

**NEW  
EXTENDED  
VERSION**



# **THE IMPACT OF CONGESTION ON BUS PASSENGERS**

**PROFESSOR DAVID BEGG**



#### **ABOUT GREENER JOURNEYS**

Greener Journeys is a campaign dedicated to encouraging people to make more sustainable travel choices. It is a coalition of the UK's leading public transport organizations, user groups and supporters. It aims to reduce CO<sub>2</sub> emissions from transport by encouraging people to switch some of their car journeys to bus or coach instead. Switching from car to bus for just one journey a month would mean one billion fewer car journeys on our roads and would save 2 million tonnes of CO<sub>2</sub> every year. For more information visit [www.greenerjourneys.com](http://www.greenerjourneys.com)

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Transport connectivity creates economic growth, jobs and builds houses. The resurgence of our cities, the places our children migrate to get jobs, is in direct proportion to their connectivity both to the rest of the world and within the city itself. And the bus service, for journeys longer than a walk, is the most common way of creating connectivity in them. So making buses work better is good for growth and jobs and good for the urban areas they serve. And both David Begg and I said so when we chaired the late and much-missed Commission for Integrated Transport.

In this study David rightly highlights the crisis which has developed in bus service reliability across the UK, and suggests a new and urgent need to make our buses quicker and more reliable to make our cities work better. The air quality effects of congestion are getting much airtime just now - the economic effects are as obvious but left unsaid for the most part. This study seeks to put that right.

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**Sir Peter Hendy CBE** *Chair, Network Rail*  
*Commissioner, Transport for London 2006/2015*  
*Chair, Commission for Integrated*  
*Transport 2005/2010*



Of course the bus industry itself must do better - cash handling on the bus slows the service down, costs money and is unnecessary in the modern age of PDAs and contactless bank cards; schedules must be up to date, tailored to time of day and produce reliability without too much recovery time. The Traffic Commissioners should have more powers and resource to prevent poor operators getting licences and to stop poor operation on the road.

But in urban areas the best operation in the world will be sabotaged if congestion destroys reliability and journey speed. David points out eloquently that the effects of congestion are doing just that - increasing costs and decreasing revenue, which leads inevitably to less service. In London, fewer but faster and reliable buses will both solve an acute financial problem for Sadiq Khan (the combination of his fares freeze and the complete removal of subsidy from TfL by 2018), and restart bus passenger growth allowing his electorate to access work, education, health and leisure more easily.

And outside London, the same proposition would produce more and better services, with the same results, too. Not to mention the beneficial effects on driver recruitment, retention and resultant customer service.

David isn't advocating anything which as a politician he hasn't done himself with the Greenways in Edinburgh. In London, for Boris, we took out significant road space for cycling. Now our towns and cities are going to have to make the same sort of radical choices for more protected road space and more and cleverer signal priority, for buses across the UK to enable the growth, jobs and house building the bus service can support.

This is a critical piece of analysis, which every local politician and highway authority in the country should read, absorb, and act on. David Begg is to be commended for it

## ABOUT THE AUTHOR

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**Professor David Begg** is a former chairman of the Government's Commission for Integrated Transport and was the chairman of the Transport Committee of the City of Edinburgh Council when the radical Greenways bus priority measures were introduced in the 1990s. He has been a board member of First Group, Transport for Greater Manchester and Transport for London. He is currently owner and proprietor of *Transport Times*, Chairman of EAMS, a non-executive director of Heathrow Airport and Chairman of the Greener Journeys Advisory Board. He is a visiting professor at Plymouth University.

## ACKNOWLEDGEMENTS

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This report is dedicated to bus drivers and their passengers who suffer from the impact of congestion on a daily basis.

I have been fortunate to have been able to discuss the economic analysis in this report with some of the best transport economists in the UK: Professor Peter Mackie, Professor Peter White and Professor Stephen Glaister. The final analysis is my own and any errors are entirely down to me.

I have become immersed in bus timetables and observed the huge frustration bus operators experience trying to run a punctual and reliable service in the face of worsening congestion. Special thanks to Martin Dean (MD, Buses, Commercial Director, Go-Ahead), Les Warneford (former MD, UK Bus, Stagecoach), Mark Yexley (Former Operations and Commercial Director Arriva UK Bus), Neil Barker (First Group), Nigel Serafini (Head of Commercial & Business Development, Lothian Buses), James Freeman (First Group), Peter Shipp (Chairman and Chief Executive, East Yorkshire Motor Services), Mike Best (Brighton and Hove Bus Company) and Martin Harris (MD, Brighton and Hove Bus Company).

They not only have supplied me with copious amounts of data, but they have educated me further on the sector. Martin has gone out of his way to dig up archived bus timetables stored at the Kithead Trust. I am indebted to Philip Kirk, who does a fantastic job looking after this archive, which is such a rich source of information ([www.kitheadtrust.org.uk](http://www.kitheadtrust.org.uk)).

Roger French, former MD of Brighton and Hove Buses has been an invaluable mentor for me in this research. He has left a fantastic legacy in Brighton.

Leon Daniels (MD Surface Transport), Garrett Emerson (CEO, Surface Transport) and Ben Plowden (Strategy & Planning Director, Surface Transport) from Transport for London have ensured that the major challenge the capital is facing, with rising congestion and sharp reductions in bus speed over the last few years, is accurately covered in this report. The new mayor would be well advised to listen to their concerns.

Dr Jon Lamonte (Chief Executive, Transport for Greater Manchester) and his colleagues Rod Fawcett and Mike Renshaw, have demonstrated to me in some detail the efforts they are making to speed up bus journey time in the face of a proliferation in road works and a rapid growth in city centre employment and demand for transport. They have been resolute in their policy objective of expanding bus priority in the face of stern criticism from some local politicians.

Anthony Smith and his colleagues at Transport Focus have guided me and reinforced my concern that congestion is the main challenge facing the sector. Joan Aitken has given me a Traffic Commissioner's view on the factors which are slowing up traffic in Edinburgh and how it impinges on bus operations.

David Brown (Group Chief Executive, Go-Ahead) and Giles Fearnley (Managing Director, First Bus) have provided wise counsel as have David Leeder, Chris Cheek (TAS Partnership) and Steven Salmon (CPT).

Vince Stops from London Travel Watch has been a passionate supporter of bus users in London and kept me right on the capital and Marshall Poulton (former director of transport at the City of Edinburgh Council) and George Mair (CPT Scotland) have been my go to men on Scotland's capital.

I have been very impressed at the close cooperation in the West Midlands, between National Express and local authorities. Particular thanks to Laura Shoaf, Managing Director for West Midlands and her colleagues Pete Bond and Guy Craddock, and to Peter Coates and David Bradford from National Express.

For the Glasgow case study I am indebted to Eric Stewart, Ronnie Park and Bruce Kiloh from Strathclyde Passenger Transport. They have a wealth of experience in the bus sector and their passion and commitment to arresting the decline in bus patronage in the city is commendable.

Phil Southall, Managing Director, Oxford Bus Company, helped me to understand the origins of the success story that is bus transport in Oxford.

Rupert Cox, MD for Stagecoach West, has provided valuable insights into the transport scene in Gloucestershire.

Tim Gaston, PTS director, National Transport Authority (Ireland) and his colleague John Keyes, kept the right on Dublin and ensured that UK cities can learn from their success.

Sir Peter Hendy has kindly written an insightful foreword. He may now be Chairman of Network Rail but buses will always be in his DNA and he leaves behind him a fantastic legacy from his time 15 years at TfL, both as director of surface transport and subsequently Transport Commissioner.

A big thanks to David Fowler and Kirsty Walton at Transport Times for making this report read much better than it otherwise would and to Katie Allister for her vital contribution on research and the case studies. It has been a pleasure to work with her again.



# EXECUTIVE SUMMARY

# TRAFFIC CONGESTION IS A DISEASE WHICH IF LEFT UNCHECKED WILL DESTROY THE BUS SECTOR.

This is a dire and sensational prediction, but the evidence uncovered in this research leads to no other conclusion. On historical, current and future trends it's a question of when, not if. There is a distinct trend across our most congested urban conurbations in the UK of bus journey times rising by – on average – almost 1% per annum.

**Over the last 50 years, bus journey times have increased by almost 50% in the more congested urban areas. If we had protected bus passengers from the growth in congestion there would arguably be between 48% and 70% more fare paying bus passenger journeys today. If the trend is allowed to continue, then our urban buses will no longer represent a viable mode of transport for the majority of its customers and will be populated largely by people with mobility difficulties.** Already in London some buses on some routes run at close to walking speed.

## THE NEED FOR THIS STUDY

Everyone in industry, local government and Whitehall knows we have a problem. Until now it has not been properly quantified. This report makes clear the true extent to which congestion has been corrosive to the bus sector. It has been caught in the vortex of three vicious downward spirals:

- 1. Slower speeds leading to higher costs, higher fares, fewer passengers, service decline, fewer passengers.**
- 2. Slower speeds leading to increased journey time, fewer passengers, service decline, fewer passengers.**
- 3. Slower speeds, punctuality and reliability decline, fewer passengers, service decline, fewer passengers.**

Bus operators are forced to respond to congestion in one of two ways. First, to try to maintain service frequency. If they do this, then every 10% decrease in operating speeds leads to an 8% increase in operating costs. If this is passed on to passengers through higher fares it results in a 5.6% fall in patronage (DfT fares elasticity of 0.7).

The second response is to operate at lower frequency. A 10% deterioration in operating speeds would lead to a 10% reduction in frequency and 5% fewer passengers (based on a frequency elasticity of 0.5). A combination of the two responses is also likely. The end result – whether it's a greater peak vehicle requirement (PVR – the number of buses required to operate the service) or reduced frequency, or a combination of both – is pretty much the same in terms of patronage decline.

To the above it is necessary to add the response passengers have to spending longer on board buses. This would lead to a further 5% fall in passengers (because of an in-vehicle elasticity of 0.5). **The net result is a direct correlation between operating speeds and patronage: a 10% decrease in speeds reduces patronage by at least 10%.** The figure could yet be higher because congestion puts pressure on punctuality and reliability which can increase waiting time at bus stops. Passengers place a value two to three times as high on waiting at a bus stop as they do for in-vehicle time.

Chronic traffic congestion is not just a headache for passengers it's also a nightmare for bus drivers. It makes it much harder to attract the very best customer-focused bus drivers into the industry, it prevents bus drivers giving the best service they can to passengers, and those who are committed and loyal often find the task so frustrating it encourages them to leave the industry - or not join in the first place. Many bus companies are once again struggling to attract enough drivers and have significant vacancies (especially in large conurbations).

## ANNUAL INCREASE IN BUS JOURNEY TIMES

Gloucestershire - where bus journey times have almost doubled on some routes over the last 25 years- highlights that declining bus speeds are not confined to urban conurbations. Rural areas with smaller towns are suffering from rising car ownership and traffic levels on road networks that are unable to cope.

Dublin has been included, in what was intended to be a study limited to the UK, to highlight what we can learn from other countries. Despite congestion growing as rapidly as any UK city, Dublin has been very successful in limiting the impact on bus speeds (0.4% p.a decrease compared with average close to 1% p.a) through effective bus priority measures.

<sup>1</sup> The TAS Partnership

<sup>2</sup> DfT elasticity

Glasgow has a higher than average decline in bus speeds (1.5% p.a) and this alone would equate to a 15% decline in bus patronage every decade. If you combine this with relatively cheap subsidised competition from an impressive urban rail network, and cheap and abundant public car parking, it explains why Glasgow has experienced an alarming decline in bus patronage over the last decade. First Glasgow- the main operator in the city- is carrying 40% fewer passengers than it did a decade ago and bus use across Strathclyde has declined by 22% over the same period.

Cities that are successfully growing bus mode share have tighter parking controls with higher charges and less provision, making it more likely that people will use the bus. Conversely, the more generous the parking provision, the less likely the bus will be used as the mode of travel and the more likely the private car will be used thus increasing the levels of congestion on routes accessing the city as well as the level of congestion within the central area of city. This is dramatically illustrated in the Glasgow and West Midlands Case Studies where car parking is cheaper and in more abundant supply compared with other towns and cities. Against this background the West Midlands deserve credit for ensuring that bus use has not declined in the way it has in Glasgow.

The West Midlands is the 5th most congested metropolitan area in England with traffic speeds more than 15% worse than the UK average. This picture is set to get far worse over the next thirty years with the forecasted population growth of almost 500,000 across the West Midlands( the size of Liverpool) combined with increased car dependency which will result in 34% more traffic. Without radical action to tackle the dramatic increase in congestion, the West Midlands faces economic stagnation and air quality levels amongst the worst in the UK.

Route 126 from Birmingham to Wolverhampton (via Dudley) epitomises the challenge facing bus companies from rising congestion. The return journey time was 160 minutes in 1987. Today it is 200 minutes, 40 minutes slower. In 1987 16 buses were needed to run a 10 minute service frequency, today the

same frequency requires 20 buses. This results in operating costs which are 25% higher with the resulting pressure on fares.

The West Midlands is still suffering from a policy approach in the 1960's which prioritised road building and car use over more sustainable modes of transport such as bus, rail, walking and cycling. This has resulted in a level of car dependency- 65% of all journeys-which is significantly higher than the 35%-45% level of car use experienced in German cities such as Munich, Stuttgart and Düsseldorf.

The West Midlands Bus Alliance, which brings together the local bus operators, Transport for West Midlands and Local Authorities, is one of the best example of bus partnership working in the UK. They have worked hard to improve the region's bus services through focused route improvements, new low carbon buses, easier to use ticketing, better information and bus priority.

The West Midlands is at a cross roads when it comes to transport policy. It should build on the excellent work of its Bus Alliance, continue with some of the more enlightened policies to encourage walking and cycling and capitalise on the huge benefits that HS2 will bring to the city region. What is missing is the kind of car restraint measures which more successful city regions embrace. A combination of carrot and stick is required to ensure that the city region does not suffer from chronic traffic congestion which will be bad for both its economy and its environment

### LONDON “FALLING”

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Despite London Buses being one of the Capital’s transport success stories over the past 15 years, more recently bus speeds have been declining faster than anywhere in the UK. This comes after decades of relative success in protecting bus passengers from traffic congestion through effective bus priority measures, such as red routes and other initiatives, and the central congestion charging zone introduced in 2003. If the average bus speed in the UK’s congested urban areas has historically been decreasing by almost 1% p.a., then for one-third of London bus routes the decline been more than five times this average over the past year.

### **THIS HAS BECOME A CRISIS FOR THE CAPITAL AND SOMETHING THE NEW MAYOR, SADIQ KHAN, MUST PRIORITISE.**

London, which for more than a decade has been the UK’s bus success story, with passenger numbers doubling since the formation of TfL in 2000, is now facing one of the fastest declines in bus use anywhere in the UK.

There is a key lesson to be learned from this. You can get all the other ingredients right: modern bus fleet, cashless buses with the most advanced smartcard and contactless ticketing

system in the world, a level of integration which is the envy of other UK cities, state-of-the-art passenger information at the bus stop and on mobile devices. Add to this population and employment growth and you should have a recipe for the London bus success story continuing. But all these laudable ingredients cannot offset the rapid deterioration in bus journey times.

TfL are facing swinging cuts to their revenue budget. London’s public transport system is expected to operate without any revenue subsidy by 2018. Hong Kong and London will be the only cities in the world expected to meet this objective. The new Mayor has committed to a fares freeze which raises the question of who is going to pay for bus services in London if it’s not coming from the taxpayer as passengers will not make up the difference in higher fares. The solution is to operate buses more efficiently by improving their speed. If London is to eliminate the £461 million per annum subsidy to its bus network then bus speeds would have to improve by 24%.

Former London Mayor Boris Johnson was right to warn that his successor will have to use tougher congestion charging measures to tackle London's growth in congestion. It can be argued this legacy was, in part at least, his creation through policies including the removal of the western extension of the congestion zone and the reduction of road capacity in central London by 25% on key routes through the introduction of cycle superhighways without taking action to curtail traffic in central London.

Cycle superhighways are a radical and welcome initiative to make cycling safer, quicker and more enjoyable. However it's a pity that the former Mayor did not listen to the advice of TfL and reduce the volume of traffic in central London to accommodate the reduction in road capacity.\*

### WHY DOES IT MATTER IF BUS JOURNEY TIMES INCREASE?

Slow buses are bad for our city economies. **If the trend for bus journey times increasing by almost 1% per annum continues we can expect to continue to lose access to around 5,000 jobs per year as a consequence.**<sup>3</sup>

Buses are vital to the health of local economies. More people commute by bus than all other forms of public transport combined and those bus commuters generate £64bn in GDP. Around 400,000 people are in better more productive jobs as a direct result of the access the bus service provides. Buses are also the primary mode of access to our city centres, facilitating 29% of city expenditure.

**Slow buses are also bad for pollution.** Fuel efficiency measured in kilometres per litre has declined by 35% since 2000, and carbon dioxide emissions per bus km in urban conditions have risen by 25%. While there are factors other than congestion driving this trend, such as larger buses, stop-start conditions caused by congestion are a key factor. Under heavily congested conditions, tailpipe emissions can be increased by a factor of three or four.<sup>4</sup>

<sup>3</sup> Daniel Johnson, Institute for Transport Studies, Leeds University

<sup>4</sup> Environmental Factors in Intelligent Transport Systems, Prof Margaret Bell. IEE Proceedings: Intelligent Transport Systems, Vol 153 Issue 2, 2006

\* There was an error in the original report which stated on one page that 25% of road capacity had been removed on roads on central London to accommodate Cycle Superhighway's. It had correctly stated on other pages in the report that this was on "key" routes.

### WHAT CAN WE DO ABOUT IT?

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**THE MANTRA FROM TOO MANY POLITICAL DECISION-MAKERS AT LOCAL AND NATIONAL LEVEL IS TO GIVE THE PUBLIC “CHOICE”. THE PROBLEM IS THAT IN URBAN AREAS THIS MEANS ALL ROAD USERS HAVE NO CHOICE OTHER THAN TO PUT UP WITH CHRONIC TRAFFIC CONGESTION WHICH WILL CONTINUE TO GROW.**

The way our road system is managed in urban areas could be argued resemble the tools used by Communist-era countries to control production: traffic volumes are regulated by congestion (queuing) in the same way the former Soviet Union used to ration bread. It is bad for urban economies and their environment. Without road pricing there is no solution to urban congestion.

There is therefore a need to return to the ethos of the 1998 White Paper on Transport which recognised the necessity of changing travel behaviour and the importance of demand management. It led to the London’s congestion charging system and dedicated the revenue raised being used mainly to improve bus services.

More cities need to follow the lead of London, with the implementation of congestion charging, Nottingham, with its workplace parking levy, and Bristol, with essential car parking restraint measures. All three cities have been prepared to use both the carrot (improved sustainable transport) and the stick (car restraint). Public transport improvements on their own are not a panacea for urban congestion. They have to be accompanied by traffic restraint measures.

**If London-style cashless buses with contactless payment and smart ticketing could be extended to the rest of the UK, bus journey times could be improved by up to 10% by halving dwell time at bus stops.** In urban conditions dwell time makes up between 25% and 33% of total journey time. The big five bus operators in the UK have set a target to introduce contactless bus transactions by 2022. They should do everything possible to accelerate this, and it is realistic for them to achieve this goal in the large conurbations within three years.

The Buses Bill should set out guidance encouraging local authorities and bus operators to set targets for average bus speeds. The minimum requirement should be for bus speeds to stop declining. Local authorities need to give priority on roads and at junctions to buses.

**Edinburgh is one of the few cities in the UK to have bucked the trend in falling bus speeds, at least for a decade. Between 1986 and 1996, scheduled bus speeds increased by 5% as a result of better conventional bus priority culminating in the radical Greenways bus priority scheme.** However, this legacy has been allowed to dissipate through weaker enforcement, a trial on removing bus priority during off-peak periods, and a failure to paint the lanes green and properly maintain them. As a result, in the last 20 years Edinburgh has reverted to the UK norm with bus speeds declining by 20%.

### SPACE WARS: POLITICAL DECISION-MAKING

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Too little focus is placed on the importance of the bus because bus passengers carry too little weight with opinion-formers and political decision-makers. The socio-economic profile of bus passengers is very different from rail users, motorists and cyclists, with a much higher percentage of those on lower income travelling by bus. It helps to explain why fuel duty has been frozen for six consecutive years despite rock bottom oil prices. During this time Bus Service Operator Grant (BSOG) has been cut by 20% which means bus operators paying more for their fuel. The motoring lobby is significantly more powerful and influential than the bus lobby.

### MORE BUS CHAMPIONS ARE NEEDED IN THE UK IN LOCAL, DEVOLVED AND CENTRAL GOVERNMENT.

The bus is the most efficient user of road space, crucial for the health of our city economies and a vital part of an environmentally-friendly local sustainable transport system.

Bus companies need to get better at communicating with their customers to keep them better informed. This would also help them to mobilise support from their customers for pro-bus measures such as bus priority. At present, it would be a rare event for a bus passenger to lobby politicians for improved bus priority; it's much more common for non-bus users to complain about priority measures. Local politicians who are making brave decisions to allocate road space for bus passengers need as much support as they can get from their local bus companies as well as bus passengers.

A sensible balance needs to be struck between making our cities pedestrian-friendly and ensuring that bus passengers can get close to their destination. It's important to remember that shopping is the purpose of around one-third of bus journeys in the UK, and bus users spend an estimated £27bn on shopping and leisure. The more accommodating city centres are to pedestrians, the more attractive they become to retail and businesses generally. Bus routes radiate from the city centre: the more people travel to our city centres, the more populated our buses are. City retail faces stern competition from out of town shopping centres and a newer threat which is growing exponentially, that of online shopping. Bus companies are often the first to protest about pedestrianisation, but it would serve them well to acknowledge that city retail is facing a major battle to hold on to customers. The viability of city centre retail and bus companies are inextricably linked.

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<sup>5</sup> A New Deal for Transport: Better for Everyone. White Paper, July 1998 [www.persona.uk.com/bexhill/Core\\_docs/CD-05/CD-05-16.pdf](http://www.persona.uk.com/bexhill/Core_docs/CD-05/CD-05-16.pdf)



**01.**  
**THE NEED**  
**FOR THIS**  
**STUDY**

There is a good deal of evidence of the impact traffic congestion has had on the economy. The Cabinet Office has calculated the cost of congestion to the urban economy to be at least £11bn per annum, while the costs to society of poor air quality, ill health, and road accidents in urban areas are each similar to congestion, exceeding £40bn<sup>6</sup>.

However, there has been little research on the impact rising congestion has had on the bus sector and consequentially on city economies and their environment.

### THE BUS SECTOR HAS BEEN HIT THE HARDEST BY CONGESTION.

Bus operators often cite congestion as a major factor in their failure to hit punctuality targets, but there is little documented evidence of the link between congestion, rising operating costs, fares and disappointing patronage figures. Motorists and freight and delivery drivers are able to view congestion hot spots on satnav and take alternative routes. This is not an option for bus drivers.

At the start of the research for this report it was clear that growing urban congestion was a serious problem facing the UK bus sector, but the detailed analysis undertaken revealed just how acute and crippling the problem the problem is. It is now a disease, and if left unchecked will irreparably damage the sector.

There is a debate to be had about the merits of bus regulation versus deregulation. This is not something which this research is concerned with. Traffic congestion had an adverse impact on bus passengers prior to the 1986 Transport Act and the advent of deregulation; it has impacted on them since and will remain a major problem in any future franchise regime. It is becoming such an acute problem in London that there has been a marked reversal in the upward trend in patronage.

This paper analyses one of the most potent headwinds facing the bus sector: traffic congestion. It ranks as one of the top three most powerful headwinds that have held the bus sector back, the other two being rising car ownership (car-owning households make 66% fewer bus trips per annum than non car owning households) and the migration of retail and business to out of town locations built around car access. In more recent times these trends have been exacerbated by online shopping and the advent of Uber.

<sup>6</sup> An Analysis of Urban Transport, Cabinet Office Strategy Unit, November 2009. <http://webarchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/media/308292/urbantransportanalysis.pdf>

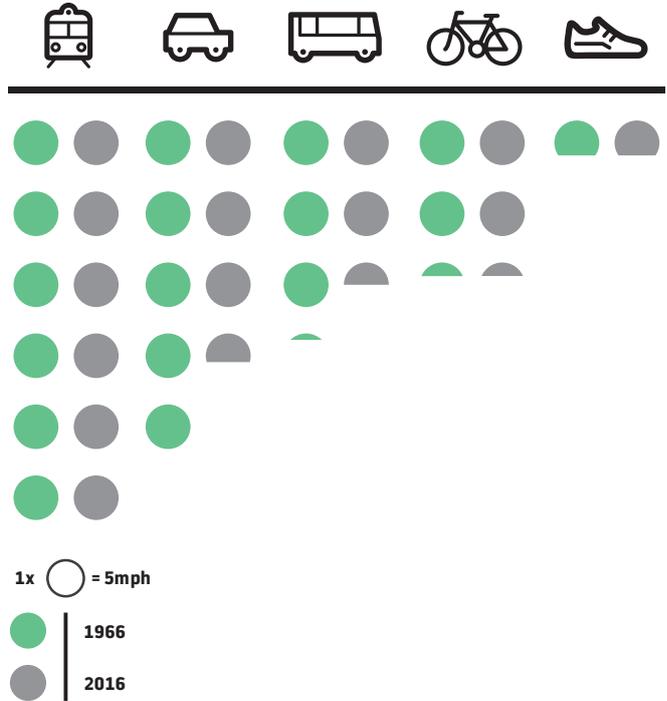
**IN LONDON BUS SPEEDS ON SOME ROUTES ARE CLOSE TO WALKING PACE AND IF THIS TREND IS ALLOWED TO CONTINUE IT WILL EVENTUALLY ONLY BE THOSE WITH MOBILITY DIFFICULTIES WHO TRAVEL BY BUS.**

This report attempts to quantify what the growth in patronage would have been if bus journey times had remained constant over the last 50 years, using elasticity analysis (elasticity is a means of quantifying how demand for a service changes in response to changes in fares, frequency and in vehicle time) It will estimate the impact the growth in journey times has had on our city economies and their environment. It will look at what policies we need to implement to reverse this debilitating downward spiral of rising congestion, higher costs, higher fares, and fewer passengers. It will look at what operators can do to improve fare transaction times and reduce dwell time at bus stops.

There are many factors outside the scope of this study which can explain why rail patronage has doubled over the last 20 years while bus patronage (outside London) has been disappointing in comparison. The graph to the right shows the trend in average speeds in urban areas for the different modes. Urban rail, walking and cycling have remained fairly stable over the last 50 years; car speeds have declined. But it's the fall in bus speeds which has been most marked, with an average decline of almost 50% in the congested urban conurbations.

In the mid 1970s bus speeds became slower than cycling and the gap has widened since. On current trends average urban bus speeds will slower than walking in 60 years' time. The speed of the number 11 bus in London is already down to 4 mph for part of its route .<sup>7</sup> Urban traffic congestion is becoming worse with each passing decade.

