LondonTravelWatch

D R A F T

Cycling in London



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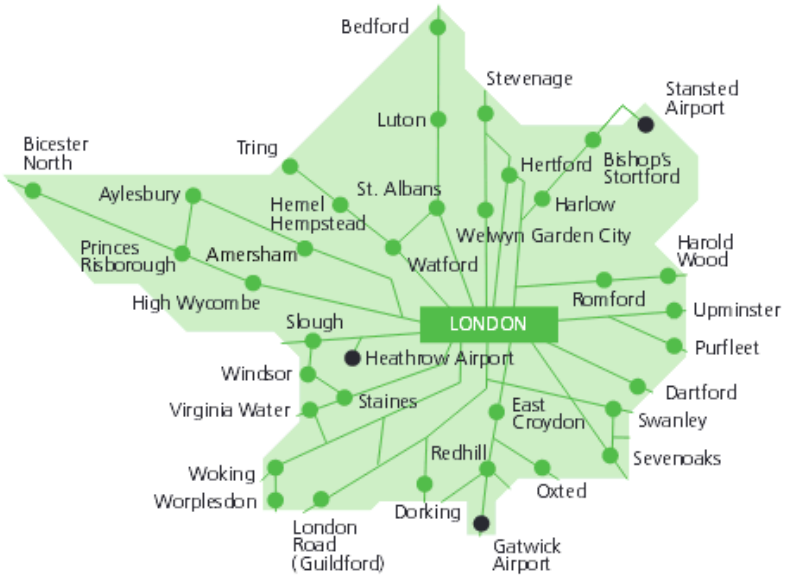
London TravelWatch is the independent, multi-modal body set up by Parliament to provide a voice for London's travelling public. This includes users of rail services in and around London, all Transport for London (TfL) services (bus, Tube, DLR, trams, taxis) and motorists, cyclists and pedestrians using London's strategic road network. We are funded by and accountable to the London Assembly.

Our approach

- We commission and carry out research, and evaluate and interpret the research carried out by others, to ensure that our work is based on the best possible evidence
- We investigate complaints that people have been unable to resolve with service providers – we get more than 6,000 enquiries a year from transport users and in 2014-15 we took up 2,300 cases with the operator because the original response the complainant had received was unsatisfactory
- We monitor trends in service quality as part of our intelligence-led approach
- We regularly meet with and seek to influence the relevant parts of the transport industry on all issues which affect the travelling public
- We work with a wide range of public interest organisations, user groups and research bodies to ensure we keep up to date with passenger experiences and concerns
- We speak for the travelling public in discussions with opinion formers and decision makers at all levels, including the Mayor of London, the London Assembly, the Government, Parliament and local councils.

Our experience of using London's extensive public transport network, paying for our own travel, and seeing for ourselves what transport users go through, helps ensure we remain connected and up to date.

Our aim is to press in all that we do for a better travel experience for all those living, working or visiting London and its surrounding region.



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Introduction

More and safer cycling has been a longstanding objective of public policy because cycling for transport has many personal, societal and transport benefits.

Travelling actively, either by walking, cycling or as part of using public transport can make a profound effect on personal health. Unlike joining a gym, playing soccer or going to the pool, active travel can be incorporated into everybody's daily lives and so more people are likely to become active. The nations Chief Medical Officers say that:

> Regular physical activity can reduce the risk of many chronic conditions including coronary heart disease, stroke, type 2 diabetes, cancer, obesity, mental health problems and musculoskeletal conditions. Even relatively small increases in physical activity are associated with some protection against chronic diseases and an improved quality of life[1].

There are transport benefits with more cycling. Switching car and public transport journeys to cycling will reduce travel demand on those modes. The graphic below shows the potential benefit of a switch from car to cycle.

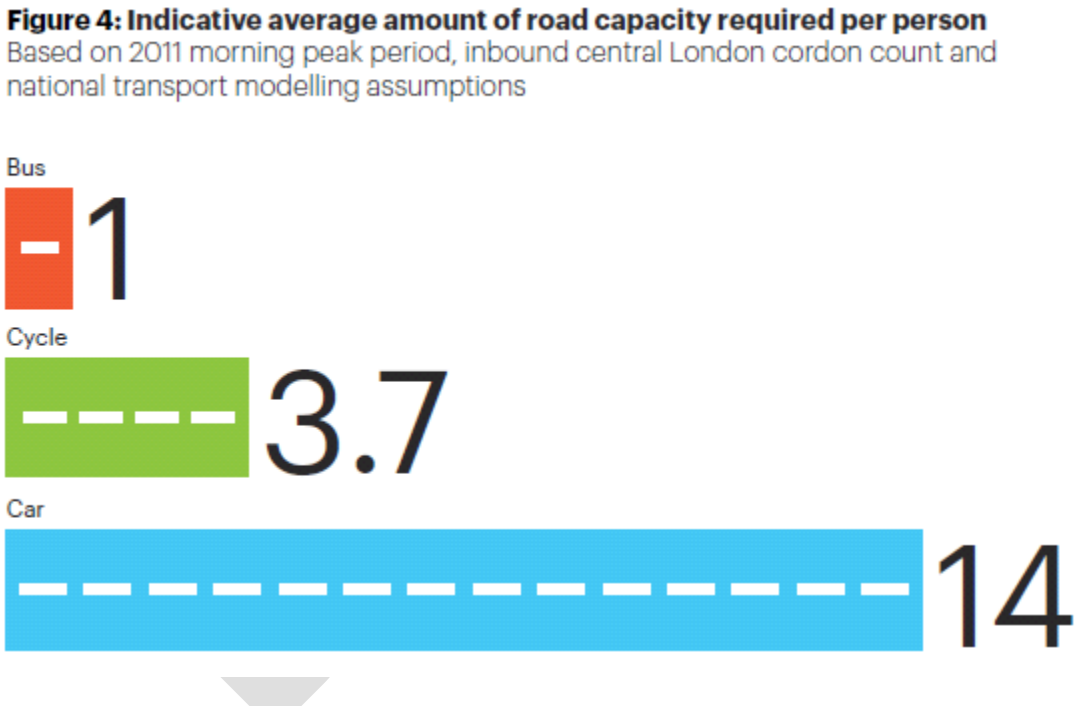


Figure 1. Graphic taken from the mayor's Roads taskforce report

There are benefits to the public purse. The widespread and numerous health benefits accrued will reduce the financial burden on health services overall. Switching public transport journeys to cycling, especially at peak hours, will reduce the demand for public transport at the time of day it is most costly to provide.

London TravelWatch supports more and safer cycling. It supports the mayor's Transport Strategy target to increase the modal share of cycling to 5% by 2026.

[1] Start Active, Stay Active: A report on physical activity from the four home countries' Chief Medical Officers

London TravelWatch must represent all the users of London's streets. It takes a balanced view of the needs of the different modes, whilst prioritising those that are most space efficient: walking, cycling and bus. These balances are not clear, because increased levels of cycling has impacts on other users of London's streets.

In 2009, London TravelWatch published *Cycling in London*[2], its perspectives on cycling. In 2013 and 2014, members considered the new cycle superhighway proposals and developed the Board's perspective on cycling further. This report represents our views now on how best to promote and enable more cycling in London.

[2] http://www.londontravelwatch.org.uk/documents/get_lob?id=1816&field=file

Stakeholders

London TravelWatch has history of engagement with many different stakeholders and representatives of different user groups as diverse as elderly and young people's forums. User groups and local government officers

Along with cycling stakeholders, London TravelWatch has taken part in TfL's scheme design review group. It has met all three mini-Holland officer teams. Over many years, we have attended cycling fora established by TfL and the Metropolitan Police Service. We attend TfL's working party that is looking at bus stop bypasses.

We have invited stakeholders, to walk through some of the new Cycle Superhighway schemes with us. Some stakeholders took up that offer. Officers have discussed these issues with London Cycling Campaign (LCC) officers and activists over a number of years**.** A London TravelWatch Board member, a regular cyclist, was assigned to be the Board's Streets' Champion. She was routinely consulted by officers.

Cycle campaigning organisations have been effective in highlighting the benefits of cycling (societal and transport) and what they believe should be done to get more Londoners cycling. Some campaigners call for 'mass cycling' and streets where everyone from 8yrs to 80 can cycle in comfort and safety. LCC and other campaigning cycle organisations want to see:

- Significant reallocation of road space and the remodelling of London's main roads to provide wide, kerb separated cycle tracks. They suggest this for roads carrying over 2000 motor vehicles a day. This would be a considerable number of London's streets, though the scale of any network is undefined;
- the removal of through traffic in minor and residential roads to provide a much quieter 'back street' cycling environment;
- slower speeds;
- remodelled town centres with less or no vehicular traffic;
- safe routes to school;
- safe routes through parks and green spaces.

The Chair of the Policy Committee and the Chief Executive Officer of London TravelWatch have met with the *Stop Killing Cyclists* group. This group organises street protests 'die-ins' to highlight the deaths of cyclists killed on London's roads by motor vehicles. This group has a series of aims, much the same as those attributed to the LCC above, but includes a demand to spend much more than is presently the case on measures they believe will make cyclists safer on London's streets – separated cycle tracks.

Cycle bloggers are influential in the cycling debate. They have particularly promoted the adoption of Dutch style street design for cycles. The then Deputy Mayor for Transport Isobel Dedring was interviewed as part of the City Lab conference in 2015. She said:

> "So the cycling agenda in London is an example where we did get it right. So in 2011 there was huge political pressure about cycling. There were some very high profile fatalities in cycling and there was a huge uproar on twitter and across sort of a series of blogging platforms about why weren't we doing more about this. And we ended working very closely with a lot of the bloggers and sort of the influencers on twitter to craft the programme we are now putting in place. This billion, we've got a

billion pound cycling programme that before that we had very, very little that we were actually doing on the network……"[3]

Not all cycle activists are enthusiasts for cycle specific measure, such as cycle tracks for a whole host of reasons. They cite Stevenage, as a town that was designed for cycling with off road facilities, but has very low levels of cycling.

Cycle stakeholders support the redesign of heavy goods vehicle cabs. Lorry bans at peak hours, marketing, cycle training, secure cycle parking and other initiatives to improve road safety and enable more cycling.

London TravelWatch has also worked with those representing older people and disabled travellers. Particularly we have met the RNIB, Guide Dogs, Transport for All and AgeUK London.

Those that represent older people and disabled travellers are all concerned about the impacts of cycles being routed onto the pavement, in front and behind of their bus stops

The charity representing guide dog users, GuideDogs, say:

> We understand that from a cycle safety point of view, this is a positive design, to segregate them from the traffic, and allow an easy approach to the bus stop for buses. However, Transport for London has a duty of care to pedestrians, especially, in this case blind and partially sighted pedestrians - in its current form; we do not believe that has happened.

The following issues are highlighted:

> A vision-impaired person would not be able to find the crossing - there is no tactile paving to direct the person to the edge of the pavement/cycle lane.
>
> - Cyclists are not encouraged well enough to slow down or give way, and as a result, do not. Our guide dog owners attempted to cross the cycle lane many times, and in one case, stepped into the lane. Not one cyclist stopped or warned the guide dog owner that they were there.
> - Once the blind or partially sighted person has crossed the cycle lane, there is no tactile guidance to the bus stop.
> - A vision-impaired person alighting from the bus at a floating bus stop receives no tactile guidance to the cycle lane crossing.

In summary, a blind or partially sighted person would avoid using this bus stop, reducing their mobility, and ultimately, their confidence.

Officers have discussed the needs of motorcyclists, with the Motorcycle Action Group. Their concerns are firstly, the reduction in carriageway lane width that gives motorcyclists less opportunity to filter safely through traffic. Secondly, they are concerned regarding the introduction of rubber blocks into the carriageway to delineate cycle lanes.

Officers are only aware of one local bus group that has expressed a view on the issue of recent cycle facility development. This is the Save our Buses group in Waltham Forest that

[3] Interview with the Deputy Mayor for Transport as part of the City Lab 2015 conference, 18 to 20 October : How to keep Cities moving: https://www.youtube.com/watch?v=KaNKJpIxcig 15 minutes in.

is concerned about the impact of the Lea Bridge Road cycle track proposal on bus service performance. London TravelWatch has received infrequent correspondence from one passenger activist concerned about the impact of cycle schemes on bus performance.

There have been a number of local residents' groups formed to oppose road closure proposals that are part of 'Quietway' cycle proposals. Their concerns are about restricted access, displaced vehicular traffic and what they believe will be associated congestion and pollution impacts.

Members and officers have discussed cycling issues at their public meetings, with TfL, local government officers and cycle campaigners, including an LCC officer.

Members and Officers met with TfL officers and the mayor's Cycling Commissioner as part of the consultation on some of the cycle superhighways.

London's boroughs are important stakeholders as they control most of London's streets. Each will have a different perspective on cycling, but are broadly supportive of more and safer cycling. The development of London's cycling policies over the last two decades has been a partnership, for some of that time the boroughs taking a lead. The development of London's cycling policies is briefly described in Appendix 1.

