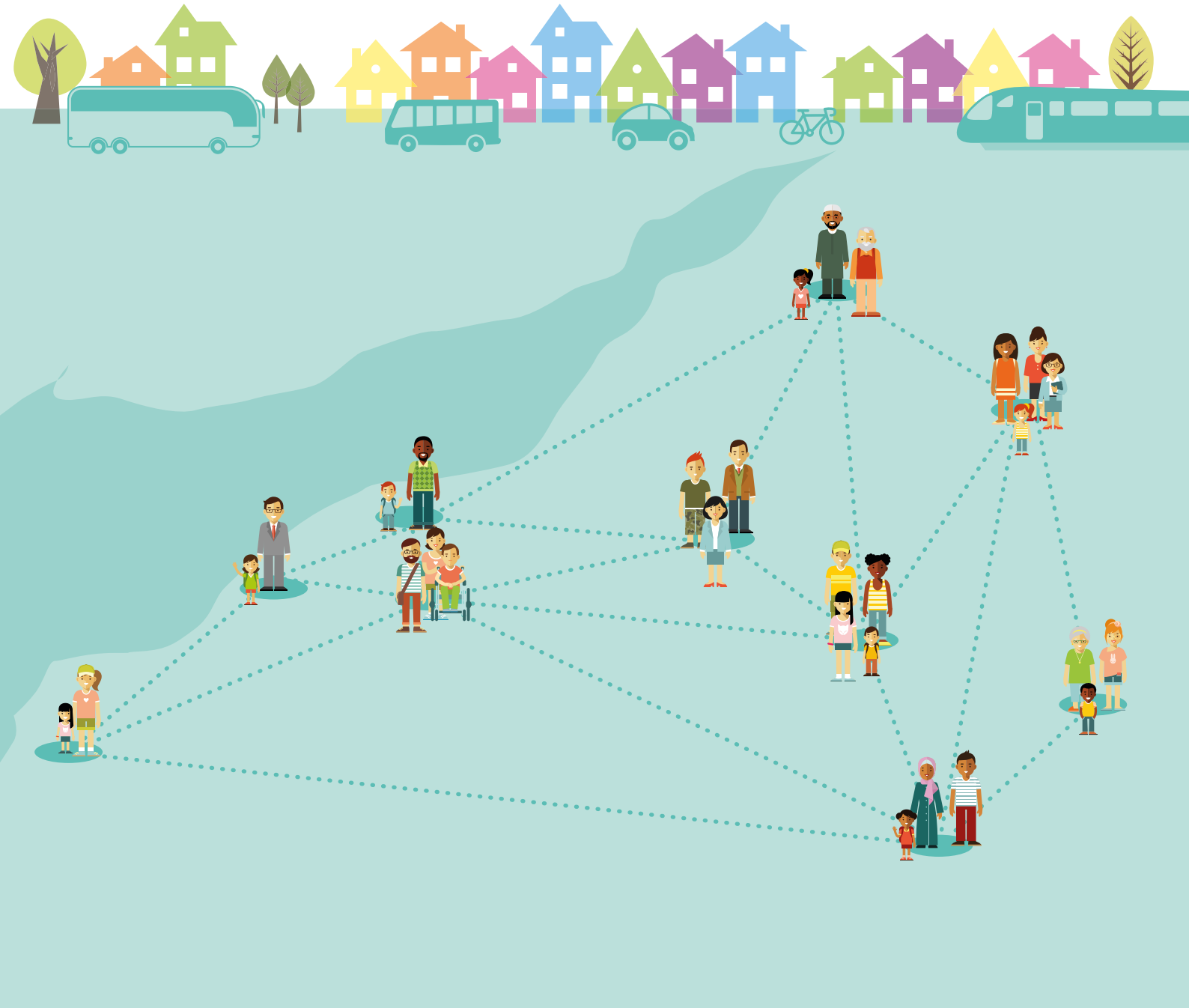
travelwest

Joint Local Transport Plan 4
2020-2036

March 2020



Bath & North East Somerset Council

Bristol City Council

North Somerset Council

South Gloucestershire Council

West of England Combined Authority

Contents

What is the Joint Local Transport Plan 4?

The Joint Local Transport Plan 4 (JLTP4) - led by the West of England Combined Authority, working with Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire councils – looks at transport up to 2036. It sets out how we aim to achieve a well-connected sustainable transport network that works for residents, businesses and visitors across the region; a network that offers greater, realistic travel choices and makes walking, cycling and public transport the natural way to travel.

A note to the text

To demonstrate how the JLTP4 policies contribute towards delivering the objectives and outcomes, a series of icons have been developed. There is one icon for each objective, with the numbers below the icons showing which outcomes the policy is likely to make the largest contribution towards achieving.

The icons are included next to each policy at the start of the connectivity sections (Sections 6–9).

The objectives are:

Take action against climate change and address poor air quality

Support sustainable and inclusive economic growth

Enable equality and improve accessibility

Contribute to better health, wellbeing, safety and security

Create better places

Climate Change – the challenge ahead

Making a difference

We have seen significant improvements in transport since our first Joint Local Transport Plan (JLTP) back in 2006.

The arrival of metrobus and the Greater Bristol Bus Network has transformed bus services and bus patronage has grown, against a national trend of decline.

The number of cycling trips has more than doubled thanks to transport packages in Bath and Weston-super-Mare and investment through the Local Sustainable Transport Fund, Cycling Ambition Grant and the Local Growth Fund, improving cycling and walking infrastructure. The Local Cycling and Walking Infrastructure Plan will provide a prioritised list of improvements across the West of England.

Rail passengers too have doubled in number since 2008. And looking ahead MetroWest, which will see new stations and reopened lines, is on the point of delivery.

Thanks to Go Ultra Low West and improved infrastructure, every year more and more car trips are made by electric vehicles.

Meanwhile work is starting on a transformational mass transit network for the West of England and we are embracing technology and how this will lead to new, innovative and low carbon ways to travel.

The challenge

All of this is good news, but we recognise the very real challenge of climate change, the emergency we face and its impact on the health, safety and wellbeing of our residents and people around the world. The United Nations Intergovernmental Panel on Climate Change (IPCC) has warned that a rise in temperatures of just 1.5 degrees could lead to ecological, environmental and humanitarian disaster. The Panel concludes we will require rapid, far reaching and unprecedented changes in all aspects of society to avoid this. This is especially true for the transport sector which, at 32%, is the largest single source of carbon emissions in the South West. For the West of England transport CO_2 emissions will rise by a further 22% by 2036 if we don't act - increasing the risk of droughts, floods and extreme heat not just globally but also for the South West region. Consequently, all four local authorities and the West of England Combined Authority have now declared climate emergencies.

Encouraging modal shift

Our Joint Local Transport Plan aims to ensure that transport is carbon neutral by 2030. To do this there has to be a substantial shift towards cleaner and greener and more sustainable forms of transport. We will need to maximise every opportunity and work in partnership with sustainable transport organisations, bus and rail operators, to encourage and help people switch from cars to cycling, walking and public transport.

We know that for some people a car is essential and is likely to remain so, maybe due to mobility impairments, work patterns or the need to transport bulky or heavy items. For most people, however, the car is often seen as the most convenient personal choice. To encourage people to move away from cars, we will need to provide transformational alternatives such as a new mass transit network. This may not be enough, so we will also consider ways to manage demand possibly through congestion charging, emissions charging and workplace parking levy-type schemes. Cities such as Oxford, Leicester and Birmingham are already actively looking at these to reduce demand and overall carbon emissions. Revenue raised from demand management measures, which could be significant, would be re-invested in public transport, cycling and walking.

Climate Emergency – the challenge ahead continued

London of course already has a congestion charging scheme, and Nottingham's workplace parking levy has raised over £61m since it was introduced in 2012, helping the city fund its second tram route.

JLTP4 and ongoing review

This Joint Local Transport Plan (JLTP4) sets out to decarbonise and promote and transform cleaner and greener and sustainable forms of transport – cycling, walking and public transport but it is unlikely to be enough to be transport carbon neutral by 2030, but it is a good starting point.

To transform our region, we will need to be flexible, agile and brave in our approach to the climate emergency as technologies evolve and lifestyles and future strategic and local development planning change so the JLTP4 will not be set in stone. For these reasons the JLTP4 will remain under review. We will undertake an immediate review which will include further work to build up the evidence base and establish what will be required to reach the 2030 target and this will set the basis for the next JLTP.

The review will also include:

- Reinventing public transport through mass transit, smart ticketing and making it more user friendly, convenient, safe, direct and attractive linking key destinations to enable everyone to use it.
- Rethinking how we use our existing transport corridors including reallocating more road space to buses, pedestrians and cyclists.
- Demand management measures to influence travel choice and raise revenue to reinvest in alternatives.
- First and last mile type solutions to provide a linked-up transport network.
- Exploring new ways to run and fund our transport networks to provide unprecedented investment in cycling, walking and public transport.
- Promoting zero carbon development that does not need to be retrofitted.

In the meantime, regular reviews and progress reports will ensure the JLTP4 remains relevant and decisive.

JLTP4 and the Paris Agreement

In line with and taking account of the Paris Agreement the JLTP4 is fully committed to reducing carbon. The JLTP4 has a significantly positive role to play in meeting the UK's international obligations through providing a well-connected and sustainable transport network which accelerates the shift towards low carbon trips, supporting sustainable development and the take up of Ultra Low Emission Vehicles to decarbonise transport. In many respects with the commitment to be carbon neutral by 2030 the JLTP4 goes beyond the Paris Agreement. Looking ahead the next JLTP as outlined above will serve to strengthen this role. As described in the following section Central Government will be expected to play its role.

Government role

The JLTP4 and its successor Plan will not be able to achieve everything on their own. Central Government will have an increasingly large role to play on issues such as the price of fuel, tightening emission standards, incentives to switch to electric vehicles and funding for mass transit. As an example the October 2019 IMF report 'How to mitigate climate change' concluded that of the various mitigation strategies to reduce fossil fuel CO_2 emissions, carbon taxes levied on the supply of fossil fuels are the most powerful and efficient because they allow firms and households to find the lowest-cost ways of reducing energy use and shifting toward cleaner alternatives. Only the Government can lead on carbon taxes.

As part of a coordinated programme we will lobby and push central Government to play its part and enable the legislation and funding necessary to deliver the JLTP.

Where we want to be in 2036

By 2036 at the completion of the JLTP4 the West of England will be a carbon neutral community where walking and cycling are the preferred choice for shorter journeys, and the vast majority of vehicles on the road are decarbonised and no longer powered by fossil fuels. People will have the opportunity to move around the region using affordable, high quality and frequent public transport to access their jobs and leisure activities and for vehicles delivering goods. Public spaces will be greener, cleaner, people focused places that are no longer dominated by vehicles.

Ultimately our transport vison is:

'Connecting people and places for a vibrant, inclusive and carbon neutral West of England.'

Read on for how we aim to achieve this.

JLTP4 and the Local Industrial Strategy

Launched in the summer of 2019 the West of England's Local Industrial Strategy sets the region's overall approach to how we will develop our regional economy through supporting innovation, skills development, enhancing productivity and infrastructure development. In turn the JLTP4 sets out how we will develop transport in the region and address our priorities to reduce energy demands, lower carbon emissions and address the climate emergency. Central to our Local Industrial Strategy and the JLTP4 are the objectives of clean and inclusive growth and these are very much aligned to the United Nations' 17 Sustainable Development Goals alongside the other JLTP4 priorities for supporting sustainable economic growth, equality and accessibility, creating better places and embracing new technology.

Climate Emergency – the challenge ahead continued

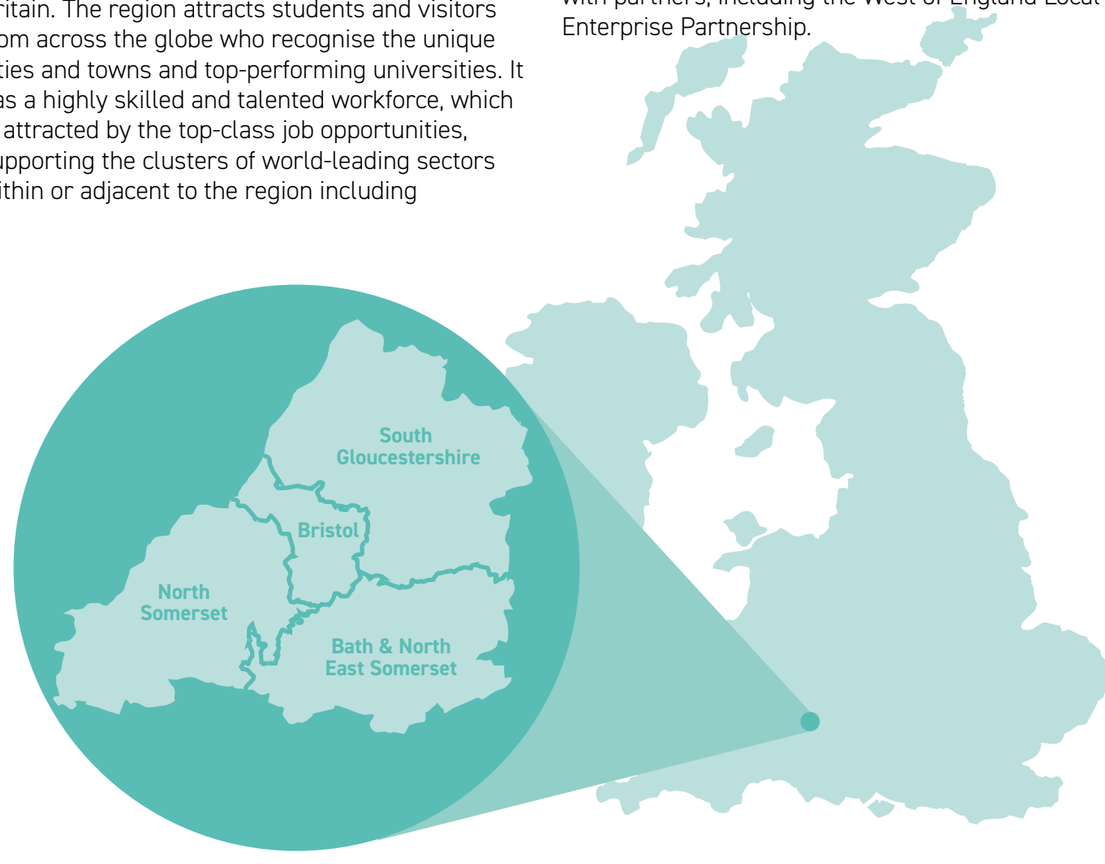
Section 1: Setting the scene

The West of England

The West of England is a prosperous city region with a population of 1.1 million and an economy worth over £35bn a year. The region is diverse, with the vibrant densely populated cities of Bristol and Bath, complemented by surrounding rural areas and towns. The region's growth has exceeded the national average over the past 15 years, while population grew by nine per cent between 2001 and 2011. Productivity is the highest of all city regions in England outside London.

The West of England is known across the UK and further afield for its creativity and quality of life; it is recognised as one of the best places to live in Britain. The region attracts students and visitors from across the globe who recognise the unique cities and towns and top-performing universities. It has a highly skilled and talented workforce, which is attracted by the top-class job opportunities, supporting the clusters of world-leading sectors within or adjacent to the region including aerospace, financial, nuclear and innovation.

