycle deaths and serious injuries are not caused by cycling itself, but by motor vehicles. These risks can be massively reduced. Countries that have invested in cycling have low injury risks, despite few cyclists wearing safety equipment. In The Netherlands, adults under 30 experience a lower risk of dying, per kilometre when they cycle than when they drive.

Per hour spent cycling, cyclists in England are around four times more likely to be killed than in The Netherlands. In 2013 109 cyclists were killed in Britain. If cycling were as safe as in The Netherlands, we would see around 80 fewer cycling deaths on the roads each year at current cycling levels. Put another way, we could have 12% rather than 3% of people commuting by bike, without any increase in cycling deaths.

A range of factors make cycling and walking more dangerous, including a lack of investment in good quality infrastructure. Macmillan et al. compared different cycling investment scenarios in Auckland, New Zealand. They found that a limited investment would increase cycling injury risk, and more ambitious changes - specifically, physical segregation on arterial roads (with intersection treatments) and low speed, bicycle-friendly local streets - were needed to reduce risks and increase cycling uptake. A recent Canadian study found lower injury risks with bike-specific infrastructure along busy streets.

Better quality infrastructure can both reduce risks and encourage more cycling. Objective injury risk matters, but people are also influenced by experiencing, seeing or hearing about hostile traffic conditions. This includes near misses, which unlike injury collisions are more likely to happen on link sections than junctions. Studies show people feel safer on routes separating them from busy motor traffic, for example, involving separate infrastructure or quiet streets.

References:
1 TfL 2012
2 Pucher and Buehler 2008
3 de Hartog et al 2010
4 Mindel et al 2012
5 DfT 2014
6 Bhatia and Wier 2011
7 Macmillan et al 2014
8 Teschke et al 2012
9 Joshi et al 2011
Cycling can improve psychological well-being

Many people who cycle say the emotional benefits are very important to them.

Travelling can be stressful, particularly on the daily commute. Traditionally, this has been accepted in transport economics, where time spent travelling is defined as lost time. However, increasingly academics argue that people can enjoy and value transport time.

We do not know enough about how cycling affects people’s moods and emotions. There seems to be much potential for cycling to improve well-being, with some studies finding a positive impact on well-being associated with cycling or walking to work. A study of longer-distance Copenhagen cycle commuters found cycling helped with stress and transitions between work and home.

Martin et al’s longitudinal study found that switching from car commuting to active travel (walking or cycling) improves psychological well-being. For example, car commuters were at least 13% more likely to report being constantly under strain or unable to concentrate, compared to those using active travel. Because cycling is a form of moderate to vigorous physical activity it may help in treatment of mental illnesses such as depression and help prevent depression in the first place.

Current cyclists value the emotional benefits of cycling:

“We found that motivations for cycling were varied and included physical health benefits, cost and convenience, which have been cited in other research. […] Additionally, emotional benefits of cycling were described as important by many interviewees, for example in terms of ‘me time’ and ‘winding down’. The physical activity provided by cycling can simultaneously produce emotional health benefits, although the extent and nature of this will depend upon the cycling environment. […]”

“[Bristol to Bath] cycle track, although it’s going into the middle of Bristol city, it feels like it’s a country lane. You’ve got like allotments either side, you’ve got trees growing over. So, it’s quite pretty. So, it just, it clears your mind a little bit. It just gives you a little bit of time to think, especially when you’re coming back to a house full of kids” Neil, Bristol.

As emotional benefits from cycling can be counteracted by hostile traffic, there is a need to provide relaxed and pleasant cycling environments. The presence of nature or green space enhances mood benefits from physical activity. Stefánssóttir found cycle commuters positively value aesthetic experience with greeneries, contact with the natural environment and distance from motorised traffic being most important.

The poorest groups suffer from lack of access to transport. Among the richest fifth of English households, half own two or more cars, with only one in seven living without a car. But in the poorest fifth of households, nearly half have no car.

Transport is a key barrier for people looking for work. The 2011 Census figures show jobseekers in England and Wales are three times more likely to live in a no-car household than employed people.

Many people on low incomes face either a struggle to get around without a car, with public transport expensive or limited, or a struggle to pay for their car. Despite this, most do not see cycling as an option.

Poor infrastructure is one reason. Studies have found that the kinds of attributes needed to be a cyclist in hostile conditions may create additional barriers for under-represented groups.

Cycling can transform the mobility and life chances of Britain’s poorest

Increasing cycling to Danish levels could increase the mobility of the poorest by a quarter.

Investing in cycling can address these physical and psychological barriers, so enabling people in lower income households to access jobs and services and reducing their need to own and use cars.

Denmark shows how different things could be. Cycling there is a normal form of transport for all income groups, but most importantly for the mobility of the poorest. Danes in households with incomes below $13,004 make 2.7 trips per day, of which 26% (0.7) are by bicycle. By contrast people in the poorest fifth of English households (below £15,823) only make 2.2 trips per day.

While trip rates in England by other modes are fairly similar to those by lower income Danes, the big difference is that cycling levels are much lower (0.03 trips per day, rather than 0.7). This suggests that if we can get people in the poorest income groups cycling at Danish levels, we could increase mobility by up to a quarter.
13 Benefits of investing in cycling

Cycling promotes independence in youth and at older ages

Provision for cycling could make a big difference to children’s and older people’s lives.