Cycling Cities

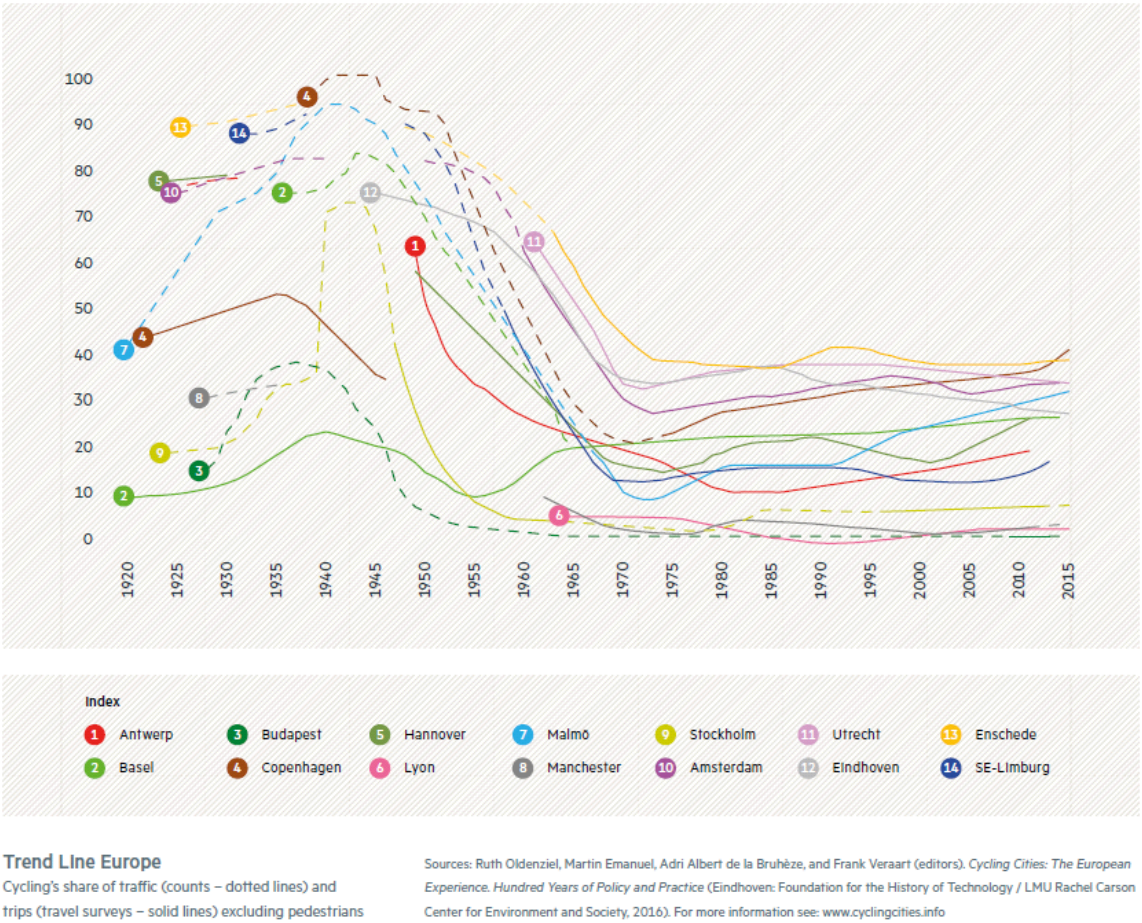


Figure 2 The *Cycling Cities* chart shows the modal share of cycling in 14 European cities over the last century (excluding walking)

Cycling Cities[4] was published by Eindhoven University academics. The book's editor Professor Ruth Oldenziel privileged London TravelWatch to host a lecture, in November 2016. The book publication is part of the 'Sustainable Urban Mobility, 1890-present' programme.

The book is a thorough study of the history of cycling in 14 different European cities. It recognises that each city is different in many ways. The urban forms are different, the history and culture is different and the 'competition' between modes: cycling, walking, private and public transport is different. It is an important piece of research because it looks at what people have actually done in terms of travel behaviour, rather than what people say, they might do. It looks at what have been the causes of the changes in travel behaviour in those cities.

It suggests that attitudes and policies about private mobility is a significant factor in the level of cycling. Cities that restrain auto-mobility will see higher levels of cycling. Cycle specific infrastructure (lanes and tracks) is less important.

In summary *Cycling Cities* concludes that there are three groups of cities with differing overall cycling levels. The high-level cities are compact with a cycling culture that has been maintained since the 1920s, but had relatively neutral cycling policies. Despite a rapid

[4] http://www.cyclingcities.info/

decline in the 1960s, these cities recovered with policy makers and activists creating pro-cycling and car-curbing policies. There central areas were often closed to through traffic and public transit did not compete with cycling. In all cases, progress was incremental.

The medium-level cities sprawled after the Second World War. Their centres were designed for auto-mobility. Eindhoven invested in cycle lanes to separate cycles, but this was to benefit the cars, Hannover and Antwerp invested in public transit to compete with cycling.

Low-level cycling cities had been redesigned for the car and public transport. Manchester falls into this group. Its post-war planning led to more sprawl and a negative image for cycling.

Professor Oldenzeil believed an incremental approach had proved best. In a post lecture comment on the *Cycling Cities* website Professor Oldenziel wrote:

> Can the 8-million city of London learn from the middle-sized cities? At the London-based Travel Watch event (November 22), the independent watchdog for transport users, Ruth Oldenziel argued that the cycling culture's diversity in London's boroughs are indeed comparable to Dutch cities' variety in cycling. Building cycling lanes are not the only precondition for attracting cycling. The event and the Twitter feed drew planners, politicians, public-transit defenders, and cycling activists.

London was not studied as part of the *Cycling Cities* research. However, its policy makers would do well to learn from the cycling history of these cities. London, like all 14 cities has its own unique history, culture, urban form and transport mix, but some of the themes of *Cycling Cities* are discernible. There was certainly a post war fall in cycling levels and a rise in auto-mobility. The fall was much more than most of the cities studied that retained much higher levels of cycling.

London is more akin to those cities with low levels of cycling. It lost its pre-war cycling culture. Walking and public transport dominate the centre, whilst private motor vehicles dominate outer London. The main constraint on more auto-mobility is congestion rather than public policy. It is therefore unsurprising that cycling levels are low and motor vehicles are dominant. The first upturn in cycling in London can be demonstrated as having been the result of motor vehicle restraint, i.e. congestion charge, rather than cycle specific measures such as separate lanes and tracks.

The increasing role of cycling in London

This chapter describes some of the statistics of cycling in London.

Cycling is growing in London albeit from a small base. In 2015 it was 2.1% of all journey stages in London or 2.8% of the 'streets' modes.

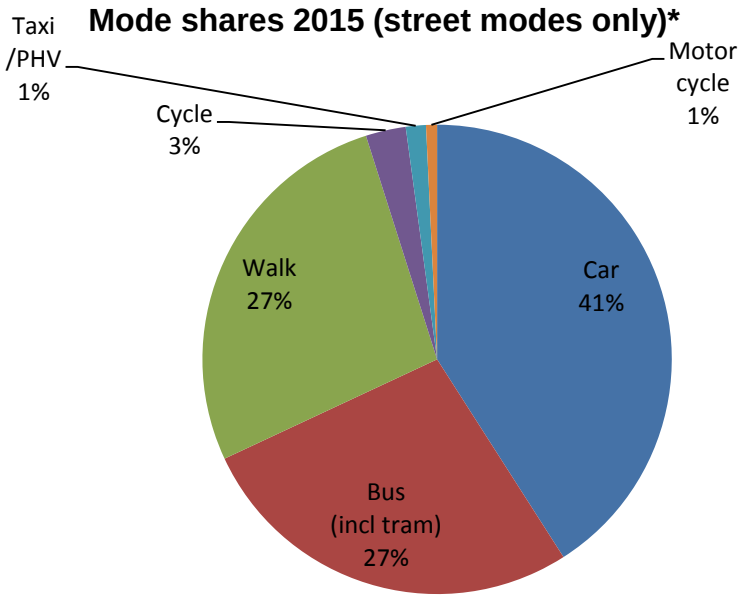


Figure 3. Derived from TfL's Travel in London Report 9. Road modal shares of daily journey stages in London, 2015.

In recent times, cycling levels were broadly constant up until 2003 when an upturn can be discerned in the statistics. This rise is associated with the introduction of the central London congestion-charging zone. At that time, this rise came as a surprise to Transport for London and was reported as such in their first report on Congestion Charging: *Congestion charging, 6 months on.*

> Pedal cycle movements have increased by 30%, much higher than TfL had expected…

The trends are demonstrated in the three graphs below. Firstly, TfL's automatic counters on their road network. Though this limited to cycling on the Transport for London Road Network (TLRN) it indicates growing levels of cycling. This statistic reports cycling flows and so could be a combination of more cycle journeys, but may also reflect that those already cycling may, perhaps be cycling more or for longer distances.

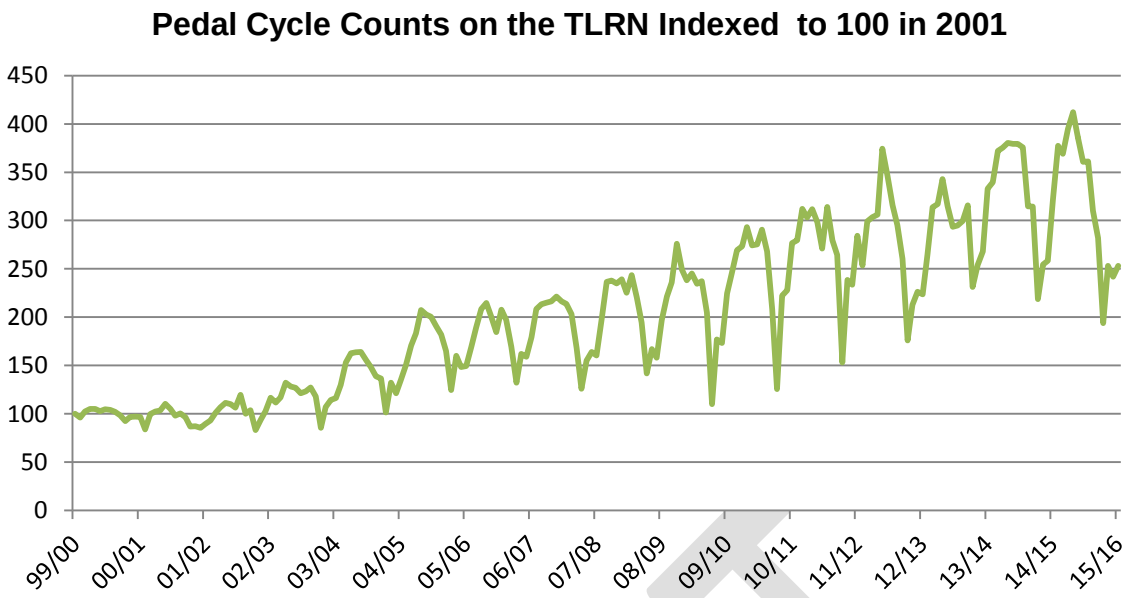


Figure 4. Cycle Flows on the TFL Road Network[5]

The second graph below is derived from the tables associated with TfL's annual statistical Travel in London report[6]. It is an estimate of cycle trips in London where cycling is the main mode.

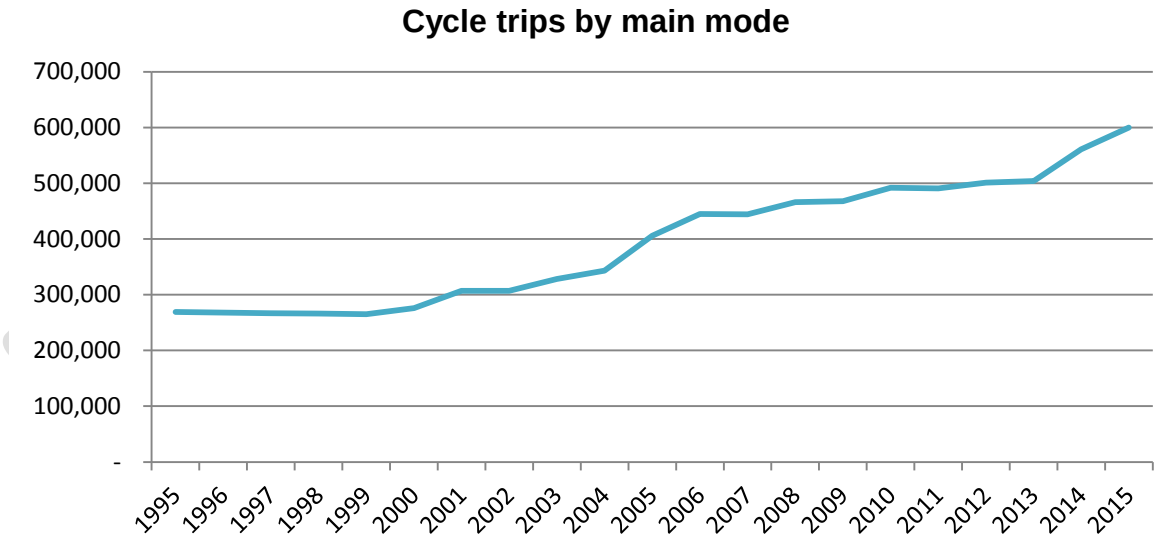


Figure 5. Estimated daily average number of trips by main mode of travel, 1995 to 2015. Seven-day week.

These statistics give an estimate of the changing number of miles and trips travelled by cycle, but are regarded as less than satisfactory for a number of reasons. A better statistic would report the growth in cycling mileage on all of London's streets, This would close reflect the changes is cycling and be useful in calculating a casualty rate per mile cycled. And so it is pleasing that TfL have initiated a much more intensive survey of cycling across London.

[5] https://data.london.gov.uk/dataset/cycle-flows-tfl-road-network
[6] https://tfl.gov.uk/corporate/publications-and-reports/travel-in-london-reports
https://tfl.gov.uk/corporate/publications-and-reports/streets-performance

The Central London results of this survey are published quarterly as part of the *TfL Streets Performance Report*[7]. The inner and outer London survey results will be published annually. The vertical axis represents the volume of cycling: 'Average daily cycle km travelled per km'. It shows that the distance cycled grew in the latest quarter reported by 5.4% within central London when compared to the same quarter in 2015/16.

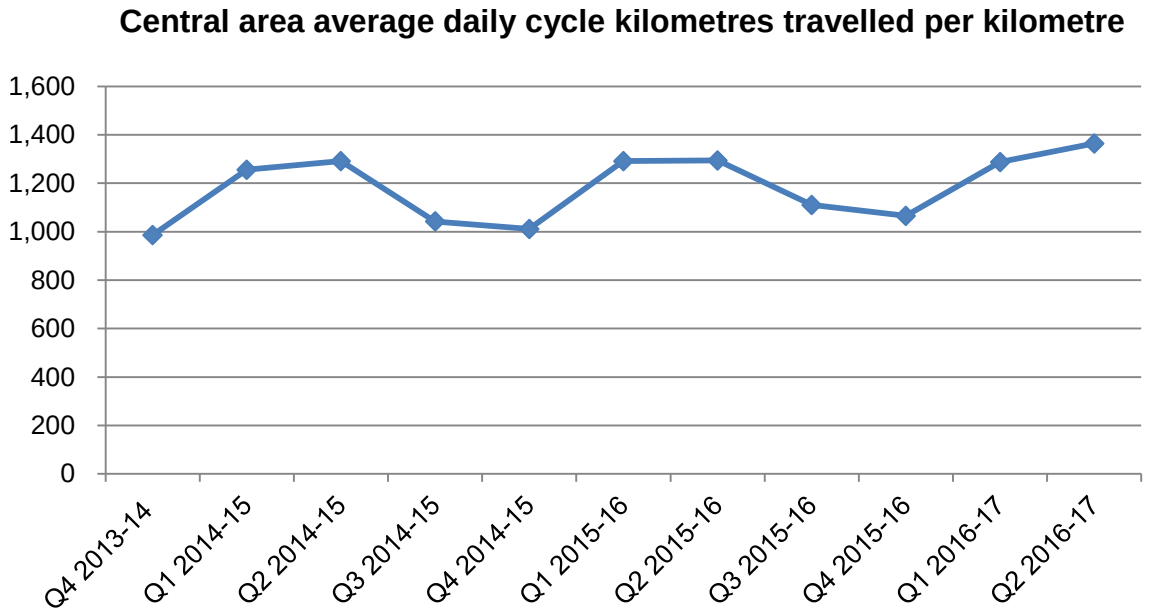


Figure 6. Central Area Average Daily Cycle Kilometres Travelled per Kilometre

TfL conduct an annual survey, the *London Travel demand survey*[8] (LTDS): of 8000 households a year (London residents). The statistics from this again show the rise is cycling trips and demonstrates that this rise is greater in inner London than outer London.