In 2017, the West of England Combined Authority (WECA) was formed to help support increasing coordination of transport, housing and skills across the area administered by Bath & North East Somerset Council, Bristol City Council and South Gloucestershire Council. It is a legal body that can make transport decisions at the combined authority level and receive devolved powers and resources. It is through the West of England Joint Committee that WECA and North Somerset Council make decisions at the West of England level. Central Government has devolved £30m per annum for 30 years to WECA, giving more local control and accountability over spending. The West of England authorities will continue to work closely with partners, including the West of England Local Enterprise Partnership.



Section 1:
Setting the scene continued

Climate emergency

As we set out at the front of the JLTP4 we need to recognise the very real challenge of climate change with all four local authorities and WECA having declared climate change emergencies. Our aim is to ensure transport is carbon neutral by 2030. This is the opportunity for all of us, from individuals to organisations, to take responsibility for and action on reducing transport carbon emissions. Of course, there is far more to declaring a climate change emergency than just transport but taking action will mean changing the way we all travel.

It is no longer enough for us to acknowledge the issue of climate change: we need to move more quickly to respond to the challenge. It is no longer enough to expect everyone else to change their behaviour or rely upon technology to solve the issue. We must all start taking personal responsibility to tackle the effects of climate change including how we decide to travel. In return we as the West of England authorities will press the Government to provide us with the tools, powers and resources to achieve our target of being carbon neutral by 2030. The policies and initiatives set out in this plan enable and encourage the increased use of sustainable and active modes of travel.

Managing demand

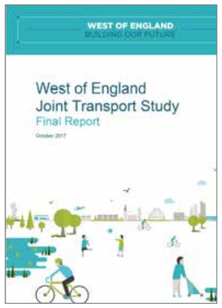
We have already flagged that we need to change the way we travel. This will mean managing demand and in turn this will mean new charges and restrictions. Tough measures that will need to be considered are:

- Management of parking provision – on street, off street, residential and business parking
- Reallocation of road space to sustainable transport modes
- Road user charging e.g. as applied in London with revenue reinvested in alternatives
- Workplace parking levy e.g. as applied in Nottingham with revenue reinvested in alternatives
- City centre and town centre private vehicle bans

The measures will raise revenue to reinvest in alternatives modes of transport.

There is nothing particularly new in these measures. They have all been successfully used, often as individual measures, in many locations across the world but what is shifting is the scale of intervention required to address climate change. Many of these measures are likely to divide opinion, and decisions must be bold to achieve the step change required by 2030. The purpose of the JLTP4 is to provide the actions, interventions and policy framework for local decisions.

More detail on how we propose to manage demand can be found in Section 7: Connectivity within the West of England.



Joint Transport Study

A Joint Transport Study (JTS) was undertaken to recommend how to address both current transport challenges, including carbon reduction, and forecast growth. The JTS, developed in partnership with Highways England, identified potential future strategic transport proposals for delivery up to 2036, that address current challenges and inform future development proposals for local and regional plans.

Future strategic planning will set out a prospectus for sustainable growth to help the region meet its housing and transport needs. It will include the policies and principles required to support the delivery of new homes and jobs. Local Plans for each authority contain the more detailed plans and policies for new development, including parking.

The JTS set out the following approach for transport:

"Transport in the West of England will be transformed over the next 20 years through a programme of complementary measures designed to address underlying challenges and to enable the sustainable delivery of new housing and employment growth."

The JTS has informed and has been informed by local and regional plans. The findings and recommendations in the JTS were advisory; this Joint Local Transport Plan takes account of these findings, builds upon them and formalises the work previously carried out.

Local Industrial Strategy

The West of England Local Industrial Strategy looks at how we need to work together to secure clean growth to benefit all residents.

Launched in summer 2019, it was developed by the West of England Combined Authority and Local Enterprise Partnership, working with regional businesses and organisations, as well as central Government.

To ensure continued success for the region, four key priorities are identified in the strategy:

- Investing in infrastructure that reduces energy demand, lowers carbon emissions and is resilient to the impacts of climate change.
- Strengthening innovation and driving productivity
- Supporting all residents to contribute to and benefit from economic success
- Providing businesses with the space, networks and skills they need to boost productivity, grow and thrive

These priorities align well with the JLTP4 objectives for addressing climate change, supporting sustainable economic growth, equality and accessibility and creating better places and the commitment for embracing new technology (see Section 4).

Sustainable Development Goals

Complementing the Local Industrial Strategy are the 17 United Nations Sustainable Development Goals (SDG) which aim by 2030 to address challenges related to poverty, inequality, environment, prosperity, climate action and peace and justice.

Although transport may not have a direct impact on every goal, there are indirect ways that most of

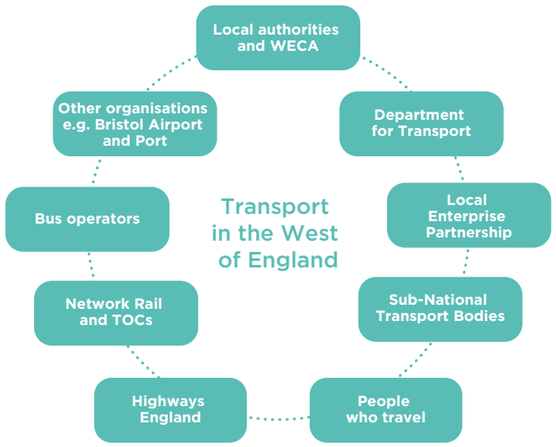
Section 1:
Setting the scene continued

the 17 goals can be met through implementing the measures of the JLTP4 including creating better places and supporting sustainable and inclusive economic growth. Indirectly, other goals are positively benefitted, such as life on land and life below water, through consideration of species in our Habitats Regulations Assessment.

Transport in the West of England

Transport in the West of England is planned, managed, delivered and funded by a large group of organisations, shown in Figure 1.1, working together to improve transport provision and support our commitment to carbon reduction.

Figure 1.1: Transport in the West of England



Local authorities and WECA

Local authorities are responsible for delivering local transport schemes. They also work together, through bodies such as WECA, on the development of cross-cutting strategies for the West of England and delivery of larger schemes, including metrobus and MetroWest. Local authorities receive regular annual transport funding from local sources, including Council Tax, business rates and parking income. However, most transport funding comes from the Department for Transport (DfT) and other arms of central Government.

Department for Transport

The Department for Transport (DfT) is responsible for allocating funding to transport schemes. In recent years, the level of regular annual funding that local authorities receive from DfT for capital transport projects and highway maintenance has been reducing. Funding is increasingly awarded through competitive bids, such as the Highways Maintenance Challenge Fund and Cycle Ambition Fund, and these can only be used for specific purposes. This shift to competitive bids means central Government achieves greater control, accountability, and stronger value for money.

However, it has led to more uncertain levels of funding for local authorities.

Local Enterprise Partnership

The West of England Local Enterprise Partnership (LEP) supports business growth and is working to attract new jobs to Bristol, Bath, Weston-super-Mare and the rest of the region. The LEP, which is accountable to WECA, brings together organisations from the private, public (including the four local authorities), education/training and social enterprise sectors, to support the delivery of the West of England Industrial Strategy. We will also work with the cross border Western Gateway powerhouse covering Bristol, Bath, Gloucestershire, Swindon, Cardiff, Newport and Swansea.

Sub-National Transport Bodies

The Western Gateway Sub-National Transport Body (SNTB) made up of WECA, North Somerset, Bournemouth, Christchurch and Poole, Gloucestershire County, Dorset and Wiltshire councils aims to provide more strategic thinking about transport investment priorities to improve regional productivity and sustainable economic growth. The Western Gateway is not a statutory body.

Five broad strategic transport corridors and three interchanges have been identified where enhanced connectivity will generate a range of economic benefits, including much-needed productivity gains, employment and Gross Value Added (GVA). The Western Gateway is strategically located so that many of the corridors provide connectivity to the neighbouring SNTBs of the Peninsula, England's Economic Heartland and Transport for the South East. A new Western Gateway rail strategy is under development.

Highways England

Highways England is responsible for the Strategic Road Network (SRN), which comprises of motorways and major A roads. Highways England receives funding from central Government and sets out its investment priorities in five-year Road Investment Strategies (RIS). The development of RIS considers local needs for improvements to the SRN, such as new motorway junctions.

Network Rail and train operating companies (TOCs)

Network Rail is responsible for the rail tracks, signalling and other rail infrastructure, including

Bristol Temple Meads station

Train operating companies, such as Great Western Railway, operate the trains and most stations. Like Highways England, Network Rail produces a five-year investment strategy, that takes into account strategic projects, such as electrification, and locally promoted projects, such as MetroWest.

Bus operators

Most buses in the West of England are run on a commercial basis by bus operating companies, such as First. They are responsible for setting routes, fares and timetables, and work with local authorities to improve services. Local authorities also subsidise a small number of services for local communities, where there is a social or accessibility need and it is not viable to run a commercial service.

Other organisations

A range of other organisations are involved in delivering transport improvements. This includes Bristol Airport and Port, housing and employment developers, walking and cycling charities and external stakeholders. Further details on how we will continue to embrace these and other partnerships are set out in Section 4.

Local Transport Plans

Local authorities have historically been required by Government to prepare LTPs; this plan is the fourth prepared by the authorities in the West of England. In the past, LTPs would set out transport improvements the local authority had identified as required, and these would be reviewed by DfT. Based on the review, funding for core schemes would be allocated, with major schemes (those over £5m) funded through a separate bidding process.

The recent shift to most transport funding coming from bids means LTPs are now more aspirational documents that are increasingly used as bidding tools. Local authorities can set out a programme they would like to deliver, and in addition to regular funding, they can still apply to DfT for larger sums of money to deliver major schemes (for further information see Section 10: Funding and Implementation).

Section 1: Setting the scene continued

Achievements during the Joint Local Transport Plan 3 period

The West of England Joint Local Transport Plan (JLTP3), prepared in 2011, set out a 15-year vision for transport across the region. It focussed on reducing carbon emissions, supporting economic growth, and improving accessibility, safety and security, health, and the quality of life. The region has made significant achievements during the seven years of JLTP3 spending over £500m on the delivery of transport projects, including:

- Step change improvements to the Greater Bristol Bus Network, including vehicle quality, information, service frequency and fare structures
- The launch of the first three metrobus routes, providing a significant increase in the quality and speed of public transport along over 50km of routes, linking central Bristol with areas of North Somerset and South Gloucestershire
- Successful bid with bus operators for designation of key bus route corridors as a Better Bus Area to target specific improvements funded by displaced Bus Service Operators' Grant
- Programmes to facilitate travel behaviour change and increase cycle and bus use, delivered under the Local Sustainable Transport Fund, Access WEST, Better Bus Area Fund, Cycling Ambition Grant and Local Growth Fund
- Large areas of public realm improvements to improve conditions for pedestrian and cyclists and remove the dominance of vehicular traffic, including Weston-super-Mare town centre and The Cenotaph in Bristol
- Completion of the Weston-super-Mare transport package, including improvements to M5 Junction 21 and the Worle Parkway station interchange
- Completion of the Bath Transportation Package, including expansion to the capacity of Park & Ride, improvements to the city's bus stop infrastructure and reconfiguration of parts of the city's road network
- Completion of the A4174 South Bristol Link, a key multimodal transport link connecting South Bristol with North Somerset at Ashton Vale, improving links between the M5 motorway, Bristol International Airport and the A38, and removing freight vehicles from Winterstoke Road

Additionally, on the rail network, delivery continues of the Great Western electrification project and new bi-mode intercity trains, bringing faster journey times and more services linking the region with London. Work is also progressing on MetroWest, which focuses on major improvements to local and suburban rail services, including the re-introduction of passenger services between Portishead, Pill, Henbury and Bristol.

These and other projects have contributed to very positive changes in how people get around the region. During the past ten years we have seen:

- The number of bicycle trips more than double, with an average year on year increase of 10%
- The number of bus passenger journeys increasing by more than one third – with 10-15% alone across much of the region in the year to 2016/17, compared to a fall of nearly 1% across England as a whole. Bus passenger satisfaction has remained stable in recent years with overall bus satisfaction levels standing at 89% in the 2017, which is higher than in most core city regions
- Rail passengers (since 2008) increasing by more than half, with more than double the number using the Severn Beach Line

We exceeded the targets set out in JLTP3 in all these areas, along with those relating to improving road safety and reducing CO_2 emissions.

Whilst the JLTP4 contains much that is new and exciting it will continue the work of its predecessor plans. Small and medium sized schemes to promote cycling, walking, road safety and public transport will remain a key part of the JLTP4.

Joint Local Transport Plan 4 (2020-2036)

This Joint Local Transport Plan (JLTP) has been prepared by WECA and the four West of England local authorities – Bath & North East Somerset Council, Bristol City Council, North Somerset Council, and South Gloucestershire Council. It takes account of the JTS findings and recommendations and will support delivery of the more detailed interventions set out in local transport strategies across the region. This includes the Bath and Bristol Transport Strategies, and other supporting strategies for cycling, parking and other modes. The JLTP4 will also be supported by other regional strategies covering cycling, walking, buses, the Major Road Network and the Key Route Network (KRN). The JLTP is fundamental in supporting the West of England Energy Strategy, along with local clean air strategies, as part of achieving carbon reduction. Future strategic planning will mainly be delivered by the Local Plans and Supplementary Planning Documents (SPDs), which include parking standards for the public highway and new development, including housing and offices. Both WECA and the local authorities will put together their capital programmes for major scheme delivery.

The relationship of the JLTP4 to other plans is shown in Figure 1.2 overleaf. The following section identifies the challenges JLTP4 will need to respond to over the next 20 years.

Strategic Environmental Assessment (SEA)

The European SEA Directive (2001/42/EC) requires an environmental assessment to be undertaken of any plans or policies that could result in an impact on the environment. The overall aim is to ensure better protection for the environment and human health. The SEA process aims to make decision-makers aware of the likely positive and negative environmental effects of policies and plans at an early stage of development.