Within the European context, children in the UK experience low levels of independent mobility\(^1\). Many older people do too, particularly when they can no longer drive. Stopping driving has negative impacts for older people, which also harms society, as it leads to reductions in paid work and informal volunteering\(^2\).

In the UK, cycling is not seen as an option by most children and older people. Only 1% of 5-10 year-olds and 3% of 11-15 year-olds cycle to school. Many would like to walk or cycle, but are not allowed\(^3\). Cycling is virtually absent among over-65s - only 8% of men and 3% of women do any cycling ever in a month, compared to 20% and 10% for all ages\(^4\). Some studies suggest mixing with motor traffic is particularly off-putting for older adults\(^5\).

In high-cycling contexts, cycling means independence for young and old alike, with a range of related benefits. 49% of all Dutch primary school children ride to school\(^6\). Over 10% of all trips by Danish and German over-65s are by bicycle, as are 24% of all trips by Dutch over-65s\(^7\). Even among Dutch people aged 80-84, over 20% prefer their bicycle to any other transport mode\(^8\).

In the UK free bus services have had positive impacts on older people’s well-being\(^9\) and investing in age-friendly cycle infrastructure could pay similar dividends. Winters et al (2014) found that in an area of Vancouver with a relatively good cycling environment, a quarter of older adults (average age 70) surveyed cycled in a week, of whom over half were getting their recommended levels of physical activity just from cycling.

Health benefits of cycling are largest for those in older age groups\(^10\). In The Netherlands, high levels of cycling help older people get the exercise they need. In fact, over two-thirds of Dutch people aged 55-74 living independently say they reach the national standard of half an hour of moderately intensive physical activity on at least five days per week, significantly more than their counterparts in younger age groups (35-54)\(^11\).

There is increasing evidence that physical activity helps reduce cognitive impairment and dementia risk\(^12\). A recent Welsh study\(^13\) found that among five healthy behaviours, exercise in particular was an important predictor of cognitive impairment and dementia:

‘Had the two and a half thousand men in CaPS [the Caerphilly study] each been urged at baseline to adopt one additional healthy behaviour [such as regular exercise], and if only half of them had complied, then during the following 30 years there would have been a 13% reduction in dementia, a 12% drop in diabetes, 6% less vascular disease and a 5% reduction in total mortality.’\(^14\)

\(^1\) Shaw et al 2014
\(^2\) Curl et al 2014
\(^3\) Lorenc 2008
\(^4\) Sport England/ONS 2014
\(^5\) Zander et al 2013
\(^6\) (while another 37% walk: Fietsberaad 2009)
\(^7\) Pucher and Buehler 2008
\(^8\) Daniel et al 2013
\(^9\) Mackett 2014
\(^10\) Woodcock et al 2014
\(^11\) de Boer 2006
\(^12\) Ahlskog et al 2011
\(^13\) Elwood et al 2013
\(^14\) Elwood et al 2013
Designing well for cycling helps create more liveable, pleasant cities

Neighbourhoods that work for walking and cycling are friendlier places.

In the post-war period, many cities were redesigned around the automobile, often creating hostile and car-dominated urban streets. By contrast, city leaders in Copenhagen have for some time seen bike-friendliness as a key part of a more hospitable and ‘hygge’ (cosy) city.

While excessive motor traffic threatens the city, re-designing cities for cycling can have wider ‘place’ benefits. Greener urban environments are associated with better experiences of walking and cycling. Routes for people on foot and on cycles that are completely away from motor traffic, like many on London’s Greenway network, can both be popular for leisure and utility trips and pleasant places in themselves.

Other interventions to boost cycling can also create better places. Making residential streets cycle-friendly, by cutting rat-running and calming motor traffic, can benefit cyclists, pedestrians, and residents. Streets with little motor traffic are popular with cyclists and pedestrians, and encourage people to make friends with neighbours and spend time on their streets. In Hart and Parkhurst’s study, people living on a street without through motor traffic knew and supported their neighbours to a much greater extent than people on two other streets with more typical and substantial levels of rat-running.

‘Especially the elderly residents on the street without through motor traffic felt supported and cared for: a 70-year old woman who lived alone remarked that “people on the street have always helped each other in times of illness and difficulty”. Another older lady living alone felt lucky to live on such a street where “everyone’s kind, thoughtful, helpful, and really lovely to me. When my next door neighbour hasn’t seen me for a few days, he knocks just to see if I’m okay”.

In Vancouver, a study of new cycle tracks suggests they may have made pedestrians perceive the block as ‘less polluted, less overcrowded, more stimulating, and more peaceful’. A recent US study examined how seven new protected bicycle lanes affected local pedestrians. At all sites pedestrians tended to report fewer pavement cyclists, while at most sites, reported benefits included lower driving speeds, safer crossings, and better walking environments.

Investing in cycling can boost local economic activity

Installing protected space for cycling can increase retail sales by up to a quarter.