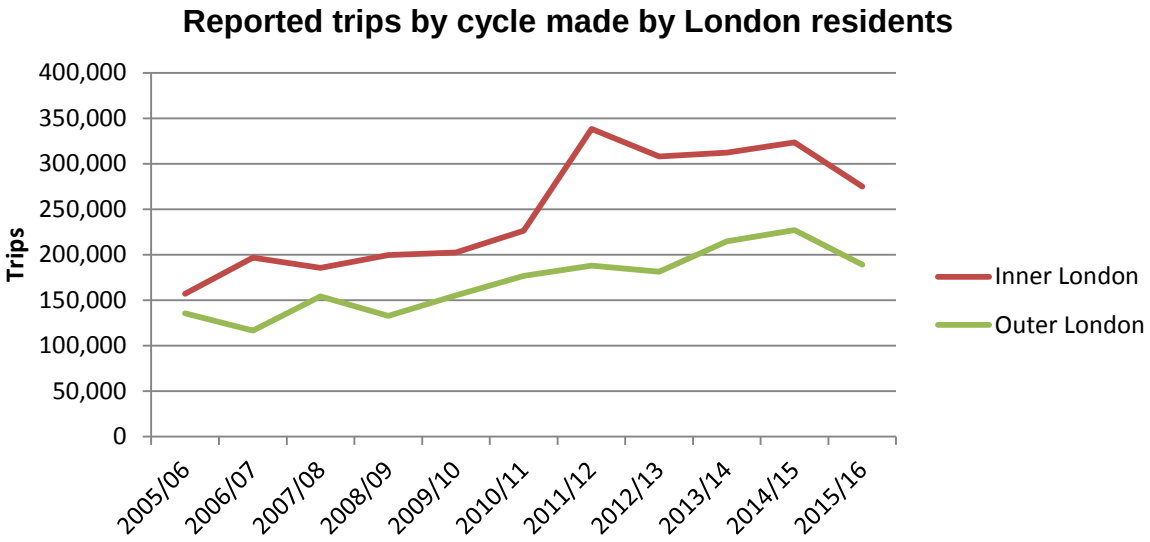


Figure 7. Total trips per day in Greater London by main mode of travel, 2005/06-2015/16 (average day, seven-day week)

[7] https://tfl.gov.uk/corporate/publications-and-reports/streets-performance
[8] https://tfl.gov.uk/corporate/publications-and-reports/london-travel-demand-survey

The Census figures also show there is generally much more cycling by the residents of the inner London boroughs than those in outer London. The graph below shows the Census 'Method of travel to work' statistic.

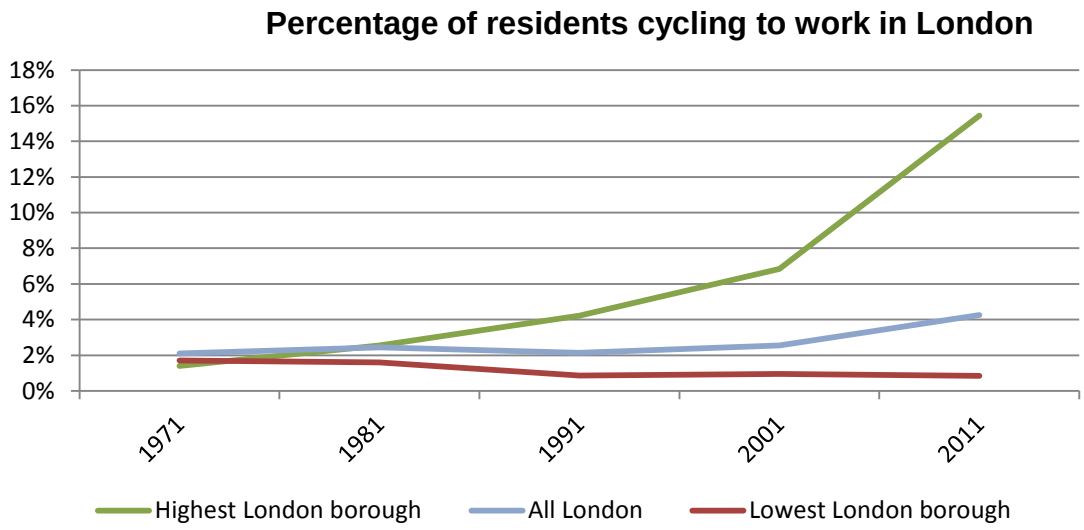


Figure 8. Method of travel to work, Census 1971 to 2011

Other cycling statistics demonstrate variability across Greater London. Inner London borough residents generally cycle more than those from outer London boroughs. However, Richmond upon Thames bucks this trend having high levels of cycling for an outer London borough, conversely Newham has low levels of cycling for a more central borough.

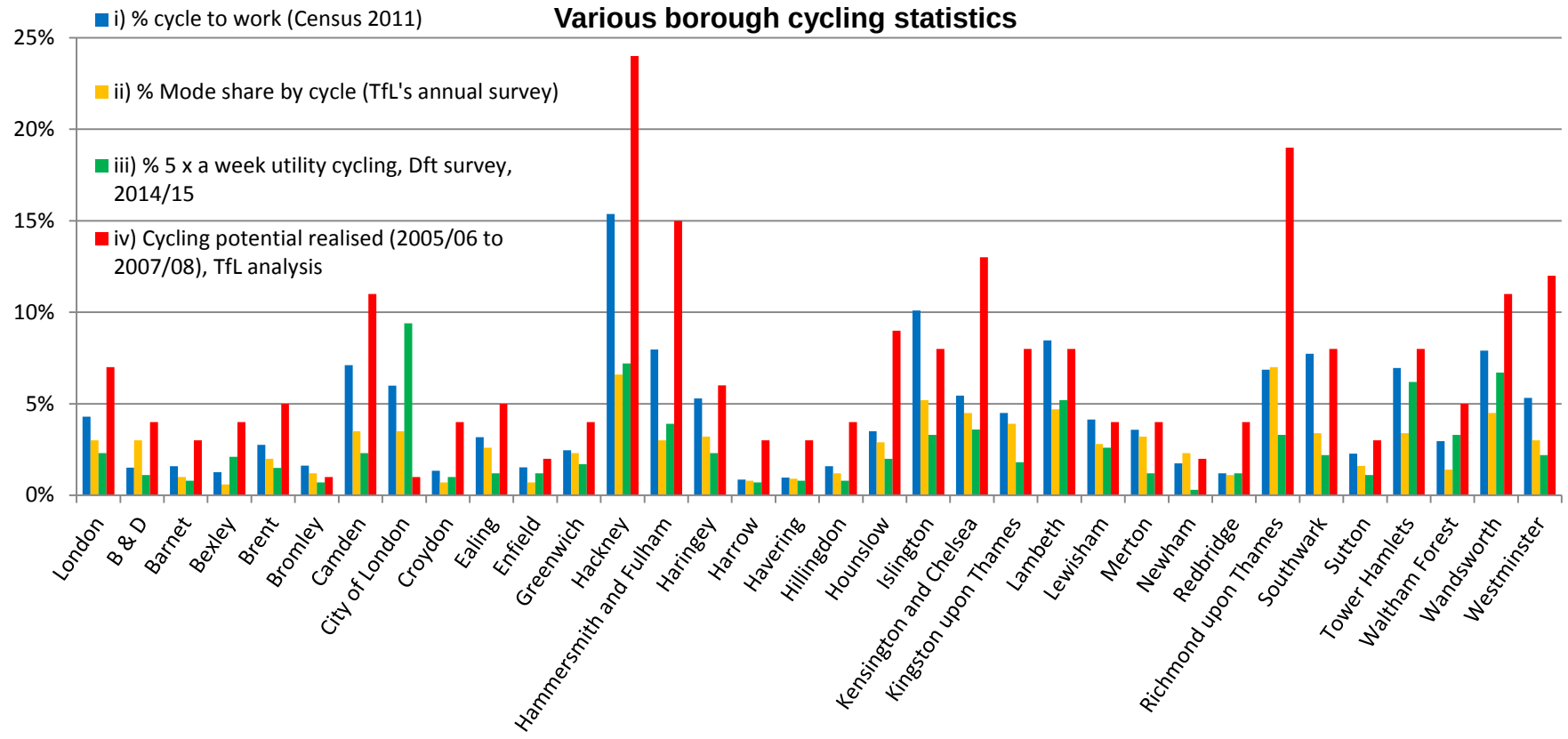


Figure 9.. By borough: i) Census 2011 Travel to work figure; ii) TfL's survey of cycle share of all trips; iii) DfT's survey of cycling and iv) TfL's calculation of the proportion of 'cycleable' trips that are cycled

Who cycles in London?

The statistics above demonstrate where in London the most cycling is happening. Broadly there is more cycling in inner and central London, much less in outer London, with exceptions in both cases.

However, there are also demographic and other distinctions made between 'types' of cyclists. Mayor Johnson described this is his foreword to his Cycling vision:

> I want cycling to be normal, a part of everyday life. I want it to be something you feel comfortable doing in your ordinary clothes, something you hardly think about. I want more women cycling, more older people cycling, more black and minority ethnic Londoners cycling, more cyclists of all social backgrounds – without which truly mass participation can never come.
>
> As well as the admirable Lycra-wearers, and the enviable east Londoners on their fixed-gear bikes, I want more of the kind of cyclists you see in Holland, going at a leisurely pace on often clunky steeds. I will do all this by creating a variety of routes for the variety of cyclists I seek.

Whilst there are no statistics for lycra wearing, there is data about gender and socio-economic make-up of who cycles in London from TfL's *London travel demand survey.*

More cyclists are male than female by almost 3 to 1.

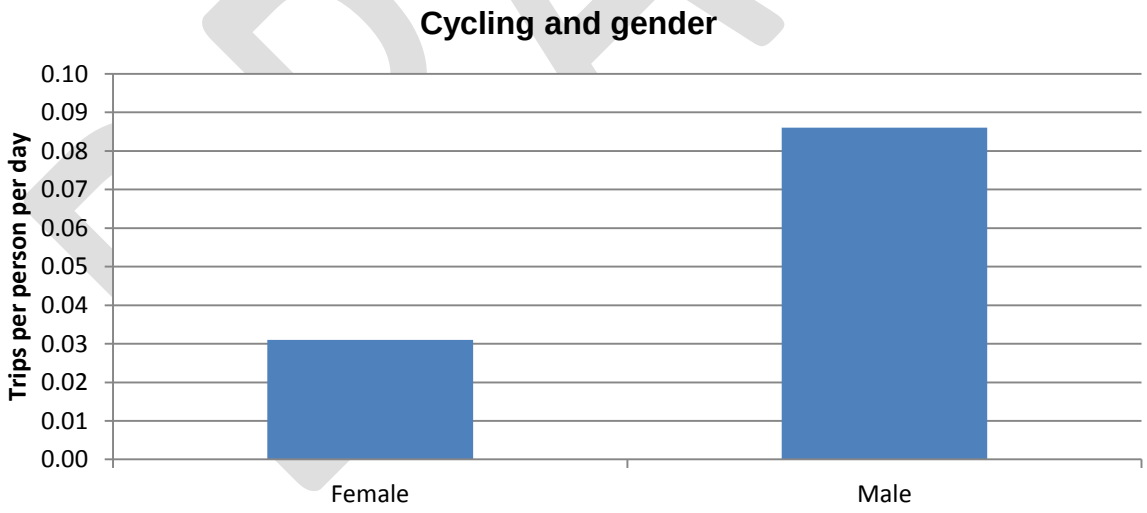


Figure 10. Trips per person per day, by mode and gender, LTDS 2015/16

Those with higher income households cycle more.

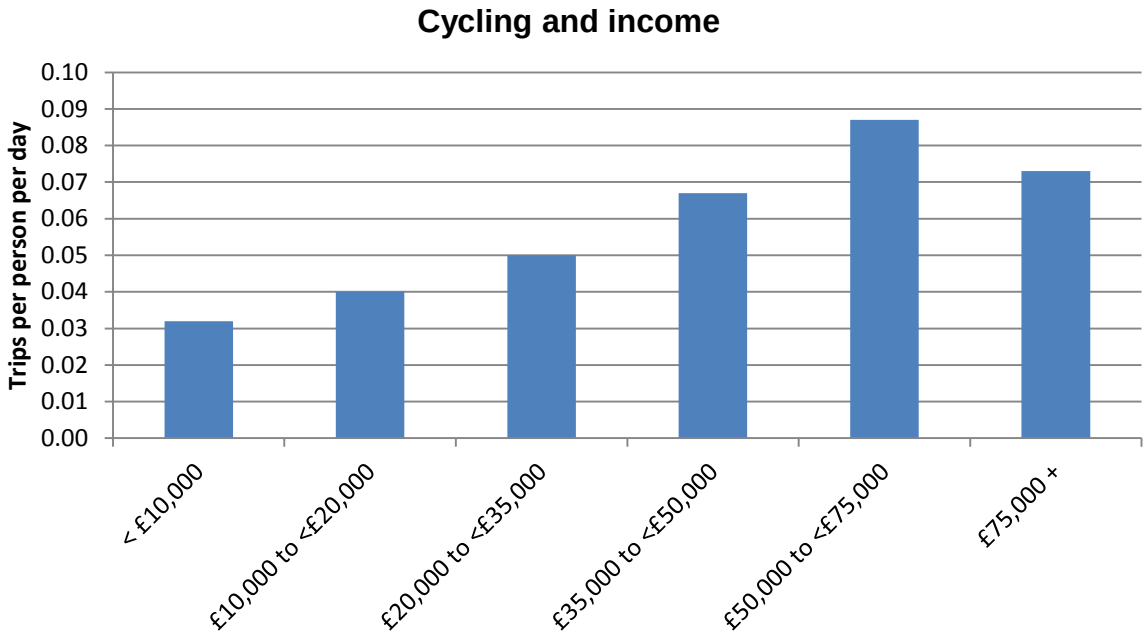


Figure 11. Trips per person per day, by mode and households income, LTDS 2015/16

There are different levels of cycling by ethnicity.