The SEA does not provide a detailed assessment of the schemes listed within JLTP4 but includes a broad assessment of the likely effects of the overall plan. It also considers the impact of adopting and implementing JLTP4 compared to the likely impact of any reasonable alternative scenarios. The likely impacts of the plan and the reasonable alternatives are identified, described and evaluated. The reasonable alternative scenarios considered as part of this JLTP4 assessment, are:

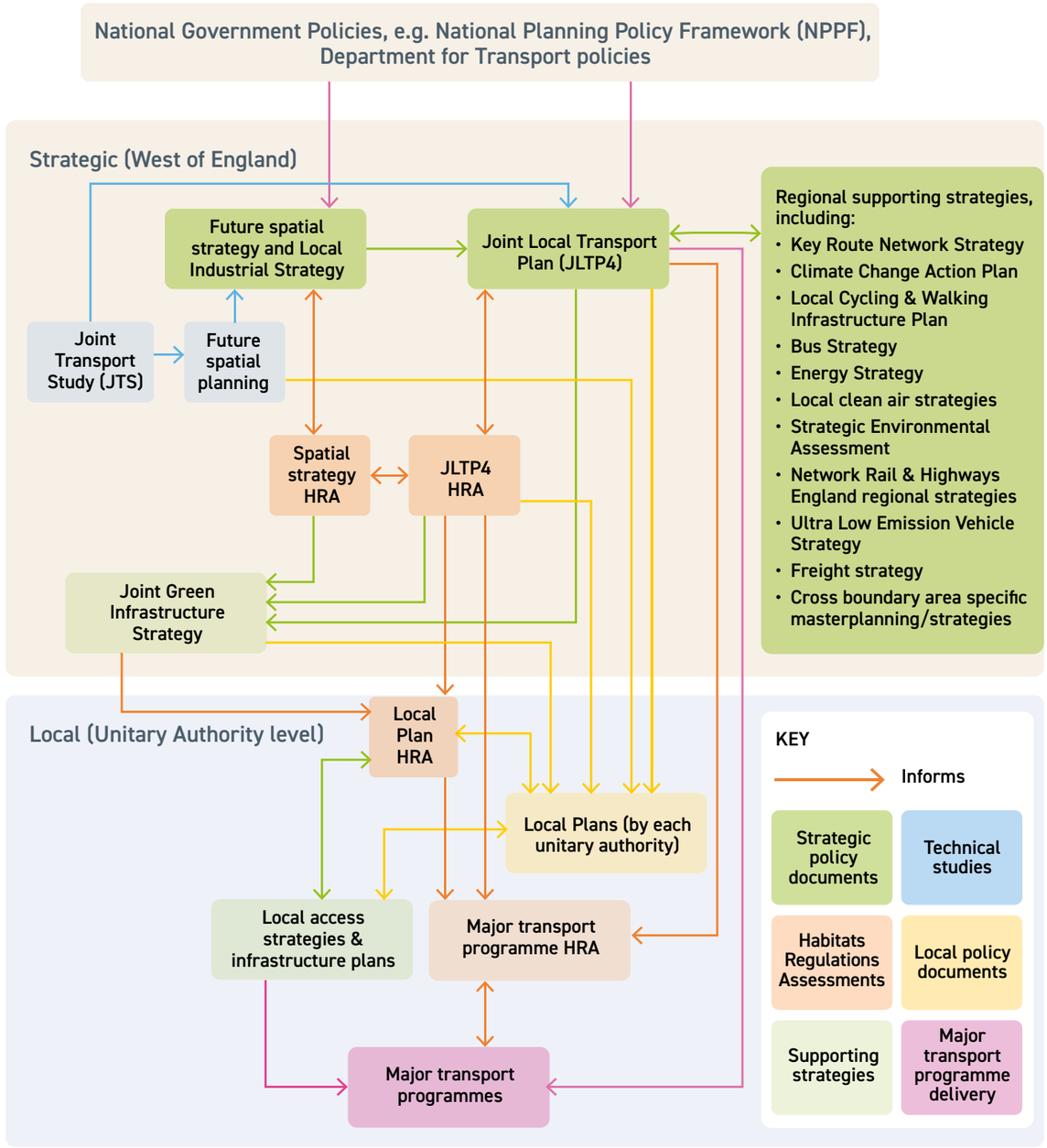
- JLTP3 remains the adopted transport policy for the West of England, and none of the transport policies included in JLTP3 are updated.
- 'No Plan' option, which assumes there is no JLTP4 and JLTP3 ceases to be in place. This means the JLTP3 policies will no longer apply, but schemes directly mitigating development locations, and individual local authority transport policies, will continue to exist.

An Environmental Report has been prepared for JLTP4, providing an assessment of "the likely significant effects on the environment". The Environmental Report includes a Habitats Regulations Assessment, Equalities Impact Assessment and Health Impact Assessment. The Environmental Report was consulted upon at the same time as the consultation version of JLTP4. A summary of the draft Environmental Report is included in Appendix 1.

The SEA seeks to identify measures that can be integrated into JLTP4 to ensure that likely adverse environmental impacts of the plan are minimised and mitigated. The mitigations included in the Environmental Report, and the feedback obtained during the consultation period, were considered and used to inform the final version of JLTP4.

Section 1:
Setting the scene continued

Figure 1.2: Relationship of JLTP4 to other plans



Joint Green Infrastructure Strategy

Transport can make a positive contribution to the natural environment by integrating green infrastructure into scheme design. Green infrastructure is a strategically planned and managed network of natural and semi-natural areas, delivering multiple benefits for people, wildlife and the environment. The West of England's emerging Joint Green Infrastructure Strategy (JGIS) provides an evidence base for Local Plan development as well as other plans and strategies; tools to enable a consistent approach to green infrastructure across the four authorities; and identifies opportunities for enhancement and improved connectivity of green infrastructure. Transport schemes designed from the outset with strong green infrastructure principles including establishment and maintenance considerations and costs have the potential to deliver significant benefits including biodiversity net gain, carbon capture, sustainable drainage systems, air quality, improvement to health and wellbeing through improving access to green spaces via active travel routes and building resilience against climate change.

The further development of Green Infrastructure Plans at an authority level will also reflect schemes contained within this JLTP4. This approach helps achieve objective 5 (SEA05) of the JLTP4's Strategic Environmental Assessment (SEA): to 'protect and enhance biodiversity and ecological networks.

Public consultation

Public consultation on the draft JLTP4 was undertaken from 6 February to 20 March 2019. We wanted to ensure that as many people as possible had a chance to respond to the consultation on the document. Over the course of the consultation, social media activity exceeded over half a million views and we received approximately 4,200 responses.

Answering the consultation questionnaire, 79% of people agreed with the challenges identified, 65% agreed with the JLTP4's vision and objectives, indicated a broad acceptance of the core principles of the plan. At 56%, fewer people agreed with the approach to improving the region's connectivity, but still indicated that an overall majority agree with the approach. Responding to this feedback, we have strengthened plans for connectivity and set regional targets for modal share, bus passenger satisfaction, and congestion and road safety (see Section 12: targets, indicators, and monitoring).

With the online Transport Priority Simulator, the most popular priorities for transport spending were: reallocating highway space (to public transport/cycling/walking), new and improved rail services, creating a comprehensive and safe network to support active travel for shorter trips and constructing a mass transit network. Responding to this feedback, JLTP4 has been amended to place greater emphasis on the highway space required for cycling, walking and public transport (see Section 4: Embracing technology and partnerships). We have also made significant progress with our plans to reopen the Portishead railway line (Metrowest Phase 1) which will upgrade the existing train service at 16 stations across three rail corridors. We have also published and consulted on the draft Local Cycling and Walking Infrastructure Plan to support the creation of a comprehensive and safe network for active travel.

In the free text comments, some people used the opportunity to highlight concerns about specific schemes. The alignment and locations of schemes shown on this plan are purely indicative. Any schemes identified in JLTP4 would be subject to further feasibility work and consultation, with most requiring planning permission.

For further information, please see the JLTP4 consultation report in Appendix 5.

Section 1:
Setting the scene continued

Updating and reviewing the JLTP4

In the light of climate emergency declarations, the need to take significant action, and potential changes to future strategic planning the JLTP4 will undergo immediate review.

We will undertake further work to build up the evidence base and establish what will be required to reach the 2030 target and this will set the basis for the next JLTP. This could include:

- Reinventing public transport through mass transit, smart ticketing and making it more user friendly, convenient, safe, direct and attractive linking key destinations to enable everyone to use it.
- Rethinking how we use our existing transport corridors including reallocating more and more road space to buses, pedestrians and cyclists.
- Demand management measures to influence travel choice and raise revenue to reinvest in alternatives.
- First and last mile type solutions to provide a joined-up transport network.
- Exploring new ways to run and fund our transport networks to provide unprecedented investment in cycling, walking and public transport.
- Promoting zero carbon development that does not need to be retrofitted.

In the meantime regular reviews and progress reports will ensure the JLTP4 remains relevant and decisive, flexible and agile.

Section 2: Transport challenges in the West of England

There have been significant achievements during the last seven years of JLTP3. Investment has contributed towards changes in how people get around the region, resulting in increased bus passenger numbers, increased levels of walking and cycling, improved road safety and reduced CO_2 emissions. However, the West of England faces serious transport challenges, which will become more acute with the anticipated scale of growth in the area. For population and economic growth to occur sustainably and be carbon neutral, connectivity across the region needs to be transformed. We are faced with ongoing and new challenges, many of which such as climate change are not unique to the West of England, and some of which we have little or no control over. This section sets out some of the key challenges faced. A high-level summary is shown in Figure 2.1.

Figure 2.1: High-level summary of transport challenges

2 of 3 commutes by car

25%
increase in trips by 2036

£6bn shortfall
in transport funding

Population growth
2016: 1.1m people
2036: 1.3m people

Over 300 premature deaths a year linked to NO_2

1 in 11 commutes by public transport

Transport is the largest contributor to greenhouse gas and CO_2 emissions

Ageing population:
1 in 5 over 65 years old

2 in 5 commutes are less than 2km

£300m
annual cost of congestion

Section 2:
Transport challenges in the West of England continued

Climate change – transport is the largest contributor to carbon dioxide emissions in the West of England

Transport is responsible for 32% of carbon dioxide (CO_2) emissions in the West of England, compared to 26% nationally. Climate change impacts on the resilience and standard of the transport network, including issues such as flooding, landslides, potholes, heat damage to roads and rail buckling. The JLTP4, future strategic planning and

West of England Energy Strategy will be key levers in supporting the UK commitment to the Paris Agreement, negotiated at the 2015 United Nations Framework Convention on Climate Change.

This aims to limit the increase in global average temperatures to 1.5°C by 2050. The Climate Change Act is a legally binding commitment by the UK Government to achieve an 80% reduction in CO_2 emissions by 2050 from a 1990 baseline.

In October 2018, the United Nation's Intergovernmental Panel on Climate Change published a report saying the world is off track to keep to the 1.5°C limit and would likely exceed it by around 2040, even with the promises made as part of the Paris Agreement.

It reports that CO_2 emissions must be cut drastically by 45% of 2010 levels by 2030 and 'net zero' levels achieved by 2050.

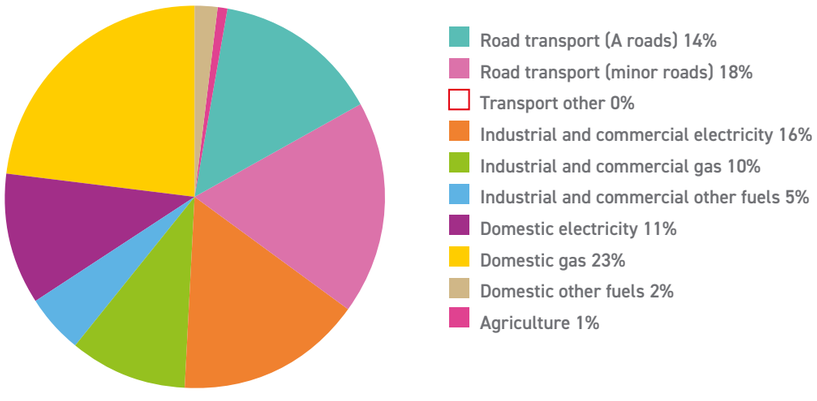
This means that alongside technology to reduce emissions, such as electric cars, significant advances are required in technology that can remove CO_2 from the atmosphere. In 2017 the Government announced plans to ban the sale of new diesel and petrol cars by 2040, with all fossil fuel powered vehicles banned entirely by 2050.

As mentioned in Section 1 the four local authorities and WECA have declared climate change emergencies with the aim to be carbon neutral by 2030. Over the last decade a reduction in transport emissions has been achieved through improved fuel efficiency and some mode shift to walking, cycling and public transport. With significant population changes, however, this trend could reverse without significant intervention and we will have to take major action to hit that 2030 target.

As later sections in the JLTP4 will expand upon we will address climate change by:

- Providing a well-connected and sustainable transport network to accelerate the shift towards low carbon trips
- Supporting sustainable development
- Supporting the take up of Ultra Low Emission Vehicles to decarbonise transport
- Embracing new technology to provide new travel options for people and ways of transporting goods

Current carbon dioxide emissions, by sector, in the West of England



- Implementing demand management measures to encourage a modal shift to more sustainable forms of travel and reinvest the revenue in public transport, cycling and walking
- Local authorities leading the way as public organisations by encouraging their own staff and operations to use sustainable forms of transport

If we don't deliver on these actions the most likely local outcomes by 2036 are:

- CO_2 emissions up 22%
- Congestion costs £800m a year
- Delays up 40%
- Vehicle trips up 26%
- Time spent queuing in traffic 74%
- Journey time up 9%

And nationally:

- Summer temperatures in the UK will regularly reach 38.5°C by the 2040s
- Heat related deaths in the UK projected to rise from 2,000 a year at present to 7,000 by 2050
- Heavier rainfall impact on drainage and sewage systems especially in urban areas

And globally:

- Higher temperatures - almost 400 all-time high temperatures were set in the northern hemisphere over the summer of 2019 with records broken in 29 countries
- More droughts and flooding
- More extreme weather events
- Retreating ice sheets - Arctic, Antarctic and Greenland
- Gulf stream continues to slow – 15% drop since the mid twentieth century
- Areas on Earth that are no longer habitable by people

Travel demand is growing, and there is an increased need to improve the offer of more sustainable modes of transport

The demand for travel to and within the West of England is growing, and will continue to grow, due to forecast housing and employment growth. This will put increasing pressure on the already congested transport network. Changing travel patterns, due to the layout and location of more recent developments, flexible working and the increasing availability of technology and telecommunications, will have some impact on transport

2 in 5 commuting car journeys less than 2km

Section 2:
Transport challenges in the West of England continued

growth, but if left unchecked there is still going to be an over-dependence on the private car, particularly for some very short journeys.

The common perception is that there are limited travel options

There can be limitations to public transport connectivity resulting from the delivery of bus services by a deregulated, commercial market, and delivery of rail services by franchisees working to the specification set by DfT.

Whilst the number of passengers has increased, public transport use is still low compared to some other city regions. Many journeys are across or around urban areas instead of to town and city centres, and travel options tend to be more limited or slower. Some rail services are still impacted by the age and low capacity of rolling stock, infrastructure problems and rail company staff shortages.

People who do not use public transport have the perception there are limited travel options, hence the level of satisfaction with public transport journey planning information is lower than the national average.

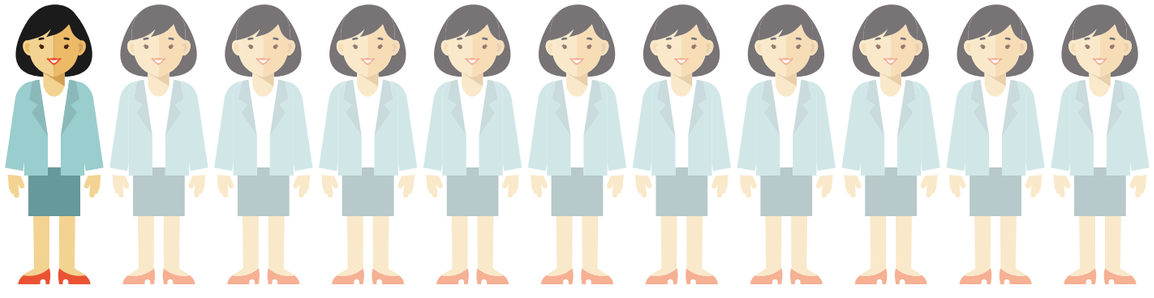
Parts of the road and rail networks are under strain

The lack of spare highway capacity impacts on providing resilience, for example for diversionary routes following an incident on the motorway network. Congestion and unreliability are a major cost to the region, estimated to be equivalent to £300m per year, due to increased vehicle operator costs and non-productive time, which are barriers to further clustering of business sectors in Enterprise Areas/Zones and other major employment areas. This will impact on our sustainable growth aspirations and competitiveness if left unchecked. The removal of the Severn Bridge tolls is likely to have worsened congestion on some major roads in the West of England. Additionally, the efficiency of the region's network is impacted by different highway network management arrangements.