**URBAN SPEEDS**



**Bus speeds have been declining faster than any other mode of transport. Urban rail, walking and cycling have remained fairly static but urban car speeds have been declining, but not as fast as bus.**

<sup>7</sup> Number 11 bus speed

<sup>8</sup> Daniel Johnson, Peter Mackie and Jeremy Shires: Buses and the Economy II, Institute for Trnsport Studies, University of Leeds, July 2014

[http://www.greenerjourneys.com/wp-content/uploads/2014/07/Buses\\_and\\_the\\_Economy\\_II\\_main\\_report\\_july.pdf](http://www.greenerjourneys.com/wp-content/uploads/2014/07/Buses_and_the_Economy_II_main_report_july.pdf)

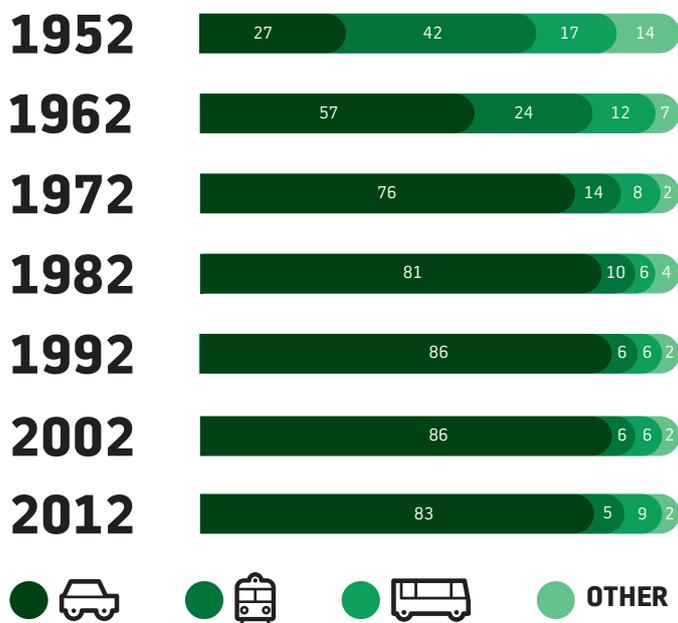
## 01. THE NEED FOR THIS STUDY

The bar chart below shows that public transport has made a comeback over the last 20 years, but it has been rail rather than bus which has been achieving modal shift from the car. This is the result of many factors: innovation in the rail industry, especially in marketing and ticketing; the advent of wi-fi, which makes it more attractive to travel by train; and the cost of motoring relative to rail fares to mention just three. Congestion is undoubtedly a key reason. **Traffic congestion is the friend of the railways but the enemy of the bus.**

This report highlights just how corrosive congestion is to bus patronage, and this research has given it a much higher weighting when ranking the factors which explain modal split trends.

If we are to emulate the success in rail, and achieve modal shift from car to bus, then we have to protect bus passengers from congestion.

### UK PASSENGER TRANSPORT MODEL SHARE OF PASSENGER KILOMETRES (%)



Source: Lazarus Partnership: Public Transport – Smartening up: Technology’s role in modal shift, September 2014

## WHY IT MATTERS - THE ECONOMY

Buses are crucial for the wider economy. More people commute to work by bus (2.5 million daily plus 1 million as vital back up) than all other forms of public transport combined, and they generate £64bn in economic output every year. Buses are the primary mode of access to our city centres – even more than the car – and responsible for facilitating 29% of city centre expenditure.

One in ten bus commuters would be forced to look for another job or give up work all together if they could no longer commute by bus. Around 400,000 people are in a better, more productive job, as a direct result of the access the bus service provides. It has been estimated that if bus journey times for commuters in England could be improved by 10% it would be associated with over 50,000 more people in employment. <sup>9</sup> If this 1% p.a. increase in journey times continues we can expect to continue to lose around 5,000 jobs annually as a consequence

There is also a direct impact on jobs. Around 90,000 of the 140,000 or so active holders of passenger-carrying vehicle (PCV) licences are engaged in driving local buses. A 50% increase in passengers would require 12.5% more drivers, or 11,250 new jobs (appendix 3). This direct employment impact underestimates the true figure as it doesn’t include the extra jobs that would be created in the supply chain.

## ENVIRONMENTAL IMPACT OF SLOWER SPEEDS

Lower operating speeds are bad for pollution. Fuel efficiency measured in kilometres per litre has declined by 35% since 2000 <sup>9</sup>.

**CONGESTION DRAMATICALLY INCREASES CARBON DIOXIDE EMISSIONS FROM VEHICLES. UNDER HEAVILY CONGESTED CONDITIONS TAILPIPE EMISSIONS CAN BE INCREASED BY A FACTOR OF THREE OR FOUR TIMES <sup>10</sup>.**

<sup>9</sup> Prof Peter White, University of Westminster: Impact of bus priorities and busways on energy efficiency and emissions. Greener Journeys [September 2015]

<sup>10</sup> Environmental Factors in Intelligent Transport Systems, Prof Margaret Bell. IEE Proceedings: Intelligent Transport Systems, Vol 153 Issue 2, 2006



# 02. METHOD- LOGY

### A. ECONOMIC ASSUMPTIONS

The assumptions made on elasticities are critical to the assessment of what impact declining bus speeds have on patronage. This research has been guided by some of the best transport economists in the UK and there has been support for the elasticities deployed in this study.

This study looks at a 50-year period and this very long run period results in higher elasticity levels than short or medium term studies.

A 10% decline in bus speeds leads to an 8% increase in operating costs: assuming operators try to preserve frequency levels by running extra buses. This is accepted by academics and bus operators (ref- TAS)<sup>11</sup>. It is then necessary to make the assumption that increases in operating costs were passed onto the fare box – in reality this would vary depending on market conditions. However, someone has to pay for higher costs and in the long run it is a reasonable assumption to make.

If operators decide to increase headways (cut frequency) in response to falling bus speeds then this also has a negative impact on frequency (frequency/supply elasticity of 0.5)

Traffic congestion has three distinct impacts on bus use:

1. **Higher operating costs and higher fares**
2. **Higher in-vehicle time**
3. **Deteriorating punctuality and reliability**

This research looks at a low and a high scenario on elasticities (see Table 1):

	LOW	HIGH
Speed/operating cost	0.8	0.8
Fares/price elasticity	0.7	1.0
Fares impact	$0.8 \times 0.7 = 0.56$	$0.8 \times 1 = 0.8$
In-Vehicle time.	0.4	0.5
Punctuality/reliability.	0	0.1
<b>Total</b>	<b>0.96</b>	<b>1.4</b>

<sup>11</sup> The TAS Partnership:



**BUSES 10% SLOWER EVERY DECADE**

**0.5** IN VEHICLE TIME ELASTICITY

$0.5 \times 10\% =$   
**5%**  
FEWER PASSENGERS

PUNCTUALITY AND RELIABILITY DETERIORATE

$0.2 \times 10\% =$   
**1%**

HOW DO OPERATORS RESPOND?

**A**  
MAINTAIN FREQUENCY BY RUNNING MORE BUSES  
**↑8%**  
IN COSTS

IF COSTS PASSED ON TO FARES:  
**↑8%**  
IN FARES

FARE ELASTICITY = 1.0  
 $1 \times 8\% =$   
**8%**  
FEWER PASSENGERS JOURNEYS

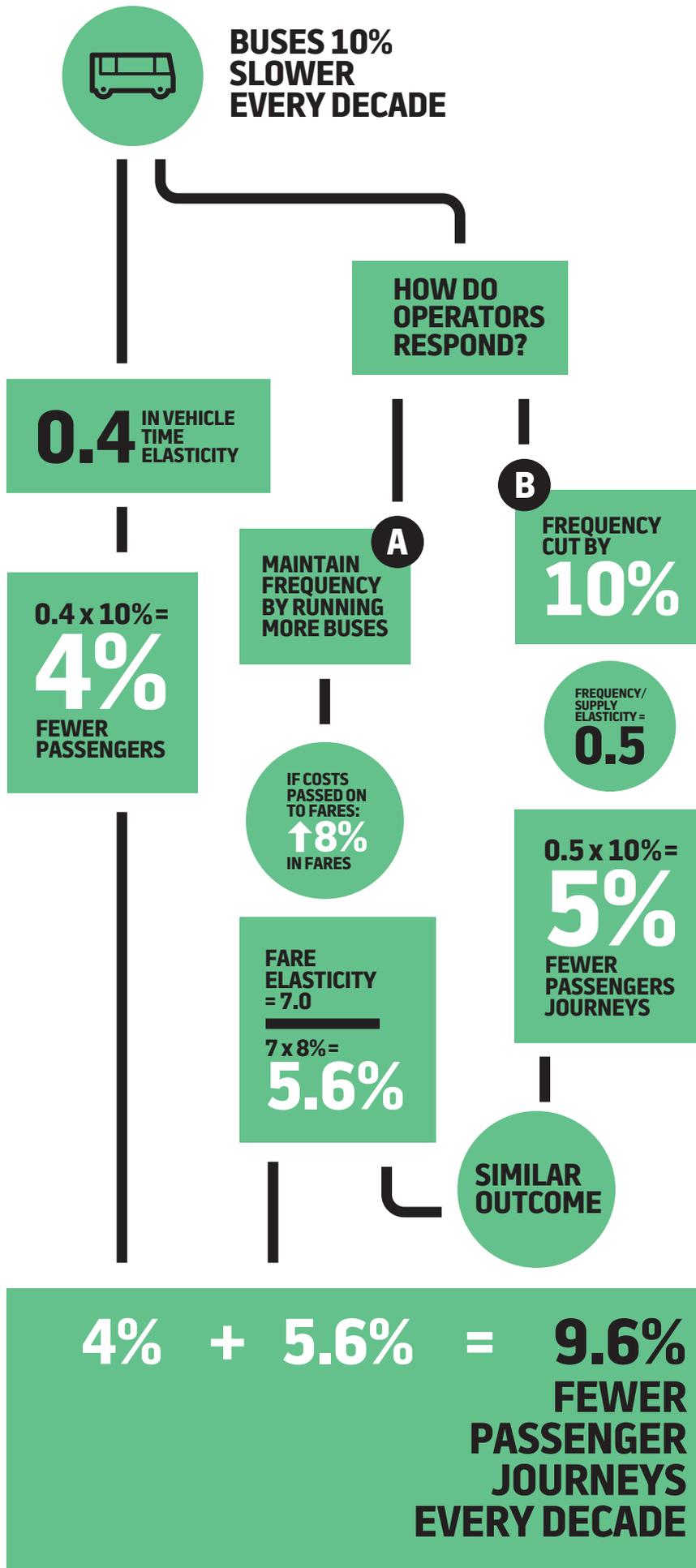
**B**  
 $0.1 \times 10\% =$   
**1%**

FREQUENCY/SUPPLY ELASTICITY =  
**0.5**

$0.5 \times 10\% =$   
**5%**  
FEWER PASSENGERS JOURNEYS

IN THIS HIGHER ELASTICITY SCENARIO MAINTAINING FREQUENCY LEADS TO A LARGER FALL IN PATRONAGE

**5% + 1% + 8% = 14% FEWER BUS JOURNEYS EVERY DECADE**



## 02. METHODOLOGY

In the low elasticity scenario this research deploys a DfT fares elasticity of 0.7 and the low range of the in-vehicle time (TRL 2004 0.4 to 0.7)<sup>12</sup>. Because of the difficulty in estimating negative impacts on punctuality and reliability this has been given a zero value.

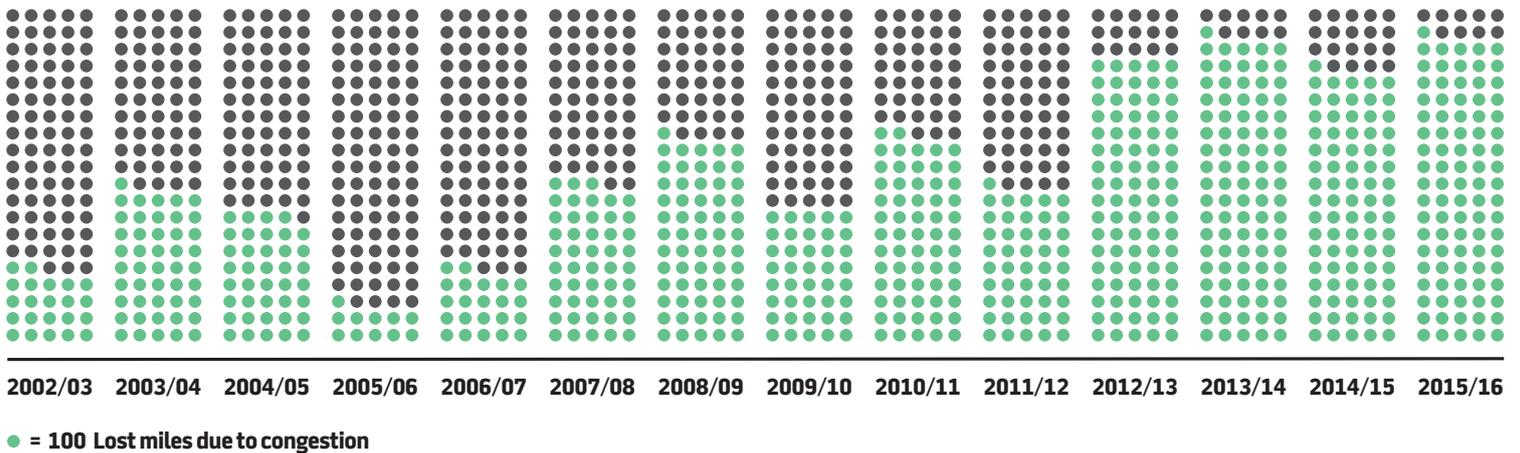
In the high elasticity scenario (another transport economists has suggested this should be labelled “medium” but this research is prudent and sticks with “high”) a fares elasticity of 1.0 has been used. The long run fares elasticity varies between 0.7 and 1.2 (TRL, 2004). For the research uses a modest estimate of 1.0 to avoid over-exaggeration. The research also has a built-in estimate for punctuality/reliability in the high elasticity scenario of 0.1. It was important to do this as waiting at a bus stop is valued twice as high as in-vehicle waiting time (ref: TRL, 2004). For in vehicle time the research used 0.5 in the high elasticity scenario, well below the high end of the range (0.7).

In short, the aggregate high elasticity scenario is 1.4. If the research were weighted towards the top end of the range it would have been 1.8. On balance, this is judged to be too high.

The above elasticities are an average and would obviously vary depending on what alternative modes of transport were affordable and available. In London, for example, bus patronage has declined by 5% over the last year, partly because for many – particularly those travelling on the north side of the Thames – there is an extensive Tube network which they can switch to. The better the alternatives available, the higher the fares and in-vehicle time elasticity.

Concessionary travel accounts for around one-third of bus trips in the UK. Concessionary travellers are immune from the fares effect of higher operating costs, but they will be affected by higher in-vehicle times and poorer punctuality and reliability. However, because this is too challenging to calculate it has been excluded from the model, which focuses on changes to fare-paying journeys only.

### STAGECOACH WEST



<sup>12</sup> The demand for public transport: a practical guide. R Balcombe (ed), TRL Report TRL 593, 2004

The chart above shows lost miles due to congestion on Stagecoach West services between 2002 and 2016. Lost mileage is defined as scheduled miles minus operating miles; it can be divided into traffic lost miles (for example delays caused by congestion) and operating lost miles (for example caused by driver shortages and vehicle breakdown).

The chart shows a threefold increase in lost miles due to congestion. This results in a much less punctual and reliable service. The research has only included the impact of this on bus use in the high elasticity scenario with a very low 0.1 elasticity.

**WHILE IT IS DIFFICULT TO QUANTIFY IN THE MODEL, IN REALITY LOST MILES ON THIS SCALE CREATE HAVOC WITH THE TIMETABLE AND ERODE PASSENGERS' CONFIDENCE IN THE SERVICE.**

### HOW BUS OPERATORS REACT TO CONGESTION

Bus operators either try and maintain frequencies, which means more buses (a greater peak vehicle requirement), or they let frequencies decline. The end result is pretty similar in the economic model used to forecast patronage impacts. If they deploy more buses then operating costs will rise by 0.8% for every 1% decline in speed. This reduces patronage by 0.56% in the low elasticity scenario ( $0.8 \times 0.7 = 0.56\%$ ).

If they decide to reduce frequency then we get a 0.5% reduction in patronage using a frequency/supply elasticity of 0.5. In reality a bus operator's response will depend on local market conditions and often will be a combination of the two reactions mentioned above.

In areas where there is day-long congestion, operators are forced to increase resources to maintain the same level of service, or look at widening headways or removing sections of route in order to implement an achievable timetable.

If the operator response to congestion is to operate with the same level of resources at lower frequency, in effect there is no change to variable driver or vehicle costs. Fewer miles are operated with the same number of buses and driver hours but using less fuel and tyre costs. This would reduce costs by 1.6% for each 10% reduction in miles, but a 10% reduction in frequency and miles might result in 5% reduction in passengers and revenue (short run supply elasticity 0.5).

If the operator response to congestion is to operate additional buses to maintain the same service frequency this would increase driver, fuel, tyre, and vehicle costs (depreciation, lease, licences) and maintenance costs (labour and materials). Stagecoach has calculated that this would increase costs by 7.9% for each 10% increase in resources – very similar to the TAS industry average calculation of a 0.8% increase in operating cost for each 1% decline in operating speed<sup>13</sup>.

**THE DIFFICULT JUDGEMENT FOR AN OPERATOR FACED WITH WORSENING PUNCTUALITY IS WHETHER TO REDUCE FREQUENCY AND RISK PATRONAGE LOSS, OR TO MAINTAIN FREQUENCY WITH INCREASED RESOURCES.**

On balance it is unlikely that operating at the same frequency, albeit more punctually, will generate sufficient additional revenue to offset the additional costs unless there are other factors generating patronage growth.

<sup>13</sup> Cost issues in public transport operation, Cfit, January 2008 <http://webarchive.nationalarchives.gov.uk/20110304132839/http://cfit.independent.gov.uk/pubs/2008/index.html>

Bus use is influenced by a number of factors—these not only relate to the bus service itself, but the supporting infrastructure and the attractiveness of other modes

- Policy
- Modal shift
- Buses

Attribute	Evidence of impact <sup>1</sup>
<b>Fares</b>	<ul style="list-style-type: none"> <li>▪ Bus fare elasticities average -0.4 in the short-run to -1.0 in the long run (i.e. a 10% rise in fares will lead to a 10% fall in patronage in the long run) – responsiveness of demand to fare changes is less sensitive in the peak</li> </ul>
<b>Journey time</b>	<ul style="list-style-type: none"> <li>▪ The elasticity of bus demand to in-vehicle time for urban buses has been estimated to be roughly in the range of -0.4 to -0.6</li> </ul>
<b>Service levels</b>	<ul style="list-style-type: none"> <li>▪ The elasticity of bus demand to vehicle kilometres is approximately +0.4 in the short-run and +0.7 in the long run</li> </ul>
<b>Ride quality</b>	<ul style="list-style-type: none"> <li>▪ Studies in London have indicated that a smooth vehicle motion is worth 10.5p per passenger (1996 prices and values)</li> </ul>
<b>Real-time information</b>	<ul style="list-style-type: none"> <li>▪ Passengers in London valued countdown boards at 9.0p per trip (1996 prices and values)</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>▪ Bus users value CCTV at stops and on the bus at 16.6p and 5.8p respectively (2001 prices and values)</li> </ul>
<b>Waiting environment</b>	<ul style="list-style-type: none"> <li>▪ The provision of information at bus stops has been valued at 4-10p per passenger</li> </ul>
<b>Interchange</b>	<ul style="list-style-type: none"> <li>▪ Passengers dislike having to interchange – the ‘penalty’ associated with the need to interchange is equivalent to 5 minute journey time even before waiting time and the cost of an additional fare is factored in</li> </ul>
<b>Car costs</b>	<ul style="list-style-type: none"> <li>▪ Bus use is sensitive to changes in the costs of fuel. A 10% fall in petrol costs for motorists is estimated to reduce bus demand by 21%</li> </ul>
<b>Income</b>	<ul style="list-style-type: none"> <li>▪ Each 10% increase in income reduces bus use by 5%-10%, this includes the impact of higher car ownership</li> </ul>

**Policy implication:** there are a number of ways to influence the level of bus demand – the list above is not exclusive; and these interventions do not just relate to bus service attributes—interventions off the bus, such as an improved waiting environment and better information, can have a significant impact on demand

The above table showing the top ten factors influencing bus use, the top three on the list are affected by congestion: fares, journey time and frequency. Source: An Analysis of Urban Transport, Cabinet Office Strategy Unit, November 2009

### B. CASE STUDIES

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#### THE UK HAS THE MOST CONGESTED ROAD NETWORK IN EUROPE<sup>14</sup>.

This was the case when the Commission for Integrated Transport benchmarked the UK against European best practice in 2001, and has been confirmed since by extensive data from companies such as TomTom and INRIX through the monitoring of live traffic flows.

The latest TomTom congestion index shows seven UK cities in Europe's top 30 most congested: Belfast, London, Manchester, Edinburgh, Brighton, Hull and Bristol. Congestion in the UK's biggest cities is 14% worse than it was just five years ago.

Across the rest of Europe, average congestion is actually down 3% over the same period.

The annual Traffic Index from TomTom shows average UK journeys in 2015 took 29% longer than they would in free-flowing conditions – up from a 25% average delay in 2010.

The TomTom index measures the difference between off-peak and peak traffic speeds. As Belfast has relatively good off-peak speeds compared with other cities, this exaggerates ITS' congestion problem.

The INRIX data has Belfast as the third most congested city in the UK, behind London and Manchester. The INRIX index measures urban motorway traffic delays, so would exclude Edinburgh and Brighton, which are mainly devoid of urban motorways.

Balancing the two indexes the following cities have been included in the case studies: Brighton, Bristol, Dublin, Edinburgh, Glasgow, Gloucestershire, Greater Manchester, Hull, London, Oxford and West Midlands. Due to difficulty in obtaining bus journey time data from Belfast it was not included in the study

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<sup>14</sup> European best practice in delivering integrated transport. Commission for Integrated Transport, November 2001 <http://webarchive.nationalarchives.gov.uk/20110304132839/http://cfit.independent.gov.uk/pubs/2001/index.html>



03.

RESEARCH  
FINDINGS

### 03. RESEARCH FINDINGS

#### A. BUS JOURNEY TIMES ARE INCREASING

The trend in bus journey times is an increase of between 0.5% and 1.5% per-annum - for city wide services (daily average) over the past 30 years, with an average increase of 0.98% per annum for the six case studies as shown in as shown in chart below.

#### (NOTES TO CHART)

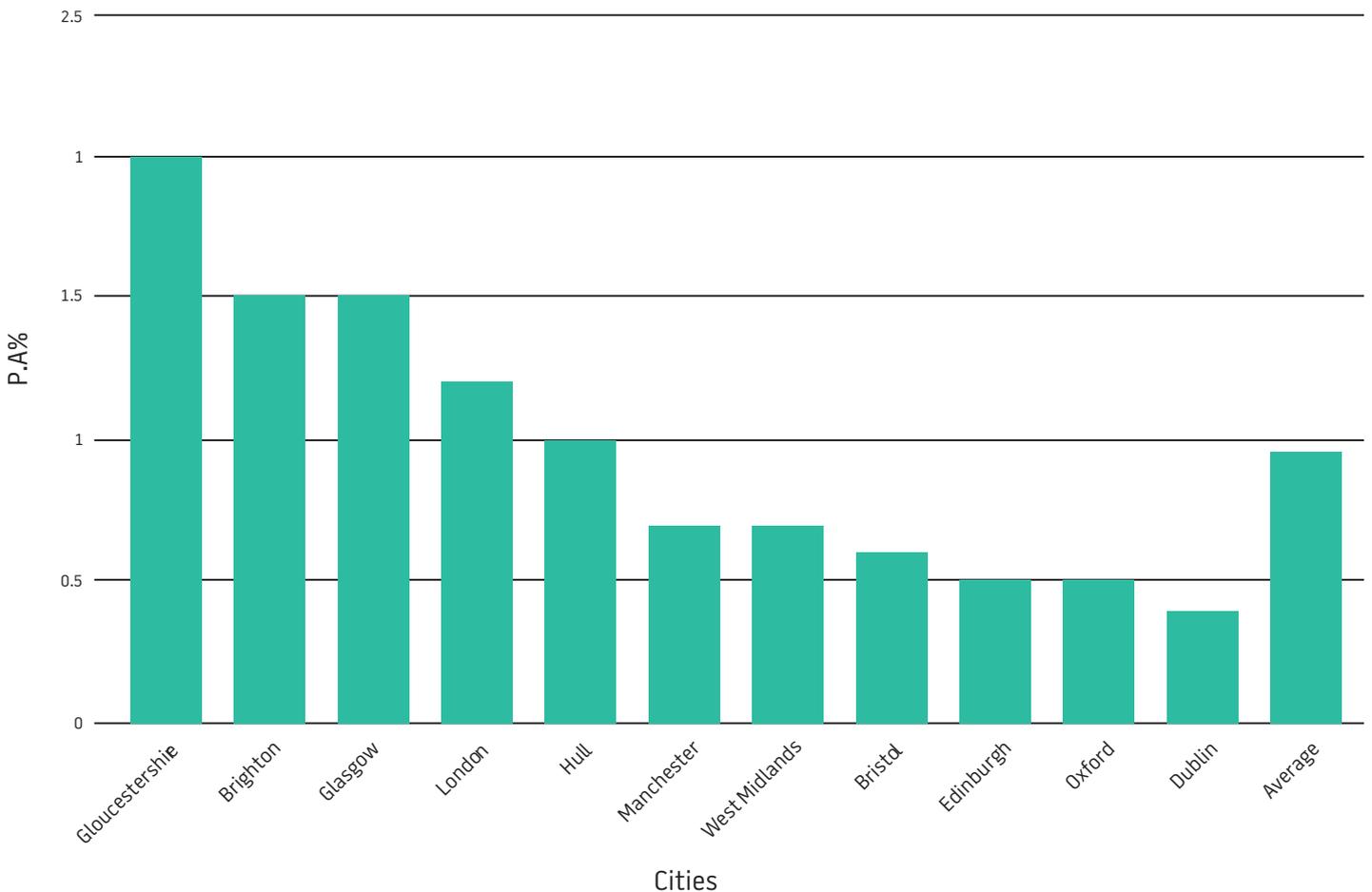
Fig 0.98% p.a Increase in average bus journey times.

Data covers 1986-2006 except for:

Brighton: 2008-2016. The south coast town has experienced a sharp increase in congestion levels.