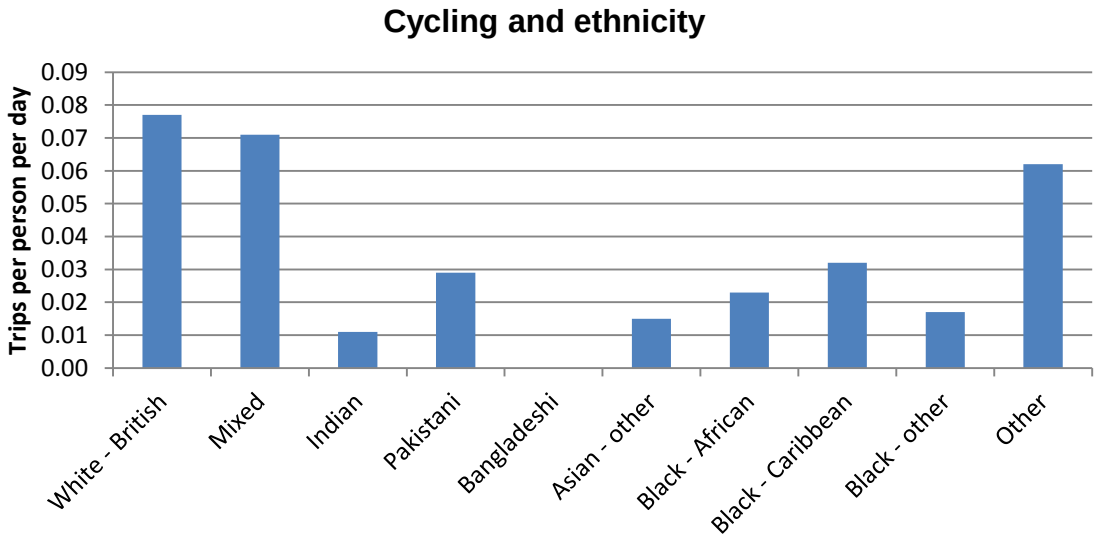


Figure 12. Trips per person per day, by mode and ethnicity, LTDS 2015/16

Most cyclists are aged between 25 and 44. But the household survey of all trips looks very different to the Census 2011 ‘Method of travel to work’ data which does not include those less than 16 years old.

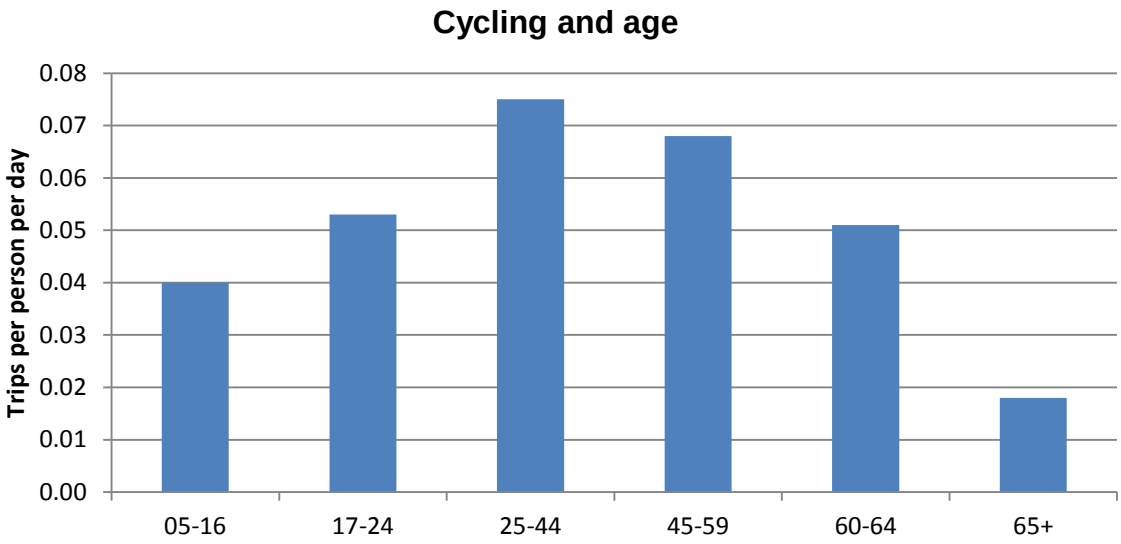


Figure 15. Trips per person per day, by mode and age, LTDS 2015/16

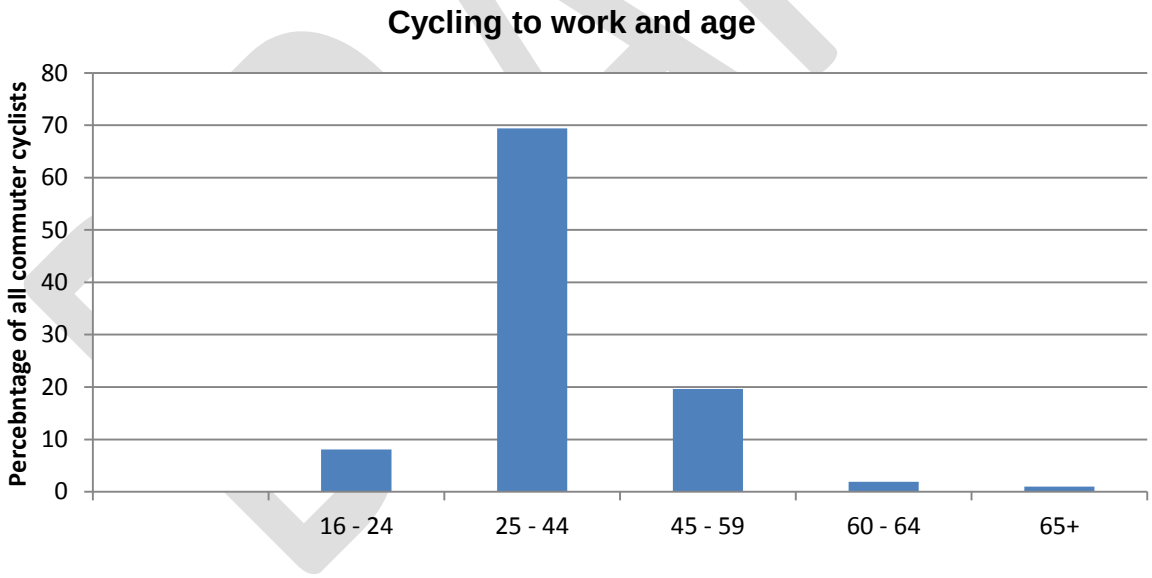
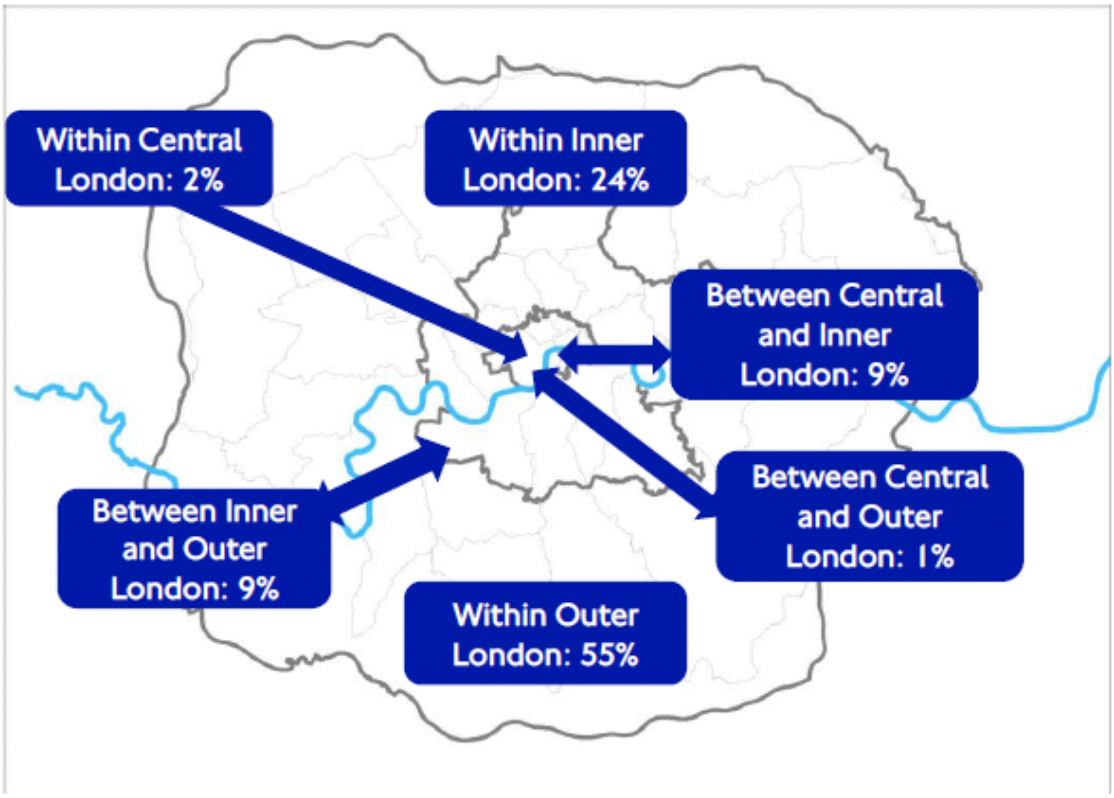


Figure 15a. Method of travel to work, census 2011

The potential for more cycling

TfL have undertaken work to estimate what the potential might be for cycling in London[9]. The report suggests that 41% of all trips could be cycled. This statistic includes those TfL also considers could be walked.

The report highlights that many of these trips (55%), which could be cycled, are in outer London.



Source: LTDS 2012/13 – 2014/15

Figure 14. Graphic showing where the potential for cycling is spatially from TfL's Potential for cycling report

This highlights that much can and should be done to improve the local environment for cycling in outer London and chimes with our report *Living on the edge*[10]. This promoted cycling as a part of a journey to the station that could reduce the cost of travel for outer London residents:

> ……cycling as a short part of a longer journey involving other modes might be a more realistic prospect, for example to a railway station in a different fare zone from where it would be cheaper to travel into central London. Cycling some of the way might reduce the number of zones travelled through by rail, or remove the need for a bus journey or car parking charges, helping to reduce travel costs overall. Outer London boroughs and communities, and

[9] http://content.tfl.gov.uk/analysis-of-cycling-potential-2016.pdf
[10] http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&field=file

Transport for London, might like to consider what they could do to integrate cycling more fully into the commuting patterns of low paid workers and job seekers. This is discussed further below.

Cycle safety

The number and severity of casualties on London's streets is reported annually. They are collated by the DfT, from police reports of collisions. The statistics are published by the DfT and reproduced on TfL's website[11] with an associated analysis. Below the table shows the 2015 statistics, reported in June 2016.

	fatalities	Seriously injured	Slight casualties
Pedestrians	66	664	4,653
Cyclists	9	378	4,087
Powered two wheeler	36	504	4,903
Car occupants	20	294	11,491
Bus or coach occupants	1	70	1523
Other vehicle occupants	4	46	1433

Over the last 25 years road safety interventions of all types have resulted in a fall in the numbers of those killed and seriously injured on London's roads. This is against a backdrop of a rise in population, and in the last decade a rise in vulnerability as the number of walking and cycling trips increased.

The trend on number of killed and seriously injured on London's roads is generally down.

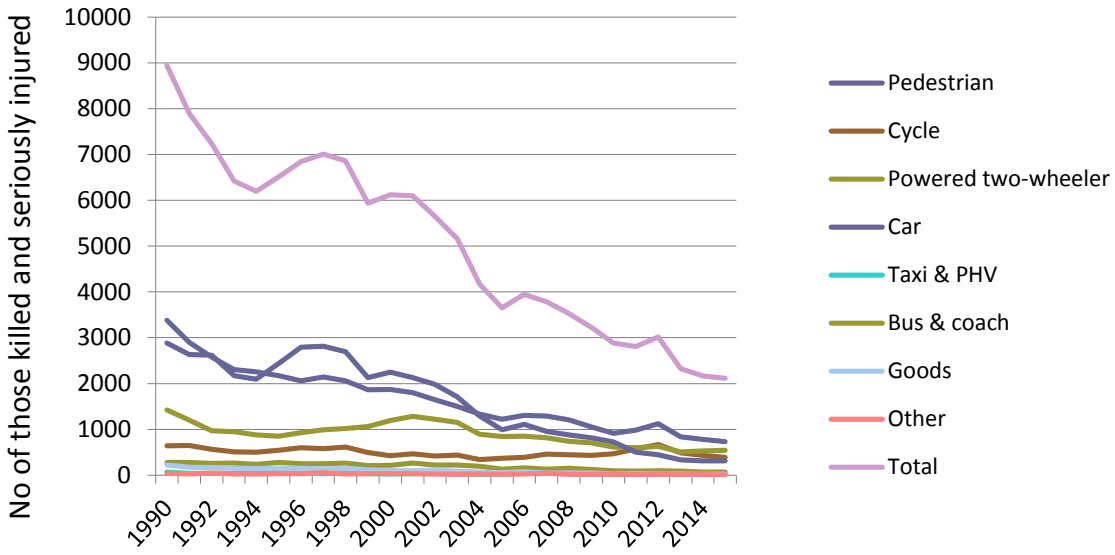


Figure 15. Numbers of killed and seriously injured on London's streets

However, this general reduction in the absolute number of killed and seriously injured of London's roads only tells part of the story. The other aspect of these

[11] https://tfl.gov.uk/corporate/publications-and-reports/road-saf

statistics is vulnerability per mile travelled. This is demonstrated in TfL's overarching road safety plan: *Safe streets for London*[12]. The graph below shows relative risk for different modes and age groups per mile travelled.