There is a need to sustainably accommodate growth in the number of delivery and freight vehicles. These are generated by the airport and port, both of which have aspirations to expand, and other road freight movements into and through the region, associated with the growing economy, population and home shopping.

The local authorities work hard to maintain their highway assets. However, budget constraints mean there is a highway maintenance backlog. There is an increasing incidence of poor or dangerous road surfaces, often arising from extreme weather events.

1 in 11 commutes by public transport



Demand is growing on the local and regional rail network, and trains are overcrowded at peak times, particularly into Bristol and Bath.

There are high levels of inequality and different accessibility needs

There are high levels of inequality across the West of England, with some communities or individuals not benefiting from the prosperity of the region but impacted by the high costs of living. The pockets of deprivation, and their historic lack of investment in transport improvements, impact on opportunities to access services and employment. One equality impact is that women are less likely to have access to a car than men and more likely to have more complex travel patterns that are not easy to undertake, especially in areas of poor connectivity. There is also an ageing population which has its own distinct travel needs. Older people rely increasingly on others to gain access to services, especially in rural areas where local facilities and public transport are lacking or limited.

Transport impacts on safety, security, air quality, public health and public realm

Vulnerable road users (particularly pedestrians, cyclists and motorcyclists) continue to be more seriously affected by road traffic incidents with motorcyclists disproportionately affected. Many streets are perceived to have safety or security issues, including high numbers of heavy vehicles.

This makes walking or cycling unappealing and can increase vehicle trips, such as on the 'school run', thereby creating a vicious circle.

Road traffic is a major contributor to both urban and global air pollution. Exposure to transport-related air pollution has been associated with adverse health impacts on local communities and the natural environment. Air Quality Management Areas (AQMAs) continue to be in place in areas including Bath, Bristol and other locations on major roads with heavy and/or slow- moving traffic. The Government has directed local authorities to prepare Clean Air Plans to reduce nitrogen dioxide (NO_2) levels in the Bath and Bristol urban areas to legal levels, which can include implementing Clean Air Zones (CAZs).

High car dependency, poor air quality and inactive lifestyles pose a major threat to public health. The quality of the public realm and green spaces are poor in some areas, and severance and noise caused by motorised traffic exacerbates this and deters the use of active modes. As well as impacting on physical health, it limits the integration and vitality of local communities and negatively affects quality of life

There is a need to manage emerging technology and innovation

We may be at the tipping point of a revolution in transport, as emerging technologies and innovation, including 'driverless' electric vehicles and smartphone apps, change how we choose to travel. We need to consider the potential for, and long-term impacts of this on mobility and travel (see Section 4: Embracing technology and partnerships for more details).

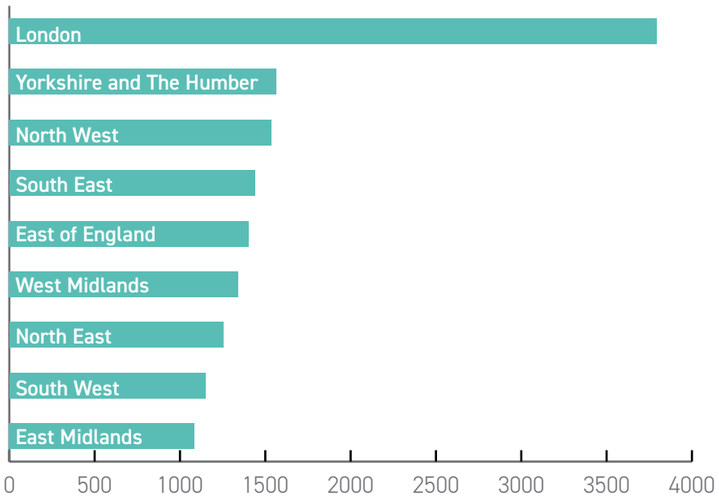
Section 2:
Transport challenges in the West of England continued

There has been limited transport funding

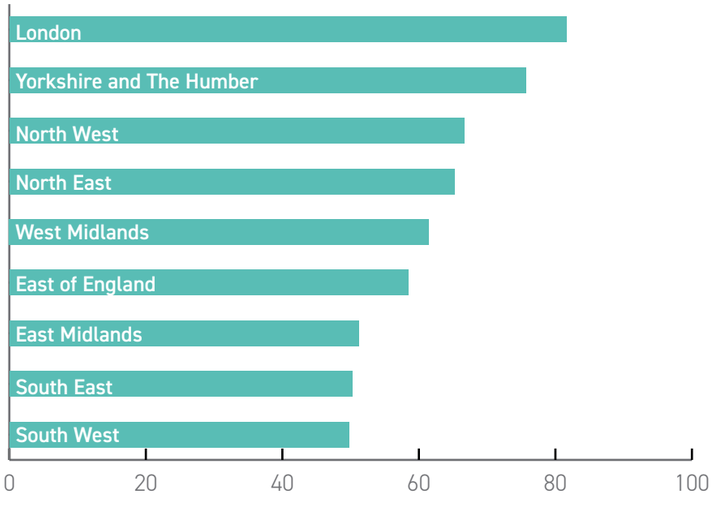
Many of the challenges are a direct result of limited transport funding across the region and wider South West for many years; the level of available resources has been insufficient to address the scale of growth. During the five-year period from 2012/13 to 2016/17, the average overall public spending on transport per resident of the South West region was around £1,150, the lowest across all regions except for the East Midlands. The average spend across England (excluding London) was nearly 20% higher, at £1,370. Furthermore, during the same period, the South West saw the lowest average overall public spend per Gross Value Added (GVA) on transport, at £49.76 per £1000 GVA. This compares to an average in England, excluding London, of £58.48 per £1000 GVA. The JLTP4 recognises the need to catch-up through the most ambitious transport programme ever for the West of England.

The following sections of the JLTP4 set out how we will continue to work together to build on our achievements to date, provide the step change in transport provision that is required, and embrace new opportunities and technology to provide enhanced connectivity across and beyond the West of England. This will ensure the West of England continues to be one of the best places to live, study work and visit.

Public spending (£) on transport per resident (2016/17)



Public spending (£) on transport per £1000 GVA (2016/17)



Section 3:
Vision and objectives

Vision

The long-term aspiration for transport in the West of England is encompassed in the vision for JLTP4:

'Connecting people and places for a vibrant, inclusive and carbon neutral West of England'

Objectives

Five objectives have been identified, based on the aspirations of the West of England authorities and previous plans and policies prepared. There is no priority allocated to the objectives as they all have a role to play in achieving the vision for the West of England. The objectives, as follows, are in no particular order:

- Take action against climate change and address poor air quality
- Support sustainable and inclusive economic growth
- Enable equality and improve accessibility
- Contribute to better health, wellbeing, safety and security
- Create better places

Outcomes

For each of the objectives, several outcomes have been agreed. These outcomes set out what we are seeking to achieve by delivering the plan. The policies included in the plan will support the delivery of the objectives and outcomes.

To demonstrate how the JLTP4 policies contribute towards delivering the objectives and outcomes, a series of icons have been developed. There is one icon for each objective, with the numbers underneath showing the outcomes the policy is likely to make the largest contribution towards achieving. The icons are included next to each policy in the connectivity sections.

Take action against climate and address poor air quality

1. Reduce carbon emissions to net zero by 2030
2. NOx, particulates and carbon emissions are reduced
3. Air quality in the AQMAs is improved
4. Air quality remains better than national standards outside the AQMAs
5. The transport network is resilient and adaptable
6. Technological advances to improve air quality and monitoring are embraced

Section 3:
Vision and objectives continued

Support sustainable and inclusive economic growth

1. Improved efficiency and reliability on local, national and international transport networks
2. Delivery of new housing and jobs is supported
3. Access opportunities to employment growth areas and education is provided for all
4. Transport assets are maintained and managed, and demonstrate value for money
5. The high-quality transport network generates inward investment
6. Congestion and demand on the network is better managed through technological advances

Enable equality and improve accessibility

1. Connectivity is increased and transformed, enabling seamless "door-to-door" movements of people and goods
2. Access for those with both visible and hidden disabilities is improved
3. Access to services and opportunities for residents in rural, remote and deprived areas is improved
4. Better information to aid travel decisions is provided
5. Low carbon transport and opportunities for reducing the need to travel are maximised
6. New public transport systems, smarter ticketing and faster payment options are enabled

Contribute to better health, wellbeing, safety and security

1. There is a step change in the number of healthy, low carbon walking and cycling trips
2. There is a continued reduction in the number of road casualties on the transport network
3. Road safety for transport users is improved, particularly for those most at risk
4. Personal safety on the transport network is improved, and there is less crime and fear of crime

Create better places

1. Journey experience is enhanced through an integrated and connected transport network
2. The impact of the transport network on the built, natural and historic environment is minimised
3. Streetscape, public spaces and urban environments are enhanced
4. The transport network supports neighbourhood renewal and the regeneration of deprived areas

Where we need to be in 2030

To achieve carbon neutral transport by 2030 requires a substantial modal shift away from cars to public transport, cycling and walking. It is likely that a significant daily road pricing charge with revenue reinvested in alternatives, and the return of the fuel tax escalator alongside further engine efficiency improvements will be needed to decarbonise transport (see Section 11 and Modal Target Shift).

Where we want to be in 2036

By 2036 at the completion of the JLTP4 the West of England will be a carbon neutral community where the vast majority of vehicles on the road are decarbonised and no longer fuelled by fossil fuels. More people will have the opportunity to move around the region using affordable, high quality and frequent public transport accessing their jobs and leisure activities and delivering freight. People's choice of mode will be reflected by the real cost in environmental terms and consequently our streets and roads will no longer be dominated by the private car. More of us will cycle and walk short distances more frequently rather than deciding to travel by car. Some of us will be travelling by connected and autonomous vehicles whilst overall the number and distance of journeys to work will decrease as more of us choose to work from home.

And where we will go next

Significant changes are taking place in society and mobility as the digital age has collided with, and is disrupting, the motor age. Social, technological, economic, environmental and political drivers are at play, creating deep uncertainty over what the future might look like. We want the West of England to be a world leader in transport provision. We want to be at the forefront of technology not just ready for technology change but actively pursuing, planning and harnessing it and in the process pushing central Government to enable the legislation and provide the funding necessary to realise this level of ambition.

Section 4: Embracing technology and partnerships

Technological advances and innovation

Technological advances and innovation are striding ahead at the global level, with new digital systems and devices becoming an increasingly important part of our daily lives. The huge rise in internet shopping, more flexible working patterns and use of telecommunications software, are leading to fewer journeys being made per person for shopping, commuting and business. Technology has had a significant impact on mobility, and this will continue.

Future mobility is about so much more than technology; it's about people, connectivity and the way we create and support change to deliver the future we want. People often adapt well to change, but opportunities need to be provided in the right place and at the right time to maximise benefits. As such, by shaping future mobility systems, we can, in turn, shape demand.

The right schemes and policy framework need to be in place to capitalise on changes, enable us to harness the potential benefits, ensure it is accessible to all and avoid negative impacts. We are witnessing rapid developments in many areas that could mean more people are able to choose walking, cycling and public transport. These changes could support a more inclusive society where the young, elderly, persons with mobility challenges, as well as those living in rural areas, have new travel options, and offer new ways of transporting goods to and around the region.

The main areas being explored, or where advances are occurring and evolving, are as follows:

Connected and Autonomous (driverless) Vehicles (CAVs) have the potential to radically transform the transport system in the longer-term future. However, the evolution of CAVs needs to be carefully managed. CAVs offer the opportunity for fewer people to own cars, if sharing vehicles and journeys becomes the norm, providing an accessible transport option for all. However, if CAVs start to compete financially with public transport this may result in people shifting away from public transport to cars, which would lead to an increase in the number of vehicles on the road network. The introduction of CAVs may also mean that some people opt to commute further for work due to their ability to work while traveling, again resulting in more vehicles on the road. Within this JLTP4 period, CAVs will only provide part of the solution, and a multimodal approach will still be needed.

Mobility as a Service (MaaS), including Pay As You Go travel, could encourage a shift away from personally-owned modes of transport and towards solutions that are consumed as a service. This could include the concept of paying for a weekly travel pass that includes bike hire, car hire, bus and train travel, rather than owning a personal mode of transport.

Open data, stemming from data collation and sharing of information obtained from journey planning tools and ticket sales, for example, can provide an understanding of travel behaviour. In turn, the data can support the identification and development of measures that influence future travel demand and mobility networks.

Future Mobility Zones (FMZs)

Smart city initiatives, that use data and technology to create a more efficient and integrated network, such as Smart Motorways and Urban Traffic Management Control.

Improved and faster wireless technology, will support development of many technologies. The ability to access information, particularly when out and about, is critical to enabling people to maximise opportunities to access the services they require.

Carbon reduction technology, such as cleaner fuel and energy, are increasing in prominence and availability. This includes hybrid and electric vehicles, and e-bikes.

Section 4:
Embracing technology and partnerships continued

Timescales are hard to predict, and a transformative change that is driven by some or all of these advances may not even occur. While mobility changes are mostly likely to occur just beyond the lifetime of this JLTP4, many of the JLTP4 schemes will have a long lifespan, so the potential technological impact needs to be considered. This will mean we are prepared for where we want to be, rather than adapting to the new mobility environment we find ourselves in. Initially, we will produce a strategy on CAVs and MaaS setting out our position, including our concerns and ambitions.

As a starting point the West of England has bid to become one of three areas nationally to share £70m of Future Mobility Zones (FMZ) funding to maximise the benefits from transport innovation in urban areas. The core projects within our FMZ bid are a data hub to unify datasets and gather new data. The aim is to maximise the understanding of travel demands and traffic and a mobility as a service platform connecting operators, consumers and transport authorities. For the user, it will mean new services, bespoke information and offers a single platform to plan and pay for mobility services. Other aspects of the FMZ involve the development of Mobility Stations to improve physical connectivity; trialling of micromobility modes; and deploying dynamic demand responsive transport services to improve first and last mile connectivity and access to employment.

Advancing together

We are committed to partnership working to ensure we are at the forefront of implementing technological advances in transport, through developing and sharing knowledge, lessons learned and innovations. The ambition for the West of England is to become a European leader in the progressive roll-out of new technologies and new forms of mobility. We will work with and support national and local legislation that encourages safe and sustainable travel, especially through technological initiatives to improve mobility.