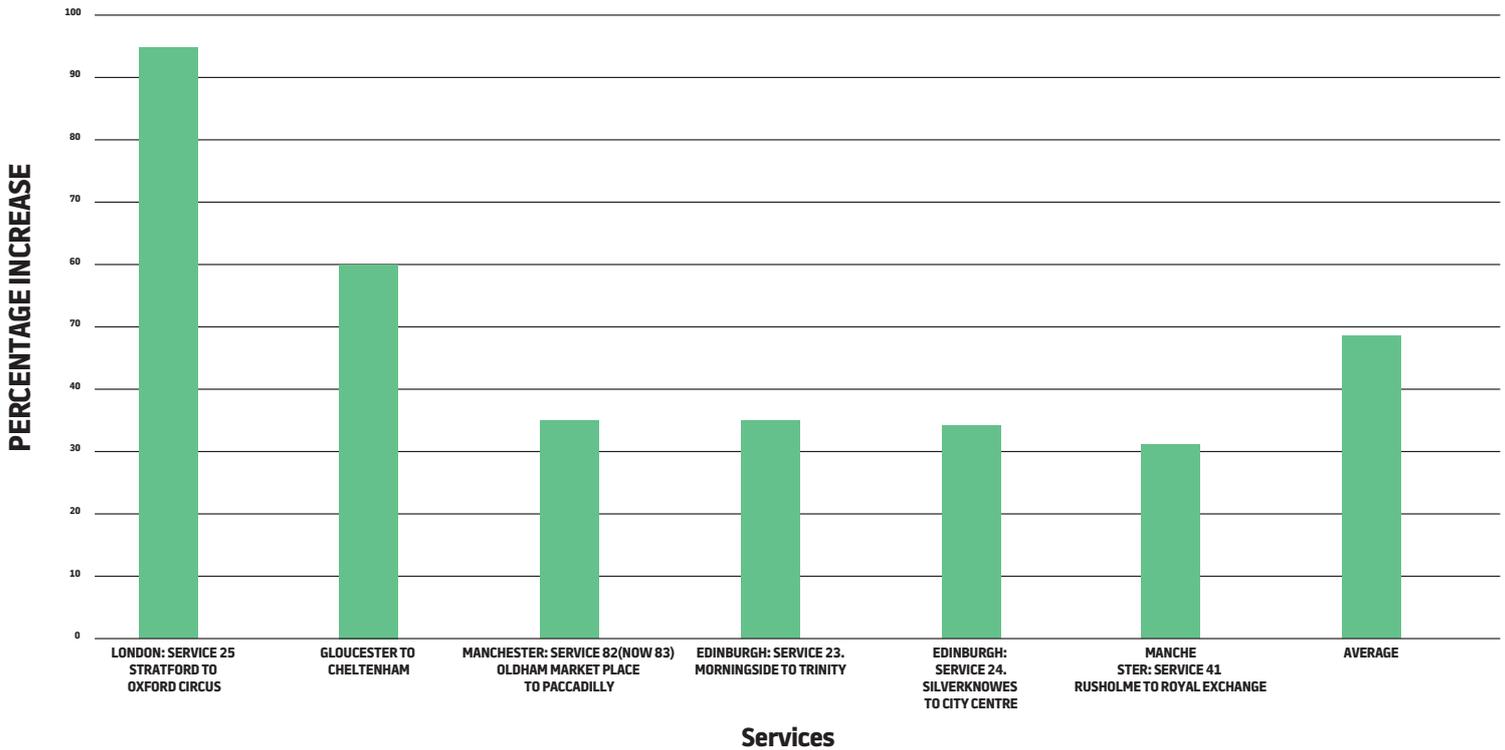
London: 2003/4 (from peak levels just after congestion charging) to 2015/16. It covers central, inner and outer London

Increase in Journey Time



### 03. RESEARCH FINDINGS

#### INCREASE IN JOURNEY TIME ON SELECTED SERVICES (AM PEAK) FROM 1966 TO 2016

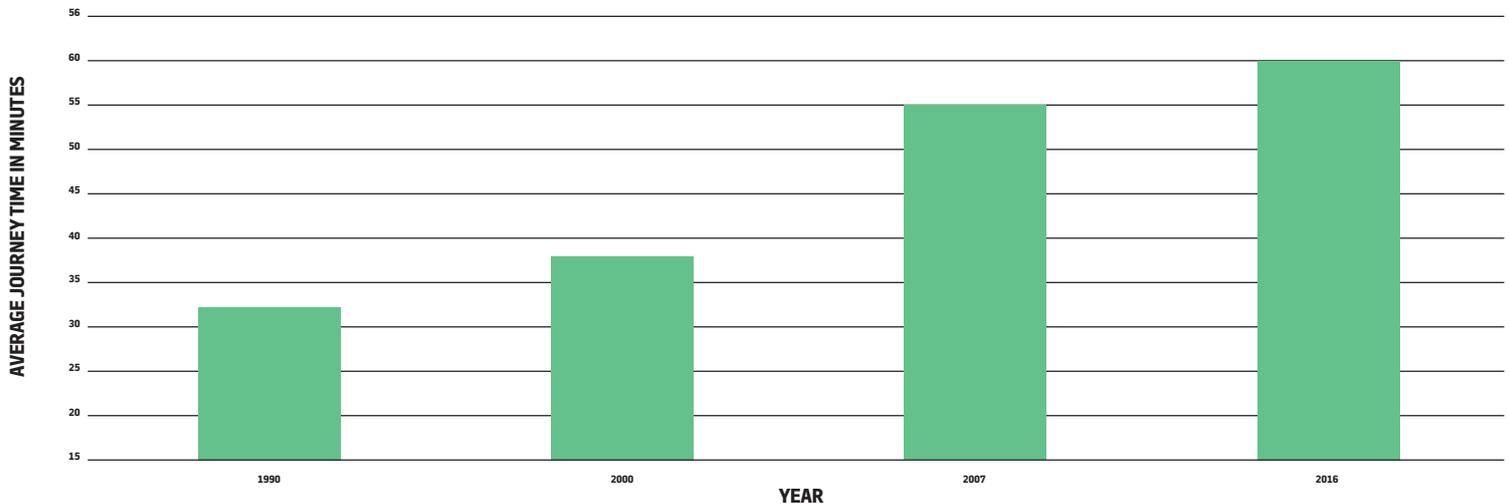


The data in the bar chart above is derived from archived timetables for 1966 and compares journey times then, with a section of the same route from today's timetable. Journey time on the 25 from Stratford to Oxford Circus in the a.m. peak has increased from 40 minutes in 1966 to 78 minutes today. The journey time has almost doubled. It must be borne in mind that the move to one man operated buses impacts negatively on journey times for the longer term data going back to the 1960's.

#### DECLINE IN BUS SPEEDS NOT CONFINED TO URBAN CONURBATIONS.

It doesn't have to be this way. Bus passengers can be protected from traffic congestion if there is the political will. Indeed, the examples below shows how we can improve journey times by bus if radical action is taken.

#### CHELTENHAM - GLOUCESTER (PEAK)



87% increase in journey time. 3.34% increase p.a. Stagecoach data.

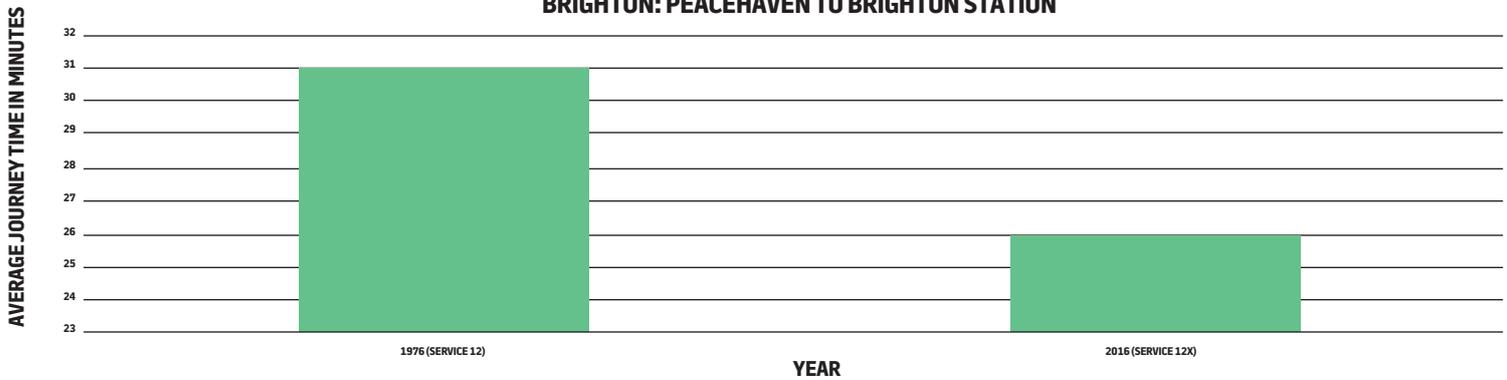
### 03. RESEARCH FINDINGS

**EDINBURGH: % CHANGE IN AVERAGE JOURNEY TIME (AM PEAK)**



In Edinburgh, the introduction of Greenways bus priority in 1996, following years of good conventional priority measures, resulted in a 4% improvement in journey times between 1986 and 1996. Alas, for reasons you can read about in more depth in the case study on Edinburgh in the appendix, this was not sustained. This included weaker enforcement, removal of priority during off peak and lack of maintenance of bus lanes.

**BRIGHTON: PEACEHAVEN TO BRIGHTON STATION**



In Brighton, on the Peacehaven to Brighton Station service, there has been a 16% improvement in journey time since 1976 and a 4% improvement per annum, thanks to highly effective bus lanes along the A259 coastal corridor. Journey time between Brighton Station and Peacehaven is actually seven minutes quicker today than it was in 1966. It shows what can be done, and that we do not have to accept declining bus speeds as being inevitable.

**B. IMPACT OF INCREASED JOURNEY TIMES ON BUS USE.**

If average bus speeds in the most congested urban areas decline on average by almost 1% per annum, this means that operating costs due to congestion are increasing by around 0.8%<sup>15</sup>. Assuming that costs are passed on to the passenger in fares, and we apply an elasticity of 0.7, this results in a 0.56% decline in passengers every year as a result of the operating cost impact. To do this it is necessary to add the decline in passenger numbers due to increased in-vehicle waiting time. With an in-vehicle elasticity of 0.5, this leads to a 0.5% decline in passengers. If the two are added together there is a 10.6% decline in passengers every decade from the congestion impact on buses on the low elasticity scenario. On the high elasticity scenario a 14% decline in bus use every decade as a result of congestion can be seen. If bus passengers had been protected from rising congestion over the past 50 years, then fare-paying patronage in the cities covered in this report would be at least 50% higher than today's figure. This time period has been chosen as the mid-1960s was when car ownership and traffic began to grow exponentially.

**LONDON "FALLING"**

**IN LONDON BUS SPEEDS HAVE BEEN DECLINING FASTER THAN ANYWHERE ELSE IN THE UK OVER THE LAST FEW YEARS.**

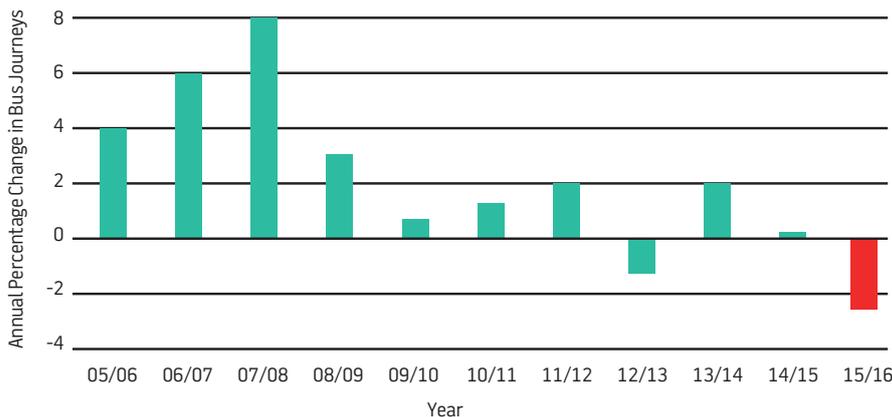
This comes after of decades of relative success in protecting bus passengers from traffic congestion through effective bus

priority measures, such as red routes and other initiatives, and the central congestion charging zone introduced in 2003. If the average urban bus speed in the UK has historically been decreasing by almost 1% p.a., then for one-third of London bus routes the decline been more than five times this average over the past year. This has become a crisis for the capital and something the new mayor must prioritise. **London, which for more than a decade has been the UK's bus success story, with passenger numbers doubling since the formation of TfL in 2000, is now facing one of the fastest declines in bus use anywhere in the UK.**

There is a key lesson to be learned from this. You can get all the other ingredients right: modern bus fleet, cashless buses with the most advanced smartcard ticketing system in the world, a level of integration which is the envy of other UK cities, state-of-the-art passenger information at the bus stop and on mobile devices. Add to this population and employment growth and you should have a recipe for the London bus success story continuing. But all these laudable ingredients cannot offset the rapid deterioration in bus journey times.

Boris Johnson was right to warn that his successor will have to use tougher congestion charging measures to tackle London's growth in congestion, but there is insufficient evidence to suggest he took enough effective action on his watch. He exacerbated the problem by removing the western extension of the congestion zone and by reducing road capacity in central London on key routes through the introduction of cycle superhighways – without taking action to curtail traffic in central London

**BUS USE IN LONDON**



<sup>15</sup> The TAS Partnership, [1] op. cit



04.

CHALLENGES  
MOVING  
FORWARD

## 04. CHALLENGES MOVING FORWARD

### A. CONGESTION IS GETTING WORSE

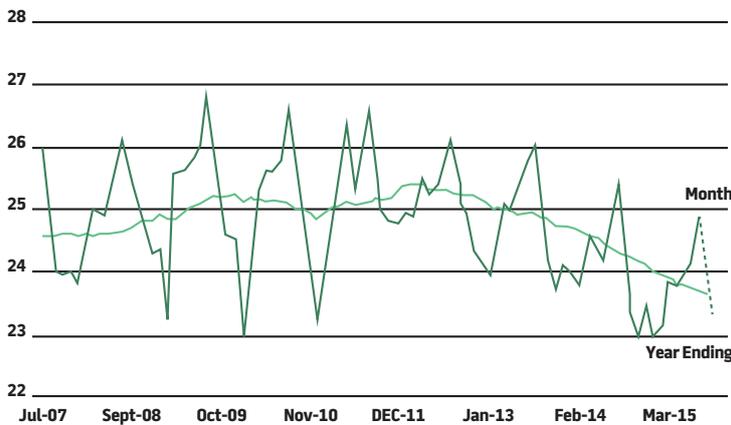
The average speed of general traffic on local roads was 23.4mph in year ending December 2015. In November 2015 it was 3% slower than in November the previous year, and in December 2015 it was 2.9% slower than the previous December.

The average traffic speed in Bristol, Reading, Slough, Manchester and London is less than 10mph.

The DfT's 2015 forecast was that traffic will grow by between 19% and 55% between 2010 and 2040

## CONGESTION ON LOCAL AUTHORITY MANAGED A-ROADS, ENGLAND

### AVERAGE VEHICLE SPEEDS (MILES PER HOUR)

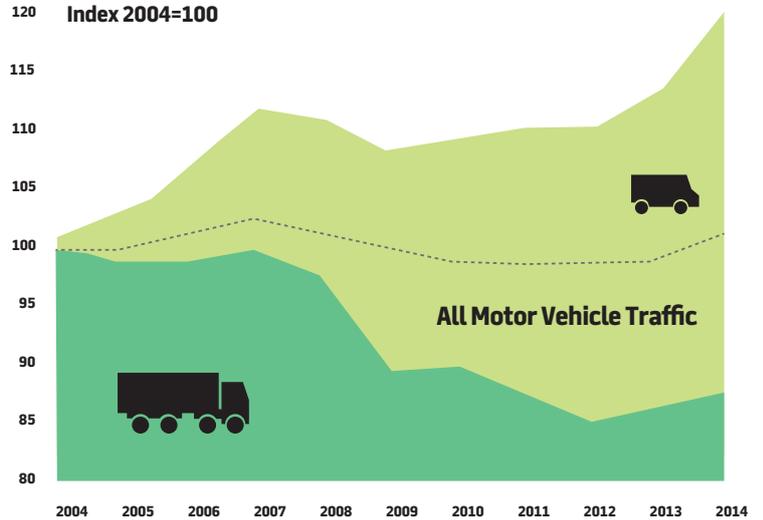


There has been a rapid decline in traffic speed over the last five years on A-roads, as shown in Fig zz. **The key causes in urban areas are: delivery vans, private hire vehicles, road works and traffic lights.**

### DELIVERY VANS

**The rapid growth in delivery vans is a result of the proliferation of online shopping.** This represents a double blow to the bus sector: first, it increases operating costs due to more congested roads, and second, there is less revenue for buses as fewer shopping trips are made (shoppers account for one-third of all bus journeys).

## GROWTH OF LGV AND HGV TRAFFIC



Van traffic has risen faster than that of any other vehicle type, with van miles increasing by 6.1% between Dec 2014 and Dec 2015 to a new peak of 47.7 billion vehicle miles. This represents a 24% increase compared with 10 years ago and a 73% increase compared with 20 years ago.

The biggest four online shopping markets in the world are predicted to double in size over the next three years as consumers buy increasing amounts of goods through the internet.

British shoppers already spend almost £1 in every £5 of their shopping via the internet and the online shopping revolution will continue.

Online retail expenditure in the UK is forecast to grow by 44.9% in the coming five years to reach £62.7bn in 2020.

It is surprising that more household parcels are not delivered in the evening when the roads are quieter and people are more likely to be at home. The proliferation in the number of vans is becoming such a problem that it is worth investigating the impact a charging scheme could have to incentivise deliveries off-peak, especially during the evening.

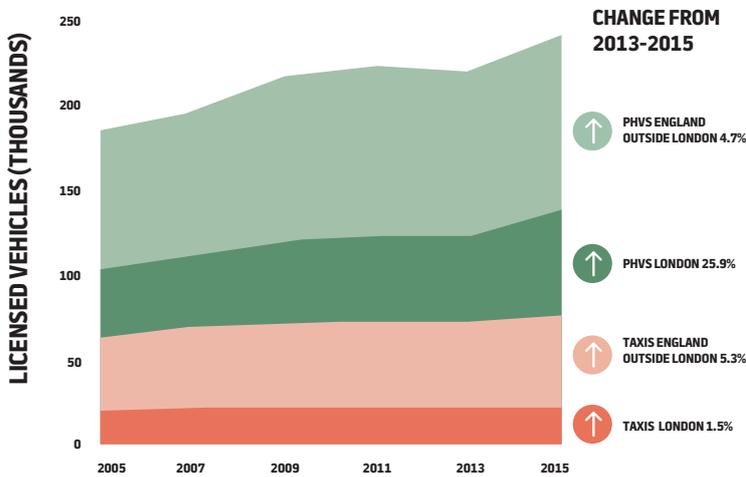
## 04. CHALLENGES MOVING FORWARD

### GROWTH IN PRIVATE HIRE VEHICLES

Private hire vehicle numbers have risen by almost 28% in the last ten years, from 120,000 in 2005 to 166,000 in 2015.

- In England outside London the number of PHVs rose by 4.5% between 2013 and 2015.

### TAXIS AND PRIVATE HIRE VEHICLES BY TYPE AND AREA: ENGLAND 2015



### PRIVATE HIRE VEHICLES IN LONDON

Between 2013 and 2015, there was a 26% rise in PHVs in London. Licensed PHVs increased from 60,000 in 2013 to 94,000 in 2015; PHV licenses are being issued at a rate of 600 every week, and so they could potentially rise from 94,000 to 124,000 by the end of 2016.

The number of new minicabs has risen by 56% in the last two years, largely due to Uber.

The increase in PHV activity in London has lengthened journey times by over 10% over the past 12 months. Uber in London has gone from having zero to 20,000 PHVs registered with it in three years (ref: GLA transport committee)<sup>16</sup>

<sup>16</sup> Addison Lee Data Analytics <https://www.addisonlee.com/addlib/london-journey-times-jump-by-10-in-a-year-says-addison-lee-research/>

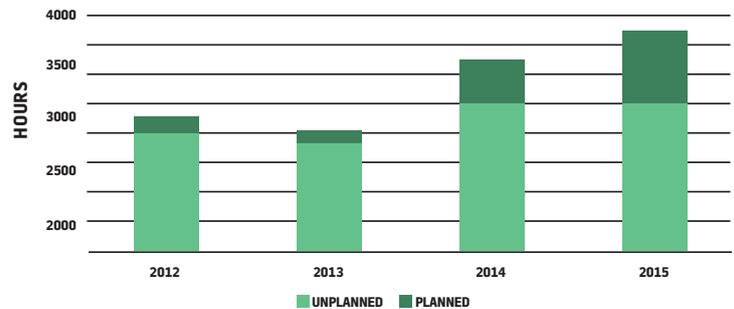
### MORE ROAD WORKS

Congestion, as always, is caused by demand exceeding supply. What is interesting about the recent sharp rise in congestion in central London – increasing by 12% per annum since 2012 (Inrix London congestion trends May 2016), is that it is mainly a supply side problem. Demand for road space has remained relatively flat, with the growth in LGVs and private hire being largely offset by a decline in car traffic.

**IT IS THE SUBSTANTIAL REDUCTION IN ROAD SPACE, WITH PLANNED ROADWORKS INCREASING BY 362% OVER THE LAST 3 YEARS, WHICH HAS LED TO SIGNIFICANT INCREASES IN CONGESTION.**

It is to be hoped that many of the road closures are temporary with major capital works such as Crossrail and Cycle Superhighways reducing available road space.

**FIGURE ES4: LONDON SURFACE TRANSPORT DISRUPTION HOURS, 2012-2015**



Ref: Inrix London Congestion trends May 2016.

### MORE TRAFFIC LIGHTS

A sharp increase in the number of signal-controlled junctions means that there is one set of lights for every 5.5 miles of road (a figure that will be much higher in urban areas), a rise of two-thirds since 2000<sup>17</sup>.

It is important that buses get as much priority as possible at junctions.

<sup>17</sup> We're Jammin': A comprehensive nationwide study into how traffic management is leading to costly delays for the UK taxpayer. Grant Shapps MP. British Infrastructure Group, May 2016 <http://www.shapps.com/wp-content/uploads/2016/05/Were-Jammin-FINAL1.pdf>

### B. SPACE WARS: POLITICAL DECISION-MAKING

The mode of transport people choose has a significant bearing on the priority they think it should be given. The majority still view the transport problem from behind the wheel of a car and this all too often is reflected in political decision-making. It would be good to be able to say that decision-making is more objective and informed by investment appraisal and cost-benefit analysis which looks at economic, social and environmental factors. But transport decision-making is much more subjective than that. Our cities deserve better.

The more affluent and generally well-educated the traveller, the more vocal and powerful a lobby they form to be able to effect change that is advantageous to their choice of mode. This helps to explain why, for the sixth year running, fuel duty has been frozen (except for buses) despite record low oil prices. The motoring lobby is powerful. It also helps to explain how rail has been allocated £38bn to maintain and improve the network until 2019, despite buses accounting for a greater proportion of trips than rail. It is the bus passenger who has the least profile and is the furthest from the ear of the politician.

People in the highest-income households travel almost five times as far by rail as people in the lowest income households, whereas people from lowest income households travel 2.4 times as far by bus as people with the highest income level. People in households of highest income group travel 2.6 times as far by car as people in lowest income households.

What is less well-known is how relatively affluent cyclists in London are compared with bus passengers. Transport for London describes the London cyclist as “typically white, under 40, male with medium to high household income”. A report by the London School of Hygiene & Tropical Medicine’s Transport & Health Group in 2011<sup>18</sup> describes cycling in London as disproportionately an activity of white, affluent men. Only 1.5% of those living in households earning under £15,000 cycled compared with 2.2% of those living in households earning over £35,000.

While more sustainable forms of transport should be supported, and the critical importance of reducing cycling accidents through segregation is clear, care must be taken to ensure cycling improvements are not to the detriment of bus passengers. Despite the commendable efforts of Greener Journeys, Bus Users UK, Transport Focus, the Urban Transport Group and Campaign for Better Transport, the voice of bus passengers does not seem to be heard by decision-makers. This can partly be explained by the lack of coverage and exposure the bus receives in the mainstream media whose management are far more likely to drive or use the train, than they are to catch the bus to work.

### THIS LACK OF PUBLIC PROFILE FOR BUSES MEANS THERE IS LESS PRESSURE ON POLITICIANS TO LOOK AFTER BUS PASSENGERS.

Roads are one of the most valuable and scarcest resources our city authorities have at their disposal. City authorities are still too focused on moving vehicles rather than people. With an average occupancy of around 1.2 for commuting trips, cars are the most inefficient users of road space.

One of the most radical reallocations of road space that has occurred on UK roads in recent years has been London’s cycle superhighways, whereby 25% of road space on key routes has been allocated to cyclists in central London. The former Mayor, Boris Johnson, made this a personal policy mission because he is a London cyclist. However, it is much more common for local and national politicians to view transport problems from behind the windscreen of a car or through the window of a train.

On a personal note, when I was appointed chair of the Transport Committee in Lothian Region (succeeded by City of Edinburgh Council) in 1994, I inherited a tram scheme which was led by Alistair Darling before he was elected to the House of Commons. When I was told by council officials that we had minimal resources at our disposal – and certainly nothing sufficient enough to build the two line scheme that was proposed – I asked what plan B was. It was Greenways bus priority.

Greenways was unique among bus priority schemes in the UK in that it was extensive and involved a much higher level of enforcement. It was and still is controversial.

For me, the decision was straightforward. Bus trips accounted for 50% of the trips into Edinburgh city centre during the peak so it was only fair that we allocated 50% of the road space to them. If I had seen local government as a stepping stone to Westminster or Holyrood, I would not have implemented it. The winners were bus passengers; winners are not vociferous and bus passengers are not anyway, certainly when compared with the perceived losers, motorists, who are very vociferous and much more influential. They are more likely to be business leaders, newspaper editors and opinion formers.

**POLITICIANS ARE MUCH MORE LIKELY TO FIND MEMBERS OF THE PUBLIC ATTENDING THEIR LOCAL SURGERIES TO COMPLAIN ABOUT BUS PRIORITY THAN TO ASK FOR MEASURES TO SPEED UP BUS TIMES.**

We need more bus champions in the UK in local, devolved and central government. The bus is the most efficient user of road space, the most environmentally friendly of the motorised modes and the one most used by those on the lower end of the income scale who are all too often less vocal, and less likely to be heard.

### MOVEMENT SPACE VERSUS PEOPLE SPACE

The desire to create more a pedestrian-friendly environment has resulted in movement space being squeezed in many cities. This has had an impact on traffic flow.

While there is often a conflict between catering for cyclists and bus passengers, and the London cycle superhighways are a topical case in point, policies favouring pedestrians and buses are more complementary and have greater synergy between them than many think.

The more accommodating city centres are to pedestrians, the more attractive they become to retail and businesses generally. Bus routes radiate from the city centre: the more people travelling to city centres, the more populated our buses are. There is at times a conflict: sometimes buses are denied access to parts of the town centre as part of a general vehicle ban. Conversely, Oxford Street in London and Princes Street in Edinburgh are two good examples of streets where pedestrians and buses compete for space.