The graph below demonstrates that cyclists, along with pedestrians and motorcyclists are relatively more vulnerable to becoming a casualty on London's roads, than vehicle occupants, when distance travelled is taken account of. The rate of cycling collisions per mile is greater than that of walking, but much less than motorcycling.

Note: The graph has a logarithmic vertical axis to allow motorcycling to be represented on the same graph, along with cycling and walking.

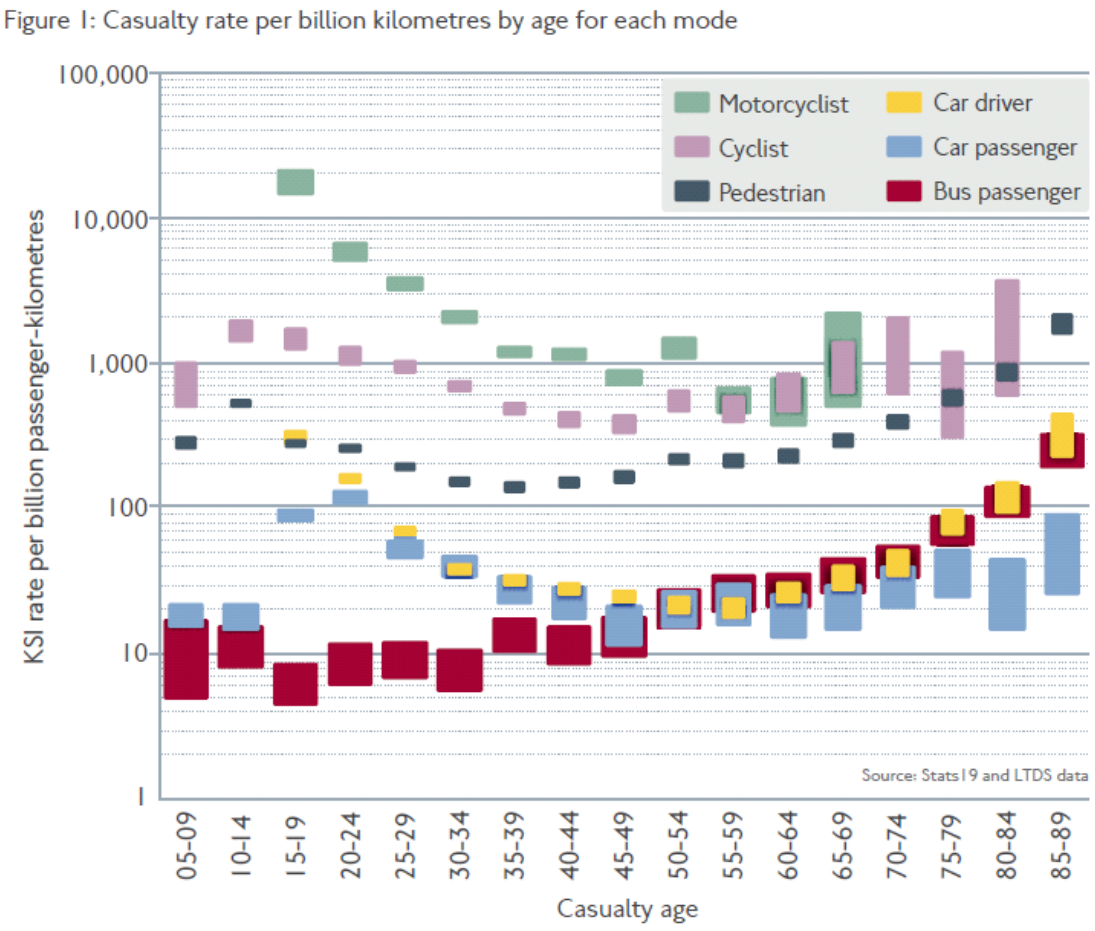


Figure 16. Casualty rate per billion kilometres by age for each mode. From TfL's Safe Streets for London

Also of interest is whether cycling is becoming safer per mile cycled over the years. This is a difficult assessment to make because, as described in the discussion above there is no very good measure the number of miles being cycled in London over time. However, TfL can demonstrate that casualty rates per mile cycled have reduced over a number of years. The graph below[13] shows the large increase in cycling as measured

[12] https://tfl.gov.uk/corporate/safety-and-security/road-safety/safe-streets-for-london
[13] Taken from TfLs report: Pedal cyclist collisions and casualties in Greater London (2011)

by TfL's automatic counters on the TLRN and much smaller increases in the number of casualties on the TLRN.

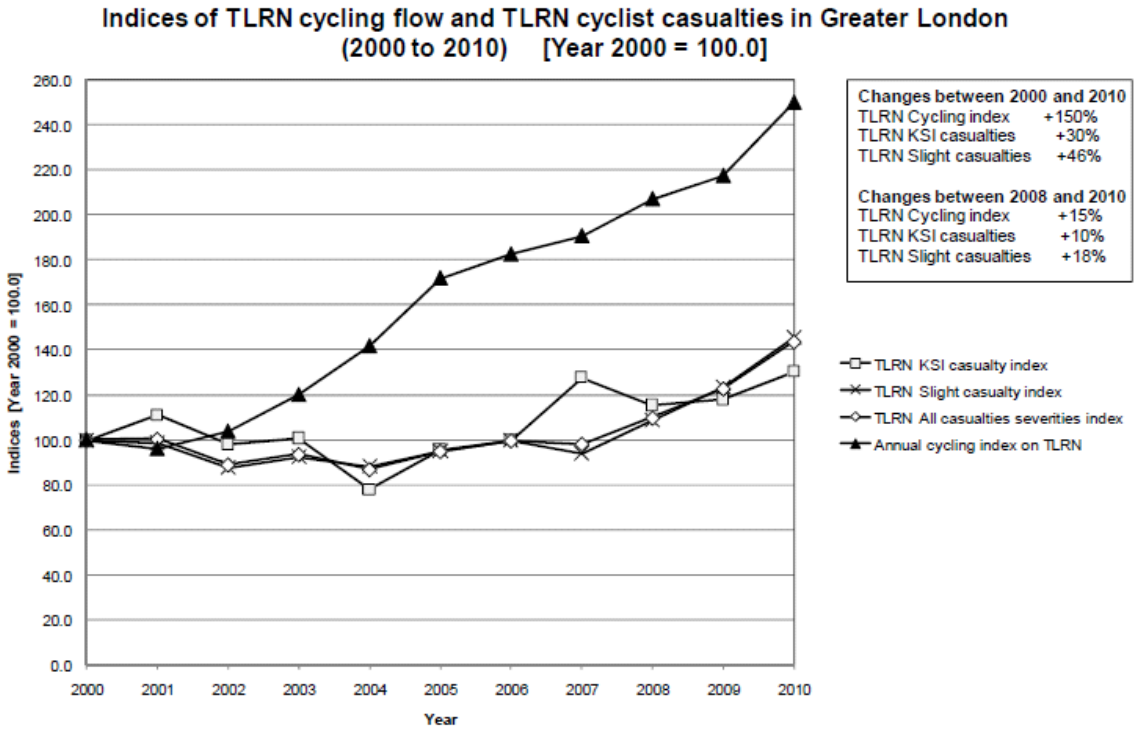


Figure 17. Miles cycled on the TLRN is growing at a faster rate than casualties. taken from TfL's published road safety reports

In conclusion, cycling is one of the three vulnerable modes along with walking and motorcycling. There has been some success in addressing the safety of cycling. It can be demonstrated that cycling has become safer per mile cycled. That said there should be continuing efforts to address cycle safety on London's streets as cycling becomes more popular because cyclists will become a rising proportion of all casualties.

Policies for more cycling

There are increasing levels of cycling across London, but generally more so in the inner than outer London, although it is in outer London where there is most potential for cycling. The growth has been achieved by a mixture of policies to address the barriers to cycling such as systematic road safety work by the highway authorities. But also, the unexpected consequence of congestion charging and perhaps, changing demographics, lifestyle choices, road congestion and crowding and performance of public transport, particularly Southern rail and London's bus services.

We have learnt from *Cycling Cities* that encouraging behaviour change to cycling has been achieved primarily by policies to restrain auto-mobility. This chimes with the London experience where the scale of the switch to cycling was an unexpected outcome of the introduction of the central area congestion charge. There are other ways in which a switch can be encouraged.

Some of the policy choices are easier than others are and will benefit all of the sustainable modes. Other policies will have an impact on other street users.

Roads pricing

Implementing a wider and more sophisticated scheme of roads pricing for motor vehicles would have many beneficial affects on how Londoners think about travel and choose their mode of travel. Many more would choose cycling, particularly for short journeys at busy times and into congested areas.

Closing minor roads and central areas to through traffic

Closing individual streets and even whole central areas to through motor traffic, whilst allowing access for public transit, cycling, residents and business, will have the effect of restraining auto-mobility. This will give an advantage to cycling and it will become a preferred mode of travel.

Closing streets to motor vehicles will lead to both modal switch, but also to some displacement of vehicles. These impacts need to be properly considered, and implies that an incremental approach to closing streets will be beneficial if additional capacity is not provided elsewhere.

Many of the successful *Cycling Cities* have used this technique to effect change in how people travel to their central areas.

Parking policies

In a similar manner to roads pricing, parking policy can be used to reduce the attractiveness of central areas to motorists and making the area more attractive to the sustainable modes including cycling.

Copenhagen embraced a policy of incrementally, but consistently removing parking from its central areas to be replaced by better public spaces and cycling facilities.

Car free development

For a number of years the London Plan has encouraged car-free development, i.e. new housing development where there is no car parking facilities for future residents (expect those with a disability) either on-site or on-street. The latter being achieved by restricting the availability of on-street parking permits. Again, this measure will encourage sustainable transport choices. Many London boroughs, particularly in inner London where access to public transport is readily available, are successfully applying this London Plan policy.

The policy recognises access to public transport modes as a requirement. This would be more effective if good access to services etc. by cycle was also considered supportive of car-free status by the planning process.

Road safety initiatives

Cyclists are one of the three vulnerable modes along with walking and motorcycling and it is likely that as cycling becomes more popular then cycling casualties will become a greater proportion of all casualties. Work must continue to reduce this toll.

Cycle safety initiatives also respond to surveys that find fear of being involved in a collision comes high up in the deterrents to cycling itself. TfL's commissions such surveys – *Attitudes to Cycling*[14]. Their survey amongst cyclists suggests 42% of cyclists are deterred from cycling more because of fear of being involved in a collision. They also find that 54% of non-cyclists are deterred from taking up cycling.

The same survey finds that "most non-cyclists (82%) continue to place themselves in the 'pre-contemplation' stage (never thought about cycling more and would be unlikely to or never thought about it but could be open to the idea in the future)."

Campaigners make the point that cycle specific infrastructure can both improve actual road safety, i.e. reduce the number and severity of injury, but also reduce the perception of danger, thus encouraging more cycling. It is to be hoped that highways interventions will do both.

[14] http://content.tfl.gov.uk/atc-online-autumn-2015-report.pdf

Training, education and enforcement

In its 2009 report, London TravelWatch supported cycle training, education and enforcement as a priority. We wanted to see more training, education and awareness raising and much more roads policing.

Ealing council had demonstrated the benefits of cycle training, finding that there had been sustained increases of cycling amongst those undergoing training courses. It is pleasing that many councils continue to offer cycle training. London TravelWatch would encourage them to do this.

Heavy goods vehicles are over represented in cyclist fatalities[15]. There has been some progress in seeking to address this within London by the implementation of traffic orders requiring improved lorry design. However, the hope that a fundamental change in the design of lorry cabs to give drivers a direct view of more of the area around their cab, has not progressed as quickly as one might wish. There is therefore a need for ongoing information campaigns directed at both cyclists and drivers to be aware of the potential dangers of a cyclist being on the left of a left turning heavy goods vehicle.

Operation FOIST was undertaken in 2007 by the Metropolitan Police Service (MPS) to target drivers of vehicles using London's roads without insurance, MOT etc. It was a very successful operation insofar as huge numbers of vehicles (1806), being used illegally were removed from the road, or their drivers otherwise sanctioned. Operation FOIST became operation CUBO that undertakes similar action.

There are many collisions where the driver leaves the scene[16]. This may be a result of the driver knowing that he, she or their vehicle shouldn't be on the road. London TravelWatch supports more CUBO type operations.

London TravelWatch wants all the users of London's streets to follow the rules of the road. Therefore, it was pleased to support operation ATRIUM that it heard about from the City of London Police. Operation ATRIUM was first conducted by the City of London Police in 2006 and continues today. It targeted drivers, riders and cyclists that broke road traffic laws. A similar model was developed by the MPS under the name of operation SAFEWAY. Both should be continued and indeed enhanced with more activity to raise the standards of cycling, riding and driving, and consideration of others on London's streets.

There are other initiatives that the Police, TfL and the local highway authorities undertake. The MPS undertake targeted enforcement against HGV operators to improve their safety performance. They take part in 'changing places' events to raise awareness of the lorry blind spot issue both by drivers and riders. The London boroughs undertake activities that often have safety education associated with them which are useful activities and should be supported.

[15] http://content.tfl.gov.uk/pedal-cyclist-fatalities-in-london.pdf
[16] http://questions.london.gov.uk/QuestionSearch/searchclient/questions/question_289422

Cycle parking and storage at home

The provision of cycle parking at home and at cyclists' destinations is a necessary part of providing for cycling. In TfL's annual 'Attitude to cycling survey', less than half of the respondents gave a good rating to the availability of cycle parking near their home. A little over half were happy with parking facilities at stations, at their work and on London's streets.

London TravelWatch advocates that the provision of cycle parking should lead demand, particularly at stations as discussed below. The provision of cycle parking will become an increasing issue, particularly near attractors of high numbers of cyclists such as town centres and stations. In Europe's cities where cycling levels are high the provision of cycle storage has become a major challenge. Some cities have responded with substantial facilities.

Figure 18. Cycle parking should be clustered on the carriageway

Figure 19.. Testing demand for cycle parking

London TravelWatch supports travel planning for schools, workplaces and has promoted them as best practice for stations. These concepts need to be extended to town centres where cycle parking needs planning for rather than being provided on an opportunistic basis as available locations are found.

Some London boroughs are locating cycle stands on the carriageway in groups rather than stringing them out on pavements, which should really be prioritised for pedestrians. This is welcome. One London borough tests the demand using temporary cycle stands which also emphasise the space efficiency of cycling – one car parking space can provide cycle parking for 10.

Major events in London can attract many cyclists, but require only temporary cycle parking. To facilitate this London TravelWatch has supported LCCs call for TfL and the London boroughs to plan for cycling routinely when they are planning the transport associated with major events, just as they would plan for bus services and their passengers.