We will release open source data for application developers to build apps and digital platforms, so the community can have direct involvement in enhancing our service. Data should be shared and open to avoid the creation of a monopoly. Open data is crucial with mobile phones and real-time information playing an increasingly important role in providing choice. We will put an expectation on our partners to provide us with any data they collect, to guide the future development of transport.

We recognise the need to gain confidence and public trust in using new technologies. We will encourage suppliers and partners to work closely with elderly and 'harder to reach' sectors of the population, to enable them to embrace new opportunities.

Case Study: Flourish

Flourish concentrated on connectivity and older people. Flourish trialled some world leading Vehicle to Infrastructure (V2I) technology including the latest generation of Wi-Fi for cars. It demonstrated communication between vehicles, and between vehicles and a base station. Flourish developed driverless pods tested in campus type environments, as well as in simulators. Flourish focused on the needs of older people when using CAVs, and built a detailed model of how Bristol could operate in future CAV scenarios.

Partners: Flourish – Atkins (part of SNC-Lavalin), Airbus Group, Axa, Dynniq, React AI, Designability, OPM, Aimsun (part of Siemens), Bristol City Council, South Gloucestershire Council, Transport Systems Catapult, Age UK, University of Bristol and University of the West of England.

The West of England authorities were project partners with the ground-breaking Flourish and Venturer projects, which considered the potential for, and long-term impacts of, technological developments such as CAVs. Both projects involved academics, as well as legal and insurance experts, to understand the societal implications of these technologies. A regional technology consortium to combine the knowledge of these partners along with vehicle manufacturers, communication providers, technology specialists, national research projects, and academics of the universities in the region has been set up.

The Government's Innovate programme is delivering research and innovation projects.

We recognise the high cost of widespread implementation of new mobile technologies and will work with suppliers and other partners to help ensure that it does not only benefit areas or users where the highest level of financial return can be gained, and that rural areas, in particular, are not overlooked.

Case Study: Venturer

Venturer concentrated on autonomy. The state-of-the-art Wildcat autonomous vehicle developed by BAE Systems allowed Venturer to develop a range of new sensor and control technology with experts at the Bristol Robotics Laboratory. A series of increasingly complex tests were carried out over three years. Year 1 focussed on handover between human and machine; Year 2 on interaction between the Wildcat and other vehicles; and Year 3 on interactions between the Wildcat and pedestrians and cyclists. It also demonstrated "see through technology" where one vehicle reports to the vehicle behind it what is in front. Venturer partner Williams developed an advanced simulator based on a Range Rover Evoque that could replicate the real-world scenarios, as well as testing human perceptions of a range of factors in a CAV.

Partners: Venturer – Atkins (part of SNC-Lavalin), AXA UK, BAE Systems, Bristol City Council, South Gloucestershire Council, First Group, Fusion Processing, Williams Advanced Engineering, University of the West of England and University of Bristol.

Section 4:
Embracing technology and partnerships continued

Maintaining and developing wider partnerships

The key to success in delivering JLTP4 is to work closely with our stakeholders and continue to build new partnerships. A JLTP4 Advisory Group was established to provide technical and professional advice, comprising over 20 representatives of transport operators and providers, transport user groups, transport discipline experts and emerging technology specialists. WECA and the four West of England councils will continue to maintain and develop partnerships with:

- Local and national transport operators and providers
- Transport user groups
- Persons with reduced mobility groups l Local businesses and business groups l Community and voluntary sector
- NHS (including Clinical Commissioning Groups) and local sport organisations
- Educational establishments
- Community Rail Partnerships
- Police and Local Community Safety Partnerships
- Neighbouring councils (including across the River Severn)
- Service providers e.g. electricity network operators
- West of England Road Safety Partnership

As each individual project is developed a consultation plan will be developed tailored to the relevant stakeholders unique to the impacted community and scheme type.

Specific examples of how we work, and will continue to work with groups or organisations, are set out in the connectivity chapters.

Section 5:
Improving connectivity

We will provide a well-connected sustainable transport network that offers greater, realistic travel choice and makes walking, cycling and public transport the natural way to travel. Trips into and within the West of England will be seamless, faster, cheaper, cleaner and safer.

It is often said that our network is at capacity, particularly during the morning and evening peak periods, but this is only the case if you consider it in terms of 'vehicle space'. If we considered our roads in terms of 'people space' there is actually plenty of available capacity on our road network.

The focus for investment is on increasing the attractiveness of more active and sustainable modes, both by improving these networks and opportunities and implementing measures that can manage private car use. Individuals will be empowered to change their travel habits, with sustainable modes becoming the preferred choice for journeys, if journeys need to be made at all.

New and expanded rapid and mass transit, across the Bristol urban area and providing links towards the East and North Fringe, Bath and the airport, will be transformative, providing fast and reliable journeys for residents and visitors. It will be supported by comprehensive walking, cycling, bus and rail networks, that enable people to get to stops/stations quickly and easily. The quality and coverage of this supporting network is critical, as the first and last mile of any journey is often the most important factor in determining mode choice.

Attracting trips made by private car onto rapid and mass transit will bring improvements in journey times, reliability, air quality, carbon emissions and overall attractiveness of the network for more sustainable modes. Less traffic will improve the perceived safety and security of the network, and the reallocation of road space, where appropriate, will allow streets to be transformed, creating better places and improved public realm in urban areas.

Park & Ride (P&R) will play an important role in enabling people living outside the urban areas, who do not have easy access to public transport, to access central areas by non-car modes. By providing P&R sites on prioritised routes into the main urban areas, the accessibility, reliability and convenience of P&R services will be improved.

We recognise that for some people the private car is essential and for others it is often the only realistic mode of travel, such as those in rural areas where a reasonable level of bus service is not sustainable. The needs of people with personal mobility challenges are recognised and supported. In line with our responsibilities under the Equality Act 2010, we will ensure all new infrastructure, vehicles and information are as accessible as possible. We will deliver improvements to existing transport networks, targeting parts that cause most disadvantage. This includes rural and deprived areas, which are in danger of getting left behind.

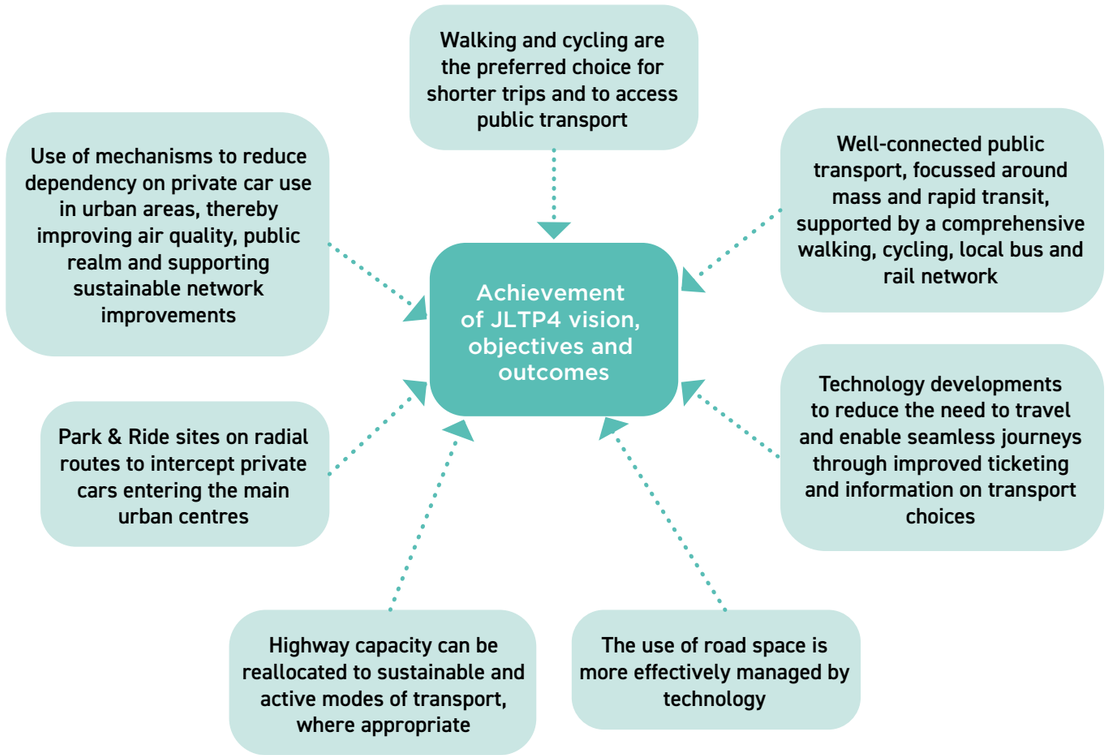
In seeking to reduce the level of emissions, including carbon, we will provide infrastructure to support the use of electric vehicles. We will also continue to explore the use of mechanisms to reduce dependency on private car use, including providing continued support in the development of new technologies.

Our strategy for improving connectivity in the West of England is shown in Figure 5.1.

This JLTP4 is structured around improving connectivity at four levels. These are not exclusive; some of the policies and interventions are relevant at more than one level, although they have not been repeated. As a plan that focuses on the West of England region rather than local areas, connectivity at the most strategic level is considered first.

Section 5:
Improving connectivity continued

Figure 5.1: Strategy for improving connectivity



Beyond the West of England

Journeys into and out of the West of England, including to other areas in the South West, South Wales, national and international. The focus is primarily on:

- Strategic road and rail networks, including the role of coaches
- Supporting the role of the port and airport, for both passengers and freight

Within the West of England

Journeys wholly within the West of England, but longer than approximately 10km, including those between main urban areas. There is recognition that long trips start with a local trip. The focus is on:

- Developing rapid and mass transit, and supporting and enhancing existing public transport
- Managing the demand of vehicles on the network
- Technology, to manage the network, provide future travel opportunities, and reduce environmental impact
- Freight and the needs of businesses

Local

Journeys of up to approximately 10km, including all journeys wholly within one urban area and those between neighbouring rural areas, and rural and urban areas. The focus is primarily on:

- Active travel, including improving cycling and walking networks
- Travel planning and increasing knowledge about sustainable modes
- Providing easily accessible information
- Access to services, including remote working and reducing the need to travel
- Improving air quality

Neighbourhood

Journeys within local communities, both urban and rural. The focus is primarily on:

- Removal of physical barriers, such as severance caused by major roads
- Safety and security, both perceived and actual
- Master planning, local planning and public realm

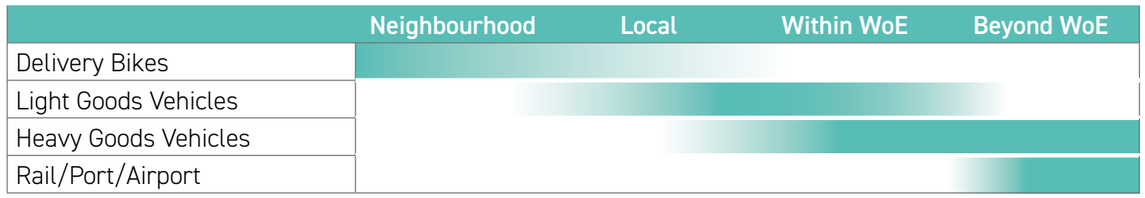
This JLTP4 is not structured around transport modes; however, Figure 5.2 sets out where the modes have the biggest role to play in improving connectivity in the West of England. Note that many journeys will combine at least two modes of travel.

Section 5:
Improving connectivity continued

Figure 5.2: Role of transport modes in improving connectivity at different connectivity levels

Personal Travel

Freight



Section 6: Connectivity beyond the West of England

Beyond West of England challenges

The West of England serves, and requires linkages to, the wider South West, South Wales, the rest of the UK and international locations, to meet its growth targets and ambitions. The economic viability of the West of England and surrounding areas is dependent upon the provision of convenient and attractive access arrangements for industrial, business, shopping and tourist trips. However, trip lengths mean travel choices are often more limited for longer journeys. Combined with a network that is increasingly under pressure, specific challenges for connectivity beyond the West of England have been identified, building on the general challenges included in Section 2:

- The Strategic Road Network (SRN), particularly the M4 and M5 motorways, have heavy traffic flows due to both longer distance through traffic, and local movements that perceive the SRN to offer the best route
- The removal of tolls on the Severn crossings in 2018, has resulted in increases in traffic using the crossings, for which mitigation measures will need to be sought
- Both the Port of Bristol and Bristol Airport have aspirations to increase throughput, impacting on the area's transport infrastructure
- HGV and other freight delivery movements are increasing, due to rising freight volumes, impacting on the already congested highway network

The impact on the built and natural environment, particularly air quality, means alternative realistic opportunities need to be investigated for longer distance freight and people movement.

Beyond West of England policies and interventions

Two main policies will support delivery of the JLTP4 objectives at the beyond West of England connectivity level:

- B1: Enhance competitiveness of major gateways and improve connectivity to international markets
- B2: Improve strategic resilience of the network for all trips

The policies will be delivered by focussing on specific interventions.

B1. Enhance competitiveness of major gateways and improve connectivity to international markets

This policy contributes towards the delivery of the following objectives and outcomes:

1,3,4,5	1,2,4,6	5	1

The main interventions that will support the delivery of the policy, are:

- Work with Bristol Airport to maximise the airport's transport connectivity as a local, sub-regional and regional transport interchange
- Enable improved transport connectivity with Bristol Port

Section 6:
Connectivity beyond the West of England continued

Work with Bristol Airport to maximise the airport's transport connectivity as a local, sub-regional and regional transport interchange

Bristol Airport is the ninth busiest airport in the UK and carried over 8 million passengers in 2017. It has applied for expansion, which if approved would cater for 12 million passengers per annum by the mid-2020s. The airport is also required to produce an airport Master Plan, which sets out long term expansion plans towards 2050.

Regardless of expansion plans, improving connectivity to Bristol Airport is crucial. In particular, we will work to increase public transport in the short term, with improvements to bus and coach services serving the airport, and in the long term through a high-frequency mass transit corridor.

There has been significant investment in improving accessibility in recent years, including the South Bristol Link and improvements to the Airport Flyer frequent bus service. However, further and more significant improvements are needed, such as mass transit on the corridor linking the airport with Bristol centre. This will enable more efficient use of transport space and provide the improved connectivity needed whilst also acting as a transport interchange for the surrounding rural communities. Enhanced connectivity is also required between the growing town of Weston-super-Mare, the J21 Enterprise Area, the Weston Villages developments and the M5. Connectivity will improve onwards to Banwell, through realising development opportunities and improvements to transport and the quality of life both bypassing and within the sensitive village centre.

The Airport Flyer express bus service from central Bristol saw a doubling of capacity in early 2018. While operating up to at least every 10 minutes during the daytime, it only operates hourly in the early morning, making it a less viable option for passengers and staff needing to arrive at the airport early. This also applies to those travelling on direct buses from Bath and Weston-super-Mare, the latter of which only has an hourly service all day.

Case study: Bristol South West Economic Link study (BSWEL)

North Somerset Council completed the BSWEL study in 2019. The BSWEL project was developed to assess existing network constraints and resilience issues and to provide a framework to assess what transport packages could support economic development along the corridor.

