# The decarbonisation dividend

## The economic, environmental and social benefits of more bus and coach journeys

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WPI ECONOMICS

# About the authors

## Matthew Oakley – Director

Matthew founded WPI Economics in 2015. He is a respected economist and policy analyst, having spent well over a decade working in and around policy making in Westminster. He has previously been Chief Economist at Which?, and Head of Economics and Social Policy at Policy Exchange. He began his career as an Economic Advisor at the Treasury, predominantly working on microeconomic, analysis and modelling issues around tax and welfare reform. He holds an MSc in Economics from UCL.

## James Edgar – Chief Economist

James has fifteen years of experience working as an economist at the forefront of policy making. Prior to joining WPI, James was Head of Policy for Digital and Regulation at the consumer champion Which?. Before this he worked for a decade at the Department for Transport, including as the Head of Road Economics after establishing the successful multi-disciplinary team and has experience of local transport, freight, rail and environmental issues. James holds an MSc in Economics from UCL.

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André is an economist from the Spanish Open University, holding as well a BA (Hons) in Politics and Portuguese from University of Bristol. Before joining WPI, André worked as an International Consultant in an innovation consultancy firm, specialising in the fields of regional development and international cooperation, particularly in Latin America, Spain and Portugal. André speaks Galician and Spanish (his mother languages), and is fluent in English and Portuguese, having lived in Portugal and Brazil during his year abroad.

# About the Confederation of Passenger Transport

We help a dynamic bus and coach industry to provide better journeys for all, creating greener communities and delivering economic growth.

We do this by representing around 900 members from across the industry be they large or small, bus or coach, operator or supplier. We use our influence to campaign for a supportive policy environment, give our members practical advice and support to run their businesses safely, compliantly, and efficiently and bring the industry together to share ideas and best practice. We are ambitious to make things better for passengers, inclusive in seeking out different perspectives and we are always there when our members need us.

# About this report

The Confederation of Passenger Transport, the trade body for the bus and coach industry, commissioned WPI Economics to analyse the role that switching car journeys to bus and coach journeys (“modal shift”) may have in achieving the country’s net zero emissions goal. This report summarises the result of the first stage of the project, demonstrating why modal shift is necessary to ensure a just transition to net zero and desirable for its multidimensional benefits, while the next report will assess different policy interventions to demonstrate that modal shift is possible.

# Foreword

Convincing people to change some of their car journeys to more sustainable transport modes, such as walking, wheeling, cycling, and as this report outlines - buses and coaches – isn't just helpful for the UK in meeting its net zero targets, it is essential. Deep down, it's what we all want to do, and will bring huge benefits to the environment, to society, and to the nation's health and wellbeing.

Critically, it's still within the grasp of the UK to achieve this. It's not too late to make meaningful change if we do this properly.

Public transport must be at the heart of the net zero transition, and we must ensure that it is fast, fair and affordable. Transport in the UK has increased its emissions since 1990, in spite of technological advances. Bus and coach is one of the few exceptions. It is critical that the UK acts quickly to rectify this, so we must encourage, and more importantly, enable more people to travel by bus and coach between now and 2050.

We cannot meet our net zero targets through technology alone – travel habits must change. Bus operators are committed to decarbonising their fleets and have made great progress so far. But it needs to be part of a wider solution. Decision makers in Westminster and beyond need to put impactful policies in place that reward people for making more journeys using public transport instead of private vehicles.

More than this, it will give individuals an affordable choice, and a fair transition to net zero. As households are coming to terms with tightly constrained budgets, the cost of a zero-emission vehicle will simply delay them from playing their part in reaching net zero. Fast, reliable and convenient public transport must be on hand to help them.

Increased use of public transport will bring a reduction in vehicle congestion, and we will see a manifold decrease in emissions beyond those not being used in favour of public transport. Bus use therefore, is a virtuous circle in relation to congestion. Faster and more reliable buses mean more people will use them, leading to fewer cars on the road, less congestion and ever fewer emissions. We need to take a course that propels us in this direction, rather than the one which leads us the other way.

If each car user switches just one journey per month from car to bus by 2030 and two journeys per month by 2050, there are almost £15bn in health benefits and £30bn in economic benefits to be unlocked. It is a straightforward and compelling equation. Alongside improving air quality and protecting the lungs of our children, these are opportunities that we can't afford to turn down – for our planet, and for our economy.

This journey is not optional, it is essential.