Cycle storage at home is a problem for many Londoners, particularly those living in flatted blocks. It will mean some don't cycle or cycle less often. The initiative of Lambeth council to provide on-carriage cycle storage is welcome and has been taken up by others.

Figure 20. 'Lambeth' hangars are now being used more widely

The London Plan suggests high levels of cycle parking provision in new developments at a rate of one cycle for a one-bedroom flat and two cycles for larger apartments.

Rail stations as cycle hubs

London TravelWatch recently published a report, *Living on the edge*[17]. looking at the travel poverty issues of those living in outer London. It found:

> Cycling is a cheap and very efficient mode of transport, though very few people will cycle from the outer London boroughs to zone 1 (for example, only 217 [1.25%] of the 17,385 Croydon to Westminster commuters cycle according to Census 2011). But, for some people, cycling could extend the area of job search and access considerably up to, say five miles, and is also very reliable in terms of journey time.
>
> The majority of qualitative participants expressed the view that cycling was either not feasible for them over the whole length of their journey (they described themselves as 'too lazy' or were concerned they would be too sweaty by the time they got to work) or that they felt unsafe in current traffic conditions. However, cycling as a short part of a longer journey involving other modes might be a more realistic prospect, for example to a railway station in a different fare zone from where it would be cheaper to travel into central London. Cycling some of the way might reduce the number of zones travelled through by rail, or remove the need for a bus journey or car parking charges, helping to reduce travel costs overall.
>
> Outer London boroughs and communities, and Transport for London, might like to consider what they could do to integrate cycling more fully into the commuting patterns of low paid workers and job seekers.

In Richmond, the outer London borough with the highest mode share for cycling in London, there is evidence that cycling plays an important role in the journey to work.

Figure 21. Richmond station has a substantial cycle parking area, but this is overwhelmed and result in this informal cycle parking.

[17] http://www.londontravelwatch.org.uk/documents/get_lob?id=4100&field=file

The *Cycling Cities* report identified cycling to and from the station as part of many work trips that had contributed to the growth in cycling in some of the studied cities. TfL and the London boroughs should do more to facilitate trips to the outer London stations as part of linked trips.

Remodelling London's streets for cycling

As discussed above, one important measure to enable more and safer cycling is to remodel London's streets for cycles. This could mean anything from simply introducing yellow lines to take away parking or introducing speed tables to, say, major engineering projects to change a complex road junction to improve road safety.

This is not straightforward and presents a dilemma for policy makers and highways authorities for many reasons. Below are some of the issues to consider before such interventions are undertaken. The next section considers some types of streets schemes that are implemented.

Cyclists have differing needs

The first consideration is that cyclists are not all the same and their needs are not the same. The Department for Transport commissioned study[18] looking at 'Cycling, safety and sharing the road', highlights the issue. The study concludes:

> Cyclists themselves have differing and potentially conflicting needs from infrastructure:
>
> - Cyclists opting for 'assertion' want infrastructure that helps to establish their right to be on the road and that clarifies how the road is to be shared; and,
> - Cyclists opting for 'avoidance' want infrastructure that gives them more opportunities to avoid traffic.

Though these two characterisations are either end of a continuum, it does highlight the difficulty of designing for cycling.

Confusing infrastructure should be avoided

The same DfT report highlights the issue of complexity. This is echoed by road safety practitioners who say that safe roads are simple and self explaining, not complex. The report concludes:

> Cycling facilities can also make the road-sharing problem worse if they create additional confusion about where cyclists and drivers are meant to go. The key issues are:
>
> - Infrastructure that is too complex and needs to be decoded by the user;
> - A failure to communicate to people how to use innovative infrastructure; and,
> - A lack of consistency from one place to the next.

[18] http://www.cyclist.ie/wp-content/uploads/2010/11/Dept-of-Trans-London-RS-Cycling-ORU-Report-1110-2.pdf

> At the very least, infrastructure should be avoided that creates more confusion about whether, and where, bicycles should be.

As an example of this issue, Camden has a policy of removing bi-directional cycle tracks because they are complex insofar as cyclists travel in an unexpected direction which means more risk and led to more collisions.

Value for money

Road safety in London has improved over a number of years. In part this can be attributed to the systematic targeting of funding at those locations where most casualty savings can be made. This is often at junctions where most (80%+)[19] casualties occur and most casualty savings can be made. It is important that this continues and that there is an understanding that remodelling London's streets is very expensive, particularly if this involves moving kerb lines and utilities under the street.

Actual and perceived safety

It is suggested that reducing the perception of danger is also important to encourage cycling. This can be achieved by obvious cycle specific infrastructure such as cycle lanes and tracks, but it may not always be the case that these measures actually reduce the number of casualties or the severity of injuries

The research available[20] suggests cycle collisions may reduce on the links between junctions if cycle lanes and tracks are introduced, but increase at junctions where separation from motor traffic is often lost and the risks greatest. A Danish academic study for the Copenhagen municipality sums up these issues:

> ….it can be deduced that the construction of cycle tracks has resulted in three important gains in road safety: fewer accidents in which cars hit or ran over cyclists from the rear, fewer accidents with cyclists turning left [right in the UK] and fewer accidents in which cyclists rode into a parked car. These gains were more than outweighed by new safety problems: more accidents in which cyclists rode into other cyclists often when overtaking, more accidents with cars turning right [left in the UK], more accidents in which cars turning left [right in the UK] drove into cyclists as well as more accidents between cyclists and pedestrians and exiting or entering bus passengers.

Infrastructure and cycling levels

Separating out the impacts of different interventions is problematic. The research in the preceding paragraph also looked at the impact of the cycling infrastructure on cycling levels in Copenhagen. It found that there had been an increase in cycle traffic of between a8 and 20%. In the case of London's cycle superhighways TfL have reported a figure of 50% increase for the North to South and East to West cycle

[19] http://content.tfl.gov.uk/cycle-safety-action-plan.pdf

[20] Road safety and perceived risk of cycle facilities in Copenhagen By Søren Underlien Jensen, TrafiTec: http://www.roadsafetyobservatory.com/Evidence/details/11592

superhighways. No equivalent figure is available for the route between Aldgate and Stratford. These figures should be treated with some caution because there are other influences such as rising congestion levels and the problems with public transport into central London. There are examples of towns, such as Stevenage where cycle infrastructure is available, but cycling levels are low.

Impacts on other street users

Cycle specific interventions, such as lanes and tracks and dedicated green signal time will have impacts on other users.

The practicability of interventions to improve London's streets for cycling

Developing policy is just part of the process of remodelling London's streets. There are clearly many other considerations in actually designing schemes in the real world. Every street will have a different topography and different uses. This inevitably leads to compromise and it can be the case cycling is less safe, rather than more.

Slower speeds

Slowing down speeds as an area wide intervention will mean less collisions and that collisions that do occur will result in less severe injury. In minor and residential streets, this is best achieved by physical means (humps or tables). London TravelWatch supports such measures providing they meet TfL's guidelines for traffic calming on bus routes.

In other streets where physical measures are not appropriate, the most effective 'device' for slowing traffic is to change the look and feel of the street. An active street will mean drivers drive more slowly. A 20MPH limit, for example, will be most effective on roads where traffic speeds are already near 20, and less effective where traffic speeds are high. The implementation of near-blanket speed limits has been shown to bring down average speeds by only one or two miles per hour.

The MPS are generally unwilling to enforce speed limits that don't meet their guidance for speed limits to be near the average actual speed. They will enforce where there are particular issues near schools, for example.

Closing streets to through traffic

Closing minor and residential streets to through motor traffic, whilst still maintaining access to residencies and businesses, will provide a safer cycling environment, not only on the street that is closed, but also across a wide area. Reducing the amount of turning movements from main roads into minor streets will also reduce the likelihood of collisions at these junctions. Pursuing a policy of closing minor roads should be accompanied by measure to ensure that motor vehicles aren't displaced to other minor roads nearby and that the main roads are being efficiently used.

Clear space for cycling

Reducing vehicle parking on main roads and extending the operation of bus priority for longer hours will assist cycles and improve cycle safety. Wide inside lanes (4.5m), bus lanes and the provision of a wide lane adjacent to bus stops will provide a good level of service for cycles and improve cycle safety.

London TravelWatch supported Camden's proposals for Tottenham Court Road that prioritises pedestrians, cycles and bus services and restricts access to general traffic. It provides a wide inside lane so cycles can pass large vehicles and large vehicles can pass cycles. We have also supported the proposals for Bank junction that also prioritises buses, cycles and pedestrians. This model, allowing privileged access for the space efficient modes, bus, cycle and walk is a feature of those cities with high cycling levels in Europe.

Figure 22. The Tottenham Court Road proposal will enable cycles to share more easily with buses in a wide lane.

Side road entry treatments and the removal of left turning slip roads

Reducing the radii of junctions and adding side road entry treatments (raising the carriageway to pavement level) can slow turning motor vehicles intending to cross the path of cyclists on their inside. Removing left hand slip roads and replacing them with conventional junctions will again slow motor vehicles crossing the path of straight-ahead cycles.

It should be noted that the borough 'side road entry treatments' appear more successful than TfL's design. This could be because the borough designs have tighter radii and steeper ramps.

Cycle lanes and tracks

Some cycle campaigners want much more to be done to improve cycle safety under the banner of ‘Space for cycling’. This space, the LCC suggests, is provided in two ways. They want to see ‘kerb separated cycle tracks’ on roads with vehicle numbers greater than 2000 a day. This separate provision could be i) a kerb running the length of the road protecting a 2.1m cycle track, ii) a track on the pavement setback from the kerb or iii) a track along the side of the carriageway, but at a level between the pavement and carriageway. At bus stops, campaigners want to see the cycle track continue, preferably around the back of bus stops. At signalised junctions, LCC wants to see dedicated green signal time for cycles to separate them from motor vehicles. At uncontrolled junctions, the LCC wants additional measures to limit collisions between cycles and turning vehicles.

If this protection is not possible then the LCC suggest that motor vehicles should be restricted to less than 2000 a day.

These are very demanding specifications, particularly if applied widely and on streets with lots of pedestrian and kerbside activity. All of London’s main roads have more than 2000 motor vehicles a day. Many minor roads also carry much more motor traffic than this. Introducing a dedicated green signal may well mean longer waits for all users, including cycles and a reduction in junction capacity for motor vehicles.

There are now examples of what TfL and the boroughs have built to accommodate cycles with tracks and lanes. Some of the schemes are described in Appendix 2.

The facilities are all very different to each other with many novel design features. For example, there is the wide bi-directional track from Blackfriars Bridge to St Georges Circus. This has attracted significant levels of cyclists. The Elephant and Castle Roundabout has been remodelled with multiple different facilities for cycles and some conventional treatments such as sharing a bus lane. There are now cycle tracks along the A11 from Aldgate to Stratford, passing behind more than 30 bus stops and with varying designs for junctions giving different degrees of separation from motor vehicles.

At the junction of Cambridge Heath Road and Mile End Road, there is a new junction design. The junction has been widened to provide cycles with a separate lane and dedicated signal time on two arms of the junction, for cycles travelling straight on and left. Cycles should take right turns in a new fashion, in two stages. The other two arms are more conventional, but with the new right turning technique. Not all cyclists use the junction as intended. There is also more complexity for pedestrians and a wider road to cross.

Some boroughs have installed much more modest lanes and tracks with a variety of ways to keep cyclists separated from motor vehicles at bus stops. Most are choosing to route cycles through the passenger boarding and alighting area with the occasional cycle lane routed behind the stop where space allows.

Only time will tell whether these facilities provide for safer cycling. There are stretches of kerb-separated tracks that will protect cycles from motor vehicles. However, at junctions, where most collisions occur cyclists may well be less safe because of the infrastructure provided. Two examples are highlighted below where cycles may be travelling at speed, too close to the junction mouth in the belief that they are safer than they are. At both locations motor vehicles turn across cycles travelling straight ahead.

Figure 23. At Rick Roberts Way, left turning vehicles turn across straight ahead cycles

Figure 24. At Aberavon Road left turning vehicles cross the path of cycles

In the further example on Blackhorse Road below, cycles merge onto the carriageway as they approach the junction. This may be a problematic manoeuvre, particularly for right turning cycles. There are problems for cycles using the cycle track at Aldgate where congestion at the Commercial Road Junction with Whitechapel High Street means cycles are blocked and have to find their way around queuing traffic.

Figure 25. The approach to Forest Road on Blackhorse Road.

Figure 26. The cycle lane at Aldgate is regularly blocked by queuing traffic.

The requirement to maintain separation from motor vehicles at bus stops has meant the wider use of so-called, ‘bus stop bypasses’ by TfL. Bus stop boarders (shared cycle lanes and passenger boarding and alighting areas) are being introduced along with ‘bus stop bypasses’ on borough schemes.

These features have been used elsewhere in London, but generally at locations with very few pedestrians, passengers and cycles. In Europe, they are said to be widely used. TfL have commissioned research looking at the design of bus stop bypasses. London TravelWatch is part of a group contributing to this work. No similar research is planned for bus stop boarders.

Arriva Denmark have undertaken some research with their drivers and found that ‘real collisions’ are occurring at these types of stops. See Appendix 3.

The photos below are of a bus stop bypasses and boarders. The first two are on the TLRN on Whitechapel High Street and at Elephant and Castle. Both are busy bus stops, the latter, one of the busiest in London. Both cycle lanes are at carriageway level. TfL are investigating the installation of Zebra type crossings for these types of stop,

Figure 27. A bus stop on Whitechapel High Street

Figure 28. The cycle lane passes behind two very busy stops at Elephant and Castle.

This Camden example, on the left, has the cycle lane running directly behind the shelter. At Waltham Forest, this example routes cycles through the passenger waiting and alighting area.

Figure 29. A hybrid bus stop boarder / bypass on Royal College Street

Figure 30 The cycle lane passes through the passenger boarding and alighting area

Bi-directional cycle tracks will introduce additional risk of collisions between cycles, pedestrians and motor vehicles confused by cycles travelling in an unexpected direction.

Figure 31.Bi-directional cycle track south of Ludgate Circus

At some locations, pedestrian refuges have been lost, whilst at others pedestrian crossings have been introduced. The photo below shows Ludgate Circus which is strangely devoid of pedestrian refuges, but now has a formal green man pedestrian crossing all four arms.

Figure 32. At Ludgate Circus it's a bit precarious crossing with no pedestrian refuge.