The study explored transportation improvements along the A371-A368-A38 corridor between Bristol, Bristol Airport, Weston-super-Mare and M5 J22, improvements to Worle Station and a mass transit link to Bristol Airport. The identified transport improvement packages would have a number of likely benefits:

- Supporting sub-regional and regional economic, employment and housing growth including any potential future growth at Bristol Airport should this be approved through the planning process
- Improved connectivity, multimodal and mass transit surface access provision to and from Bristol Airport ensuring benefits of new infrastructure are shared with local communities
- Enhanced network resilience and reliability by addressing congestion along key strategic routes to the Airport and the wider sub-region
- Improving the environment and quality of life for residents and businesses in the area

Transport packages have been identified and would require more detailed options assessment work, should the funding become available and the local and regional requirements for them develop.

Bristol Airport is required by Government to produce an Airport Surface Access Strategy. Improved access arrangements will enable the airport to provide passengers, staff, businesses, delivery and also local public transport users a greater range of sustainable transport options for a more accessible regional transport interchange. It will include options to improve connectivity across transport modes including Park & Ride, local bus services, and highway junction improvements on the nearby transport network, and exploring tram, light rail and heavy rail opportunities. This could be partly funded through S106 contributions, either from existing planning permission or any future contributions, should any expansion be approved.

The airport is making sustainable improvements to some of its operations through national initiatives such as Sustainable Aviation, and their own initiatives such as the Noise Action Plan and its Environmental Impact Fund. However more significant measures will be required to respond to the Climate Emergency challenge.

We will work with Bristol Airport to define and deliver a low carbon, accessible, integrated, and reliable transport network, for both staff and passengers to access the airport when they need to.

While ensuring affordable car parking is available for passengers for whom public transport is not an available or practical option, the demand for driving to the airport needs to be managed. The provision of infrastructure to cater for technological advances in electric and autonomous vehicles will be prioritised, supporting delivery of improved air quality, health, and meeting the challenge of the Climate Emergency.

We will work with the airport to limit the increase in demand for additional car parking provision, and support them in identifying infrastructure that prioritises lower emission vehicles.

Bristol Airport has dedicated airport private hire operators. Whilst private hire vehicles need to be readily available to passengers, operators will be encouraged to improve their vehicle fleets and embrace technological advances in electric and autonomous vehicles.

At present, there are no designated air freight services operating at Bristol Airport, although an estimated 900 tonnes of cargo per year of passenger belongings is carried in passenger aircraft. The Airport has no specific plans to introduce any air freight route as part of the ongoing expansion plans, but as it would be a commercial operator's decision, there is still the potential for this to happen. Approximately 1500 freight vehicles (LGVs and HGVs) use the airport main entrance per day, which would increase should the proposed expansion plans be approved.

We will support Bristol Airport in including freight in its Airport Surface Access Strategy, by identifying sensitive freight routing and delivery periods to minimise the impact, if road freight is the only option.

Section 6:
Connectivity beyond the West of England continued

Enable improved transport connectivity with Bristol Port

Bristol Port is one of the most productive and technically advanced ports in Europe. Current movements at Bristol Port include the storage and onward movement of bulk cargo, employees accessing the site for work and cruise passengers. In April 2018, the Department for Transport (DfT) set out their plans for improving the connectivity of England's ports by publishing 'England's Port Connectivity: the current picture'. It contained nine regional case studies, including Bristol.

Issues impacting on the efficiency of port operations (including Avonmouth and Portbury), are:

- Journey time and reliability on the M5, particularly evening congestion at Junction 19, and the huge increase in traffic and congestion in the summer months
- Resurfacing and rebuilding of sections of the A403, as it forms a crucial link to the port
- Rail connectivity, such as gauge clearance for containers and the need to remove potential conflicts with passenger services
- The motorway severs the connection to/from local neighbourhoods, making it difficult for local employees to access the area by modes other than private car
- Significant freight movements to and from the port discourage walking and cycling due to perceived safety and air quality issues, and shift work means it is difficult and unattractive for employees to use public transport

We will work with Highways England to improve M5 Junction 19 to enhance access between the motorway network and the Royal Portbury Dock, Portishead, Portbury and Pill.

Case study: Bristol Cruise Terminal

Bristol Port now accommodates a range of tourist cruise liner services, with 2017 seeing 12 different cruise lines embark from the port to places such as Norway, the Caribbean and Mexico, the Azores, Portugal and Spain, the Fjords, the Scottish Highlands and Islands, Normandy, Canary Islands and Madeira. This will improve the region's offer for both outgoing and incoming tourists, enabling competitiveness with other national cruise terminals.

The development of the Bristol Cruise Terminal also opens up an important tourism market for visitors to the West of England region and beyond. With good strategic road links, local rail links to Bristol and Bath and a direct waterway access to Bristol and the North Somerset coastline, visitors are well connected to a range of local and regional tourist attractions, providing a new and important source of income and recognition for the West of England region.

The amount of freight is set to increase in the future, with recent or planned investments at Bristol Port including £20m towards car handling facilities and consented development for a potential £800m container terminal. Improved connectivity is vital for the port as it expands further, enabling it to remain such an economically important player in the region's development and national and international links.

We will support Bristol Port in strengthening existing healthy working relationships with Network Rail, Highways England, relevant local authorities and the Local Enterprise Partnership, ensuring road and rail needs are incorporated into wider connectivity improvement plans and any expansion is 'green'.

There is an opportunity to maximise the developing tourist offer from the Bristol Cruise Terminal, by providing more seamless connections across multiple travel mode choices. For onward travel to Bristol city centre, opportunities could include: increased frequency ferries along the River Avon and to the North Somerset coastline; improved bus and coach connection via the nearby Shirehampton Park & Ride; local rail connection via Avonmouth or Shirehampton rail stations; and improved car hire options at the Bristol Cruise Terminal (including electric vehicle hire). Improved bike hire facilities and cycling provision along the A4 Portway cycle route could benefit both tourists and staff who work at the terminal.

We will work with Bristol Cruise Terminal to explore ways that onward travel options across multiple mode choices can be improved, including opportunities with emerging technologies, such as electric vehicles.

B2. Improve strategic resilience of the network for all trips

This policy contributes towards the delivery of the following objectives and outcomes:

1-6	4	3,4	2

The main interventions that will support the delivery of the policy, are:

- Maximise opportunities arising from improvements to the strategic road and rail network, and identify and support delivery of further changes
- Identify opportunities to manage the impact of Severn Bridge tolls removal
- Support the role of coaches for residents and visitors
- Manage and mitigate the impact of regular and infrequent events on the transport network

Maximise opportunities arising from improvements to the strategic road and rail network, and identify and support delivery of further changes

Section 6:
Connectivity beyond the West of England continued

Strategic Road Network

The Government's Strategic Road Network (SRN), covering the country's motorways and some major A-roads, is managed and operated by Highways England (HE). As well as providing for strategic movements into and through the West of England, the use of the SRN needs to be balanced with an appropriate level of local accessibility and the use of the Major Road Network (MRN).

We will work with Highways England and neighbouring authorities to find the optimum balance of use of the SRN for strategic movements and appropriate local accessibility.

Investment in the network is funded by the Road Investment Strategy (RIS) and set out in the Route Strategies, three of which include SRN roads passing through the West of England:

- London to Wales (M4, M32, M48 and M49)
- Birmingham to Exeter (M5)
- South West Peninsula (A36/A46 south of the M4)

These routes frequently suffer from high levels of congestion and delays, particularly around Bristol and on the A36/A46. This impacts on the operation of adjoining and parallel roads, with some traffic (including heavy vehicles) using less appropriate roads; further, there are serious challenges with network resilience during incidents, causing temporary road closures. Conditions are particularly poor during summer weekends and holiday periods on the M5. Improving resilience on the SRN, through the provision of new motorway junctions or completion of link roads, would better manage the strategic movements between the far south west and the rest of the country, as well as in the Bristol area, and will enable the sustainable delivery of growth along the corridors it serves.

The only committed HE scheme included in the current RIS delivery plan is the new M49 Avonmouth junction (to improve access to Avonmouth and Severnside), currently under construction.

The JTS, which was co-funded by HE, highlights the need for substantial investment in the SRN, including extensions to Smart Motorways and new and improved motorway junctions and links. This includes the need for a new motorway junction between M4 Junction 18 and Junction 19 (Junction '18a'), an associated link road to the A4174 Ring Road and a new motorway junction between M5 Junction 21 and 22 (Junction '21a') to serve Weston-super-Mare, Bristol Airport and an associated link road to the A38. The link road to the A4174 Ring Road scheme would help tackle congestion problems in the north-east fringe of Bristol and help businesses operate more efficiently. A feasibility study identified a new junction located in the Emersons Green Enterprise Area. This would require improvements to the M4 between Junction 19 and the new Junction 18A, and improvements to all junctions on the Ring Road from The Dramway to the A4 Hicks Gate junction. HE has accepted the broad principle of these proposals, and we will work with HE on the detail of scheme location and design, ensuring they meet the needs of the SRN and local road network.

We will work with Highways England to progress further work on a new M4 Junction 18A and associated improvements to the A4174 Ring Road.

We will also work with Highways England and Sedgemoor District Council, Somerset County Council and beyond into the south west, including improving strategic connectivity with major employments at Hinkley Point and Bristol Airport.

The Government has published a revised Route Investment Strategy (RIS2) to cover the period from 2020 to 2025, which includes a vision for the SRN to 2040 and beyond. It was hoped this would include substantial investment in the SRN across the region (as detailed in this section of the JLTP4) to ensure future growth is not constrained, and that growth in neighbouring regions does not negatively impact on the West of England SRN routes.

We will work closely with Highways England, neighbouring authorities and other partners on the RIS2 M4 to Dorset Coast study and connectivity improvements and will continue to make the case for new and upgraded junctions on the M4 (new Junction 18a) and M5 (Junctions 14/19/new 21a) and Park & Ride on the M32.

Direct improvements on the SRN itself should include measures to benefit non-car modes. This is important in the Bristol area, where interactions between the M4, M5 and local highway network are closely linked. The successful delivery of the M32 bus lane and bus-only junction demonstrates the benefits of greater integration of urban mobility and the strategic network.

We will encourage Highways England to give greater emphasis to non-car modes on the SRN in making investment decisions, as well as providing greater flexibility in using funding to help deliver infrastructure on the local highway network near to the SRN.

The SRN is limited in providing for longer distance north-south journeys passing through the region. The A36/A46 route provides a strategic north–south link between the south coast and the M4, much of which is single carriageway. Links from the region to Poole/Bournemouth and Weymouth are via less direct and lower standard A roads, particularly the A37 and A350.

The A36 and A46 have large proportions of freight traffic and there are safety concerns on the A36 through Claverton village and on the A46 at Hartley Bends. The A36/A46 also routes traffic through the congested edge of central Bath, contributing to the poor air quality along London Road.

An initial economic study into improved north-south connectivity has identified that key outcomes of improvements to this corridor could result in an additional £20.5 billion generated to the economy with 1,400 jobs being created annually.

The Port of Poole saw the completion in 2018 of a £10m expansion of the harbour to accommodate large cruise and cargo ships, which is expected to see a notable increase in the volume of goods and passengers. This will increase demand for journeys along the north-south corridor.

We will continue to work with Bournemouth, Christchurch and Poole, Dorset and Wiltshire councils through the Western Gateway Subnational Transport Board in encouraging Highways England to undertake a strategic study to develop the case for improvements to north-south strategic connectivity, in seeking to include funded schemes in the next Government's Road Investment Strategy. This includes:

- **South Coast to M4 connectivity improvements: to provide a high-quality transport option.**
- **A46 to M4 route improvements at Cold Ashton: capacity improvements especially at the Cold Ashton roundabout to remove existing delays**

HGV movements will continue to play a significant role in distributing freight into and through the West of England. However, there is potential to improve the efficiency of road freight movements by consolidating, enabling fewer, fuller, and cleaner vehicles to take the most appropriate routes. Alternatives, such as water and rail freight, will remove trips from the highway network and help to reduce the impact of freight movements on the environment. Emerging technologies will enable further use of cleaner vehicles. We will use the West of England Key Route Network (see Section 7) to designate a core network for freight movements, ensuring these are kept on the most appropriate routes and that appropriate levels of lorry parking are provided in suitable locations.

Section 6:
Connectivity beyond the West of England continued

We will work with Network Rail, the South West Highways Alliance, Highways England, the Freight Transport Association and other partners to manage cross-boundary freight movements and promote more efficient movements, such as consolidation centres and the use of lower emissions modes.

Strategic Rail

The West of England lies at the confluence of a number of frequent long-distance inter-city and regional train services. Great Western Railway (GWR) links the region with inter-city trains to London, South Wales and the South West, and regional trains between South Wales and the south coast via Salisbury. CrossCountry inter-city train services provide links to the Midlands, the North, Scotland and the far South West, and South Western Railway provide services to London Waterloo.

Bristol Temple Meads station is a nationally significant rail interchange, as well as a vital regional and local transport interchange and gateway to the city and wider region, including Bristol Airport. The station has over 11 million passengers passing through each year, with usage anticipated to reach 22 million by 2030. Sitting at the heart of the region, the station has the potential to be the best connected and most productive area within the West of England; it is key to delivering other transport infrastructure.

The station is managed by Network Rail, who along with WECA, Homes England and Bristol City Council is leading on the development of a masterplan to ensure the station has the capacity, design and quality it needs to meet its role. New northern and eastern entrances will be provided along with new internal passenger circulation routes, additional platform capacity, a new transport interchange and expanded cycle parking. The redevelopment of Temple Meads station will promote sustainable transport choices for trips to and from the station and surrounding area, providing attractive interchange facilities for bus users, pedestrians and cyclists. This will allow users to secure their bike and continue by bus or train, thereby facilitating multimodal trips.

Bristol Temple Meads has a critical regeneration role in unlocking and serving as the catalyst for growth, from the Temple Quarter Enterprise Zone and St Philips Marsh to development areas across the West of England. The 'Temple Quarter' will see new homes and employment space being delivered, the University of Bristol's new Enterprise Campus and other retail and leisure uses.

We will work with Network Rail, Homes England, Bristol City Council, the University of Bristol, transport operators, developers and other delivery agents to transform Bristol Temple Meads into a regional interchange, enabling seamless connections with sustainable modes and providing new cycling and walking links to local destinations.

Bristol Parkway, located on the London to South Wales and cross-country routes, is also a principal station providing access to education and employment facilities, metrobus and offering faster services to London than from Temple Meads. Bath Spa station, the main gateway to the region for tourists, is served by services from South Wales to the south coast, in addition to trains to London. Weston-super-Mare station is located on a single line loop off the main line and is served by a very limited number of long-distance trains. As a result, there is an aspiration to provide an hourly service from Weston-super-Mare to London. Worle station, on the eastern side of the town, could provide an alternative stop for services remaining on the main line, a parkway style interchange for Weston-super-Mare and a gateway for Bristol Airport.

We will continue to work with our neighbouring local authorities to support service and infrastructure improvements that would benefit West of England residents and businesses.

The full electrification of the Great Western Main Line to Bristol Temple Meads, via Bath Spa and Bristol Parkway, remains an aspiration, as does the extension of electrification from Birmingham to Bristol and on to Weston-super-Mare. As well as delivering a carbon neutral network it will bring benefits to long distance services and provide the longer-term opportunity to link into HS2 (High Speed 2).