City retailing faces severe competition from out of town shopping centres and a newer threat which is growing exponentially, online shopping. Bus companies are often the first to protest about pedestrianisation; it would serve them well to acknowledge that city retailers are facing a major battle to hold on to customers, and that the viability of city centre retail and bus companies are inextricably linked. A sensible balance needs to be struck between making our cities pedestrian-friendly and ensuring that bus passengers can get close to their destination.

**It is important to remember that shopping represents around one-third of bus journeys in the UK.**



**05.**

**FIVE**

**POINT**

**PLAN**

### 1. SET BUS SPEED TARGETS

**The Buses Bill should set guidance encouraging local authorities and bus operators to set targets for average bus speeds** (with a minimum requirement of stopping bus speeds declining any further). This should apply in both a regulated and deregulated environment. In the latter, it should be a requirement for the new Enhanced Quality Partnerships proposed in the upcoming Buses Bill.

Local authorities would deliver their side of the partnership by giving priority on roads and at junctions to buses, and bus companies would focus on significant improvements to dwell times by accelerating the programme for off-bus ticketing, smart cards and contactless payment. Paying cash on a bus is archaic and should be made a relic of history as quickly as possible.

ITSO smartcards have considerably slower transaction times than those in London. It's imperative that the rest of the UK emulates the high bar that London has set in ease of ticketing and speedy transaction times.

### 2. DEMAND MANAGEMENT

There has been a fundamental change in transport policy over the last 20 years, away from changing travel behaviour to giving people choice. **The consequence of this laissez-faire approach is rising congestion, slower traffic speeds and gridlock becoming all too often the norm.** This is bad for our city economies and their environment.

It is interesting to note the comments below from TomTom Traffic Vice President, Ralph-Peter Schaefer. They could have been taken straight out of the 1998 White Paper on Transport:

“Transport authorities are managing congestion with well-engineered policies, but you can't just build your way out of traffic jams. Studies have shown that policies of 'predict and provide' are unsustainable. Building new motorways and ring roads doesn't eliminate congestion. More must be done to better manage existing road space and to spread demand.

People simply aren't doing enough to change their travel habits – such as working flexible hours, avoiding peak commuting times, making use of real-time traffic information and trying alternative travel modes. If only 5% of us changed our travel plans, we could improve traffic congestion on our main roads by up to 30%.”

### CHOICE MEANS NO CHOICE BUT TO SUFFER WORSENING CONGESTION

The problem with this policy shift is that it means that all users of our city roads, from bus passengers to motorists, from delivery and freight vehicles to taxis, **all now have no choice but to sit in ever-worsening traffic jams.** Without some form of demand management, from parking restraint to the more effective congestion charging, coupled with improved public transport, we will regulate traffic volumes in our cities through congestion. This explains why peak hour city centre traffic volumes have remained fairly static over the last 30 years, and why the morning and evening peaks continue to lengthen. We reached saturation point and road users responded by adjusting the time of day they travelled. While many motoring and freight trips have some flexibility in the time of day they are made, this does not apply to buses. **Nor are bus drivers able to take advantage of satellite navigation to negotiate their way through traffic jams. They have to stick to their route.**

### STICK NEEDED AS WELL AS CARROT

While it is crucial that we do everything we can to provide better public transport, this is not a panacea for city traffic congestion. If we are successful in shifting car trips to public transport, the road space that is vacated will be taken up by latent demand – road trips that people did not make because congestion proved to be a deterrent, until they were enticed back on to the road network as congestion declined.

Munich is<sup>19</sup> one of the best examples of what a strong devolved regional and city government could achieve on the public transport front. It had everything we aspired to in the UK with public transport provision, and yet traffic

<sup>19</sup> Commission for Integrated Transport: Study of European best practice in the delivery of integrated transport: report on stage 2 – case studies: 3, Munich,

Germany November 2001. <http://webarchive.nationalarchives.gov.uk/20110303161656/http://cft.independent.gov.uk/pubs/2001/ebp/ebp/stage2/03.htm>

congestion continued to rise. The city transport officials in Munich recognised that they were powerless to prevent this without demand management measures to constrain the growth in car use. It has long been acknowledged that we need the stick as well as the carrot. However, politicians find the latter much easier to deliver than the former.

### LONDON'S SUCCESSFUL CONGESTION CHARGE

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Introduced in 2003, the London congestion charge achieved its objective of cutting traffic volumes in the charging zone by 20%. (This has since been more than cancelled out as road space has shrunk in central London through road works, cycle superhighways, growth in delivery vehicles and private hire). The congestion charge had the added benefit of providing a valuable revenue stream to improve bus services and hold down fares. The bus sector benefited most from congestion charging, not just from the hypothecated revenue stream but from improved journey times and reliability.

In the first year of congestion charging, bus speeds in the central zone improved by 7% and excess waiting time was cut by 30%.

### THE CONGESTION CHARGE GAVE A BIGGER BOOST TO BUS PASSENGERS THAN ANY OTHER SINGLE MEASURE.

Speeds increased by 14.6% (comparing three months before with three months after introduction) in the Congestion Charging Zone (CCZ) following the introduction of the charge. However since 2004 bus speeds in London have been gradually decreasing to below pre-congestion-charging levels. This trend grew worse from 2014, in line with increased road congestion caused by the economic recovery, a proliferation of roadworks and the reallocation of road space to Cycle Superhighways.

The former Mayor, Boris Johnston, against the advice of TfL, rejected demand management as a policy weapon and immediately on his election removed the western extension to the congestion charging zone. Again he went against the advice of TfL by implementing Cycling Superhighways without reducing traffic volumes in central London. **You can't take 25% of road space out on key routes in central London without doing anything to compensate by reducing traffic. The result has been worsening congestion and slower traffic speeds. Bus passengers have been the main losers.**

When his term as London Mayor ended, Boris Johnson warned his successor that he will have to take action to cut traffic volumes by increasing the congestion charge. However, this solution has resulted from the decisions he took during his eight years in office.

The other good example of a city adopting a radical demand management measure is Nottingham with its workplace parking levy. It is well known that if people have a free parking place at work it is very difficult to get them to use public transport. It is no coincidence that Nottingham is one of the few cities in the UK to have experienced a decline in traffic volumes and city centre congestion over the past decade. The success has been built on carrot and stick.

The proliferation in the number of delivery vans in London is becoming such a problem in many cities that it is worth investigating the impact a charging scheme could have to incentivise deliveries off-peak, especially during the evening

### BACK TO THE FUTURE

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**There is a need to return to the ethos of the 1998 White Paper on Transport, which accepted the necessity for demand management in our cities and the crucial importance of bus priority.** It was right then and the passage of time has made its conclusions and recommendations even more essential.

Those cities that have embraced this agenda, such as London and Nottingham, have been successful in cutting traffic congestion. In the case of London, the early success

of congestion charging has been eroded by capacity reductions on the road network and the failure to build on the very positive legacy of the congestion charge when first introduced in 2003.

The Conservative Government in the 1990s also accepted there could not be a free-for-all in our cities and proposed a “roads hierarchy” which gave priority to pedestrians, cyclists, bus passengers and motorists, in that order <sup>20</sup>. This was nothing to do with being anti-car, but a logical acceptance that cars, with an average occupancy of around 1.2 for commuter journeys, are highly inefficient users of road space. One of the most precious and scarcest of resources that local authorities have at their disposal is road space. They can choose how they allocate it. The enlightened ones recognise the roads hierarchy and are not afraid to make the tough decisions.

### 3. BUS PRIORITY

The road network needs to move people and goods efficiently if we are to ensure the social and economic wellbeing of our communities. Buses have a vital role to play in this, as they can make excellent use of limited road space, carrying many more passengers than a private car for a given amount of space. **However, the potential benefit of the bus is stifled by traffic congestion.** Local authorities and bus operators need to work in partnership to make buses a more attractive alternative to the car by releasing them from the congestion delays experienced by other road users. This in turn will improve reliability and help make the bus an attractive choice for more car users as well as providing quicker journeys for both bus and other road users.

Experience from schemes around the country shows that bus lanes may reduce bus travel times by 7 to 9 minutes along a 10km congested route and also improve their reliability. Reliability means buses operate in accordance with their timetables on every journey, which is important to bus users. Measures to assist buses in one metropolitan city have halved the variation in journey times that operators

experienced in that corridor, enabling them to operate their buses more efficiently.

By introducing bus priority with other improvements, services can become more attractive to potential passengers. For example, a comprehensive quality corridor initiative in a major conurbation delivered a 75% increase in bus passengers over 5 years, with 20% being new customers.

**IN A 2015 REPORT FOR GREENER JOURNEYS, KPMG ESTIMATED THAT BUS PRIORITY SCHEMES CAN GENERATE UP TO £7 BENEFIT OF NET ECONOMIC BENEFIT FOR EVERY £1 INVESTED <sup>21</sup>.**

This represents excellent value for money, compares well with other forms of urban transport investment, and scores more highly than many much larger transport infrastructure projects. Bus priority schemes are also cheaper to build and maintain, and quicker to implement, than many traditional transport schemes.

In the words of the Urban Transport Group:

“Bus priority is about more than smoother bus journeys. Indeed, it is about more than improving transport. It can make a considerable contribution to local economies and quality of life. Bus priority schemes are significant projects which can provide the catalyst to assess how streets function, what people and businesses want from their local area and how to resolve longstanding issues effectively. This integrated approach delivers many benefits. They range from quicker journeys for all road users to greater access to employment, better trading conditions, safer streets, and public realm that makes for more enjoyable time in our towns and cities.” <sup>22</sup>

<sup>20</sup> Steven Norris: Minister for Transport.

<sup>21</sup> An Economic Evaluation of Local Bus Infrastructure Schemes, Greener Journeys, 2015 [www.greenerjourneys.com/publication/an-economic-evaluation-of-local-bus-infrastructure-schemes/](http://www.greenerjourneys.com/publication/an-economic-evaluation-of-local-bus-infrastructure-schemes/)

<sup>22</sup> Bus priority works, Urban Transport Group, July 2014 [www.urbantransportgroup.org/resources/types/reports/bus-priority-works-business-shops-communities-and-growth](http://www.urbantransportgroup.org/resources/types/reports/bus-priority-works-business-shops-communities-and-growth)

4. SPEED UP DWELL TIME AT BUS STOPS

While this report has focused on the impact rising traffic congestion has on bus journey times, in urban environments between 25% and 33% of journey time is spent picking up and dropping off passengers (dwell time).

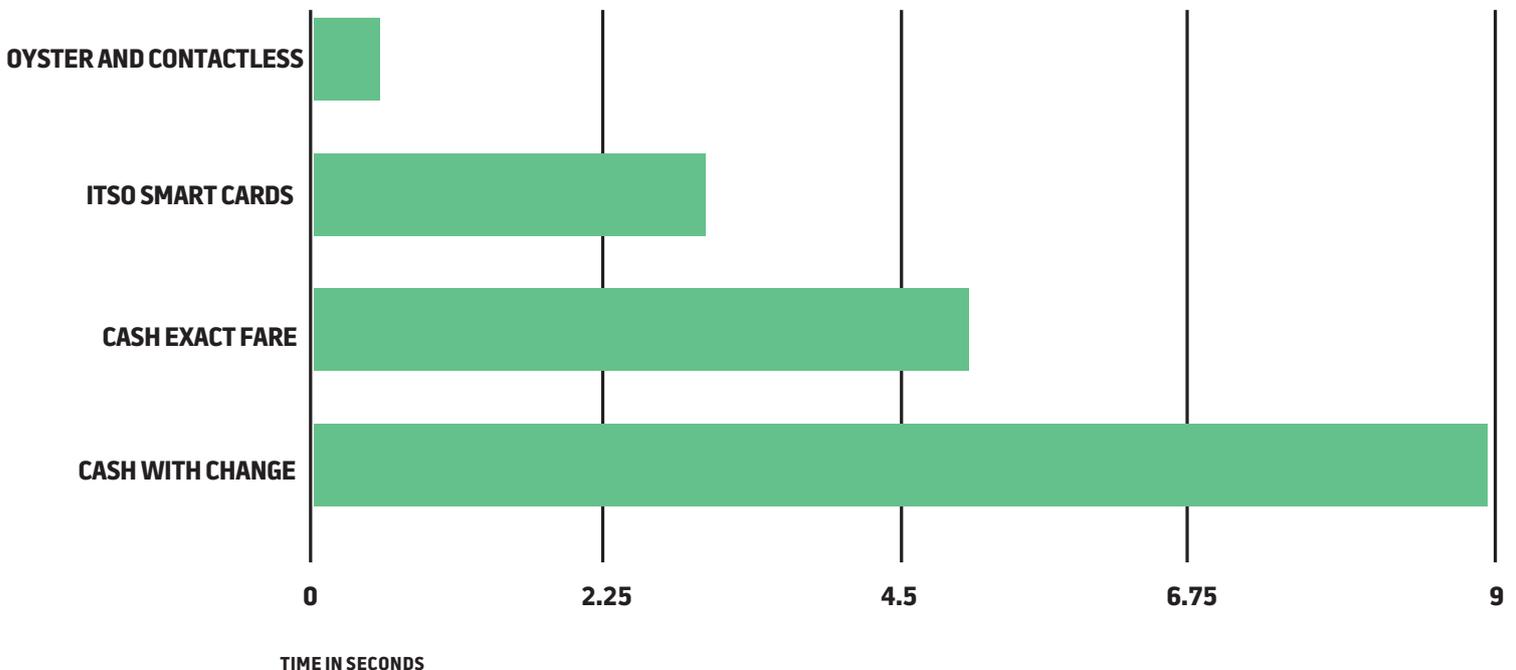
**London has led the world on cashless buses, which have had a dramatic impact on reducing dwell time at bus stops. The 0.5 seconds per transaction on London buses is unrivalled anywhere in the world.** Dwell time has been cut by at least half. Transport for London believes that the total run time of buses has been reduced by between 7 and 10%.

Most of the operating cost of buses is directly driven by run time, so that translates into a straight saving of some £120-180m annually. This dwarfs the one-off cost of introducing Oyster (£50m) and contactless (£68m).

If London-style cashless buses and contactless payments could be extended to the rest of the UK bus journey times could be improved by up to 10% by halving dwell time at bus stops.

The big five bus operators in the UK have set a target to introduce contactless bus transactions by 2022. This should be the very latest date for this to be introduced UK-wide, and everything possible should be done to accelerate it. It is feasible for bus operators to achieve contactless payments on buses in the major urban conurbations within the next three years.

**FARE TRANSACTION TIMES (SECONDS) PER PASSENGER**



5. MOBILISING BUS PASSENGERS

Too little focus is placed on the importance of the bus because bus passengers carry too little weight with opinion-formers and political decision-makers. The socio-economic profile of bus passengers is very different from rail users, motorists and cyclists, with a much higher percentage of those on lower income travelling by bus. It helps to explain why fuel duty has been frozen for six consecutive years despite rock bottom oil prices: the motoring lobby is powerful. Cheaper fuel reduces the competitive position of the bus versus the car.

We need more bus champions in the UK in local, devolved and central government. The bus is the most efficient user of road space, crucial for the health of our city economies and a vital part of an environmentally-friendly local sustainable transport system.

Bus companies need to get better at communicating with their customers to keep them better informed. This would also help them to mobilise support from their customers for pro-bus measures such as bus priority. It would be a rare event for a bus passenger to lobby politicians for improved bus priority; it's much more common for non-bus users to complain about priority measures. Local politicians who are making brave decisions to allocate road space for bus passengers need as much support as they can get from their local bus companies

SUMMARY OF FIVE POINT PLAN RECOMMENDATIONS

1	Bus speed targets
2	Demand management
3	Bus priority
4	Speed up dwell time
5	Mobilise bus passengers



06.

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07.

APPENDICES  
/CASÉ  
STUDIES

## BRIGHTON

Brighton and Hove has long been considered to be a beacon of best practice on bus policy, resulting in strong bus growth and very high per capita bus use. The number of bus journeys in Brighton & Hove has doubled in the last twenty years with bus journeys rising from 22 million in 1992/93 to 44.8 million in 2012/13. This was in marked contrast to the national story on bus use where the figures showed a continuous decrease in passengers.

This impressive rise in bus use has been facilitated by the favorable climate created by an excellent local bus company working in partnership with Brighton & Hove City Council, who have implemented a number of pro-bus measures, including:

- A network of priority bus lanes on key routes, such as the Western Road/North Street corridor, the A259 coast road and the A270 Lewes Road
- Real Time Information signs at bus stops that let people know when buses are due – these have also increasingly been installed in buildings so that people can time when they leave to avoid waiting for the bus. The system can also be accessed from mobile phones and Brighton & Hove Bus and Coach Company was the first bus company to launch an iPhone app to do this
- Being the first council to introduce ‘talking bus stops’ for visually impaired people so they can access the ‘real time’ information and be independent travelers
- Bus priority at traffic signals which gives buses a head start in traffic, delivering passengers to their destinations quicker and helping with punctuality
- In 2004, Brighton & Hove became the only English city, outside London, to have a commercially viable night bus service when the bus route N7 was launched. This was subsequently joined by other commercially operated night buses by the bus company
- A Quality Bus Partnership that has produced a number of initiatives, including making bus stops more accessible

(providing a level surface from the pavement onto the bus)

- Joint work on specific projects with bus companies on improving routes, such as the Lewes Road transport corridor and the better bus area for Edward Street, Eastern Road and Valley Gardens
- Support through winning EU funding to enable the bus company’s smartcard (known as ‘the key’) to be available on local trains and tendered bus routes operated by other bus companies enabling people to prepay their journeys on a card that can be scanned on the bus. The bus company has also introduced extensive use of mobile phone based ticketing
- Breeze Up to the Downs, a successful partnership service that links buses from the centre to some of the most popular countryside destinations outside the city

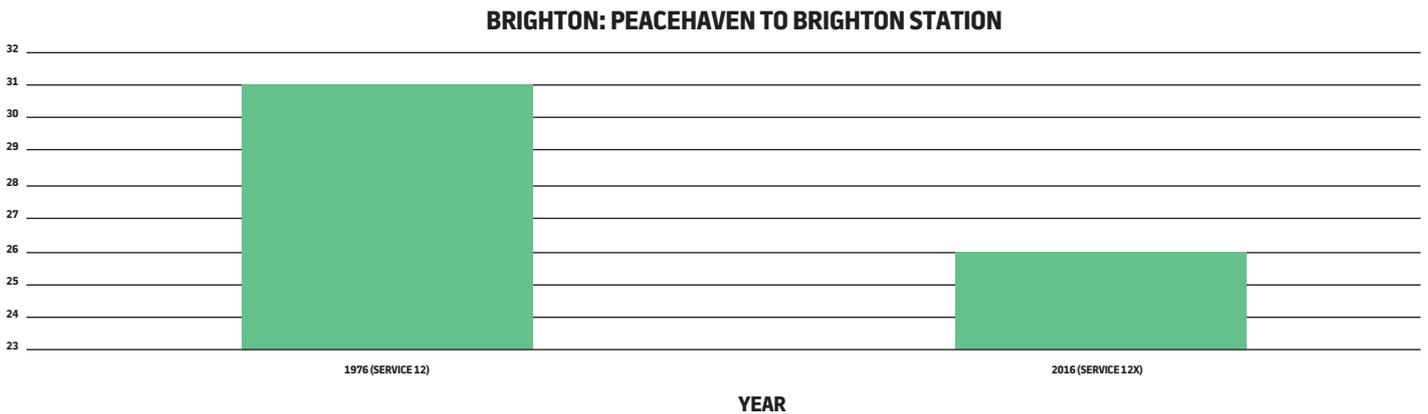
The most critical of these factors behind the impressive growth has been the council’s long held commitment to bus priority which has allowed for the creation of a virtuous circle whereby the bus operators have been able to invest in new vehicles, smarter ticketing, more frequent services, encouraging more people to use the bus. From the mid-1990s to date, a significant length of bus lanes have been introduced: through the city centre, the Coast Road as well as the road accessing the two universities which allowed buses to bypass long, regular traffic queues.

The most dramatic effects have been seen on the Coast Road where the reason for the bus lane was to bypass regular queuing traffic. On the Peacehaven to Brighton Station service (Route 12 and all its variants) since the bus lane was introduced not only are bus journey times shorter but they are much more predictable. There has been a 16% improvement in journey time since 1976 and a 4% improvement per annum. Journey time is actually 7 minutes faster today than it was in 1966. It shows what can be done and how we do not have to accept declining bus speeds as being inevitable. The number of passengers on the main route to use the bus lane has increased by 63% between 2007 and 2015, although data is not available on the extent of diversion from other modes.

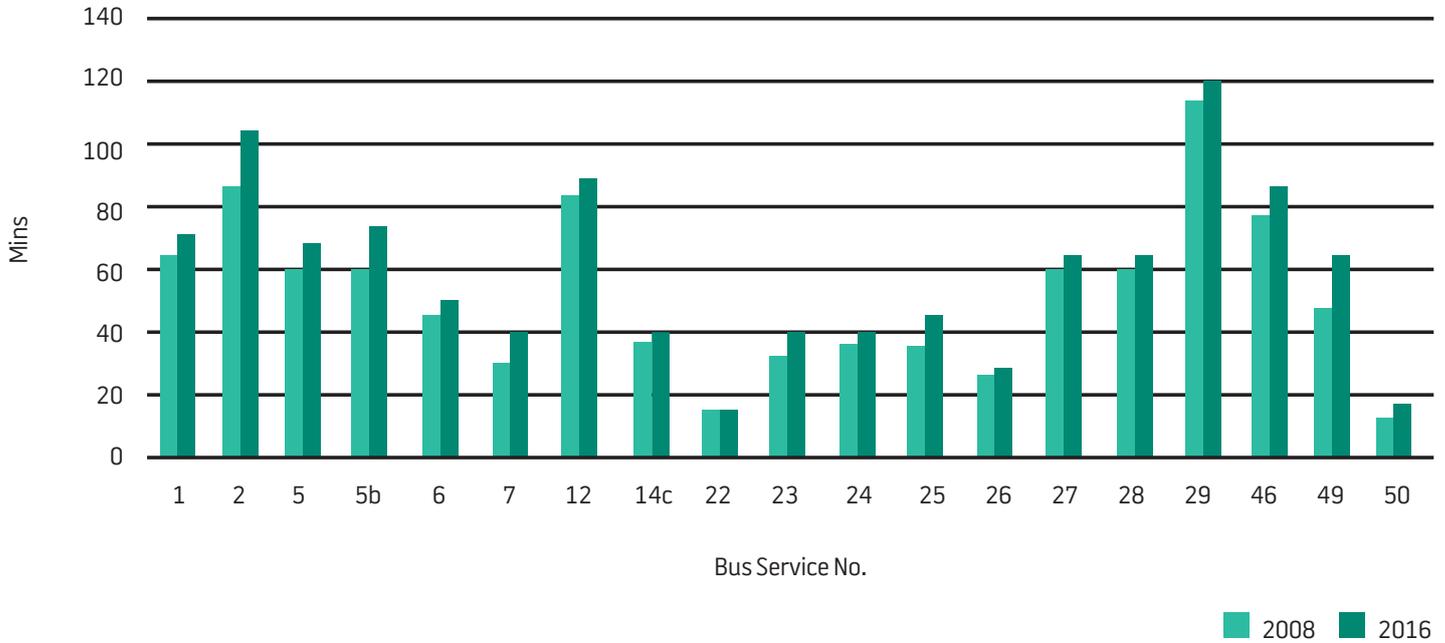
## 07. APPENDICES / CASE STUDIES

In 2012 the operator carried out a simple survey on the Coast Road by counting the number of vehicles and the number of occupants in each during the morning peak and found that buses made up 2% of the number of vehicles but carried 45% of the people.

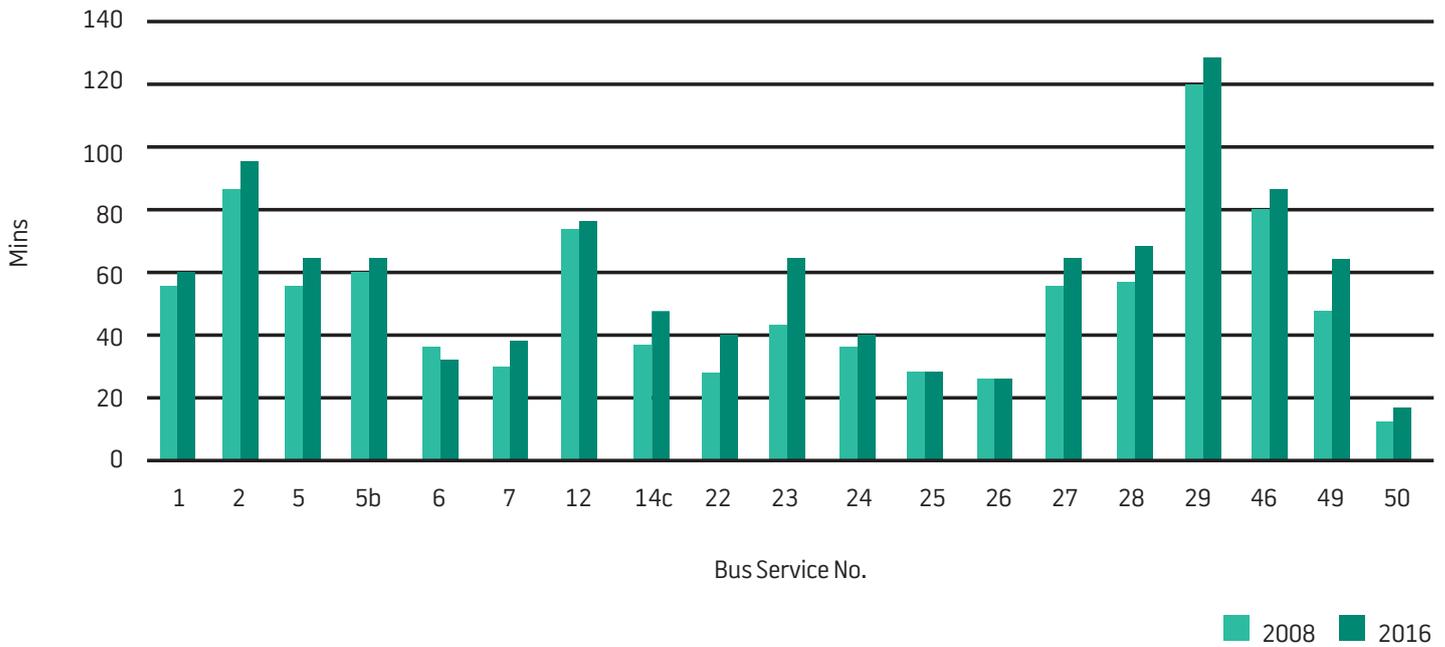
However, the south coast city has experienced a sharp increase in congestion levels over the past decade culminating in Brighton along with Gloucester coming out worst for congestion, with an average increase in journey time of 1.5% per annum. Unsurprisingly, this has had a detrimental effect on bus operations and without further action, could jeopardise the status of Brighton as a shining light in sustainable transport use.