The economic downturn has hit town centres hard. Nationally, two in every 15 shops are standing vacant, with some regions and cities suffering much more. For example, in Swansea nearly one in four shops is vacant.

While providing more car parking is often touted as the solution, encouraging sustainable transport plays to the strengths of the local high street. Retailers over-estimate the contribution of drivers and many studies find users of sustainable modes spend more per month. Providing for cycling can be good for local business. Examples from North America show high-quality bicycle infrastructure does not harm business districts, and can have a positive impact on local shops.

The NYCDOT (2014) study found streets where protected cycle lanes were installed saw an increase in retail sales up to 24% greater than comparator sites without protected lanes. One reason for this could be that the cycle lanes improved pedestrian environments, with shorter crossing distances.

Cycling can help create the kinds of places people want to shop, as in Amsterdam’s Utrechtsstraat, where thriving independent businesses happily coexist with streams of parents carrying children on cargo bicycles. At a city-level, after the Hague implemented its Circulation Plan, reallocating space from through motor traffic to walking and cycling, changes in local economic indicators beat comparator cities. By contrast higher levels of motor traffic have been associated with higher shop vacancy rates.

Impact goes beyond retail: a national US study found that for each $1 million, cycling infrastructure projects created 11.4 local (state) jobs compared to 7.8 jobs for road-only projects. Just looking at cycling-related purchases and services, UK cyclists each contribute £230 yearly to the economy.
Cycling means more predictable journey times for people and goods in cities

Shifting urban trips from car to cycle makes for a more reliable transport system.

Peak hour congestion means slow and unreliable motorised journeys. Average speeds on local 'A' roads in England during the weekday morning peak are less than 25mph, falling to 16 mph in London. One in five journeys on 'strategic' Highways Agency roads are delayed. Transport modelling and appraisal has traditionally prioritised saving journey time. But having predictable journey times may actually be more important to people than saving time in itself.

The importance of journey time reliability is another argument for investing in cycling, which is a relatively predictable mode. Traffic conditions affect the speeds of people cycling less than they affect the speeds of people driving. Unsurprisingly journey time reliability is an important motivator for cycling.

Journey time reliability is also a motivator for cities to invest in cycling. In London alone the annual economic cost of motorised vehicle delays is estimated at over £1.5 billion. Because cycle journey times are relatively constant, shifting trips from car to cycle in congested cities can increase the reliability of the transport system.

Freight journey time reliability is also important, with late deliveries meaning negative impacts for carriers and customers. Cargo cycles could replace up to a quarter of European urban freight trips, with reliability and speed cited as advantages.

'Vive la Rose [...] has used cycle freight carriers for two years now and is very positive about them. They find them quick, reliable and efficient.'

'Pocket Guides have found that the bicycle couriers are always very reliable and they have not experienced any problems.'

'Normal car couriers give [PSC] a certain delivery time within three hours due to the traffic and parking etc. whereas the bicycle courier guarantees a one hour delivery. Deliveries by bicycle also work out cheaper than deliveries by car or motorbike. [...] PSC feel that bicycle courier is much more efficient and reliable than a motorised courier and would not consider switching back even if that option was cheaper.'

As with personal journey times the reliability benefit depends on infrastructure: for example, whether cycles can legally use one-way streets in both directions.
Planning well for cycling enables a more efficient use of the transport network

Cycle trips are over three times, and cycle parking up to eight times, more space efficient than cars.

A transport system based around the private car is inefficient in space and energy terms. It threatens Britain’s ability to meet its commitment to an 80% cut in Greenhouse Gas Emissions by 2050.1

Per person-kilometre, cycling is the mode with the lowest energy intensity.2 So increases in cycling can also make Britain’s transport system more energy efficient.

In many of our cities there is also severe pressure on road space, and buses and cycles are the most space-efficient passenger transport modes.3 Average car or van occupancy is 1.56, and with cycles valued as taking up 1/5 the space of a car, on average each cycle trip is over three times more space efficient per person than each car trip.

Providing for cycling can help authorities better allocate scarce capacity, managing congestion on public transport and on roads.4 Cycling could reduce pressure on suburban corridors that link residential areas with rail stations. Only 3% of feeder trips to UK regional train services are cycled, compared to 30% in The Netherlands.5

Vehicles spend over 80% of their time parked,6 so car parking also makes major demands on city space and resources.7 Cycle parking is highly space-efficient, with one on-street car space able to accommodate up to 10-12 bicycles. Again dividing by average car or van occupancy, this means cycle parking is up to around eight times more space efficient per person trip.

Supporting cycling can help make the whole transport system more efficient. Seville’s cycling revolution provides one example: while some cycle trips replaced bus trips, overall public transport’s mode share grew, as some car commuters then shifted to buses.8 Allocating space for cycling has benefited other users in New York’s Central Business district, with car and taxi journey times stable or even decreasing.9

1 DECC 2014
2 Lovelace and Philips 2014
3 Balderson 2013
4 GLA 2012; van Sinderen and Gudelius 2011
5 Martens 2004
6 Marsden 2006
7 Shoup 2011
8 Marques et al 2012
9 NYCDOT 2014
Where a source is freely available online, the URL has been provided.