We recognise there are considerable capacity constraints around Bristol and the wider rail network. A high-level report, the Greater Bristol Area Rail Feasibility Study jointly commissioned by the Department for Transport and WECA, identified enhancements and the capacity improvements required to deliver them. This work will now feed into the joint Network Rail and WECA Strategic Rail Programme for a 10-year delivery plan and 25-year Strategic Outline Business Case. The Williams Rail Review may provide further opportunities for greater WECA involvement in services and investment and these will be explored.

Train services to and from the region also suffer from short-term resilience and operational issues. These include the closure of the line west of Exeter following severe weather damage to the sea wall in the Dawlish area and train operator staff shortages, faults with rolling stock and signal failures.

Although frequent, north-south public transport connections are poor between Bristol and Bath and the south coast. Slow regional or local stopping rail services operate to Weymouth, Southampton and Portsmouth. Travelling to Bournemouth and Poole requires a change of trains, meaning that the 70-mile road journey from Bristol to Poole takes around 3 hours by train. Coaches do not currently offer a direct or convenient alternative to rail either, with trips to the south coast requiring a journey via London. The Western Gateway's Rail Strategy aims to address these connectivity issues.

Other key connectivity aspirations for the JLTP4 are:

- Bristol to Birmingham and HS2 – Midlands Connect proposal for two extra trains per hour (one from Temple Meads, one from South Wales via Parkway) linking to Moor Street station for HS2 services to the North at Curzon Street
- Western Rail Link to Heathrow – through services from Bristol, South West and South Wales
- Three train per hour IET service from London Paddington to Bath Spa and Bristol Temple Meads
- Hourly IET service London Paddington to Exeter via Taunton and Weston-super-Mare

We will work jointly with Network Rail, the Department for Transport and the franchise and freight operators to produce a 10 Year Delivery Plan and 25 Year Strategic Outline Business Case as part of the Strategic Rail Programme for the West of England. The Programme will improve network capacity and resilience, provide infrastructure and rolling stock enhancements and deliver improvement schemes. This includes better long- distance rail links to the South West, South Coast, South Wales, London and the Midlands.

Identify opportunities to manage the impact of Severn Bridge tolls removal

Since the end of 2018, motorists are no longer charged for crossing the M4 and M48 Severn crossings. Over a year on, the impacts of their removal are still being realised, and the potential mitigation options are part of an ongoing assessment. The lower transport costs and opportunities for increased agglomeration of the economies either side of the bridge is anticipated to increase trips across the bridges, with the following impacts:

Section 6:
Connectivity beyond the West of England continued

- Increased delays on already congested sections and junctions on the M4 Junction 19 to 20 and M5 Junctions 16, 17 and 19, including an increase in heavy road freight movements in this area and on connecting routes
- Increased congestion at these and other locations is expected to lead to a diversion of trips onto other routes across the West of England, impacting on the North and East Fringe, Severnside and North West Bristol, the A4 Portway, the A369 and the A46 from M4 to Bath
- Increased delay to buses, as they get stuck in additional traffic. Trains could also become less attractive, as the cost of travelling by private car becomes more comparable

A number of interventions identified through technical work will increase capacity and enable mode shift, thereby reducing the impacts of congestion on the road network. These include new or improved mass transit, metrobus, Park & Ride, bus and cycle routes, and junction improvements, such as:

- Divert traffic to the Bristol urban area from the M4/Almondsbury towards the M49
- Capture vehicle trips bound for North Somerset and the Bristol urban area by new Park & Ride, metrobus and other bus links, as well as MetroWest
- Consider demand management measures, such as local network charging measures and controls to raise revenue for sustainable transport alternatives.
- Improve the offer (including frequency) of cross-Severn public transport linking the West of England with Chepstow, Newport and Cardiff

Case Study: Zeelo

Whilst more traditional forms of public transport move thousands of users across the region on a daily basis, improvements in technology are quickly resulting in more shared mobility services being developed.

One such example is Zeelo, a UK company founded in 2017 which uses complex algorithms to enable transport services and routes to be devised around the user in order to better meet the consumer's needs.

Initially devised to provide a shared mobility service for under-served areas the company now provides services for commuters including a service with multiple pick up and drop off points between Newport and Bristol. Through its website and mobile phone app Zeelo allows users to select a pick up and drop off location, choose their preferred journey date and time, purchase multiple tickets at a reduced rate and receive those tickets directly to their mobile phone device. This service and many like it are now giving thousands of daily travellers in locations that traditional forms of public transport found difficult to reach a viable alternative to the car.

We will work with Highways England, Network Rail, public transport operators, local authorities in South East Wales and other partners to identify options that will manage the impact of Severn Bridge tolls removal, and work with DfT to secure appropriate funding to mitigate the impacts on the West of England.

Support the role of coaches for residents and visitors

Coaches (chartered and scheduled) play an important role in the West of England's economy and provide inclusive mobility for all citizens and visitors. Coaches can reduce dependence on private cars and so help improve air quality, congestion and provide access to leisure opportunities for those who are unable to use cars.

However, the presence of large numbers of coaches can have a detrimental effect, with impacts on noise, air quality and visual impact, as well as unofficial parking. These effects are compounded when coaches don't stop within our cities meaning that there is little or no benefit in terms of the tourist economy. As a result, there is a need to improve the management of coaches, including embracing new technologies to enable improved enforcement, better monitoring, and more efficient movement and parking.

The West of England has important tourist and visitor destinations that attract both national and international visitors with its combination of a varied natural environment and stunning rural areas, a rich cultural heritage, and historic market and seaside towns. It is essential that the destinations continue to be attractive for coach tourism and leisure, to sustain the tourist economy. This includes providing facilities so visitors wishing to arrive by coach can do so in a safe, convenient and comfortable manner.

Scheduled coaches, including National Express and Megabus, require high quality provision for passengers to wait for, board and alight from coaches, and interchange with connecting local travel options. Services currently operate from Bath and Bristol bus and coach stations, UWE and on-street stops across the region where waiting facilities are poor. Coach operators require standing space and driver facilities while coaches are between services.

Case Study: Weston-super-Mare bus and coach interchange

As part of the ambitious Weston-super-Mare Town Centre Regeneration programme, North Somerset Council has won funding to create a centralised bus and coach interchange at Alexandra Parade. The centralised interchange will integrate bus and coach services into one area, with improved real-time information infrastructure and waiting facilities. With tourist numbers increasing in Weston-super-Mare, the new interchange will ensure that the already important role of coach travel in bringing tourists to the town will be improved further. It will create a key public transport interchange closer to local facilities, helping to achieve a vibrant town centre for visitors and residents alike. The scheme is due to be completed spring 2021.

We will provide improved pedestrian routes and wayfinding between coach drop off and pick up locations and key destinations, offering easy, high quality and convenient routes.

Without a light or heavy rail link to Bristol Airport, the role of coaches is becoming increasingly important in delivering passengers from across a wide catchment area. The airport's catchment area spans the South West and into South Wales, with 19% of air passengers originating from Devon and Cornwall, 10% from Somerset and 20% from South Wales. There have been coach services set up to improve public transport access to manage this demand, including up to ten coaches per day from Cardiff and an hourly service linking Plymouth, Exeter, Taunton, Bridgwater, Burnham and Bristol city centre with the airport. These services have given direct access to the airport for a large geographical area.

Section 6:
Connectivity beyond the West of England continued

Case study: Tourism in Bath

The City of Bath is an important tourist destination, in both regional and national terms. A total of 5.8 million visitors come to Bath each year. The total value of tourism to the city is £432 million per annum. Coach visitors are important to the economy of Bath with an estimated 11,000 coaches visiting Bath each year, and it is estimated that coach tourism is worth £25 million per annum.

We will develop a coach strategy for Bath that will form an effective long-term plan for management of coaches in the city, and the provision of adequate coach infrastructure.

We will continue to work with Bristol Airport to support and promote the use of coaches as a sustainable way to access the site.

Bristol City Council has commissioned a study to investigate the value of coach-based tourism on Bristol's economy and to identify possible sites for coach parking, interchange and pickup/drop off locations. Once the results of this study are available, Bristol will seek to produce its own coach strategy for the city. North Somerset Council will investigate coach interchange and coach parking provision in Weston-super-Mare town centre, alongside a wider review of parking issues in the district.

We will continue to work with coach operators and the Confederation of Passenger Transport and seek to achieve 'coach-friendly town' status for our key destinations.

We will work with coach operators to embrace new technologies, enabling improved enforcement, better monitoring and more efficient movement and parking of coaches that will seek to reduce the need to travel in the most sensitive and already congested parts of our highway network.

Manage and mitigate the impact of regular and infrequent events on the transport network

The strategic highway network, rail network and coaches all have a role to play in providing access for tourists and for those coming into the West of England to attend events. Tourism, in particular, has a significant role to play in supporting the economy. However, we need to provide the infrastructure to support trips and enable visitors to make the 'right choice' for travel, minimising the impact individual trips have on the network.

We will provide travel information at major interchanges, such as airports and rail stations, on travel options into the West of England, including cost and journey time.

The transport elements of event management depend on whether it is a regular event, such as football matches, or an irregular event, such as large concerts. Planners will work together to minimise clashes of events, liaising with rail and highway operators to ensure the network can be prepared for additional trips on a given day.

We will continue to encourage key event organisers and transport operators to work together to minimise the impact of large scale planned events.

Section 7: Connectivity within the West of England

Within West of England challenges

Without further major intervention, cars will continue to be the dominant form of travel and could become significantly cheaper to use with emerging technology. Further increases in the volume of car trips, such as from more people living and working in the area, will lead to significant increases in traffic and pose problems to the future operation of the transport network.

Building on the general West of England challenges identified in Section 2, more specific challenges for connectivity within the West of England have been identified, as follows:

- Congestion is currently experienced on the M32, reflecting heavy commuting into central Bristol, as well as other radial routes (A4 Bath Road, A4 Portway, Cumberland Basin, A37 and A420), the A4174 Ring Road, the A432 and A38, the A4 and A36 in Bath and the A370 in Weston-super-Mare
- Managing parking supply to reduce the number of trips made by the private car into town and city centres wherever possible and increase the trips made by walking, cycling, and public transport, as the availability and cost of parking is closely linked with the demand for motorised vehicle use
- Bus and rail use is significantly lower than other major UK cities, with common perceptions including limited travel options, congestion, reliability, resilience and connectivity
- Overcrowded trains deter people from using rail for business and leisure trips
- Most business-related travel within the West of England is by road, and the large amount of delay on the road network adds costs to journeys, both in terms of lost productive staff time and increased costs of moving goods
- Potential clustering of businesses is limited by the capacity of the transport network, including congestion in central areas, reducing productivity of the workforce and competitiveness of the West of England
- Climate change is impacting on the standard of our transport network, including temporary problems such as localised flooding, and long-term issues such as potholes

To deliver a more resilient and reliable network, the role of the private car needs to be managed, local and regional networks need to be integrated, and realistic alternatives need to be provided. As well as our need to reduce carbon emissions and take action against climate change, there is a need to adapt and create resilience to unavoidable climate change. The scale of work to be done to achieve these changes, and the cost of delivering network improvements at different levels, should not be underestimated.

Within West of England policies and interventions

Connectivity within the West of England will support delivery of the JLTP4 objectives, by focussing on these main policies:

- W1: Provide more public transport options and improve service quality
- W2: Provide for journeys where public transport is not an option
- W3: Use, as appropriate, measures and technological advances to influence and better manage demand
- W4: Improve resilience of the network, providing increased reliability
- W5: Enable business clustering and the efficient movement of freight

The policies will be delivered by focussing on specific interventions.

Section 7:
Connectivity within the West of England continued

It should be emphasised, as illustrated in Figure 5.2, that interventions for connectivity within the West of England are not limited to W1 to W5 above, as both bus and rail trips routinely cover local connectivity the policies for which can also be found in Section 8.

W1. Provide more public transport options and improve service quality

This policy contributes towards the delivery of the following objectives and outcomes:

1-3,5	1-6	1-4	4	1,2,4

The main interventions that will support the delivery of the policy, are:

- Provide high quality and reliable mass and rapid transit
- Support and enhance existing public transport services
- Improve the availability and accessibility of accurate travel information and ticketing

Provide high quality and reliable mass and rapid transit

Many cities across Europe accommodate a mass and/or rapid transit public transport network, with an emphasis on segregation from general traffic. These can efficiently provide public transport trips that are less well covered by local bus or rail networks, either due to the journey distance/speed, or limited access to rail services.

Technical work, including the JTS, identified the need for a mass transit public transport mode across four core corridors with higher potential trip demand, to bring additional capacity and attractive, reliable journey times. Mass transit usually runs on rails. Examples include trams as an above ground option, or underground trains as a below ground solution.

Any mass transit network will be complemented by the emerging Bus Rapid Transit network, metrobus. We have delivered an initial, 50 km metrobus network that provides for trips up to around 10 miles in length and with a stopping pattern around every 500 metres.

A future challenge is the need to manage the integration of any mass transit network and metrobus with the local bus network. The objective would be to maximise patronage on higher-quality mass transit and metrobus, whilst maintaining a comprehensive bus network for those not directly linked to these networks, and avoiding duplication of services. The mass transit network will also need to link to walking and cycling networks to support first and last mile trips by active modes to the frequent-service mass transit corridors, and take account of, and where possible, enhance parallel walking and cycling facilities. This will enable and support people to access the network by active travel, maximising its accessibility.

High quality and reliable mass transit

The delivery of mass transit schemes will be transformative for trips within the West of England, whilst also having the potential to shape the scale and pattern of employment and housing growth.

A mass transit network could dramatically improve journey times across the Bristol and Bath urban areas, achieving reliable 15-20 minute connections between Bristol city centre and the urban fringes and Bristol Airport; and Bath gaining easier and faster movement in and around the city. In both instances congestion could be significantly decreased, leading to quicker and more reliable journeys for other modes such as cars and buses. These changes would encourage clustering of businesses, attracting additional jobs, and enable additional housing and economic growth.

The ambition is for new forms of mass transit (e.g. light rail or trams) where the potential is greatest for high passenger flows. On major corridors, rail-based mass transit will be considered to accommodate future demand and to maximise mode shift from car-based trips.

Mass transit will, wherever possible, be configured to complement metrobus routes and to integrate with the existing passenger rail network. New mass transit services could be introduced on some corridors by diverting through traffic onto other new or improved roads. For example, on the A4 Bristol – Bath corridor through Brislington, road space will need to be reallocated to accommodate mass transit services by diverting through traffic onto the Callington Road Link.

In some locations, it will be very challenging to achieve on-street running, for example through East Bristol, North Bristol, and some parts of South Bristol. In these cases, some underground sections may be required. The JTS highlighted potential for mass transit routes on the four major corridors, as shown in Figure 7.1.

Feasibility studies are underway to explore all mass transit options for above and below ground for the Greater Bristol area and to connect Bristol and Bath as well as the urban areas within Bath itself. This will consider the best performing options for mass transit.