**BUS SERVICE RUNNING TIMES EASTBOUND PM PEAK: 2008 v 2016**



**BUS SERVICE RUNNING TIMES WESTBOUND PM PEAK: 2008 v 2016**



A study by one of Brighton’s bus operators of running times (the maximum running time for each direction, by am peak, daytime, and pm peak) for each route shows that, on average, peak running times in the city have increased by about 13% since 2008, or put another way, bus speeds have declined by this amount.

This has led to operators having to increase the PVR just over the last few years just to maintain the required service level in the face of this congestion. Another report showing worsening services (and operational costs increases) demonstrates how although the maximum running times appear reasonable, the peaks are starting earlier and finishing later. For example instead of using daytime running times until 4pm and then longer peak running times until 6pm, the longer peak running times are now needed between 3.30pm and 6.30pm.

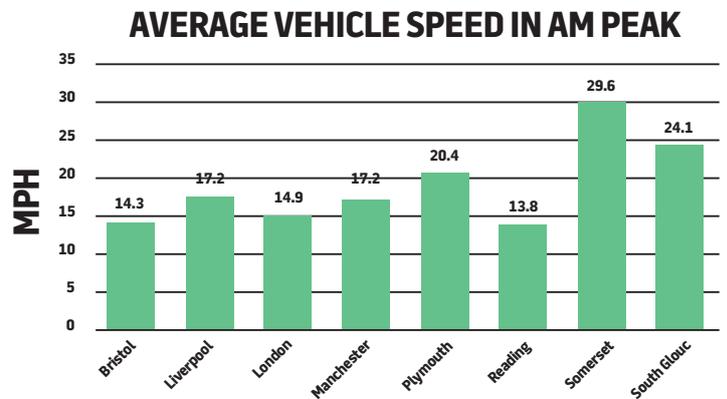
## BRISTOL

Over the last decade and in particular since the four local authorities in the West of England (Bristol, North Somerset, South Gloucestershire and Bath & North East Somerset) came to-gether to form a partnership to deliver on areas like transport, Bristol saw large improvements to bus priority, principally under the auspices of the Greater Bristol Bus Network.

The Greater Bristol Bus Net recognised the vital role that bus services had to play as the backbone of cost effective urban public transport systems. An effective partnership between the commercial bus operator and the local authorities delivered a series of bus network enhancements which brought 10 key routes up to showcase standard, with:

- Over 120 new buses
- Nearly 1,000 improved bus stops - new shelters, new information panels, level access
- More than 300 new real time information displays
- New bus priority signals at junctions that turn green when buses approach helping them stay on time
- Bus priority lanes allowing buses to bypass general traffic
- Road widening in key traffic hot spots

In 2017, the long gestation of the Metrobus project – high priority and high speed bus services connecting several parts of Bristol that will link in with existing bus and rail services – is set to become operational. It will be operated with modern, low-emission vehicles that will run on segregated bus ways and bus lanes which have right of way over traffic on sections of the route. Bus stops will



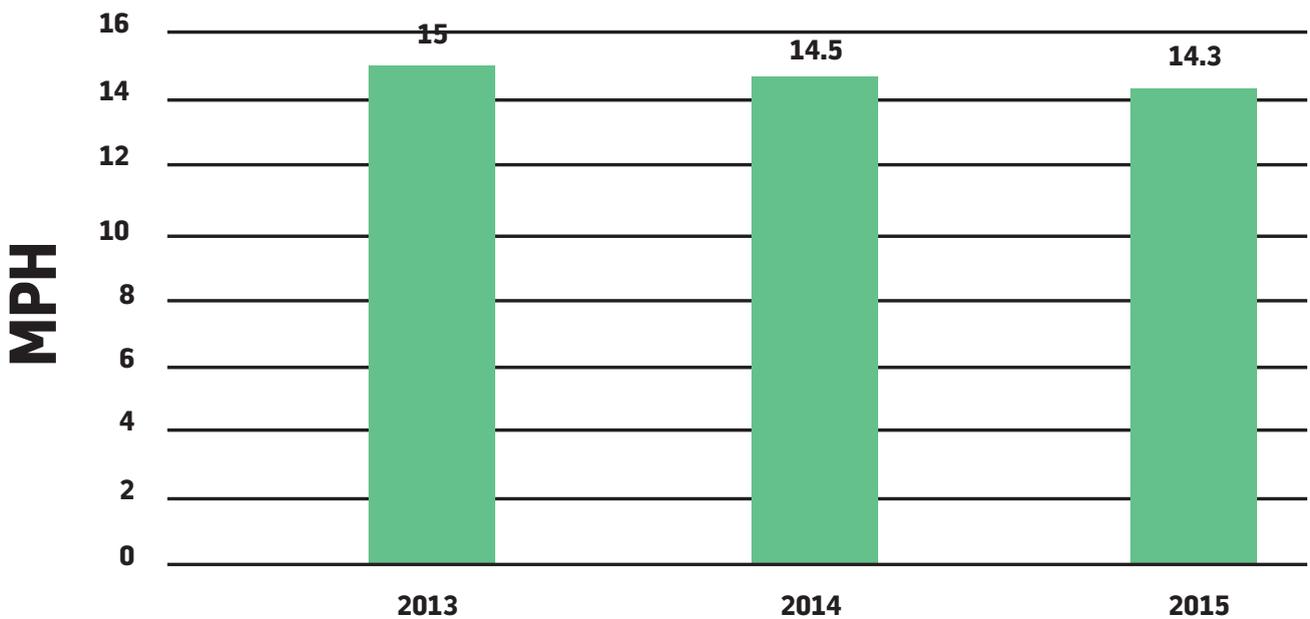
provide electronic, real-time information displays with fast-boarding and smartcard ticketing. In 2015, the bus company carried 54 million passengers in the West of England, a 20 per cent increase from two years ago.

Despite active promotion, an increase in use of public and active transport in the city, and being selected as the European Green Capital for 2015, Bristol has a severe congestion problem with regular grid-locks an all-too-familiar feature of local life. The Department for Transport's figures show that Bristol is in fact the most congested city in the country and that traffic moves slower during peak times than any other city, including London. On A roads in peak times, the average speed of vehicles in Bristol is 14.3 mph (compared to London's average of 14.9mph). The city's latest average represents a drop from 14.5mph in June 2014 and 15mph the year before.

Bristol is a busy city and the urban hub of the West of England sub-region with half a million car users travelling in to the city each day. A historic deficit in transport infrastructure, with lower than average public transport for a city of its size, high levels of car ownership (during the period 2012-2015 the DVLA recorded an additional 18% of vehicles registered in the West of England partnership area), a rapidly rising population (+12,000 a year in the city alone) as well as increasing prosperity has seen traffic levels and congestion at breaking point during peak times. This has had a seriously adverse impact on bus journey times and reliability.

The reality is that Bristol's new directly elected Mayor, Marvin Rees, will have no choice but to tackle the problem head on and follow in the vein of his pro-bus and pro-public transport predecessor, George Ferguson.

## REDUCTION IN VEHICLE SPEEDS IN BRISTOL 2013-15

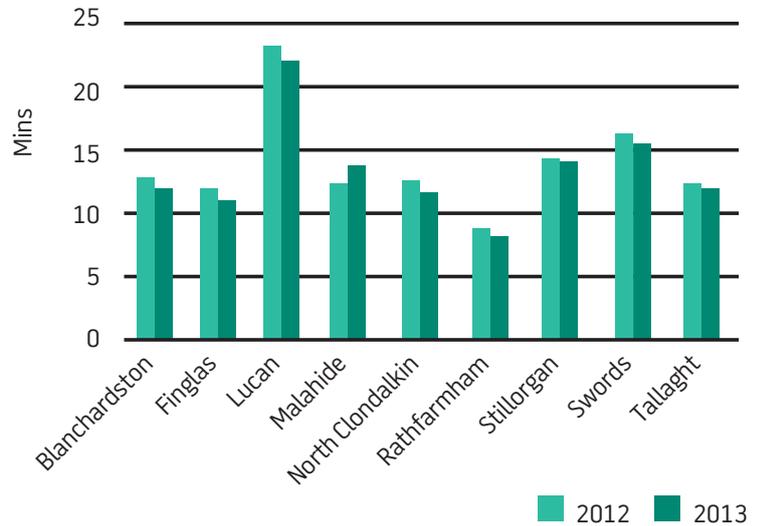


## DUBLIN

As the capital of one of the fastest growing economies in the developed world since the mid-1990s, Dublin has faced major infrastructural bottlenecks. With the rapid economic growth came the related rapid growth in private car ownership which resulted in increased car-commuting and increased congestion in the Greater Dublin Area. The main policy instrument designed to change this situation was the Dublin Transportation Initiative strategy in 1995 which set out an ambitious program of dedicated bus corridors with bus priority measures to achieve a shift away from private car use towards public transport. Overall, there are approximately 213 kilometres of dedicated bus lanes in the Greater Dublin Area. As a result the bus plays a vital role in the transport network of the capital city with 61% of all public transport trips in to Dublin city centre being by Dublin Bus. The overall mode share for car is 33%, while 48% of people travel into the City Centre by public transport and 16% walking or cycling. Dublin City Council is seeking to achieve modal share of 55% for public transport, 15% for cycling, 10% for walking and 20% for private car use in the annual cordon count by 2017 <sup>1</sup>.

As Ireland’s economic recovery continue since the crash of 2008, car volumes have been rising again, particularly over the last three years. The annual Tom Tom congestion survey index 2016 claims that Dublin is the 15th most congested city in the world and drivers spend 40% extra travel time per journey on average, compared to what it would take on traffic-free streets and can rise to 85pc extra in the morning peak. Congestion across the city has grown since last year. As with other urban centres featured in this report, congestion levels have had a negative impact on bus speeds and reliability, although they (along with Oxford) have been better protected than in many other towns and cities by the large amount of quality bus corridors and bus priority measures in place. Average bus speeds in Dublin have fallen by 0.4% from last year<sup>2</sup> compared to the national UK average of 1%

DUBLIN INBOUND BUS SPEEDS - AM PEAK 2012-13



The slower decrease in bus speeds in Dublin compared to other UK cities clearly demonstrate the direct correlation between good bus priority and bus journey speeds and reliability. It also shows the positive impact that fast and reliable journeys have on bus passenger numbers with Dublin Bus recording a 2.5% increase in 2015 from the year before taking the overall number of bus passengers to 122 million. Bus Éireann (the other main bus operator) also recorded increased passenger numbers.

The relatively good performance in Dublin on protecting bus speeds compared with UK cities comes despite the light rail line (Luas Cross City) currently being constructed through the heart of the City Centre. Construction commenced in 2013, and road space has been taken away in order to facilitate construction. A number of bus routes have been re-routed to facilitate the works, resulting in longer distances travelled to get through the City Centre. The transport and roads authorities have worked to minimise the impacts on bus journey times by implementing priority measures such as new ‘double bus lanes’, new contra flow bus lanes and AVL based bus priority at specific traffic signals in the City Centre. It might be worth including this in the case study.

Even with the large number of bus corridors across the city, there are those with more comprehensive bus priority in place than others and this is reflected in the performance of the bus service.

N11 QBC, which runs from Dublin City Centre through south eastern suburbs along the route of the N11 Road, a main arterial route into the city as upgraded to a quality bus corridor and for most of the route, is segregated from general traffic. Variability in journey times is far lower for the bus than for the car on this route and peak bus journey times can be considerably quicker. The modal share of the bus along the corridor has increased by 239 percent between 1997 and 2003 (representing a modal share of 46.76%). Over that same period, the modal share of the car along the route has fallen by over 40 percent to 29.0 percent<sup>3</sup>. In comparison, only sections of the bus network in the City Centre are segregated from general traffic and as such, undermines the operation of bus services accessing to and exiting from city centre by frequently delays and the reliability of the bus network affected by any incidents, events or accidents which cause general traffic to be delayed<sup>4</sup>.

On four QBC across the city, Malahide Road, Rock Road, Ballymun and Swords, Automated Vehicle Location (AVL) technology system has been trialled on each Dublin Bus to analyse particular areas of congestion and give green light priority to buses at certain junctions. This has resulted in journey time savings of up to four minutes and an improvement in journey times travelling through junctions of up to 41 per cent. Dublin Bus is now extending AVL to all Dublin bus corridors by the end of the 2016, which will provide reduced and more consistent journey times, greater reliability, reduced waiting times at stops, and prevent “bunching” of buses.

With the economic upturn and evidence of increased volumes of traffic on the radial approaches to Dublin and on the M50, this trend is set to continue. In 2014, there were circa 192,000 journeys into the City Centre each weekday in the peak morning period alone (7am to 10am). By 2023, it is anticipated that Dublin City Centre will have to cater for an additional 42,000 journeys in the morning peak, an increase of over 20%<sup>5</sup>. It will not be possible, or desirable, to cater for this growth in demand by car which is why Dublin City Council and the National Transport Authority intends to continue to nurture a progressive pro-public transport environment across the Greater Dublin Area with particular focus on further strengthening the supportive climate for bus use.

They acknowledge that a rebalancing of the available road space will be required on various streets to facilitate the introduction of additional capacity for public transport, and that significant changes to the traffic network in the City Centre will be necessary, with the objective of guaranteeing that the overall transport system is capable of operating efficiently and reliably, with consistent journey times. The strategy also involves the conversion of certain streets to public transport/ cycling/pedestrian access only to enable improved bus, tram, cycle and pedestrian movement around the central area; removal of through-traffic which currently traverses the central area, thereby releasing certain road space to other modes of transport. It will also seek reductions in the availability of workplace parking in urban centres to discourage car commuting, where alternative transport options are available; support the introduction or expansion of on-street parking controls, and charging structures, that seek to reduce commuter parking and which contribute to greater parking turnover for non-commuting purposes; assess the need for the introduction of parking charges at out-of-town retail centres, to reduce the congestion potential at these locations; and Seek the implementation, at the appropriate time, of demand management measures to address congestion issues on the radial national routes approaching the M50 motorway, to ensure that these routes retain sufficient capacity to fulfil their strategic functions.

The Greater Dublin Transport Strategy 2016 – 2035 also proposes a “Core Bus Network” for the region comprising 16 radial bus corridors; 3 orbital bus corridors; and 6 regional bus corridors. This core network represents the busiest bus routes in the region with high passenger volumes which require a high frequency of bus services. In order to ensure an efficient, reliable and effective bus system, it is intended to develop the Core Bus Network to achieve, as far as practicable, continuous priority for bus movement on the portions of the Core Bus Network within the Metropolitan Area. This will mean enhanced bus lane provision on these corridors, removing current delays on the bus network in the relevant locations and enabling the bus to provide a faster alternative to car traffic along these routes, making bus transport a more attractive alternative for road users.

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EDINBURGH

Edinburgh's Greenways.

This year marks the 20th anniversary of Edinburgh's radical Greenways bus priority scheme. It has won plaudits from transport professionals and central government: "Edinburgh Greenways scheme is successful" (DFT: 2010. "Bus Priority – The Way Ahead") and "Edinburgh's Greenways have proved to be a high profile and effective form of bus priority which substantially insulates the buses using them from the worst effects of congestion"(The Scottish Executive Central Research Unit 2000).

I need to declare an interest as I was the politician responsible for Greenways. While it's reassuring to receive plaudits from fellow transport professionals I still, 20 years later, get stuck when I return to my native city!

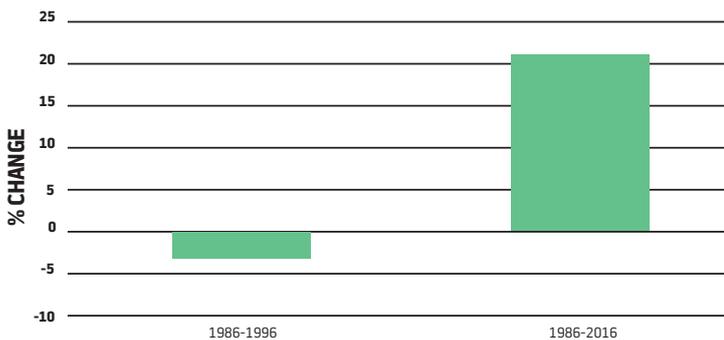


Look how green the bus lanes are! They look nothing like this now as they are not as well maintained.

You were 15 times more likely to be caught by a traffic warden for illegally encroaching on a Greenways bus priority, compared with a conventional bus lane.

What is startling about the bus journey time data from Edinburgh is that from 1986 to 1996 all day average bus speeds – as a result of good conventional bus priority followed by Greenways – bucked the UK trend and actually improved by over 5%. It's the only conurbation wide example in the UK where bus journey times have actually improved over a prolonged period. From 1996 to 2016 journey times in Edinburgh revert to the UK wide trend and declined by 20%

**EDINBURGH: % CHANGE IN AVERAGE JOURNEY TIME (AM PEAK)**

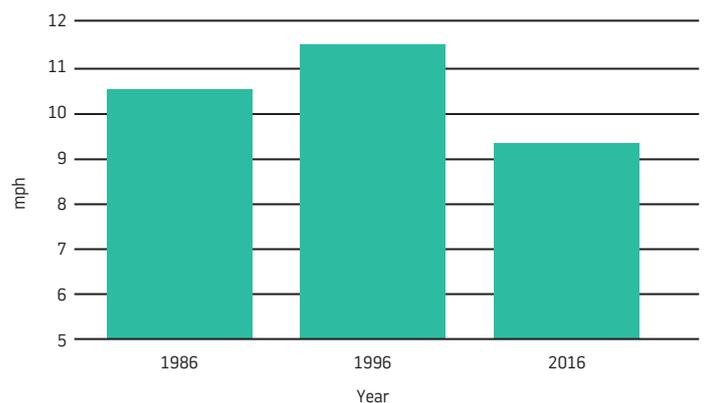


The City of Edinburgh Council needs to stand firm against those who want to dilute Greenways enforcement and point to the fact that bus speeds are now falling by 10% every decade.

Whilst the Greenways in Edinburgh were a bold and strategic way forward for the mass movement of people in the 1990's their effectiveness has declined over the last 20 years. There are a number of measures the City of Edinburgh Council can take to reverse the upward trend in bus journey times:

- Review traffic signal timings. Best practice would indicate that this should be done every three years.
- Don't become too reliant on camera enforcement of bus priority lanes. With only 9 road side camera's to enforce over 60 km of bus lanes there are too many unauthorised vehicles using them.
- Properly maintain Greenway's. They no longer look green and the white line segregating the bus lanes from general traffic should be clearer. The Council should allocate a proportion of the annual dividend they receive from Lothian Buses to finance bus lane maintenance and enforcement. It would provide the Council with a great financial return through increased patronage and higher future dividend payments. A 10% improvement in bus speeds would result in an increase in passengers of between 10% and 14%.
- The 9 month trial they have embarked upon to remove bus priority during the off-peak should not be made permanent. If it is this will lead to a permanent reduction in off peak bus speeds and patronage with a consequential impact on dividend payments.

**EDINBURGH: AVERAGE SPEEDS (MPH) OFF PEAK**



The data from Lothian Buses shows that bus speeds have declined by 19% over the last 20 years even during the so called off-peak! This evidence should persuade the City Council that the trial should not be made permanent.

Lothian Buses are one of the best bus companies in the UK and the vital backbone of Edinburgh's public transport system. They deserve the very best level of protection from rising traffic congestion.

## GLASGOW

Glasgow is a compact city with high population density and relatively low car ownership, making it ideal for a high sustainable transport modal share. However, between 2001 – 2011 bus use in the city reduced from a modal share of 23.5% to 20.3% while the proportion of commuters using a car (either as a driver or passenger) increased to 40.9%<sup>1</sup>.

Demand for bus travel has been showing a persistent and significant fall in metropolitan built-up areas in Scotland (of which Glasgow is the biggest) with the average annual distance travelled by bus also decreasing by 27% between 2007/08 (564 miles) and 2009/10 (412 miles)<sup>2</sup>. The number of people using buses across the Strathclyde region (which covers the whole of Greater Glasgow, Ayrshire and Argyll and Bute) has fallen by 22 per cent in the decade to 2014/15 - equivalent to 49 million fewer bus passengers<sup>3</sup>. First Glasgow – the largest bus operator in the city - suggests it has lost 40% of its bus passengers in the last decade.

The dramatic fall in bus travel is despite the fact that Glasgow has, on average, a relatively low car ownership level compared with the rest of Scotland. More than one-half (51%) of households in Glasgow do not have access to a car and nearly two-thirds (64%) of households located in the most deprived areas in Glasgow do not have access to a car<sup>4</sup>.

There are a number of factors which help explain why bus use is falling, and which together paint a picture of a city whose

overall environment is not optimised for high levels of bus travel in the same way as cities like Dublin, Oxford, Brighton, London and Cambridge.

Bus speeds have fallen faster in Glasgow (1.5% p.a) compared with the UK average (1.0%). This alone would result in around 15% fewer passengers every decade (see section 3 of this report). The growth in traffic congestion undermines the achievement of optimum bus use in Glasgow. The annual Tom Tom traffic congestion survey reveals that Glasgow's drivers currently spend 26% longer on their journeys than if they were travelling where the traffic is free flowing. Traffic flow in Glasgow was worse in 2014 compared to the previous year.

Another crucial factor which puts Glasgow at a serious disadvantage in attracting passengers to buses is the competition from an extensive and heavily subsidised urban rail network. This is not a criticism of transport policy - indeed the Scottish Government and SPT should be congratulated on taking such a pro rail approach. However, one of the consequences is that for a number of journey's rail is cheaper than bus. It is people in Strathclyde who do not have a rail service who are the most heavily penalised - especially those who don't own a car are and dependent on the bus.

Cities that are successfully growing bus mode share have tighter parking controls with higher charges and less provision, making it more likely that people will use the bus. Conversely, the more generous the parking provision, the less likely the bus will be used as the mode of travel and the more likely the private car will be used thus increasing the levels of congestion on routes accessing the city as well as the level of congestion within the central area of the city. According to Europe's Parking U-turn, ITDP 2011, 50% of traffic jams are simply cars looking for a parking space. This is dramatically illustrated in the West Midlands Case Study in this report.

In Glasgow in recent years, the number of car parks in the city has increased and there are now approximately 10,000 spaces available in over 25 dedicated car parks across the city centre<sup>5</sup>. In particular, inexpensive temporary car parks have sprung up across the city on vacant land as building work slowed in response to economic conditions. On-street parking is also available throughout the city centre. The Council has limited control over private car parks making it difficult to manage

## 07. APPENDICES / CASE STUDIES

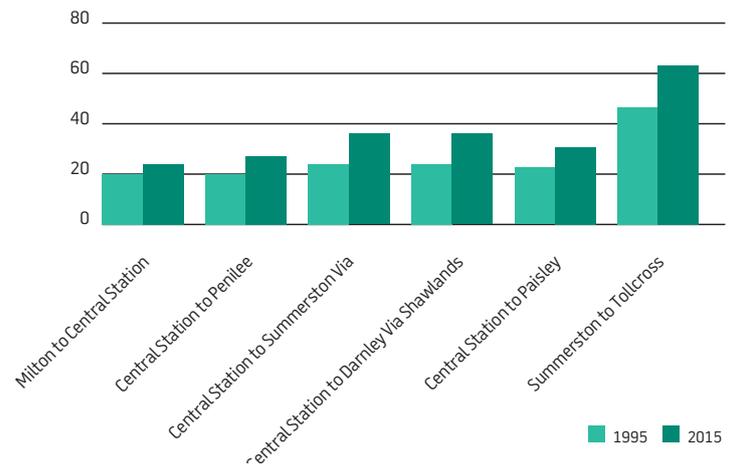
the supply and cost of parking in the city centre. The Council's Transport Strategy intends to encourage people to park their cars at the periphery of the city centre by using signage to direct people approaching the city centre to their nearest car park, reducing the number of people travelling unnecessarily through or around the city centre to reach a car park. However the Strategy also reveals the caution which the Council feels it must adopt stating its parking policy must be 'handled sensitively, because the role of the car in supporting visits for business, retail and leisure activities is recognised.' This approach may not be sufficiently robust if the Council wants to achieve a tangible modal shift away from private car.

This level of traffic congestion has been having a consistently negative effect on bus services across the city through its impact on bus speeds. Declining bus speeds not only make it extremely difficult to attract new users but crucially it has also led to former bus users switching modes. In the last 10 years First Glasgow data indicates that average speeds in Glasgow have dropped by about two miles an hour. SPT's figures show that the speed of the most heavily used bus service in Glasgow has fallen as low as 3.5 mph through the city <sup>6</sup>. This has a direct and detrimental impact on bus journey times which have also been rising with many increasing by as much as 30% <sup>7</sup> which, again, reduces the attraction of using the bus.

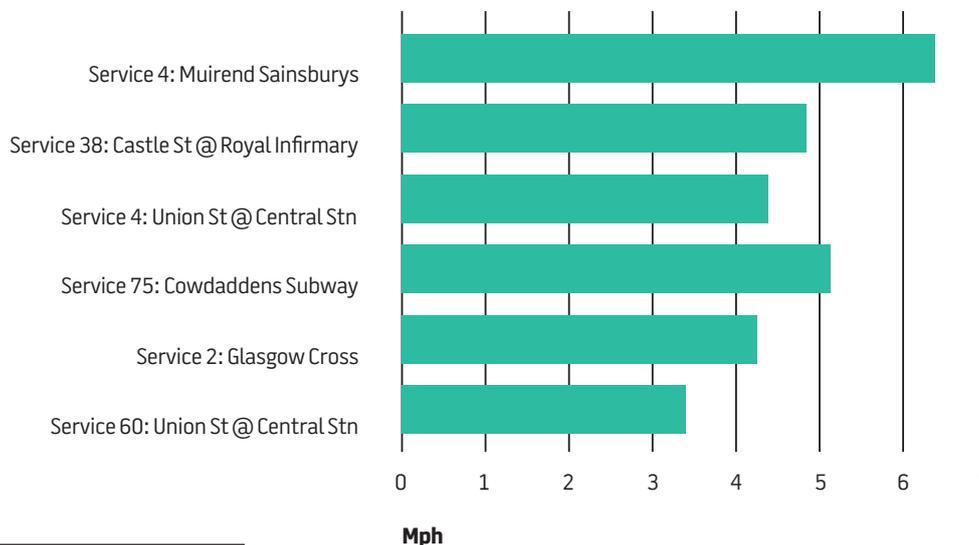
Glasgow's congestion problem goes hand in hand with

the city's long-standing air pollution problem which is predominantly caused by road traffic. In February 2014 the European Commission started legal action against the United Kingdom for failing to bring levels of Nitrogen Dioxide to within legal limits by the deadline under EU Law in several cities across the UK, including in Glasgow (air pollution levels were due to be brought to within the legal limit by 1 January 2010)<sup>8</sup>. Glasgow City Council has declared 4 Air Quality Management Areas ("AQMA's") which are zones where levels of air pollution are in breach of Scottish air quality standards. Air pollution from PM2.5s, also known as fine particles, kills an equivalent

INCREASE IN GLASGOW'S PM PEAK BUS JOURNEY TIMES 1996 VS. 2015



Glasgow Bus Service Speeds



Glasgow Bus Service Speeds Graph Source: SPT

of 308 people in Glasgow each year and is responsible for 1 in 20 deaths in Glasgow according to statistics produced by Public Health England in March 2014 <sup>9</sup>.