The impact of the new cycle infrastructure

The Mayor's 'Vision for Cycling' programme heralded a change in emphasis in TfL's approach to managing its streets. The vision focussed on providing for cycling, not managing demand. There was to be carrot, but no stick. TfL proposed many cycle centric schemes. The London boroughs supported to initiate cycle schemes on their streets.

The impact of the new cycle infrastructure on cycling

The greatest impact of these schemes has been to provide dedicated infrastructure for cycling, the cycle superhighways. This has enabled cyclists a more comfortable and faster journey along stretches of major road that would have previously been quite hostile. For example along the Victoria Embankment, Upper and Lower Thames Street, and between Elephant and Castle and Blackfriars Bridge. There are also some quieter back streets that cyclists will feel more comfortable cycling on. There are a few area wide schemes that provide for a very low motor traffic environment by closing residential streets to through traffic. More are proposed.

TfL have reported much greater numbers of cyclists using both superhighways described above. TfL have yet to report the origin of these additional cycles and how new cyclists previously travelled.

However, there are interventions that are of less benefit to cyclists and may well be less safe. Some of the infrastructure is confusing and will give false assurance to cyclists. At some locations, signs describe how a junction should be negotiated. Cycle training suggests cycles take a more central position in the lane. Some of the new infrastructure encourages fast cycling too close to the kerb and crossing junctions too far to the left will mean cycles are more vulnerable to collisions from left turning vehicles. Turning right has become a two-stage process described by signage.

Only time will tell whether there is an overall safety benefit for cycles. It is important that that there is a thorough review of the infrastructure that has been introduced.

The impact of the new cycle infrastructure on pedestrians

There have been impacts on pedestrians. There have been some improvements such as additional pavement space and an improved public realm. For example in Orford Road, in Waltham Forest where the street has been closed to through traffic (except the bus) and the public realm upgraded. There are examples of additional and widened pedestrian crossings on the cycle superhighway.

There have also been significant changes that have affected the amenity of pedestrians. Pavements are now used for cycling, sometimes at very busy locations such as at Seven Sisters Underground station and Vauxhall Bridge. Waltham Forest are converting pavement to cycle tracks and shared use at junctions.

To maintain a separate facility for cycles bus stop bypasses and bus stop boarders have been introduced that route cycles either around the bus stop or through where passengers board and alight their bus. Bi-directional cycle lanes are a significant feature of the superhighways. These are more problematic for pedestrians to cross both informally and at formal pedestrian crossings. There has been a loss of pedestrian

refuges at some crossing places, for example at Ludgate Circus. Other crossings are now more complicated and less comfortable for pedestrians, for example at the junction of Queen Street and Upper Thames Street.

It is unclear whether there are any additional collisions with pedestrians. From observation, there are near misses and therefore one would think it likely, occasional collisions. One hopes that the work TfL is undertaking on their bus stop bypasses will improve them for pedestrians, but it is unlikely that any design changes will eliminate the impact on amenity. We understand that there is no similar study on the borough bus stop boarders.

Cycle tracks are being delineated in various ways, kerbs, rubber blocks, plastic poles and cats eyes. All, bar the latter, of these will affect pedestrians as they pass through them or over them. The City of London and Camden have removed rubber blocks where there were concerns about pedestrian tripping. Kerbs will reduce the opportunity for informal crossing and mean wheelchair users are unable to access taxis.

The impact of the new cycle infrastructure on bus performance

The central London cycle superhighways have affected bus service performance in two ways. At Vauxhall Bridge, Harleyford Road and Blackfriars Bridge Road bus lanes were removed to provide for the cycle tracks. The eastbound bus lane on Leabridge Road in Waltham Forest is being converted to a cycle lane.

Bus services have also been affected, by the general reduction in road capacity for motor vehicles associated with these schemes. There has been some mitigation of the impacts. TfL have developed new traffic management techniques and is looking to introduce additional bus priority elsewhere on the routes.

Bus priority schemes were promised as part of the development of these schemes. Not many were in fact introduced. Delivery of additional bus priority will be challenging for TfL and the boroughs.

The impact of the new cycle infrastructure on motorcycles

Motor cycle groups are concerned about the reduction in lane width they believe has occurred because this reduces motorcyclists' ability to filter safely past slow moving traffic. They also have concerns that the rubber blocks used to delineate cycle lanes may unseat riders who inadvertently hit them at an acute angle.

Cycling in London's parks and along its waterways

There are some well-established cycling routes in London's parks and green spaces. The canal system's towpaths are often well used, though there is conflict due to the narrow nature of many towpaths. Some of these routes are formalised and cycling is actively encouraged. In other locations, cycling is discouraged with by-laws, barriers and bans. Recently the Royal Parks have sought to slow cycles using some of their paths with 'rumble strips'.

Whilst developing the 2009 report members visited a variety of these locations to judge for themselves what criteria should be applied to use.

London TravelWatch expects cyclists to primarily use the road network, but recognises the importance of off road provision and that parks and the waterways will be used by cycles. When using these types of routes cyclists should recognise that they are guests and take particular care. Speeds should be kept down. Pedestrians should have priority and this priority may need to be reinforced by appropriate signing and sometimes enforced.

Physical measures to bar cycles and slow them down must be well thought out as they can be ineffectual and disadvantage those using the route considerately. The surfacing of off-street facilities can affect the speed at which cycles are ridden without impacting on the ride quality, for example, crushed chalk is used along Parkland Walk in Haringey.

Photo

It is to be regretted that some of London's park roads are utilised as part of the public highway and are often busy roads. There is a proposal to close Regent's Park Outer Circle road to through traffic, which London TravelWatch supported. This would have provided an excellent cycling environment. Its closure would also have reduced the volume of motor traffic on roads approaching the park for cyclists too. Disappointingly, this proposal is presently stalled.

New off-road provision may be possible to provide. London TravelWatch has previously suggested several that could use redundant infrastructure for cycling;

- Bow Church to Hackney
- Finsbury Park to Muswell Hill
- Mill Hill East to Edgware
- Belmont to Harrow & Wealdstone
- Croydon to Canary Wharf cycle route using redundant railway alignments between Crystal Palace and Nunhead, and through public parks between Croydon and Crystal Palace

Conclusions and recommendations

There are multiple reasons for supporting policies to change the travel behaviour of Londoners and that more of them cycle as part of a more active lifestyle.

London TravelWatch has developed its policies over a number of years. This has involved consultation and engagement with numerous stakeholders representing all the users of London's streets and transport systems. London TravelWatch has a particular remit to represent disabled travellers.

In November 2016 we were privileged to host a lecture held in the memory of our former Deputy Chair, Ruth Thompson. Professor Ruth Oldenziel, of Eindhoven University, gave the lecture, Ruth presented *Cycling Cities*, the book she had edited looking at the cycling history of 14 European cities over 100 years.

This research suggests that those cities that have the highest levels of cycling are those that have i) adopted policies to restrain auto-mobility, ii) have a history of relatively high levels of cycling maintained from before the second world war and iii) have not had a strong tradition of good public transport.

London was not one of the cities studied. In contrast to the cities with high cycling levels, cycling in London fell dramatically after the Second World War to near zero, it has had high levels of public transport and only limited policies to restrain auto-mobility except in the inner and central area.

Cycling has started to become more popular in London, particularly following the introduction of the 'central area congestion charge scheme'. Since then cycling levels have been steadily rising. In the latest quarter, TfL reports a growth of 5.6% in the central area compared to the same quarter last year.

Cycling can be seen to be most popular amongst the young, professional segment of the population. More men than women cycle and white British cycle more than other demographic segments. TfL have investigated the potential for more cycling and calculate that 41% of all trips by London residents could be cycled. At present they suggest just 6% are being cycled. Most of the trips that could be cycled, 55%, would be journeys within outer London.

There are too many casualties on London's streets. Pedestrians, motorcyclists and cyclists are particularly vulnerable. TfL have demonstrated that cycling is becoming safer for Londoners per mile travelled, pedestrian casualties are generally falling, but motorcycling looks to be getting less safe. The general improvement in road safety has been a function of many years of data-led interventions by the local highway authorities and the police. More could and should be done to continue the systematic assessment of collisions on London's streets to reduce the numbers further.

Increasing cycling levels is not straightforward. The evidence from *Cycling Cities* supports what transport planners and practitioners say more generally about travel behaviour change. Both carrot and stick are needed. Restraining auto mobility, the stick, is a necessary part of any transport strategy to change travel behaviour to the space efficient modes. Relying on congestion itself, or poorer public transport

services to change travel behaviour is fraught with problems. Professor Oldenzeil believes an incremental approach is best.

There are many other initiatives to promote and enable more cycling. This can range from reducing speeds and enforcement of the rules of the road, to improving the safety and perception of safety of London's streets for cycling.

Cycle campaigners promote the provision of cycle specific infrastructure - cycle tracks separated physically from motor vehicles by the means of kerbs or dedicated green signal time. Both the North to South and East to West cycle superhighways are proving popular with cyclists.

Providing this dedicated space and signal time clearly means taking it away from existing users. This is not straightforward, and will affect other road users. It may just mean removing parking spaces on some streets, but it will also mean taking bus lanes, pavement space, pedestrian refuges etc. The routing of cycles onto pavements once reserved for pedestrians and bus passengers will also clearly cause issues of conflict. Providing for cycling will mean change and may well result in more complex designs and difficulties for all users.

The remodelling of London's streets must be pragmatic and take account of all users. Cycle specific infrastructure may well be more appropriate alongside London's fast, busy dual carriageways than its bustling highstreets with multiple uses and kerbside activity.

The issue of heavy goods vehicles needs to be addressed because these vehicles are not well suited for London's streets and they are disproportionately involved in road fatalities. There has been good work done to promote awareness amongst drivers and riders of this issue. The MPS and City Police are actively policing heavy goods vehicles on London's streets. There are grounds to believe that improved cab design will reduce casualties and so this must be a priority for London, and indeed national government.

Appendix 1. The development of London local government cycle policy

For many years, London local government has sought to increase cycling levels with a broad range of actions. In 1989, the London Planning Advisory Committee (LPAC), a consortium set up after the abolition of the Greater London Council, proposed a 1,000-mile strategic cycle route network for London. In 1997, the *Cycling Strategy for London* was launched with an ambition to complete a London Cycle network (LCN) and a target of a 10% modal share for cycling by 2012 was adopted.

Shortly after its formation in around 2003, TfL established a 'Cycle Centre of Excellence' to deliver improvements for cycling. In 2004, TfL produced its cycling action plan: *Creating a chain reaction*.

A broad range of initiatives included cycle training, additional secure parking and highways engineering. Highways engineering interventions were to be improved and standardised. The flagship scheme was to create a cycle network London Cycling Network+ (LCN+) which would be more limited in coverage, but of higher quality than its predecessor LCN.

London TravelWatch generally supported TfL's approach, but expressed concern regarding the use of the pavement for cycling and the high cost of kerb separated cycle tracks. London TravelWatch's submission wanted more focus on dangerous junctions, reverting gyratory systems and making the carriageway safer.

The action plan had some successes. However, many of the routes promoted as part of the LCN+ were incomplete insofar as they stopped at many difficult locations. Those sections of route that were built sometimes introduced cyclists onto the pavement or included design features that were criticised – cycle lanes that were parked in, too narrow, provided no protection from motor vehicles (particularly at junctions), encouraged poor cycle position etc.

In 2010 the, then, new Mayor of London determined to turn the focus away from the LCN and address cycle safety on London's main arterial roads. London was to have a *Cycling Revolution*, a 'Year of Cycling' and become 'a cyclised city'. Cycle hire, cycling boroughs and the first two 'cycle superhighways' were proposed.

The cycle superhighways were to be substantially along TLRN roads. They were to be continuous marked lanes (blue surfacing) along 12 of London's main arterial routes from central London outwards for about 8 miles. TfL claimed that following implementation of Cycle Superhighway 7 there had been a 70% increase in cycling. Not all of the cycle superhighways were introduced. The schemes received a mixed reaction from cycling groups.

London TravelWatch expressed its concerns about some aspects of the designs of the blue paint Superhighways. Specifically London TravelWatch was concerned i) that the surfacing (cycle lanes) would sometimes encourage cycles to be in the wrong position on the road particularly at junctions; ii) some of the cycle lanes were confusing as they were effectively half of a bus or general traffic lane; and iii) the

most problematic junctions, where most collisions occur along these routes, were not being remodelled as part of the process.

In 2013, the Mayor proposed to upgrade the cycle superhighway between Bow roundabout on the A13 and Stratford Town centre by introducing kerbs separating cycles from motor vehicles. This separation routed cycles around the back of most bus stops. However, separation was only partial insofar as one section remains as a mandatory blue surfaced cycle lane and cyclists merge with motor vehicles at junctions.

At the same time, the Mayor published his *Vision for Cycling in London*. This proposed: i) a number of Quietways (back street cycle routes; ii) a central London grid (cycle routes in and around the central area); iii) a competition for London boroughs for three £30m grants to be spent on cycling initiatives (the so-called Mini-Hollands programme); iv) a programme of further (largely) segregated cycle superhighways.

Alongside these a further cycle standard manual (the third) was developed; a programme to improve 100 junctions with the worst collision histories This ‘Better Junctions’ programme was subsequently reduced to 33 locations, some of which were to be tackled as part of the superhighway proposals.

Additionally the vision continued to support other road safety initiatives, cycle hire, policing, training, marketing and a schools initiative, although the schools initiative was later omitted and the budget redirected to fund infrastructure.

Appendix 2, Description of the Mayor's Cycling Vision Programme

Quietways

The Quietways are progressing, but more slowly than was hoped. A route between Greenwich station and the South Bank at Waterloo Bridge has been launched. This provides a useful route on a mixture of back streets, (some of which have been closed to through traffic) and a newly opened off-road section. There are two sections with cycle traffic separated from general traffic by a kerb and a section of shared pavement. Overall, it is a useful intervention.

Central London Grid

The Central London Grid is a selection of central London streets that are to join up with the cycle superhighways to enable safe cycling across central London. They are to be completed by the end of 2016, although this seems unlikely. The interventions are generally minor depending on the local authority. To give a flavour of the interventions there are:

- separated cycle lanes with bus stop borders and bypasses Cycles generally merge with motor traffic at junctions;
- speed tables and side road entry treatments with cycles using the general traffic lanes;
- wayfinding cycle logos painted on general traffic lanes.