**Ralph Roberts, CPT President**

# Executive Summary

The Confederation of Passenger Transport, the trade body for the bus and coach industry, has commissioned WPI Economics to analyse the role that switching car journeys to bus and coach journeys ("modal shift") may have in achieving the country's net zero emissions goal. This report summarises the result of the first stage of the project, demonstrating why **modal shift is necessary** to ensure a just transition to net zero and **desirable for its multidimensional benefits**, while the next report will assess different policy interventions to demonstrate that **modal shift is possible**.

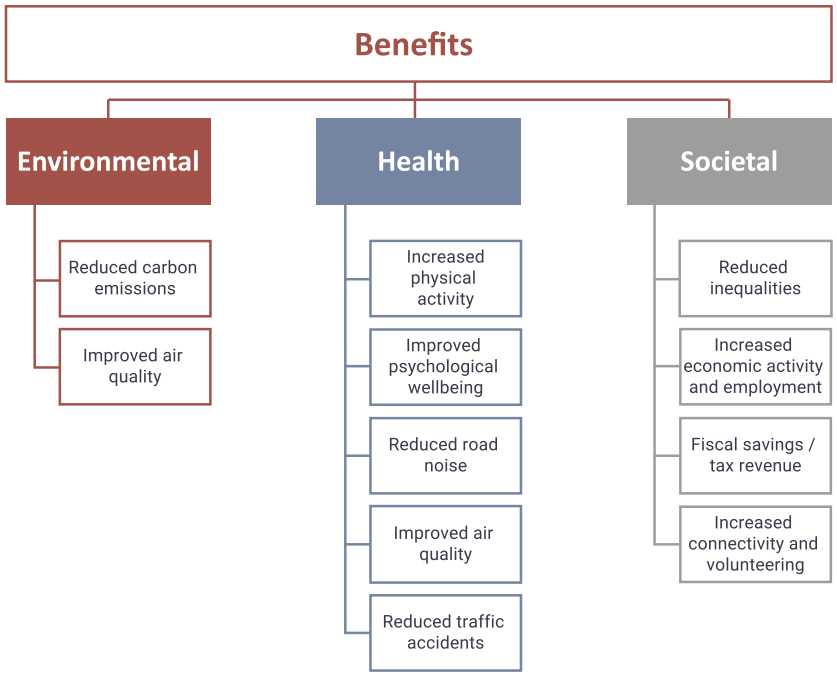
## Modal shift is necessary to ensure a just transition to net zero

The UK's net zero commitments require a decarbonisation of the transport sector, the highest emitting sector and the only one whose emissions have increased since 1990. This requires ambitious action to tackle car greenhouse gas (GHG) emissions, which account for the majority of surface transport emissions. While the electrification of the car fleet has a role to play in this, the Climate Change Committee (CCC) and others have established that technological change alone is not enough. Decarbonisation also requires limiting demand for car travel in favour of lower-carbon modes of transport. **In short, the UK will not meet its net zero ambitions without shifting some of the demand for cars into buses and coaches**.

**Without shifting demand from cars to buses and coaches, the UK will fall short of its net zero ambitions**

## Modal shift is desirable for its environmental, health and societal benefits

The benefits of modal shift are not just environmental. In fact, higher public transport use has additional benefits: it would be cheaper, fairer and more equitable than a car-led transition.



## Estimating the benefits of modal shift

We have modelled three scenarios based on three different scales of modal shift across Great Britain, all consistent with the CCC's Balanced Pathway to net zero. For Great Britain as a whole, the modal shift modelled in our central scenario sees **bus patronage increase by more than 80% in 2050 relative to 2018/19 levels**.

| | Local bus pkm (billion) | | | | |
|---|---|---|---|---|---|
| **Region** | **2019** | **2030 - baseline** | **2030 - with modal shift** | **2050 - baseline** | **2050 - with modal shift** |
| **East Midlands** | 1.5 | 1.3 | 2.3 | 1.3 | 3.2 |
| **East of England** | 1.4 | 1.4 | 2.6 | 1.4 | 3.9 |
| **London** | 9.5 | 10.1 | 10.8 | 10.1 | 11.5 |
| **North East** | 1.0 | 1.1 | 1.5 | 1.1 | 1.9 |
| **North West** | 2.5 | 2.4 | 3.7 | 2.4 | 5.0 |
| **Scotland** | 2.8 | 2.8 | 4.1 | 2.8 | 5.2 |
| **South East** | 2.4 | 2.2 | 3.8 | 2.2 | 5.6 |
| **South West** | 1.7 | 1.6 | 2.6 | 1.6 | 3.7 |
| **Wales** | 0.9 | 0.8 | 1.5 | 0.8 | 2.1 |
| **West Midlands** | 2.0 | 2.2 | 3.3 | 2.2 | 4.4 |
| **Yorkshire and The Humber** | 1.9 | 1.9 | 2.9 | 1.9 | 3.8 |
| **Great Britain** | **27.6** | **27.8** | **39.0** | **27.8** | **50.4** |