Using bus priority measures as a policy tool to both increase bus journey times and service reliability and at the same time reducing traffic congestion is a well-documented solution (and recorded extensively within the case studies of this report) and an essential part of the policy mix to create a bus friendly operating environment. Glasgow City Council's own modelling and monitoring work shows that as a result of using bus corridors across the city, general traffic speeds fall by up to 6% (PM peak period, 1600-1900), but bus speeds increase by up to 7% in the same time period <sup>10</sup>. There are eight quality bus corridors totalling 120km in the Greater Glasgow area.

In 2014/15, £7.2 million was invested in a 'Fastlink' core scheme between Glasgow city centre and the South Glasgow Hospitals (SGH) campus. Fastlink services began operating in early May 2015 and the Fastlink Statutory Quality Partnership came into effect in June 2015, following extensive consultation with bus operators. Analysis undertaken in October 2015 shows a 15.6% journey time saving has been realised <sup>11</sup>, from the overall target of 20% which according to SPT is on course to being met. SPT and the Council are currently rolling out a programme of immediate enhancements including the installation of signal detection loops, introduction of SCOOT signalling and working with Stagecoach Western to install Automatic Vehicle Location (AVL) equipment on their Fastlink X19 service to further enhance bus priority signalling. A £3.14 million package of works has also been agreed between GCC and SPT, to deliver Bus Priority Measures and improved Passenger Facilities within Glasgow City Centre. These works will deliver further journey time savings for all bus services operating in the City Centre (e.g. up to 180 buses per hour in Union Street) in alignment with the targets set out in the Final Business Case. In March 2016, the Council also upgraded its IT system that provides bus priority at intersections and real-time information to passengers, with the complete package now hosted on the 'cloud'.

While these measures are indeed progress towards improving bus travel, the Council must take a holistic approach if it is to achieve a bigger switch from private car to bus by truly creating a pro-bus environment across the city which will also involve

complimentary parking policies and re-distribution of road space. The council's Transport Strategy states traffic flows will be managed to discourage through trips through the heart of the city centre by making through routes more circuitous and less appealing to drivers. Instead, people will be encouraged to stay within the area of their point of entry to the city centre supporting the function of each district as a distinct location and destination in its own right. In view of the rise in congestion levels and the serious fall in bus passenger numbers, this move may not be sufficient. It is not simply bus travel that is otherwise being hindered, but the 29% of all businesses across Scotland that are based in the Glasgow and Clyde Valley ty Region which generates around 32% of Scotland's Gross Value Added (GVA) and 33% of Scottish jobs <sup>12</sup>.

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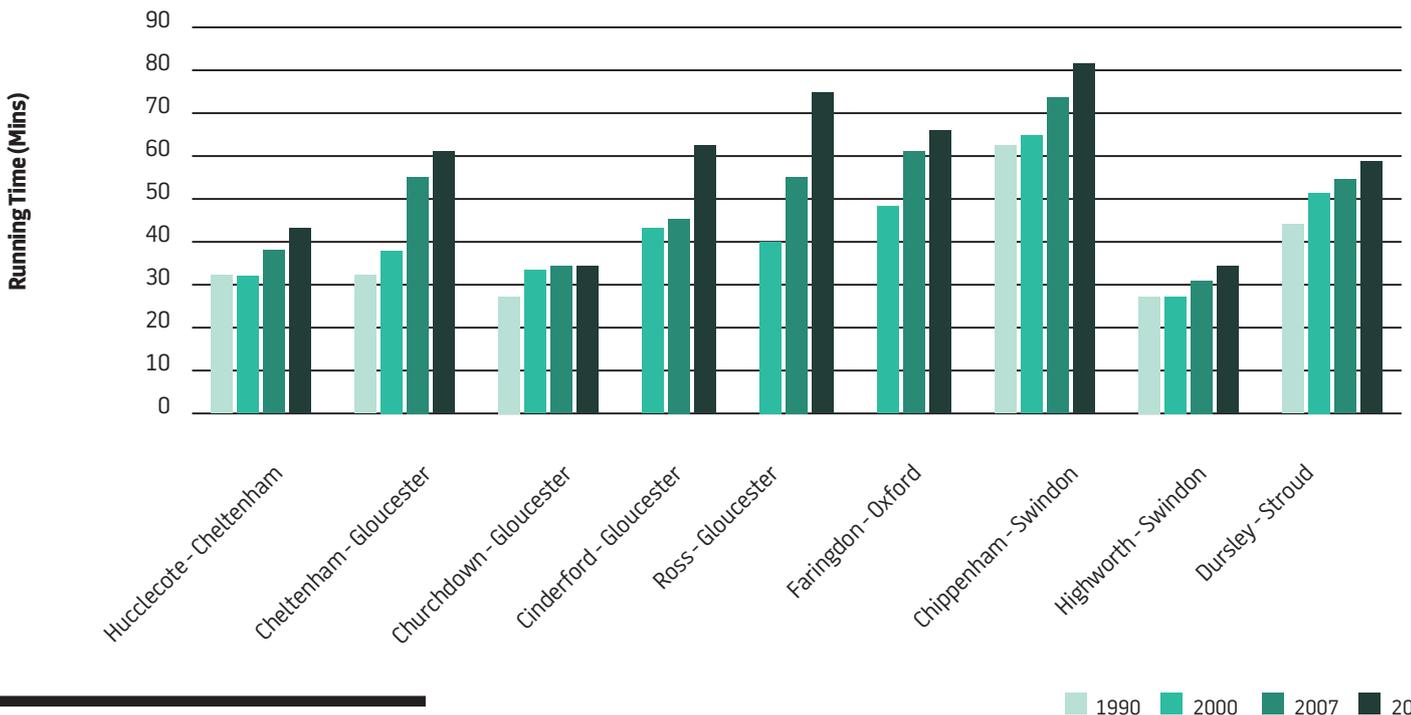
- <sup>1</sup> Understanding Glasgow: The Glasgow Indicators Project
- <sup>2</sup> First Group Application of Undertakings
- <sup>3</sup> Bus Policy: Market Conditions and Outlook, SPT, 2016
- <sup>4</sup> Scotland Census 2011, National Records of Scotland and Scottish Index of Multiple Deprivations 2012, Scottish Government
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- <sup>7</sup> SPT
- <sup>8</sup> [http://europa.eu/rapid/press-release\\_IP-14-154\\_en.htm](http://europa.eu/rapid/press-release_IP-14-154_en.htm)
- <sup>9</sup> [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317141074607](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317141074607), <http://www.foe-scotland.org.uk/node/1821>
- <sup>10</sup> Glasgow City Centre Transport Strategy 2014 – 2024, Glasgow City Council 2015
- <sup>11</sup> SPT – Fastlink Route Performance Report, Oct 2015
- <sup>12</sup> GLASGOW AND CLYDE VALLEY CITY DEAL Renfrewshire Council & Glasgow City Council Airport Access Project Strategic Business Case v1.2

## GLOUCESTERSHIRE

Gloucestershire is a predominantly rural county with a population of 597,000, which has grown by over 32,000 in the last ten years (2001- 2011). Despite being rural, the county is still not immune to the biggest disruptive problem that affect urban bus services – traffic congestion. Specific challenges are around A417 – The ‘Missing Link’; A46 Tewkesbury to M5; A40 to west of River Severn; A40 between Gloucester and Cheltenham; Cheltenham and Gloucester centres. This has led to average bus journey times during the peak between Cheltenham and Gloucester almost doubling since 1990 from 32 minutes to 60 minutes. On some routes, bus journey times have risen by almost 90%<sup>1</sup>. Peak hour journey times in Gloucester have been increasing 20% every decade – the highest increase in the country. This presents a huge obstacle in trying to persuade people to use the bus as a viable alternative to using their cars especially given the bus has to share the same congested highway network with the car.

The county’s congestion levels are aligned with its generally high levels of affluence and high rates of car ownership. The number of non-car households in the county is 17%, which is significantly lower than the national average of 26%. As would be expected from high car ownership, car and van travel is the predominant choice of travel to work in Gloucestershire, with 70% modal share – up from 62% in 2004. While there are over 20 million bus journeys across the county every year, bus travel modal share in Gloucestershire is only 4%. Only the key urban centres of Cheltenham and Gloucester achieve bus modal share comparable with the national average of 7%<sup>2</sup>. Passenger trips by bus have increased in recent years. Despite continued growth between 2003/04 and 2010/11, there was an observed drop in demand in 2011/12<sup>3</sup>. Overall car traffic in Gloucestershire increased by 13% between 2000 and 2015<sup>4</sup>. Commuting modal choice is skewed towards the car by the availability of abundant and cheap parking in the main centres. Between 2006 and 2016, the cost of two hours parking in Gloucester has actually fallen from £2.60 to £2 and has remained the same in Cheltenham at £2.60.

**Gloucestershire Bus Running Times 1990 - 2016**



As is evident from other case studies in this report (particularly West Midlands), there is a clear correlation between the price and availability of car parking and the choice of mode, with the lowest levels of bus use found in those areas that have cheap and plentiful parking.

Car traffic on the A40 (between the M5 J11 and B4063) the strategic corridor between Gloucester and Cheltenham and a key junction on the 94 bus route has increased between 2000 and 2015 by 39%. On this corridor, delay makes up 29-30% of the journey time between the Gloucester and Cheltenham<sup>5</sup>. High levels of in and out commuting flows between the two results in congestion in both peaks. The 94/94U/94X are covered by a voluntary Quality Partnership (QP) agreement, signed in 2004 and renewed in 2009. Service 94 now regularly struggles to match the commitment made by GCC in the 2009 agreement that its maximum end-to-end time should not exceed 50 minutes. Lack of journey time reliability is a key deterrent to people using bus services.

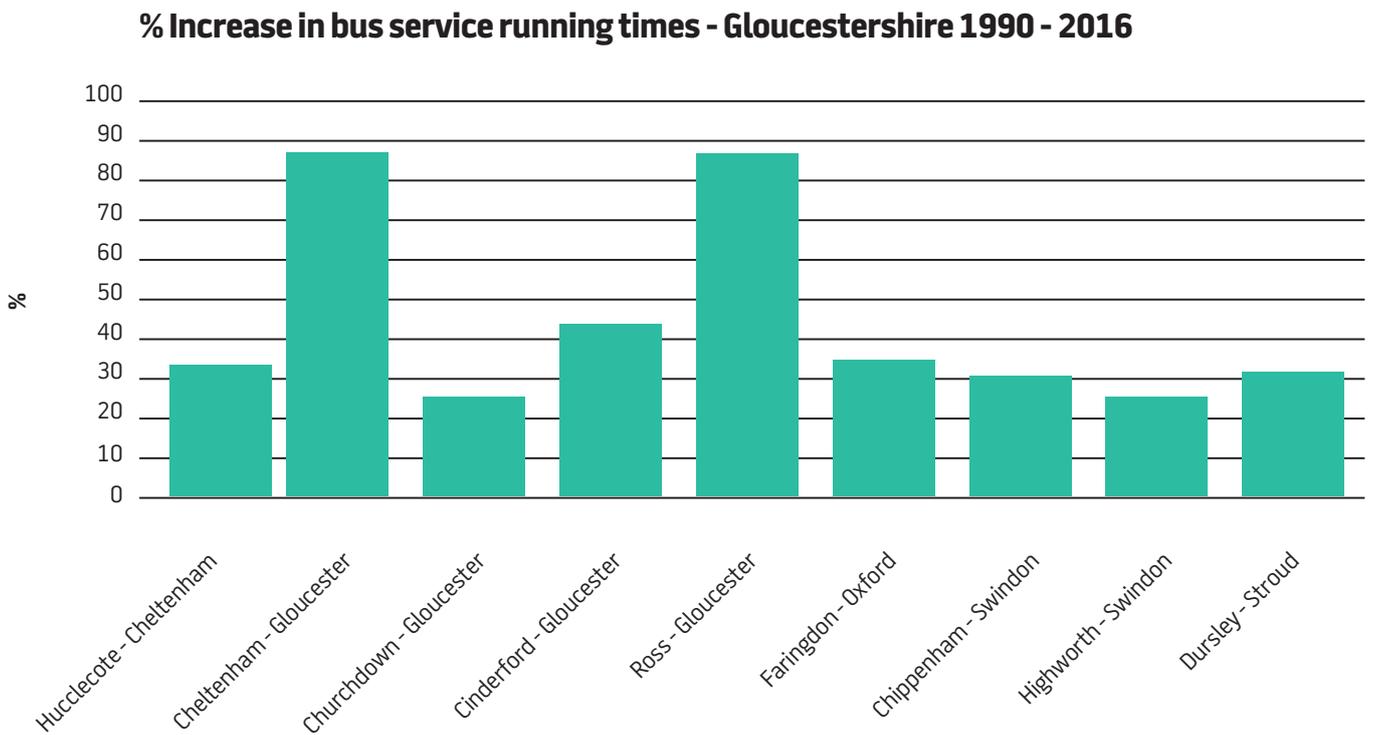
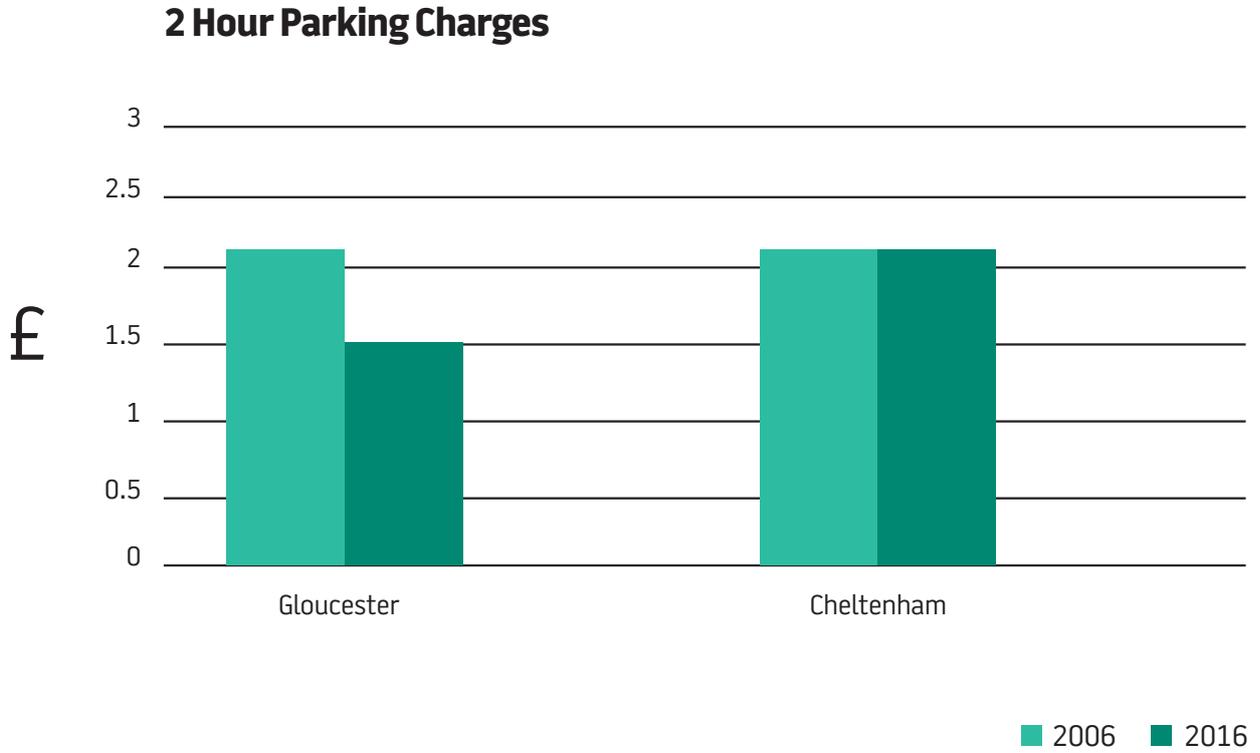
Gloucestershire is self-contained in terms of travel to work with some 88% of the resident population living and working in the county. The main economic hubs for the county – Cheltenham and Gloucester draw in a significant number of commuters which places a considerable strain on the central areas in terms of traffic congestion and pollution and as a result, Air Quality Management Areas have been designated in parts of Gloucester City and throughout the Cheltenham Borough Council area. The position will only worsen if good public transport is not available. Over the period 2012-2031, the population of Gloucestershire is expected to increase by 52,837 people (9%). Population growth will be focused in and around existing urban areas, such as Gloucester City (43% increase) and Cheltenham (21% increase) where already over two thirds of Gloucestershire's residents live. 30,000 houses are planned to be built in the Cheltenham, Gloucester and Tewkesbury area by 2031<sup>6</sup>.

A bus priority scheme to improve journey times along the A40 for public transport users has been submitted to the county's Local Transport Board and the Local Enterprise Partnership for funding by Gloucestershire Council and bus operator Stagecoach West. This will be critical to reducing congestion and pollution problems in the county but it will not be sufficient

on its own. A clear and comprehensive strategy for putting buses at the heart of the transport network with underpinning policies to encourage modal switch and passenger growth must be developed including further bus priority and enforcement, a re-allocation of road space away from the private car, more Park and Ride and stricter parking controls are all essential ingredients. Given the high level of self-containment in terms of travel to work in the county, the Workplace Parking Levy appears to be an obvious lever available to help shift car commuters on to the bus, but even then, without reliable, fast bus routes in to the centre, this will not be possible.

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# GREATER MANCHESTER

Transport for Greater Manchester (TfGM) is delivering the largest contemporary urban public transport investment programme outside London, working closely with district authorities in order to create a world class public transport network in order to achieve world class city status for the city of Manchester. The aims of its public transport network are to increase sustainable travel and reduce car travel, cut congestion, improve the environment and allow communities to flourish. Critically, its public transport system is designed to provide access to jobs and strengthen the Greater Manchester economy – the largest regional economy outside London

Data relating to travel demands to the city centre during the AM Peak period (0730–0930) show that the number of inbound movements that cross the cordon using a car has reduced by 22% (-7,123) over the period between 2006 and 2014 as investments in public transport attracts increasingly greater proportions of commuters.

Its impressive investment programme includes the expansion of Metrolink, major transport interchange facilities and extensive bus priority and busway schemes, investment to boost rail travel, significant cycling, town centre and highways improvements, and evolving integrated travel information systems.

However, traffic congestion on the region's highways has reached such a level that it has begun to seriously affect ridership on non-congesting forms of travel, most critically the bus. Ironically much of the congestion has been caused by disruption from the construction and development of public transport infrastructure designed to strengthen bus operations (and other public transport), which have temporarily reduced or eliminated highway capacity. Coupled with traffic growth of 4% per annum, emergency highways repairs and population (the number of city centre residents grew 177% between 2001 and 2011) and employment growth (district of Manchester has seen a 31% increase in residents of working age between 2010 and 2014), congestion has increased to unprecedented levels. This has produced extremely challenging conditions for bus companies.

According to bus operators, this has resulted in average bus service punctuality over the last two years being reduced by 10 per cent. On the poorest performing days, this can reach 50 or 60 per cent below the regulatory target.

Bus operator data shows that this reduction in punctuality has led to longer journey times (up to 100% longer in the evening peak on cross-city routes and also longer in the mid and late evenings); gaps in service as controllers attempt to reschedule and reallocate resources; increased regulatory risk (3 DVSA investigations over reduced punctuality ongoing); doubling of lost mileage; a 10% increase in customer complaints; an increase in staff overtime payments (up 400% in the last quarter of 2015); and, critically, plans for permanent reductions in peak period service levels.

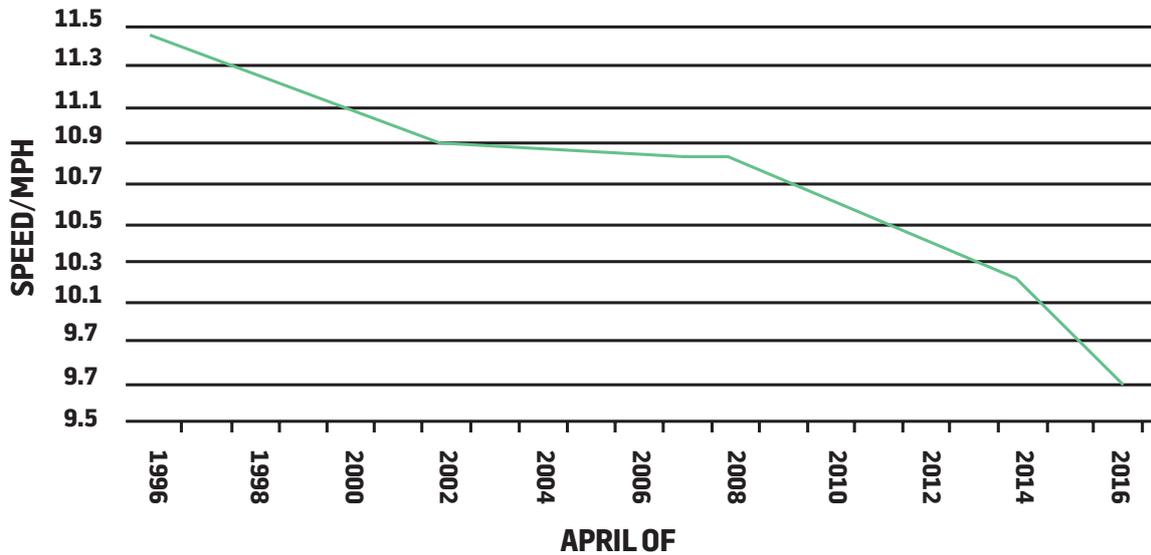
The same data shows additional vehicles have been deployed daily since November 2014, from at least 2 to a peak of 17 between October and December 2015. It is currently 5. Average journey speed has fallen from 11.2 mph in 1996 to 10.2 mph in 2014, and then to 9.7 mph in February 2016.

Several services have observed average peak journey time increases of between 40 and 60 per cent and from January 2016, peak period headways have been widened on several services. 89 timetables have been adjusted for headway or journey time since May 2015.

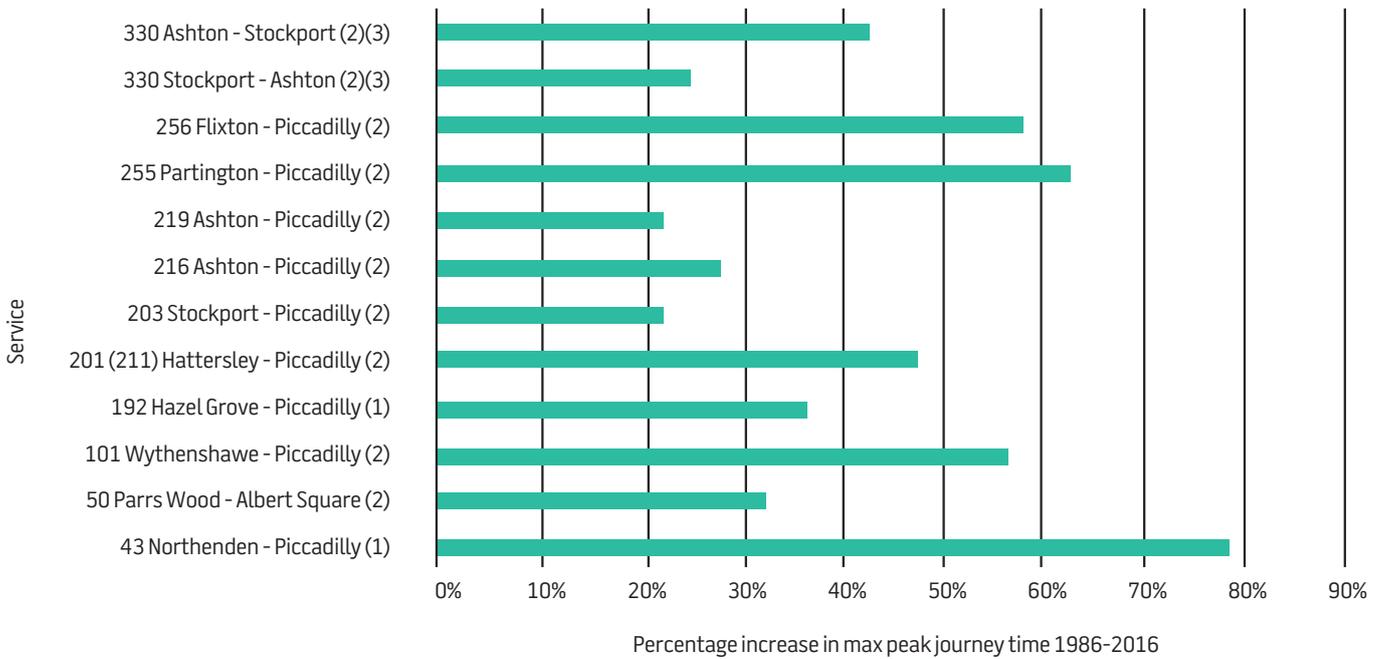
For the services in South Manchester below, Stagecoach have added 42% more PVR's since 1986 due to impact of congestion on running time. Overall 125% more PVR's due to also increasing frequencies.

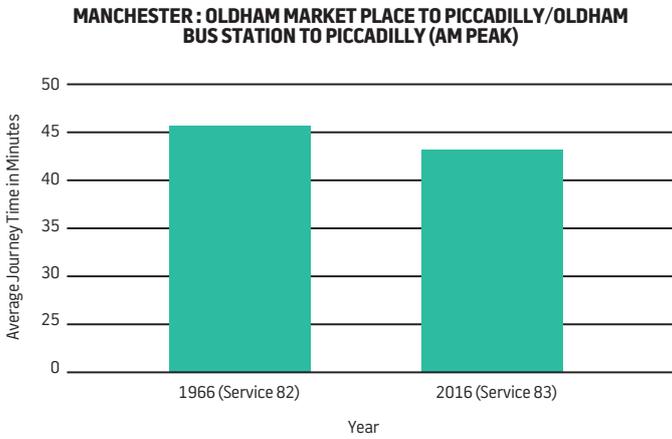
Average mileage is down by 3% year on year (4.5% after allowing for a service enhancement) and critically, passenger numbers are down by 2.4% on year (after allowing for service enhancements). These figures are despite operating hours being up by 0.4% on the year.