Mini Hollands

Three boroughs have received a substantial capital grant to introduce a package of cycling measures under the banner of Mini-Hollands. Two of the three have rebranded their projects.

Waltham Forest

Waltham Forest has progressed further than others have. It has introduced road closures on some of its residential streets to reduce through vehicular traffic and substantially improved the public realm of a district centre - Orford Road. There has been an interesting programme of 'side road entry treatments' to slow turning traffic and a series of cycle lane sections. There are a mixture of bus stop bypass and bus boarders at bus stops where cycles are routed either behind or through the passenger boarding and alighting area. Two sections of a flagship cycle lane along Lea Bridge Road are being progressed. One section involves the remodelling of the Whipps Cross roundabout and a section of off-road cycle track. The majority of the Lea Bridge Road cycle lane will be off of the carriageway, either sharing the existing pavement or on a widened area at pavement level. At controlled junctions cycles will progress, using controlled crossings in parallel with pedestrian crossings.

Bus routes 48, 55 and 56 will lose long sections of an eastbound bus lane along Lea Bridge Road to provide the space for the cycle tracks. TfL and the borough are seeking to reduce the impacts on bus journey time and reliability along the road and

introduce other schemes to assist bus services elsewhere. There will nevertheless be a negative impact on these high frequency services: journey times and reliability will worsen. The cycle lanes affect pedestrians, particularly where they cross the pavement at junctions and bus stops.

Enfield

Enfield has rebranded its Mini-Holland project to become Cycle Enfield. The focus is on providing longer distance cycle lanes on the carriageway delineated by rubber blocks. There is to be an Enfield town centre scheme, but it is unclear what is proposed.

The main impact of these schemes will be for passengers at bus stops where there is a mixture of cycle lane provision. There are both bus stop bypasses and bus boarders at bus stops. Enfield is proposing the first substantial use of rubber blocks on the carriageway to delineate long sections of cycle lane. There is concern about the use of these blocks by motorcycling groups and some history of pedestrian tripping incidents in the City of London, Camden and Brighton. These issues will need monitoring.

Kingston upon Thames

Kingston upon Thames has rebranded its Mini-Holland project as ‘Go Cycle’ The focus is on several cycle lanes / tracks which will have various treatments as is felt appropriate to the location. The first substantial scheme is under construction. It includes a short section of bi-directional cycle track that routes cycles through the area bus passengers board and alight along. The two-way nature of the cycle track through the bus stop will be problematic for passengers boarding and alighting their bus.

Cycle Superhighways

The most high profile intervention of the Mayor’s Vision cycling programme have been the cycle superhighways. The Vision proposed a programme of tracks for cycles separated from the main carriageway by a kerb wherever possible, though cycle superhighways would not necessarily follow the TLRN and not all would have separated tracks. The schemes have evolved from the first at Stratford High Street, which opened in November 2013, and have many innovative features not used on UK roads before. The descriptions below give a sense of the schemes, the variety of treatments, and how they should work for cycles.

Stratford High Street (CS2 extension)

The first scheme along Stratford High Street has sections of separated cycle track running in each direction and a section of mandatory cycle lane along one stretch. The cycle tracks route cycles through the pavement around the back of all but one bus stop in a track below pavement level. At the major signalised junctions, cycles merge with general traffic. There are some conflicting movements at these junctions as left turning general traffic crosses the path of straight-ahead cycles. Right turning cycles are supposed to turn in two stages at a green signal and so avoid conflict with

general traffic. At the un-controlled junctions, blue paint is used to highlight the presence of cycles. Again, there will be conflicting movements. At Bow roundabout there is a novel traffic light sequence designed to assist cycles through this very busy junction.

Bow roundabout to Aldgate (CS2 Upgrade)

Between Bow roundabout and Aldgate the cycle tracks again run in each direction. The cycle tracks are generally separated by kerbs from motor traffic and run around the back of the numerous bus stops. There are sections of mandatory cycle lane at carriageway level, bus lane used by cycles, cycle lane at pavement level and cycle lanes 'protected' by upright plastic poles. The busier controlled junctions allow cycles travelling straight on and turning left to do so without conflict with left turning motor vehicles by splitting the green time between cycles and motor vehicles. Right turning cycles are supposed to turn right in two stages in time with the signals. At less busy junctions, cycles get an early start, but some cycles will merge with general traffic crossing them. At side roads, the cycle lanes cross the mouth of the junction and fast cycles may come into conflict with left turning motor vehicles. Cycles joining the superhighway do so in a conventional manner.

The East to West cycle superhighway (CS3)

The East to West cycle superhighway from Tower Hill to Parliament Square has been designed with bi-directional tracks. Whilst there are known issues with bi-directional tracks associated with cyclists travelling in an unexpected direction, it was felt by TfL that on balance there would be less interaction with side roads, bus stops and delivery bays. The cycle tracks are generally separated from motor traffic using kerbs, but there are sections of separation provided by plastic poles. Cycles should make their way through very busy junctions without any conflict with motor traffic and pedestrians during a cycle only traffic signal. Turning off of the cycle track will involve mandated two-stage turns. Cycles are routed behind bus stops. Passengers must cross these to board and alight buses. At Parliament Square, cycles are routed around the square with some physical separation, though it is a bit unclear in parts and the waiting times at lights can be very long and the lights often ignored. The section beyond Parliament Square is incomplete.

The North to South cycle superhighway (CS6)

The North to South scheme is generally a bi-directional track between Elephant and Castle roundabout and just north of Ludgate Circus. The superhighway route is indirect and uses St Georges Road. Some cyclists therefore use London Road. The superhighway uses a mixture of what was general carriageway, pavement and bus lane. It intersects with the East to West scheme at the Blackfriars underpass. Bus passengers again have to cross the bi-directional tracks to board and alight the bus. The Ludgate Circus junction is extremely busy. Pedestrians have benefitted from new crossings at Ludgate Circus, but have lost pedestrian refuges, which makes crossing uncomfortable and unpleasant.

Oval station and Vauxhall Bridge (CS5)

The scheme at Vauxhall is again a bi-directional track. It helps cycles avoid the very busy Vauxhall gyratory system. It utilises what was general carriageway, bus lane and pavement. The route across the bridge has introduced a particular conflict with large numbers of pedestrians having to cross the bi-directional cycle track at the southern end of the bridge.

City of London to Tottenham cycle superhighway (CS1)

Cycle Superhighway 1 is different from other recently built cycle superhighways. Through Hackney, it is essentially an upgraded LCN route with a substantial element of public realm improvement and road closures to facilitate quieter streets. South of Tottenham it is routed onto the pavement of the A10. There are significant conflicts with pedestrians at the entrance to the Seven Sisters Underground station where cyclists share the pavement with large numbers of pedestrians.

Better Junctions

The overwhelming number of collisions (80+%) happen at busy intersections and a focus on their design can be critical in reducing collisions for all users. The Cycling Vision suggested 100 junctions would be tackled, but this was subsequently reduced to 33, many of which are on the cycle superhighway routes described above.

Developing schemes for these very busy junctions is clearly not an easy task because the aspiration for safer junctions conflicts with the requirement that they carry large volumes of motor vehicles. It is also costly and disruptive to undertake such works. London TravelWatch has been part of TfL's stakeholder group commenting on some of the designs.

Clearly adding in a requirement to separate cycles from general traffic by means of separate cycle tracks or separate green traffic light time adds in another layer of complexity. These issues are exemplified at Elephant and Castle roundabout. The junction is now very complicated. A turn has had to be banned and there are one-way and two-way cycle tracks crossing the pavement. Separation has been possible at some locations, but not others. For example outside of the Northern Line station entrance one bus stop has been moved to reduce conflicts between buses and cycles and there is a wide inside lane provided for cycles and buses to share the carriageway.

The compromises and complexities of Elephant and Castle beg the question as to whether a simpler solution without separation would have been worth consideration.

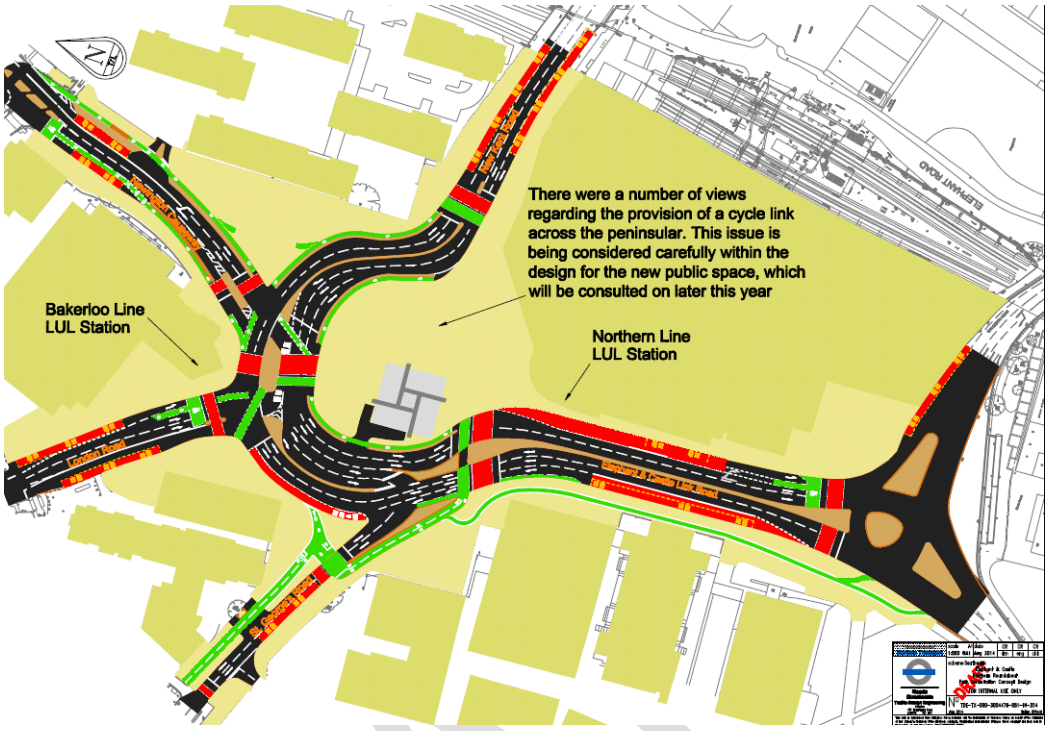


Figure 32. The final design for Elephant and castle junction is complex. Cycles are allowed across the public space.

Other Cycling Vision interventions

It is widely recognised that heavy goods vehicles are disproportionately represented as the 'other vehicle' in collisions that result in a cycle fatality. To address this there have been many initiatives from training and awareness raising publicity to the implementation of voluntary and enforceable modifications to vehicles. There are proposals for lorry bans during peak hours and suggestions that the drivers' mates return. It is hoped that a remodelled driver's cab that allows better visibility for drivers may reduce the number of cyclist fatalities in the future. This is an initiative that London TravelWatch supported as part of its Transport Users' Priorities document prior to the mayoral election.

The City of London and Metropolitan Police Services undertake enforcement operations to improve general road user behaviour targeted at busy junctions. London TravelWatch has called for additional roads policing for a number of years and particularly that the Metropolitan Police Service follow the City of London initiative, ATRIUM, to introduce high profile policing on London's streets to improve user behaviour. The Cycle Vision programme included an enhanced policing role in the form of Operation SAFEWAY that does replicate ATRIUM. Other policing initiatives have targeted uninsured motor vehicles and poorly maintained heavy goods vehicles.

Cycle hire, parking, marketing and other initiatives are also included in the Vision programme. A schools programme was dropped from the initial programme.

Appendix 3, Research regarding bus stop collisions undertaken by Arriva Denmark

Arriva Denmark study regarding cycle / passenger interaction at bus stops

We asked the 3 questions:

1) Have you within the last year experienced, that a passenger had a "**nearby**" accident with a cycklist, when entering og leaving the bus?
    a. YES (ja) / NO (nej)
    b. For the people answering *Yes* (ja), we asked how often he or she expeciences that: Dayly (Dagligt); Several times a week (Flere gange om ugen), A couple of times a month (Et par gange om måneden); A coulpe of times a year (Et par gange om året).

2) Have you within the last year experienced, that a passenger had a "**real collision**" with a cycklist, when entering og leaving the bus?
    a. YES (ja) / NO (nej)
    b. For the people answering *Yes* (ja), we asked how often he or she expeciences that: 1 time (1 gang), 2-5 times (2-5 gange); More than 5 times (Mere end 5 gange)

3) Du you ever experience dangerous situation, when passengers go from the sidewalk across the bike lane to enter the bus?
    a. YES (ja) / NO (nej)
    b. For the people answering *Yes* (ja), we asked how often he or she expeciences that: Dayly (Dagligt); Several times a week (Flere gange om ugen), A couple of times a month (Et par gange om måneden); A coulpe of times a year (Et par gange om året).

Samlet : 5 største byer i DK

	Ja	Nej	Dagligt	Flere gange om ugen	Et par gange om måneden	Et par gange om året
Har du inden for det seneste år oplevet, at passagerer i din bus har været tæt på at blive ramt af en cyklist, da han eller hun steg ud af bussen?	286	40	70	121	69	21

	Ja	Nej	1 gang	2-5 gange	Mere end 5 gange
Har du inden for det seneste år oplevet, at passagerer i din bus er blevet ramt af en cyklist, da han eller hun steg ud af bussen?	130	196	38	68	23

	Ja	Nej	Dagligt	Flere gange om ugen	Et par gange om måneden	Et par gange om året
Oplever du nogensinde, at der opstår farlige situationer når passagererne skal over cykelstien fra stoppestedet og ud til bussen?	288	37	80	102	78	23

Samlet : 5 største byer i DK

	Ja	Nej	Dagligt	Flere gange om ugen	Et par gange om måneden	Et par gange om året
Har du inden for det seneste år oplevet, at passagerer i din bus har været tæt på at blive ramt af en cyklist, da han eller hun steg ud af bussen?	88%	12%	25%	43%	25%	7%

	Ja	Nej	1 gang	2-5 gange	Mere end 5 gange
Har du inden for det seneste år oplevet, at passagerer i din bus er blevet ramt af en cyklist, da han eller hun steg ud af bussen?	40%	60%	29%	53%	18%

	Ja	Nej	Dagligt	Flere gange om ugen	Et par gange om måneden	Et par gange om året
Oplever du nogensinde, at der opstår farlige situationer når passagererne skal over cykelstien fra stoppestedet og ud til bussen?	89%	11%	28%	36%	28%	8%