All regions except London see substantially higher increases than the Great Britain average. This reflects the more modest increase (in proportional terms) in the capital, where bus passenger kilometres (pkm) go from representing 16.8% of car pkm in 2018/19 to 17.6% in 2050.

This means that some more rural regions, like the East of England, see large increases in bus pkm *in proportion to current usage*. This represents the scale of the challenge posed by the decarbonisation of transport in areas that have relied more on car transport. Buses and coaches (as well as other lower/carbon modes of transport) will need to achieve a higher degree of penetration in these areas than has traditionally been the case.

We use these projections for increases in bus patronage, alongside evidence of the environmental, health and societal benefits of reduced car use and increased use of bus and coach, to estimate the potential benefits of modal shift.

## The decarbonisation-dividend from modal shift

The main environmental benefits of modal shift derive from its contributions to decarbonisation and to better air quality .

**x4**

**Travelling by car from Cardiff to Manchester produces on average 4 times more $CO_2$ emissions than travelling by coach**

Modal shift brings about these environmental benefits directly, by switching higher-emitting car miles for cleaner bus miles. It also has indirect benefits; by increasing demand for buses, modal shift will improve the economic and

environmental case for investing in zero emission buses and coaches. Modelling for this report suggests a total of 19.5 million ton reduction in CO2 up to 2050, resulting from modal shift from car to bus and coach.

### Cumulative GB savings in GHC emissions by 2050

**from modal shift to local buses:**

**15.8** million tons of $CO_2$

**more than the total $CO_2$ emissions of the North East in 2019**

**from modal shift to coaches:**

**3.7** million tons of $CO_2$

**equivalent to the total $CO_2$ emissions of Leeds in 2019**

## Improvements in air quality from modal shift

Improvements in air quality are driven by reductions in emissions resulting from a shift from car to bus and coach. In addition to the direct difference in cars' and bus emissions, modal shift to buses and coaches can also improve air quality by reducing congestion, a key driver of air pollution.

**x10** euro 6 diesal cars produce **10 times more $NO_x$ emissions** per passenger/km than a Euro VI diesel bus

Modelling for this report suggests a total of 5,600 ton reduction in nitrogen oxides (NOx) and 121 ton reduction in PM10 up to 2050, resulting from modal shift from car to bus.

### Cumulative reduction in air pollution by 2050 from modal shift to local buses

**5,600** tons of $NO_x$

**more than the total $NO_x$ emissions of diesel cars in London in 2019**

**121** tons of PM10

**more than the total PM10 emissions from motorway car driving in Scotland in 2019**

These reductions in air pollution are valued in **£28 million – enough to pay 800 nurses for year**.[1]

**Cumulative benefits from reduced air pollution by 2050 valued at:**

**£28m**

**Enough to pay 800 nurses**

## Health benefits from modal shift

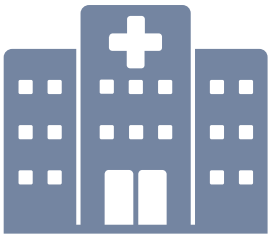
Increasing people's use of buses and coaches can have a positive impact on their and others' health outcomes by:

- Contributing to more active mobility and to **increased levels of physical activity**.
- Reducing traffic and therefore leading to **fewer road accidents and lower levels of road noise**.

Modelling for this report suggests that the cumulative value of these positive impacts by 2050 amounts to close to £15bn. These health benefits are comprised of:

- Reductions in road accidents valued at £9.3bn.
- Reductions in noise pollution valued at £160m.
- Improvements in lifestyle valued at £5.4bn.