## AVERAGE BUS SPEED IN MANCHESTER

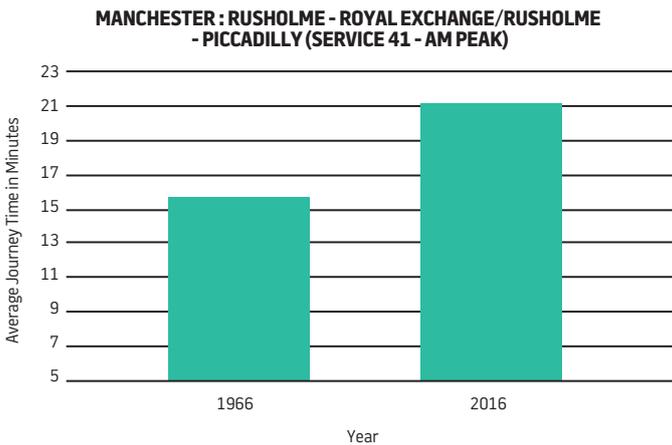


### MANCHESTER MAX PEAK SPEED

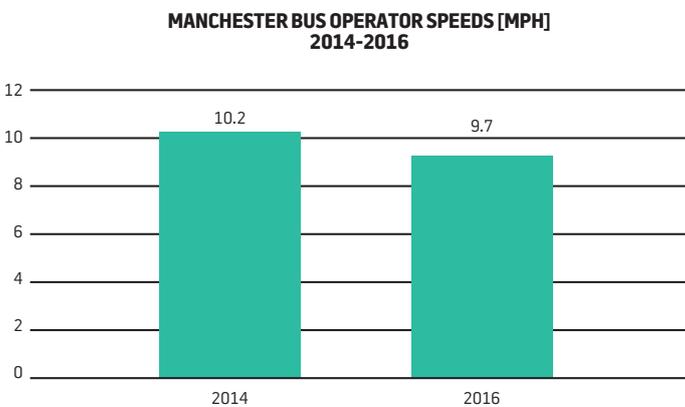




35% increase in journey time. 0.7% p.a.



31% increase in journey time 0.62% p.a.



The long term data shows a decline in bus journey times of between 0.6 and 0.7% per annum from 1966, on the two sections of route, that compared current timetables with historic.

This compares favourably with the UK trend which is nearer 1% per annum decline.

However, it is the dramatic increase in journey times over the last few years which are much more worrying. Data shows how Stagecoach’s average bus speeds decreased by 4.9% between 2014 and 2016, way above the average trend of 1% per annum for the six most congested conurbations.

TfGM publicly recognises that traffic congestion on its highways is a real challenge and is undertaking a broad programme of activity that recognises the role and further potential that buses have in helping meet the challenge of congestion and equally, the effect congestion has had on bus operations across Greater Manchester. In particular, it is recognised that there is limited resilience on key parts of the highway network, and that relatively small increases in demand can cause significant levels of congestion. Hence there is a key role for bus, functioning efficiently within a more integrated public transport network, to attract as much demand as possible thereby helping reduce highway congestion in aggregate.

Based on the success of its £88m Quality Bus Corridors implemented between 1998 and 2008, TfGM showed its continued commitment to bus priority by implementing its £122m Bus Priority Package from 2008 to date. Patronage on its QBC routes had increased by 7.9m journeys (18.6%) between March ‘04 and July ‘08 and the “gap” between car and bus journey times reduced, increasing bus competitiveness. Safety also improved in the location of major QBC schemes with an average reduction in all accidents of 19%; and average bus speed in bus lanes was 25kph, 38% faster than the average speed of 15kph where bus lanes were not provided. The study also showed marginally improved average journey times for general traffic.

These achievements led it to embark on its £122m Bus Priority Package which is one of the largest investments in Greater Manchester’s bus network for decades, with over 25 miles of the network being either created or improved. The investment

will allow cross city bus services to run directly through the heart of Manchester city centre so passengers won't need to change buses. It will also improve accessibility and connectivity between areas in the north and west of Greater Manchester to the Regional Centre and Oxford Road. This includes the North West's first guided busway which opened in April 2016.

In the short term, some disruption during construction phases is inevitable, but close liaison between TfGM with all agencies including bus operators and careful forward planning will hopefully help mitigate the effects. And in the longer term, investments such as the Cross City bus priority schemes confer significant operational and efficiency advantages for bus operations.

Looking ahead, as part of the 2040 Greater Manchester Transport Strategy, assessment is underway of key locations causing bus delays. A long term strategy for bus priority investment is in development, an integral part of the Highway Strategy for Greater Manchester

## HULL

Through a Quality Bus Partnership approach between Hull City Council and the two main bus operators, Stagecoach in Hull and East Yorkshire Motor Services, bus patronage has grown by 30% since 2002/3 with around 26 million bus journeys being taken on the city's combined bus network each year. This represents twice the rate of growth achieved throughout the country during the same time period. This is also the equivalent of cutting more than 3.5m car trips from the city's roads.

Such impressive growth has been the result of improved fares structures; Park and Ride schemes; extensive bus priority; a major new transport interchange; award winning marketing campaigns and the bus lane enforcement scheme.

Despite such a success story, congestion in Hull is a major issue which is impacting significantly on the city's radial routes and the A63 Trunk Road Corridor. The latest research by 'Tom Tom' identifies that Hull is the sixth most congested city in the UK.

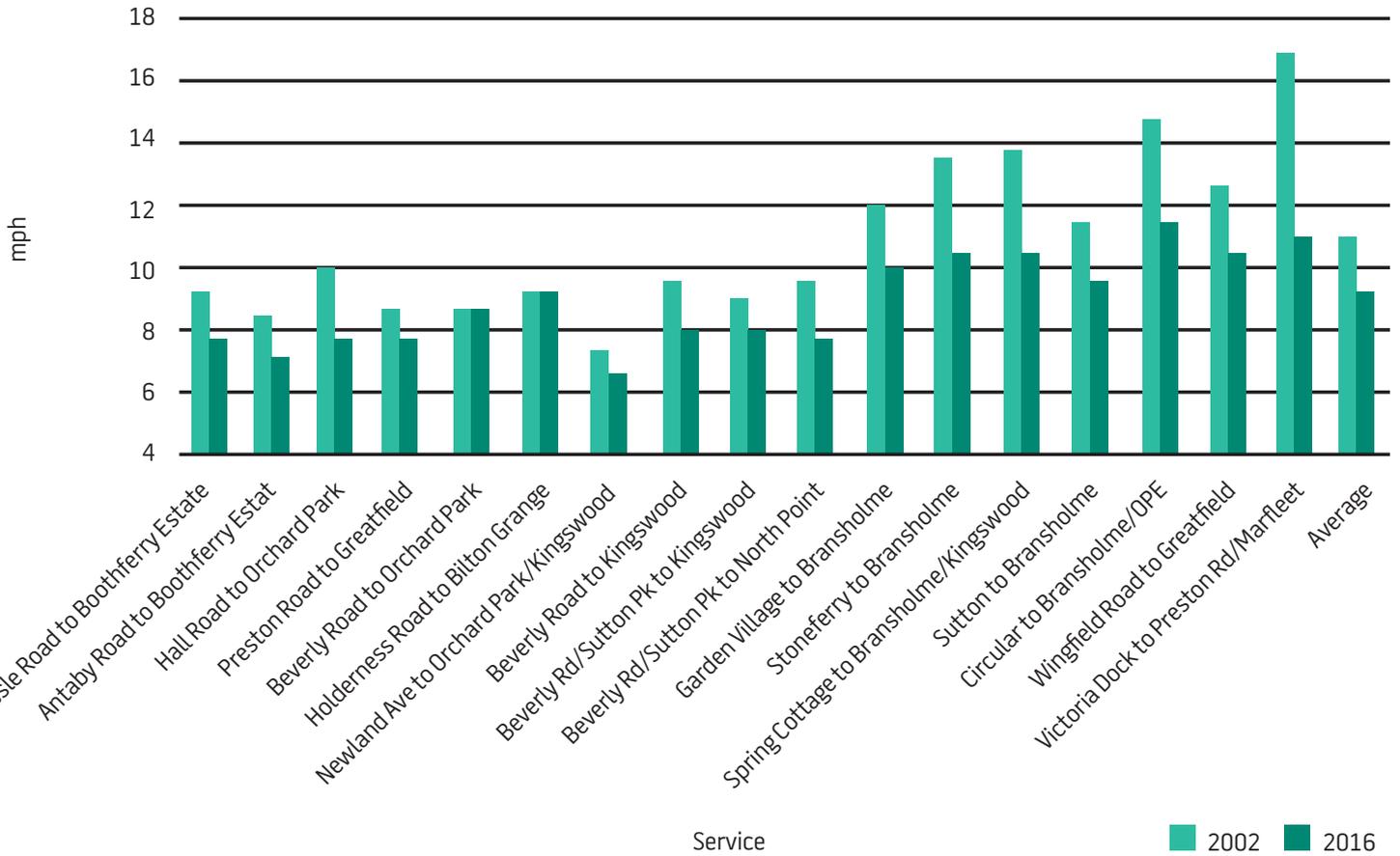
There are a number of factors behind the severity of congestion levels. Car ownership and car use in Hull is growing. The city's role as a strategic port and a 'gateway to Europe' creates additional traffic which has to pass through the city centre to access and depart from the docks on the eastern side of the city, making the A63 trunk road the most congested part of the local road network. The reduction in Humber Bridge tolls led to a 25% increase in traffic with most vehicles going in to Hull on the A63.

According to the Tom Tom study, journey times on Hull's roads are on average 33% slower than they would be in free flowing traffic. According to the Department for Transport's Average Delay on Local A Roads 2014, Hull experienced an average delay of between 60 to 90 seconds per vehicle mile which it categorizes as high levels of delay. DfT statistics show that between December 2014 and December 2015, the average speed on local roads during the weekday AM peak fell from 16.7 mph to 16.1 mph. It also shows that during the last quarter of 2015 alone, speeds fell by 1.3%.

Inevitably, Hull's congestion problem has had an adverse impact on buses. Additional buses have been added to the network simply to increase bus running times to reflect lower traffic speeds and the effect of traffic congestion. Bus operator data has quantified the effect of increased congestion by recreating and comparing the resources that would have been required to run today's service levels using 2002/3 bus running times and schedules. Bus speeds have slowed from 10.8 mph to 9.1mph and the current network could be operated with 15% fewer buses in the traffic conditions experienced in 2002/3.

The city council and in particular Councillor Martin Mancey, has continued to be supportive of pro bus measures and public transport in general, which it has voiced as being the only solution to reducing some of the congestion in the city, and regularly encourages people to switch from using their cars to non-congesting modes. However, budget cuts are now biting, with the council unable to afford to submit the planning application for an additional park and ride. Given the city's strategic role as an international trading route, a continued rise in congestion is not only going to continue to negatively impact local bus services but on both the local and national economies.

### HULL BUS SPEEDS BY ROUTE



## LONDON

In London bus speeds have been declining faster than anywhere in the UK over the last few years. This comes after decades of relative success in protecting bus passengers from traffic congestion through effective bus priority measures, such as red routes and other initiatives, and the central congestion charging zone introduced in 2003. If the average urban bus speed in the UK has historically been decreasing by almost 1% p.a., then for one-third of London bus routes the decline been more than five times this average over the past year. This has become a crisis for the capital and something the new mayor must prioritise. London, which for more than a decade has been the UK's bus success story, with passenger numbers doubling

since the formation of TfL in 2000, is now facing the fastest decline in bus use anywhere in the UK.

There is a key lesson to be learned from this. You can get all the other ingredients right: modern bus fleet, cashless buses with the most advanced smartcard ticketing system in the world, a level of integration which is the envy of other UK cities, state-of-the-art passenger information at the bus stop and on mobile devices. Add to this population and employment growth and you should have a recipe for the London bus success story continuing. But all these laudable ingredients cannot offset the rapid deterioration in bus journey times.

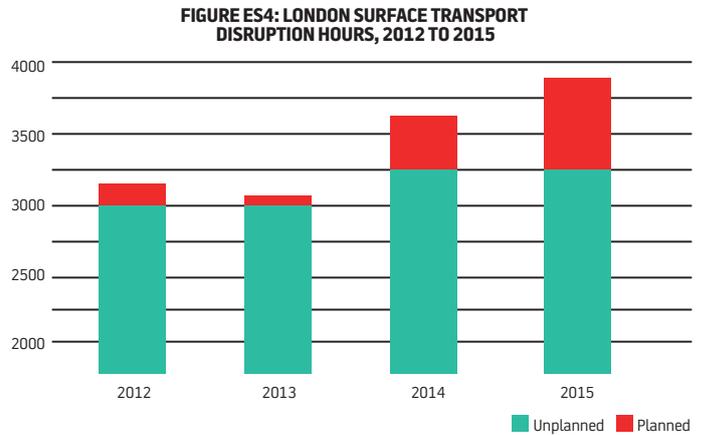
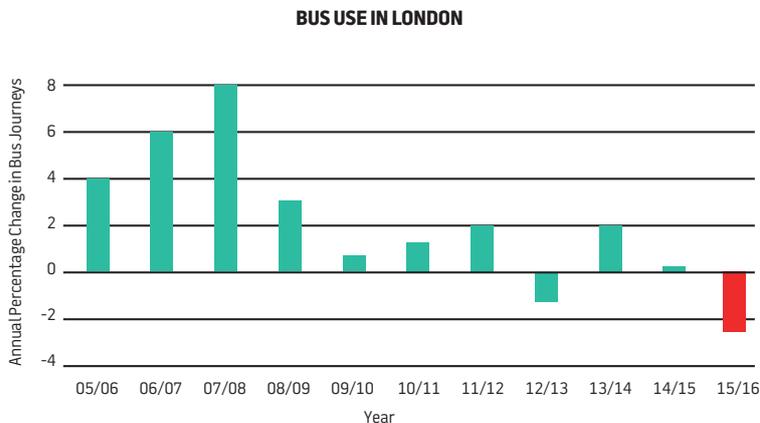
Boris Johnson was right to warn that his successor will have to use tougher congestion charging measures to tackle London's

growth in congestion, but it's a pity he did not take action on his watch. When his term as London Mayor ended, Boris Johnson warned his successor that he will have to take action to cut traffic volumes by increasing the congestion charge. However, this solution has resulted from the decisions he took during his eight years in office. He exacerbated the problem by removing the western extension of the congestion zone and by reducing road capacity in central London by 25% on key routes through the introduction of cycle superhighways – without taking action to curtail traffic in central London. Both decisions were taken against the advice of TfL.

London Buses have undoubtedly been one of the Capital's success stories, however, recent growth in traffic and congestion over the last few years have undermined bus speeds and reliability to the degree that buses are now facing a crisis.

The historic pattern of slowly declining patronage was dramatically reversed in the late 1990s to one of strong growth. Over the 13 years from 2000/01 to 2013/14, the number of bus journey stages in London increased by 59.9 per cent, and passenger-kilometres grew by 73.8 per cent. More than half of all bus journeys taken in England are made in London.

However, this upward trend in bus patronage levelled off in recent years and over the period between 2014/15 and 2015/16, patronage actually declined by 71 million journeys which represent a decline of 3% year on year



**ref: Inrix London Congestion trends May 2016.**

The primary cause of this significant decline in patronage is the increased road congestion caused by London's population growth and the construction of major highway and urban improvement schemes which has led to severe pressure on the road network. This has caused such a deterioration in traffic speeds and bus network reliability that frustrated passengers have stopped using the bus as much as they would have previously.

While levels of road traffic had been falling for much of the last decade, they have increased for the last few years. Car driver trips increased by 1.2 per cent in 2014, the first increase since 2009. During 2014, traffic volumes started to increase in all parts of London – by 3.4 per cent in central London, 1.4 per cent in inner London, and 1.9 per cent in outer London (1.8 per cent at the Greater London level), relative to 2013.

Congestion, as always, is caused by demand exceeding supply. What is interesting about the recent sharp rise in congestion in central London – increasing by 12% per annum since 2012(Inrix London congestion trends May 2016) is that it is mainly a supply side problem. Demand for road space has remained relatively flat, with the growth in LGV's and private hire being largely offset by a decline in car traffic. It is the substantial reduction in road space, with planned roadworks increasing by 362% over the last 3 years, which has led to significant increases in congestion. It is to be hoped that many of the road closures are temporary with major capital works such as Crossrail and Cycle Superhighways reducing available road space.

The knock on effect for buses in London is that bus speeds have declined faster than anywhere in the UK over the last few years. This comes on the back of decades of relative success in protecting bus passengers from traffic congestion through effective bus priority measures, such as red routes and other initiatives, and the introduction of the central Congestion Charging Zone (CCZ) in 2003. Speeds increased by 14.6% (comparing speeds 3 months before to 3 months after) in the CCZ following the introduction of the charge, however, since 2004 bus speeds in London have been gradually decreasing to below pre congestion-charging levels. Bus operations have suffered as a result. Bus kms lost for traffic reasons rose from 1.8% in 2012/2013 to 2% in 2014/15 and average excess waiting time (mins) on high frequency services rose from 1.02mins to 1.09mins.

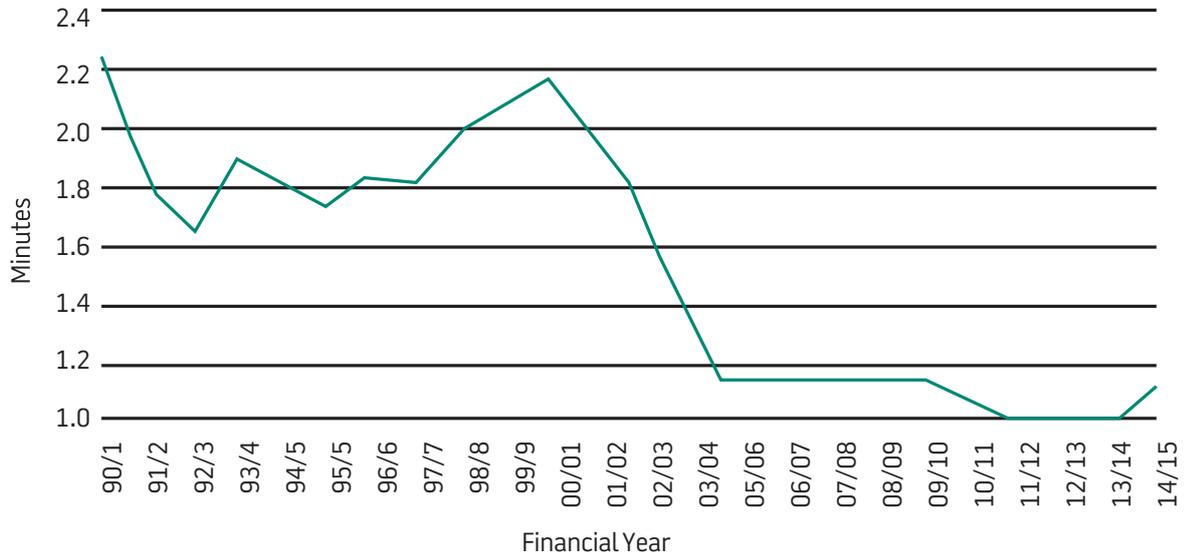
London Buses have already become the butt of media jokes in the media with speeds being compared unfavourably with a donkey (ref Sun) and a chicken (ref Hackney Advertiser). Some of these media comparisons on journey times in London are worst case scenarios and made in a jovial manner. While bus speeds in London have fallen dramatically in recent years they provide an insight into where the trends are taking us in the rest of the country unless radical action is taken especially given that congestion in inner London is projected to rise by 25% and in outer London by 15% by 2031.

London has led the world on cashless buses, which have had a dramatic impact on reducing dwell time at bus stops. The 0.5 seconds per transaction on London buses is unrivalled anywhere in the world. Dwell time has been cut by at least half. Transport for London believes that the total run time of buses has been reduced by about 7-10%.

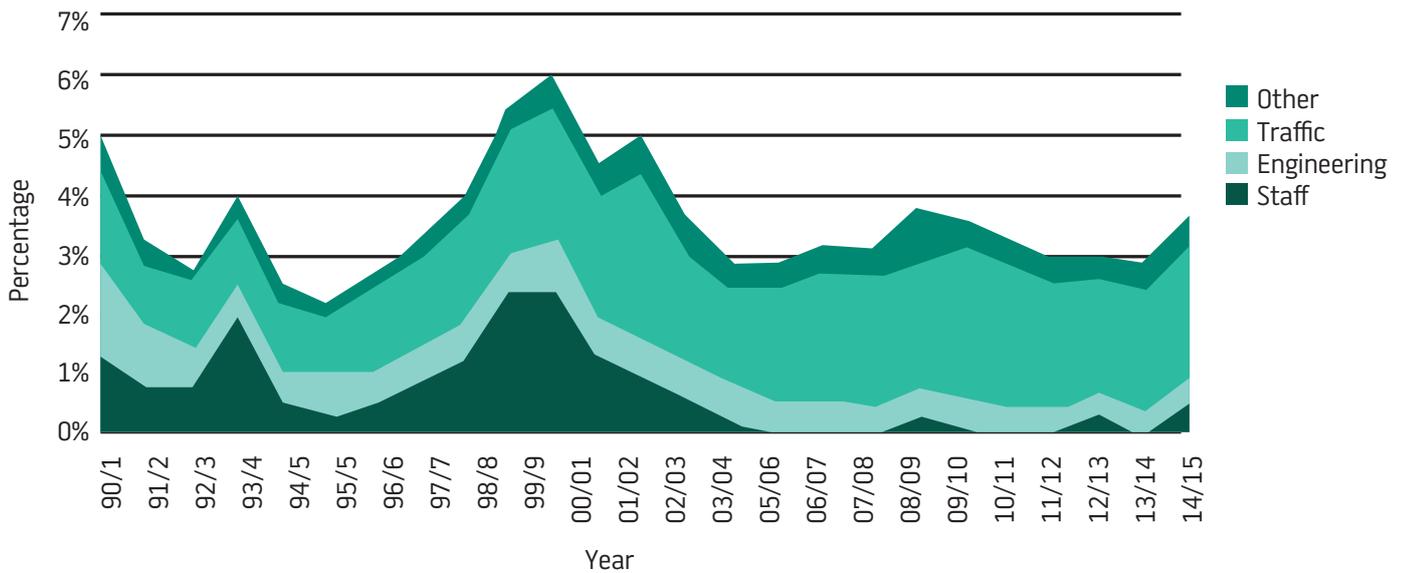
Most of the operating cost of buses is directly driven by run time, so that translates into a straight saving of some £120-180m annually. This dwarfs the one-off cost of introducing Oyster (£50m) and contactless (£68m).

If London-style cashless buses and contactless payments could be extended to the rest of the UK, bus journey times would improve by up to 10% by halving dwell time at bus stops.

### EXCESS WAITING TIME FOR HIGH FREQUENCY BUS SERVICES



### LOST KILOMETRES BY CAUSE

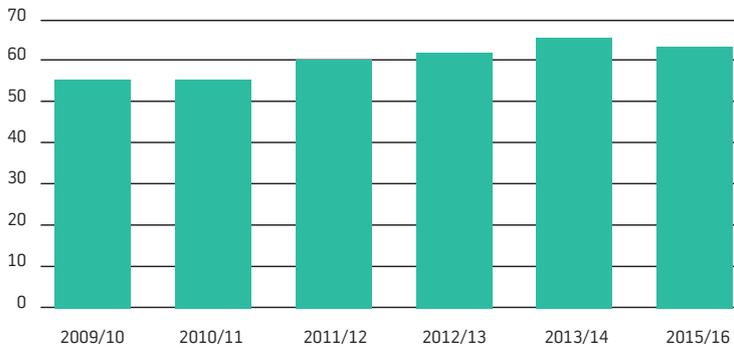


# OXFORD

Buses have long been at the heart of transport policy in Oxfordshire with pro-bus policies pursued by local authorities stretching back to the 1970s with the World first Park and Ride system; bus priority on the main radial routes in to the city and city centre; parking controls and pedestrianisation; bus gates, buses only and bus and access vehicles only in the city centre during the daytime; a segregated bus stopping area; junction improvements to assist buses in entering the main flow of traffic; the use of SCOOT traffic signal controls to give buses priority at signalised junctions; bus lanes on trunk roads; and a multi bus operator smartcard scheme ('Oxford Smartzone').

This comprehensive, long-term approach to buses helps explain why it has one of the highest levels of bus use in the UK with around 50% of all journeys in and around the city made by bus<sup>1</sup> and modal share towards public transport increasing over recent years. Unlike the national trend, bus

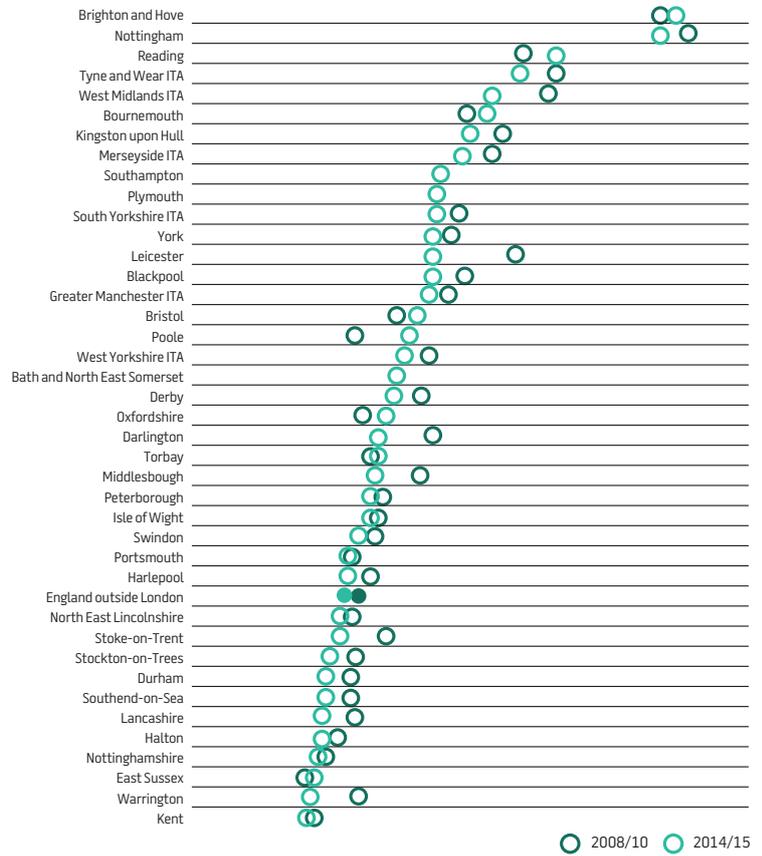
**Passenger Journeys on Local Bus Services Per Head: Oxfordshire**



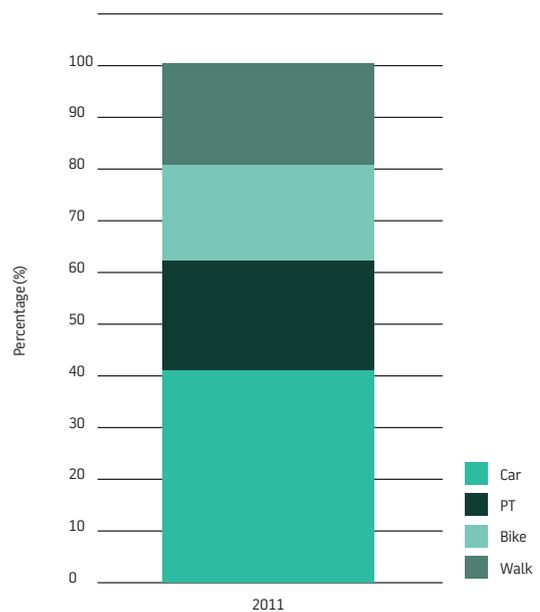
use between 2009 and 2014 increased by 14%<sup>2</sup>. The success of buses in Oxfordshire is also thanks to a consistent history of partnership between local authorities and operators. Quality Bus Partnerships were entered into in 1998 and this partnership was updated and superseded by an agreement in 2006.

Buses in Oxford, however, eventually became a victim of their own success and were seen as a major contributor to congestion and air pollution in the city centre. The need to reduce both bus volumes and their emissions therefore became a major concern for Oxfordshire County Council over the last decade. The two major operators (Stagecoach and the

**Local Bus Use per Head by Local Authority 2009/10 - 2014/15**



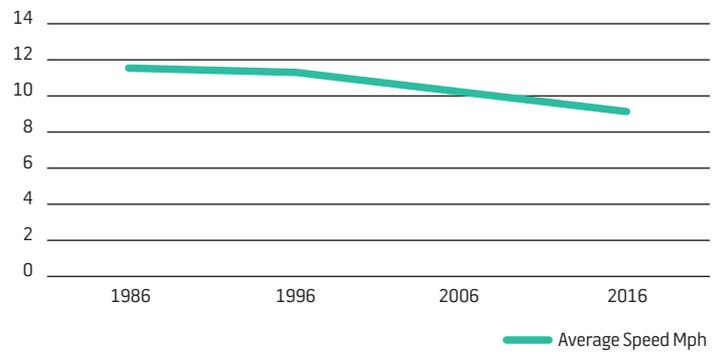
**Oxford Modal Split (Based on 2011 Census)**



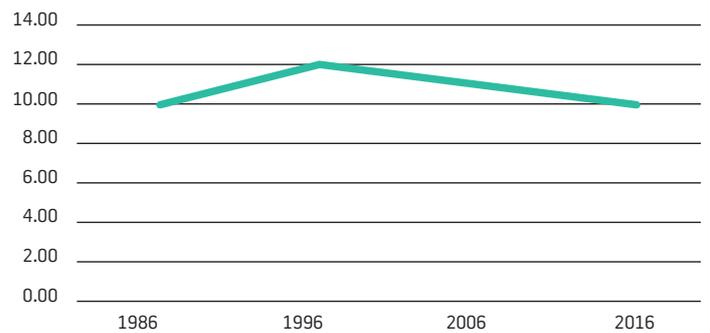
Oxford Bus Company) responded positively to this challenge by proposing an agreement between them to reduce the number of buses by up to 25% on heavily trafficked radials and environmentally sensitive streets in central Oxford and mitigating the resulting effect on passengers by co-ordinating timetables and stopping patterns to increase frequency and switching from single deckers to double deckers to maintain capacity. An interoperable smartcard ticketing scheme ('Oxford Smartzone') was also introduced alongside their own separate commercial offers. Running fewer, fuller buses had a dramatic effect on reducing CO<sub>2</sub> and other emissions per passenger which, coupled with the introduction of the Oxford Low Emission Zone in 2014 which requires all buses to meet Euro 5 standard or higher, has made a positive contribution to air quality. Passenger Focus commissioned market research on the cross-operator smartcard amongst bus users in Oxford in 2013 which indicated a very positive passenger response. More than a quarter of smartcard holders claimed to use the bus more than they did before they had a smartcard and found that three million more people were getting on the bus because of the smartcard. Between 2011 and 2013, there was an 8% upsurge in bus passengers. However, one effect of running fewer vehicles with the same (or even more) passengers is that each vehicle has had to pick up and set down more passengers, so the dwell time at bus stops has increased. This has been particularly pronounced on the Kidlington route, where bus numbers were initially halved which caused a drop in overall bus speeds on the route.

Oxfordshire County Council's rejection of road building and a successful focus on buses is explained in part by the sensitive nature of the city's medieval built environment and the constraints which this imposed on expanding road capacity and parking supply. The effect of the adopted approach has meant that despite Oxford's population rising at an unprecedented rate in recent years (+14% between 2001 and 2013) and the additional travel demand generated by this growth, the city has been able to develop without year on year rises in traffic levels<sup>3</sup>. In turn, this has meant the effect of congestion on bus speeds has been more contained than in other areas, with bus speeds experiencing a lower annual drop of 0.5% in bus speeds compared to the national average of around 1% decline year on year.

**Oxford Average Bus Speed 1986-2016**



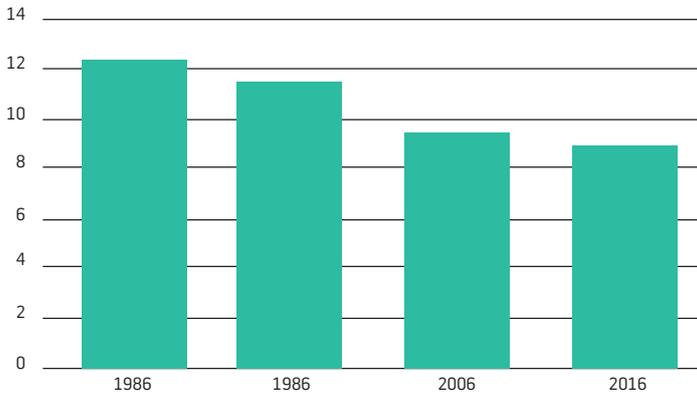
**Bus Speeds (Mph) 1986-2016 Oxford - Abingdon Corridor**



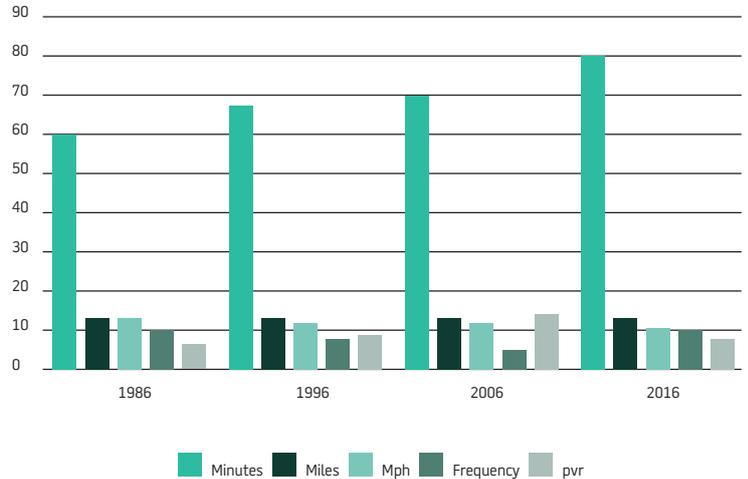
However, peak period congestion remains a persistent problem, with traffic building at bottlenecks which has an inevitably negative effect on bus speeds and service operation. Part of the reason for peak congestion has been the level of road works over the last three years, which inevitably caused delays. On some corridors like Barton to the City Centre, speeds have fallen by almost 15% and the number 10 route in Cowley has seen the number of buses serving it doubled from six to 12 to ensure it remained frequent enough. When the road works are completed, there should be improved flow for buses as well as more bus priority on junctions where new controls have been put in.

Whilst the modal share for public transport for trips to the city has increased steadily in recent years, travel by car remains the dominant form of transport to all destinations other than the city centre. Over the last fifteen years, car commuter trips have risen by 25% (Oxfordshire County Council).

Bus Speeds (mph) Barton - City Centre - Barton



Kidlington - City Centre - Kidlington



With existing congestion already requiring extensive engineering solutions to junctions on the ring-road, the predicted growth of homes and jobs in Oxford and throughout the county will only exacerbate the problem. It is estimated that job growth within and outside Oxford, could result in 26,000 additional journeys within the city boundary by 2031 – a 25% increase from 2011. Initial estimates suggest that, without improvements to the transport network and changes of travel behaviour, this could result in approximately 13,000 more commuter car trips each day. Local Plans’ pre-SHMA housing allocations in Oxfordshire are forecast to result in a 16% increase in traffic on Oxford’s radial roads and 21% on the ring road in peak hours. By 2031, the impact of the resulting congestion is forecast to result in a loss of around £150 million from the economy of the city<sup>4</sup>. Car journey times from the surrounding Oxfordshire towns are anticipated to increase on average by 18% to the city centre and 14% to Headington<sup>5</sup>. More demand also means more buses, with the number of vehicles entering the city centre set to grow by over 40% if left un-checked, putting substantial strain on the historic core. Increased traffic will impact on local communities, and longer journey times will make it more difficult to reach jobs and services.

The journey to work remains the most significant challenge for the transport network, and increasingly this involves people travelling in from outside the city. More jobs which require a commutable journey in Oxford are now held by those living outside the city (45,750) than those living within it (42,406). Commuters who travel from outside of Oxford are typically far

more car dependent and the total number of car commuting trips rose by 9% between 2001 and 2011<sup>6</sup>. Trips to work by public transport have increased for those travelling from outside, but at far more modest levels. As part of the Council’s new Local Transport Plan (LTP) 4, the issue of bus speeds is being addressed, with the concept of rapid transit lines across the city being planned. The Council is continuing to move in the right direction with Oxford’s biggest Local Growth Fund (LGF) project being a £40million pound bus priority project including dedicated lanes and junction priority into and out of Oxford along the A40 to and from Eynsham and Witney. It is set to be delivered by 2019/20.

The challenge for the Council is to continue their efforts to mitigate the effect of growing car use and road congestion on bus speeds and service operation, and for operators to ensure that ticketing technology choices reduces dwell times, so that public transport is able to continue to attract new users and shift people away from their cars and on to buses as they have so successfully done in the past. This is a challenging prospect given the large growth forecasts but lack of car restraint (as is present in the London context). Therefore the Council may now need to look beyond simple bus measures, and consider the introduction of a policy tool that has worked so well for another UK city with excellent public transport mode share - Nottingham and its successful Workplace Parking Levy, which appears to be more politically palatable than road pricing.

**REFERENCES**

- <sup>1</sup> Oxfordshire County Council Local Transport Plan 4: 2015-2031
- <sup>2</sup> DfT Bus Statistics: Passenger journeys on local bus services per head by local authority: England, from 2009/10
- <sup>3</sup> Oxfordshire County Council Local Transport Plan 4: 2015-2031
- <sup>4</sup> Oxfordshire County Council Local Transport Plan 4: 2015-2031
- <sup>5</sup> Oxfordshire County Council Local Transport Plan 4: 2015-2031
- <sup>6</sup> Oxfordshire County Council Local Transport Plan 4: 2015-2031

**WEST MIDLANDS**

The West Midlands region is still suffering from a policy approach in the 1960’s which prioritised road building and car use over more sustainable modes of transport such as bus, rail, walking and cycling. It is notable that cities with a higher public transport mode share have thriving, prosperous and successful economies. Large European towns such as Munich, Stuttgart and Dusseldorf have levels of car use of between 35-45% while in the West Midlands Metropolitan Area, cars typically account for 63% of all journeys<sup>1</sup>. In the UK, successful local economies (measured by GDP per capita) like London, Edinburgh, Oxford, Brighton and Cambridge all have lower car modal share. The reason why cities with low car modal share and high public transport share are the most economically successful is that public transport is a far more efficient mover of people along finite road space than the car which only has an average occupancy of 1.2 people per vehicle. The focus needs to be on moving people rather than vehicles.

Against this weak planning and transport legacy, local authorities, Transport for West Midlands (TfWM) and the largest local bus operator, NX (operates 80% of bus mileage which accounts for almost 90% of bus journeys), have worked hard to improve the region’s bus services through focussed route improvements, network reviews and customer research to deliver improved information, cleaning, ticketing, interchange, easy to understand bus networks, low carbon technology, new buses and bus priority. This partnership has delivered some notable success stories in bus travel (which are outlined later).

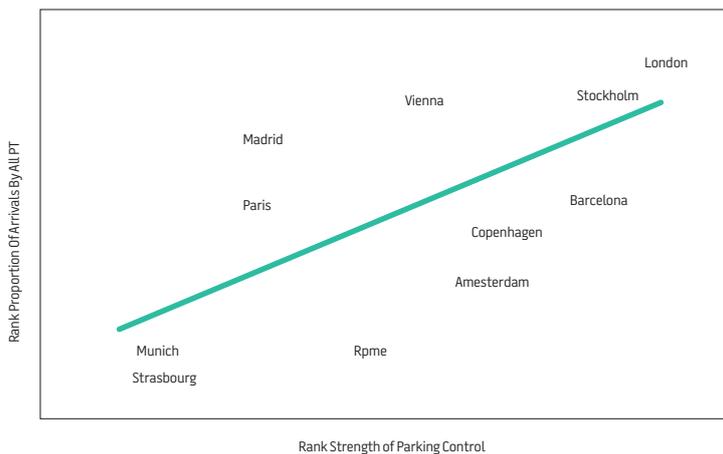
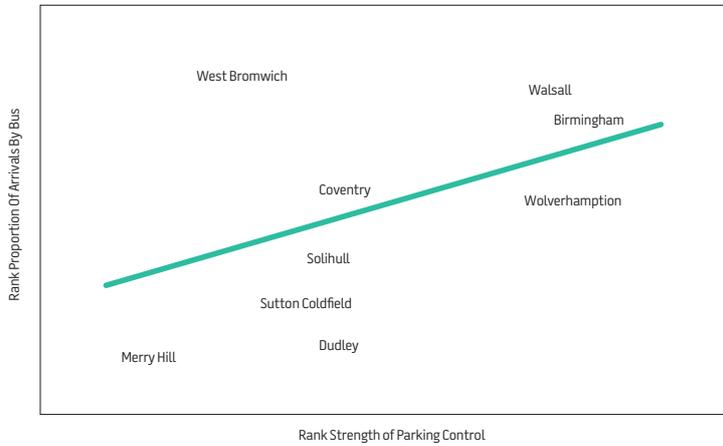
According to KPMG, every £1 spent on bus lanes or bus priority measures creates over £7 in economic benefits, whilst conversely the increased in car use will generate dangerously high levels of air pollution<sup>2</sup>. The latest partnership deal with National Express will see a positive effect on the region’s air quality given the agreement to make 80% of its bus fleet Euro

Centres of:	AM Peak Arrivals	Parking Controls		Proportion Arriving By Bus
		Spaces Per Arrival	First Hour Charge	
Birmingham	93,974	0.7	£0.89	27%
Brierley Hill	12,174	5.4	£0	13%
Coventry	38,543	0.5	£0.57	19%
Dudley	24,686	0.3	£0.29	15%
Solihull	19,804	1.6	£0.99	17%
Sutton Coldfield	16,708	0.7	£0.41	17%
Walsall	16,845	0.4	£0.67	30%
West Bromwich	11,069	0.8	£0.24	32%
Wolverhampton	30,757	0.3	£0.79	27%

5 and 6 within three years, thus massively reducing NOx. All new buses will be Euro 6 - the very highest rating possible – which all-but-eliminates NOx and particulates. Large scale car parking provision would have a hugely negative impact on the demand for bus services as Transport for West Midlands’s (TfWM) table below shows:

The more pronounced local parking controls are, the better the bus mode share. Conversely, the more generous the parking provision, the less likely the bus will be used as the mode of travel and the more likely the private car will be used thus increasing the levels of congestion on routes accessing the city as well as the level of congestion within the central area of the city. According to Europe’s Parking U-turn, ITDP 2011, 50% of traffic jams are simply cars looking for a parking space.

The charts below illustrate this point with Merry Hill in the West Midlands. Low levels of parking control make it easy to park and result in the lowest levels of bus use in TfWM’s study.



Walsall and Birmingham on the other hand, where stricter parking controls are in place, enjoy far higher bus modal share. This relationship is mirrored across European capital cities whereby Stockholm and Barcelona’s strict parking policies have produced the highest levels of bus use. The same is true for London where bus travel is seen as one of the biggest success stories of its transport network.

Not only does bus priority and bus lanes remove buses from normal traffic so they are not slowed down by the vehicles stopping to pick up passengers, but as evidenced later in this case study, they also speed up bus service journey times and improves reliability which are key attributes when trying to encourage people to switch from their cars to using the bus. Such modal shift will be critical if the region is to combat congestion which is a threat to its growing economy. Indeed,

41% of journeys under 2 miles in the West Midlands are by car (compared with 38% in the UK)<sup>3</sup> so there is clearly scope to shift car journeys on to sustainable means thereby helping to reduce congestion.

Inrix’s 2015 survey of traffic conditions ranked Greater Birmingham as the fifth most congested metropolitan area in England. Tom Tom’s 2015 Traffic Index shows that the UK city that has recorded the largest overall growth in congestion is Coventry – up 67% since 2008 compared to the national average of 29%. Inrix’s Traffic Scorecard 2015 found the biggest increases in congestion was seen in Coventry (+33%) and North Staffordshire (+37%). Some of Coventry’s congestion is due to a plethora of major road works over the last four years The Midlands Connect study<sup>4</sup> shows that road connections into and across the Birmingham area perform worst in terms of congestion with a number of routes with speeds of more than 15% worse than average road speeds. For example, Brierly Hill/Dudley to Birmingham, Walsall to Hub@UKC (Solihull), West Bromwich to Birmingham, Wolverhampton to Walsall, Wolverhampton to Birmingham, , Wolverhampton to Hub@UKC (Solihull), Cannock to Birmingham. Car use in West Midlands Metropolitan Area typically accounts for 63% of all journeys while other large European towns like Munich, Stuttgart and Dusseldorf – thriving, prosperous, attractive cities - have lower levels of car use of between 35-45%.

This level of traffic congestion is already having a negative effect on bus services through its impact on bus speeds. Despite steady improvement to the bus network, Route 126 Birmingham to Wolverhampton via Dudley has seen its average bus speeds drop by 20% from 16.9km/hr in 1987 to 13.5km/hr

in 2015. In 1987 the return journey time was 160 minutes with 16 buses needed to provide a ten minute frequency. By 2015, the journey time had risen by 25% to 200 minutes with 20 buses needed to maintain a ten minute frequency.

Bus operator data shows that average bus speeds in Birmingham fell by 6% between 2010 and 2016 and average bus speeds across the West Midlands region fell by almost 5% across the same period.

With dwell times accounting for up to 40% of journey times in urban areas, it is crucial that bus operators introduce smart card and contact payments as quickly as possible. National Express have amongst the most ambitious plans in the sector on this front. It has begun the process of fitting contactless payment devices so that bus fares can be paid using bank cards, smartphones, swift cards and smartwatches which the operator hopes will reduce overall bus journey times by around 10% by halving dwell times at bus stops. This smart ticketing programme will also will allow smart ticketing on any bus, train or tram. However, this alone will not be enough to stave off the increasing decline of bus speeds caused by overall traffic congestion, especially given the projected rise in population and car use.

The population of the West Midlands is forecast to grow by 500,000 people between 2014 and 2035 – the size of Liverpool - while travel demand is forecast to increase by 22% over the next 20 years. Combined with a long term trend for longer journeys this has culminated in a forecasted 34% increase in the number of car kilometres which is an extra 1.2 million extra car journeys per weekday (the equivalent to the amount of traffic carried by ten 3-lane motorways). Car ownership is also projected to increase with 77% of households having access to a car in 2015 compared with the projected 81% in 2035. In this context, it will be vital to further develop a climate conducive to the development of public transport, such as the provision of more bus lanes and priority measures, tighter parking controls, pro-active marketing and smarter

choices programmes as well as rolling out smarter ticketing. It may be that cities and large towns across the West Midlands will have to eventually embrace more radical car restraint policies such as the Workplace Parking Levy, which has worked so well in Nottingham.

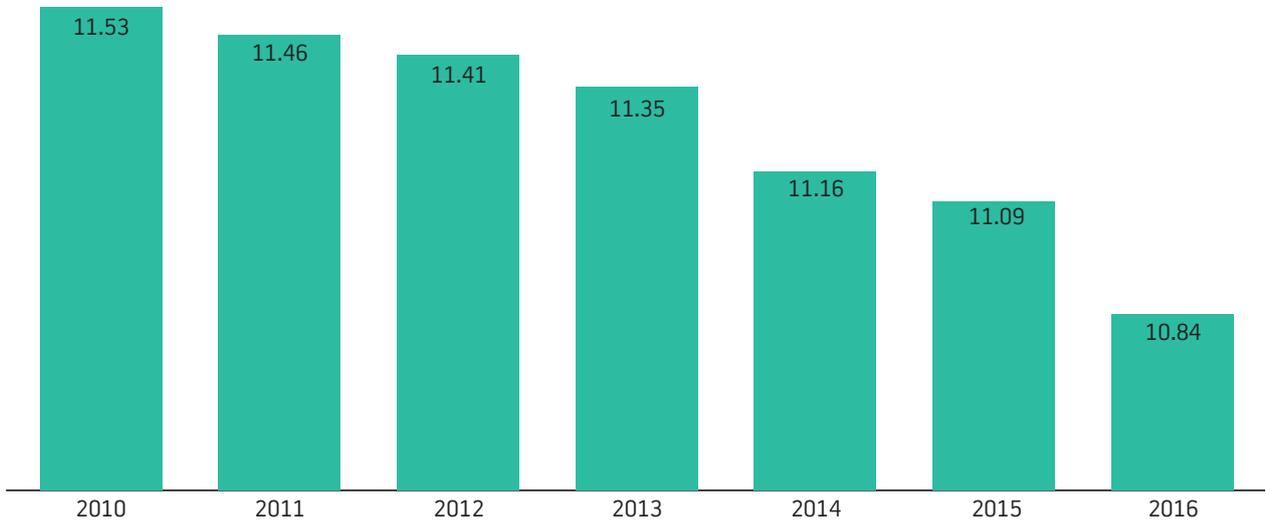
There is a good platform for bus travel to build on across the region with the partnership between bus operators, local authorities and TfWM having greatly improved services over time, particularly on routes where pro-bus interventions have been made. The West Midlands Showcase concept was to enhance the quality and reliability of key bus services through bus priority and highway improvements. Line 33 Birmingham to Pheasey was the first Showcase scheme to be introduced in 1997 and resulted in buses arriving within one minute of the scheduled time during morning rush hour. The impacts of the showcase measures vary between routes but they have increased bus patronage between 10-30% and a 5% of bus patronage mode shift from the car<sup>6</sup>. Line 33 for example saw patronage growth of almost 29% and a 2% decrease in journey times in the AM peak and a 6% reduction in the PM peak<sup>7</sup>. On Showcase routes in Walsall and Coventry, the average interval between buses was reduced and the number of cancellations fell significantly. Service 560 in the Wolverhampton to Bloxwich corridor, punctuality increased from 83% to 91% following Showcase investment and on route 67, 94% of departures met the target compared with 87% pre-Showcase<sup>8</sup>.

Launched in 2004, Primeline was another partnership project between local authorities, bus operators and TfWM to improve bus travel, which delivered bus priority measures along 6 key routes across Coventry and resulted in increasing bus use by an average of 6%, with punctuality improving by 40%<sup>9</sup>.

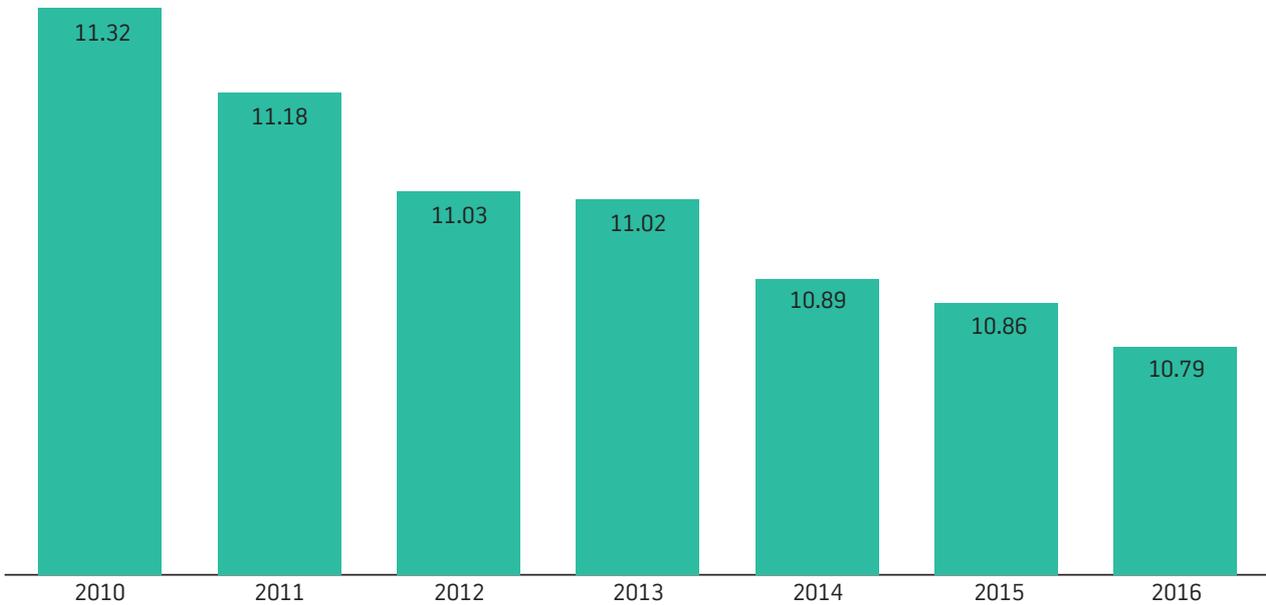
Partnership Plus followed in 2013 which was the next phase of partnership working and saw a 7% improvement in punctuality and an 8% gain in customer satisfaction scores<sup>10</sup>. The latest partnership devised by TfWM and the West Midlands Integrated Transport Authority in 2015 – The Bus Alliance - was the first of its kind in the country and will see £150 million invested by bus operators and partners (TfWM), highways departments and leaders of local councils) between 2015 and 2021. The initiative consists of a ground breaking Alliance Board offering joint input into resource allocation and investment including fares. The Alliance is personified by shared offices to optimise the joint working ethos. The Alliance has developed a multi-million pound package of measures to improve peak time journey speeds together with increased investment in bus priority to aid overall journey times and reliability across the region. National Express's Platinum bus services are already showing a 12% growth in patronage<sup>11</sup>.

### REFERENCES:

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- <sup>6</sup> Transport Instruments: A Policy Guidebook, KonSULT/ITS Leeds
- <sup>7</sup> Bus Priority: The way ahead, DfT
- <sup>8</sup> Centro Press Release, 4th May 2004 <http://www.centro.org.uk/about-us/news/archive/survey-shows-region-is-mything-the-bus>
- <sup>9</sup> UK Bus Awards entry
- <sup>10</sup> UK Bus Awards entry 2014
- <sup>11</sup> Proposals for a new Alliance to deliver a world class bus system by 2020, National Express



**Birmingham Average Bus Speeds (Mph) 2010 - 2016**



**West Midlands Average Bus Speeds (Mph) 2010-2016**