**Cumulative health benefits by 2050 valued at:**



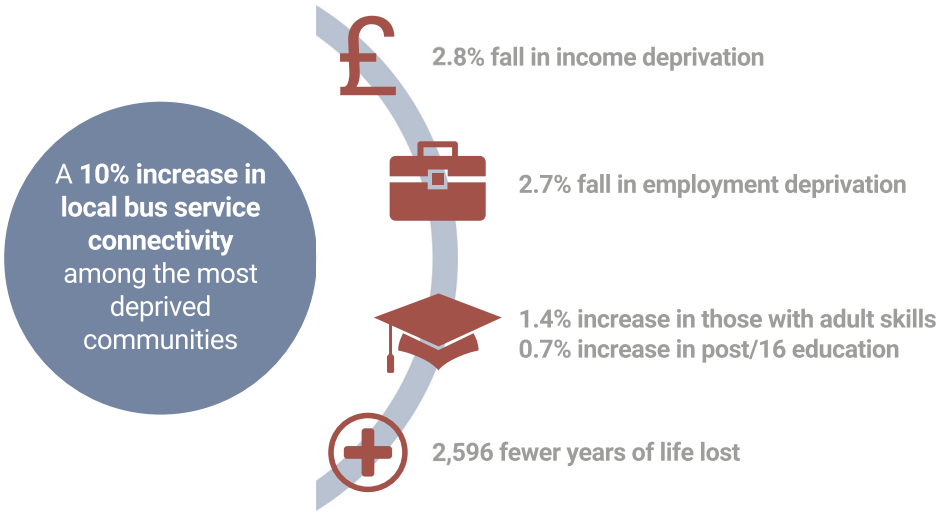
**£14.9bn**

**This would be enough to build**

**33 new NHS hosptails**

## Societal benefits of modal shift

A well-designed transport system, with good and affordable provision of public transport, can play a role in mitigating socio-economic inequalities:




Source: Greener Journeys – The Value of the Bus to Society

Bus connectivity supports both:

- **Employment**: for instance, if bus journey times for commuters were reduced by 10%, there would be more than 50,000 additional people in employment; and
- **Economic activity**, by helping reduce congestion.

Modelling for this report focuses on a relatively narrow measure of societal benefits – the economic value of reduced congestion. Even this narrow measure suggests cumulative benefits from modal shift to bus and coach of close to £30bn by 2050.

**Cumulative reductions in congestion by 2050 valued at:**

**£29.4bn**

**That's more than the GDP of the city of Manchester in 2019**

## Conclusion

The main body of this report shows that modal shift from car to bus and coach is both necessary and desirable.

### Necessary — To ensure a just transition to net zero

- Technological change alone is not enough; decarbonisation requires reducing demand for car travel in favour of lower-carbon modes of transport, including buses and coaches.
- A transition to net zero supported by increased public transport usage will be fairer and more equitable than a car-led one.

### Desirable — For its multidimensional benefits

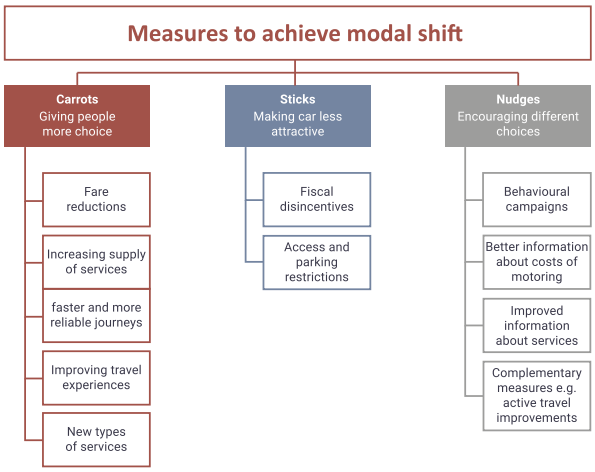
- There are environmental, health and social benefits from switching from car to bus & coach journeys.
- These are benefits that accure not only to new and existing bus users, but to society at large.

The final section of the report builds on this to show that it is also possible.

### Possible — Based on evidence and public opinion

- Even in a general context of declining bus patronage some local authorities and bus operators have recently managed to increase demand for buses.
- Public opinion is receptive to the idea of reducing car traffic and using buses more.
- There is evidence that different interventions aiming to give people more choice and encouraging them to choose the bus can increase demand for bus.

The progressive modal shift we have modelled would require **every person in Great Britain to switch just over 1 car trip per month** (13 trips per year) **for the bus by 2030,** rising to just above **2 car trips per month** (26 trips per year) **by 2050**. Despite reductions in bus and coach use over several decades, there is evidence that indicates that such change is possible. The next stage of this project will be to develop and model a set of approaches through which this modal shift could be realised. This will consider the full range of possible options, including those in the figure here.



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