The studies will explore:

- Potential technology options for each route and/or the entire network
- Potential alignment options and station/stop locations
- Patronage forecasts
- Benefits assessment
- Funding options
- Environmental impacts

The scheme development process will take several years and include extensive engagement and consultation. A mass transit system will take many years to deliver and we must begin work now if it is to become a reality and unlock the potentially transformative benefits for the West of England.

We will continue to progress the work on mass transit options, leading to delivery of services along four corridors linking Bristol Airport, the north and east fringes, A4 Bath corridor, and Bristol city centre.

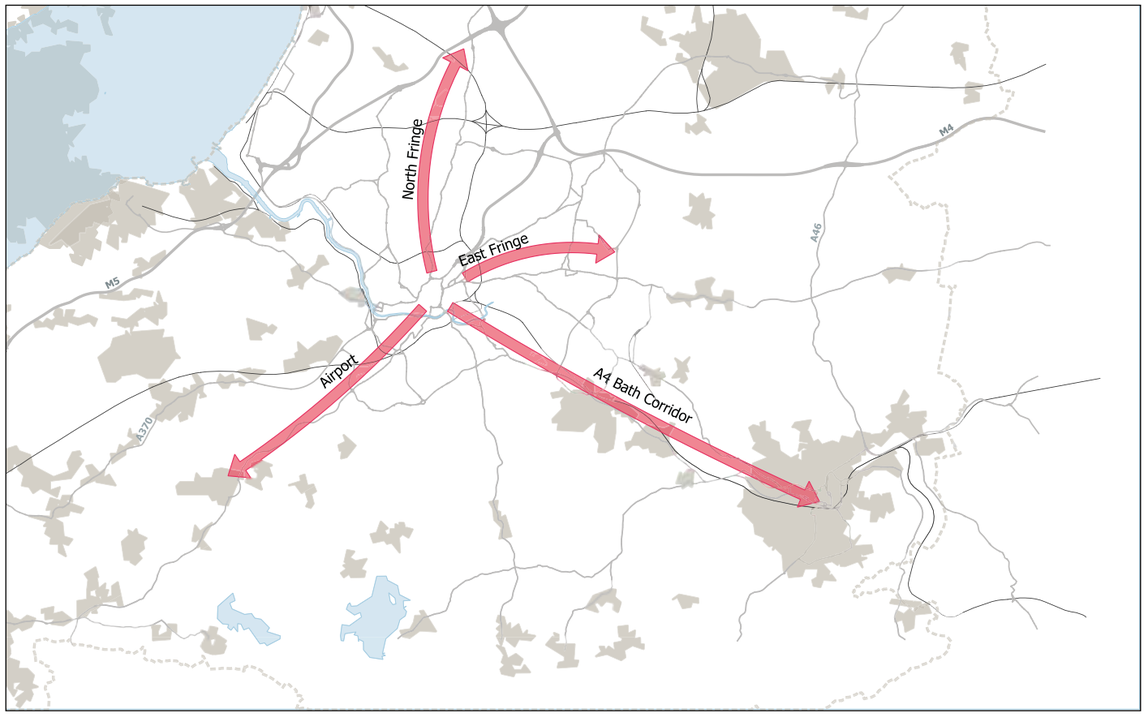
B&NES has already carried out a high-level study to understand the potential of re-introducing mass transit into Bath and how this might form part of the wider transport strategy for the city. By doing this, Bath would join other cities and world heritage sites that have reintroduced mass transit as part of the solution to reduce congestion, ease traffic pollution and re-energise the economy. Through further detailed technical work, the major role trams could play in helping to meet the future growth and transport needs of the city, and improved connectivity with Bristol, will be established.

Through further detailed technical work, B&NES will continue to explore the possibility of introducing mass transit in Bath to help meet the future growth and transport needs of the city.

Section 7:
Connectivity within the West of England continued

Mass transit Bristol to Airport	Connecting the city centre, South Bristol, and the Airport. In the short to medium term, feasibility and options will be developed on a metrobus extension to Bristol Airport. This would enable many to choose fast, frequent, space-efficient and a lower carbon mode choice to this local and regional transport interchange, instead of the private car.
Mass transit Bristol to North Fringe	Connecting the city centre, North Bristol, Southmead Hospital, Cribbs Causeway.
Mass transit Bristol to East Fringe	Connecting the city centre, East Fringe and East Bristol.
Mass transit Bristol to Bath	Initial priority for metrobus corridor to Bath, with longer-term ambition for a high-frequency mass transit solution between Bristol and Bath. Longer-term ambition for light rail between the Hicks Gate/Keynsham area and Bristol city centre, to serve Hicks Gate Park & Ride/transport interchange and beyond, and Temple Meads.

Figure 7.1: Potential mass transit routes



Bus Rapid Transit – metrobus

In 2018/19, the councils launched a 50 km network of three metrobus corridors, creating a new, bus-based rapid transit mode with a forecast passenger total of 4.5 million passenger trips per year. The metrobus network has the following characteristics:

- An emphasis on segregation from general traffic, through bus lanes or bus-only alignments, with shared running in certain areas where traffic is free-flowing
- Highly visible and identifiable stops and interchanges, with good walking and cycling links to local neighbourhoods
- Rapid boarding times, with ticket purchase before boarding, facilitated through the provision of `iPoints' at all stops
- Consistent marketing and branding, emphasising the quality and status of the mode
- A high-quality bus-based vehicle, with twin doors and ultra-low emissions
- Complementary benefits for cyclists, pedestrians and public realm delivered on the back of the metrobus infrastructure

The JTS recommended substantial extensions to the metrobus network, to be delivered up to 2036, which is supported by the JLTP4. These are proposed where they enable sustainable economic growth and contribute to substantial improvements to accessibility in the local area.

Extensions are proposed to serve the growing communities outside the Bristol urban area, together with an orbital route connecting South Bristol to Emersons Green via the ring road, serving Park & Ride sites. A new orbital metrobus coupled with associated Park & Ride facilities will reduce existing pressure on radial routes leading into Bristol and help provide new capacity for sustainable forms of travel in this area.

Proposed extensions include:

- Bristol city centre to Avonmouth/Severnside
- Bromley Heath to Yate
- Almondsbury to Thornbury
- Bower Ashton to Nailsea and Clevedon
- Bristol to Bath (A4) corridor metrobus, with potentially a light rail system extending from Hicks Gate to Bristol in the longer term
- Bristol Parkway via The Mall to Cribbs Patchway
- Orbital metrobus route connecting South Bristol to Emersons Green via the Ring Road, serving Whitchurch, Hicks Gate and the East Fringe
- Weston-super-Mare network (to link the new Weston Villages developments, the accompanying M5 Junction 21 Enterprise Area, and the proposed Park & Ride site east of the town)
- Bristol city centre to Bristol Airport

We will investigate and deliver future extensions to the metrobus network, in a closely coordinated manner.

We support the provision of a 'consolidation package', to lock in the benefits of the network, including further bus priorities, signal upgrades and vehicle replacement.

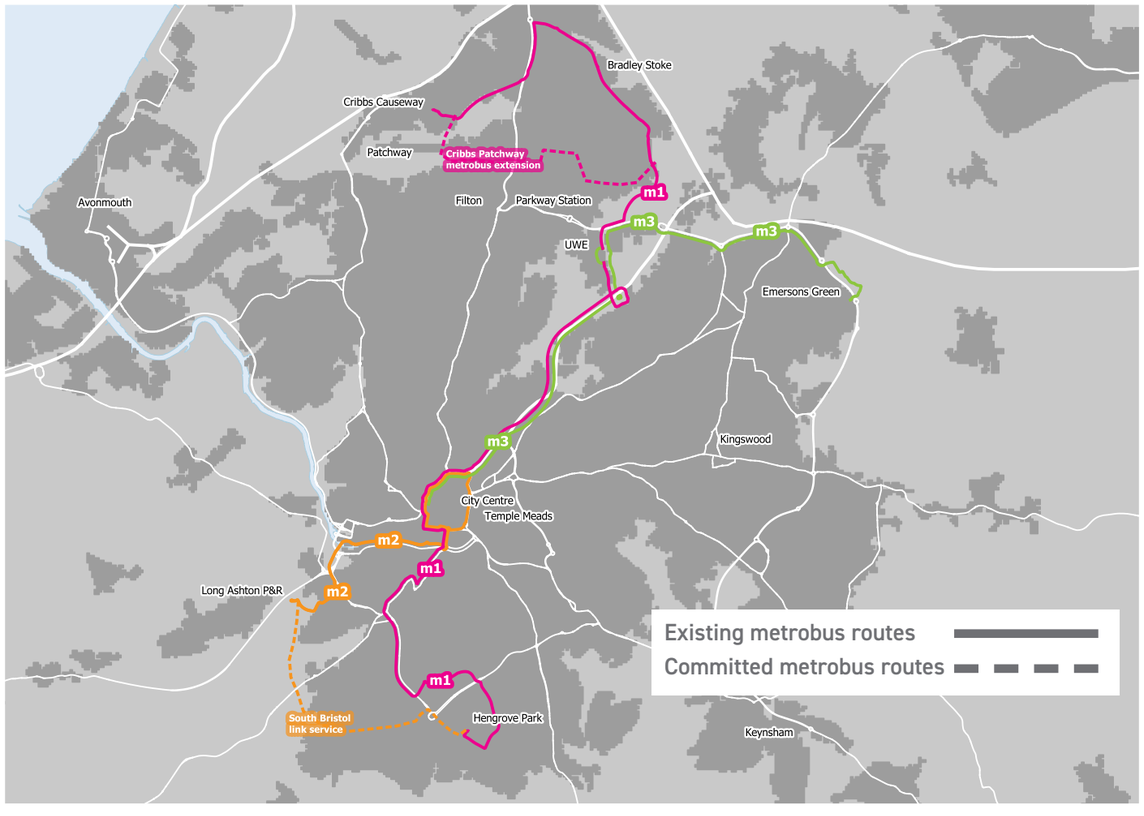
Section 7:
Connectivity within the West of England continued

Case study: metrobus

The recently completed network represents a £230 million investment and includes some major interventions such as a kerb-guided busway, the first bus-only motorway junction in the country on the M32, and a major remodelling of the Cenotaph area in Bristol city centre to improve public transport interchange and the setting of the monument. There were three separate metrobus schemes coordinated under a joint governance structure.

The initial network is forecast to carry around 4.5 million passengers per year.

Figure 7.2: Existing and committed metrobus routes



Support and enhance existing public transport services

The existing bus and rail networks will continue to have an important role to play in providing connectivity within the West of England. The need for infrastructure and service improvements is recognised, alongside making it easier to use bus and rail.

Bus Strategy

Public transport has a key role to play in enabling mode shift and tackling congestion. This includes seeking to provide realistic alternatives to private vehicle trips by continuing to improve local bus and rail networks, completing and expanding of the metrobus network, and improving routes to bus stops and stations for people cycling and walking.

The Bus Strategy supports this JLTP4. It will detail how further growth in bus patronage will be encouraged, including specific proposals and frameworks intended to provide faster, more frequent, reliable and accessible services, combined with new and improved bus stations and other interchanges. Operator engagement has already been undertaken to help inform current challenges to improving the network and opportunities to grow patronage.

Buses play a pivotal role in the current transport network. The West of England has experienced significant, recent growth in bus passenger numbers, bucking the national trend. This increase is likely to result from changes to fares, the expansion of residents' parking schemes in Bath and Bristol, bus lanes, infrastructure upgrades, improved information, and fleet investment by operators. Bus passenger satisfaction has also improved. This success will be built on and an ambitious target to grow passenger numbers further will be set.

Following its creation in March 2017, the Combined Authority has a number of functions related to the 2000 Transport Act (including provision of bus passenger information, concessionary travel, and non-commercial bus services shared with the constituent councils). The Bus Services Act 2017 gave additional powers to the Combined Authority Mayor, including stronger operator partnership arrangements and the power to franchise local bus services under certain conditions. A franchised network would be similar to London, where WECA would specify routes, fares and frequencies and operators would bid to run them. It should, however, be borne in mind that a franchised network, of itself, will not deliver cheaper fares or higher frequencies, as these would probably still need to be funded through public subsidy.

Local bus services need to be as fully accessible as possible to passengers experiencing a mobility impairment. As well as being Equality Act compliant, local bus services need to provide a service which is attractive to different sections of the population in different locations. Crucially, this must include services connecting villages and rural areas with at least one of our towns, cities or major transport interchanges. Any remaining local bus services need to be used by local residents in rural areas and smaller villages in order to maintain the bus service's commercial viability and generate demand for additional services. This way, residents in rural and deprived areas may not necessarily be able to get direct links to their final destinations, but are able to access education, employment and services via interchanging at the nearest public transport corridor, whether this be through local bus services or community transport solutions. Public transport vehicles should also be of high, modern standards to utilise alternative fuels where possible, to minimise emissions and help improve air quality.

The Bus Strategy will consider a wider framework to assess gaps in the commercial bus network, including consideration of estimated patronage, links to deprived areas, links to employment and contribution to tackling traffic congestion. This information will be used to ensure bus services provide realistic opportunities for travel.

Section 7:
Connectivity within the West of England continued

We will work with developers, education and key employment locations to identify how routes can be made more attractive in terms of facilities and providing 'seamless door-to-door journeys'.

We will work with operators and local communities to preserve, support, enhance and promote conventional bus services to meet rural needs, within available resources, both within available resources and through the identification of new funding opportunities.

Improving coordination between the various transport providers in the voluntary sector has the potential to offer users improved efficiencies in public and demand responsive transport provision.

We will work with bus operators, and where necessary invest in the community and voluntary transport sector, to provide services in areas that are not adequately served by scheduled bus services.

We will work with operators to focus local bus services on connecting to high frequency services, to provide well integrated, seamless and reliable passenger transport services.

The English National Concessionary Travel Scheme, funded by central Government, is administered locally by WECA and North Somerset Council under the joint Diamond Travelcard brand. At the time of writing, the constituent councils of WECA carry out most of the administrative functions on its behalf. The Diamond Travelcard offers additional benefits which are funded locally. This means those with the Diamond Travelcard can travel for free on journeys starting in our area at any time except between 0400 and 0900 on Mondays to Fridays, also on local buses starting anywhere else in England on Mondays to Fridays between 0930 and 2300 and any time on Saturdays, Sundays or public holidays.

Councils have powers to introduce other concessions for specific groups of people, such as young persons or apprentices. Such concessions, generally reduced fares rather than free travel, need to be funded locally, but can be effective in making access to education and employment easier.

Case Study: Greater Bristol Bus Network (GBBN)

The GBBN was an ambitious project covering 10 'showcase' bus corridors along strategic transport corridors across the four West of England authorities. The £80 million investment was funded by a range of project partners, including the DfT and First West of England, as well as local/developer contributions.

The key outcomes were to improve and upgrade the bus network infrastructure, and to enhance the bus passenger experience with better buses and improved information and reliability; reducing congestion and reducing emissions. The GBBN was also developed to deliver substantial improvements to the speed, quality, reliability and attractiveness of bus services.

Improvements included over 120 new buses, nearly 1,000 improved bus stops with new shelters & access, more than 300 real-time information (RTI) displays, bus priority signals, bus lanes to bypass traffic, pedestrian and cycle access improvements, public realm improvements and various marketing and promotion initiatives.

The GBBN set out an Evaluation Plan that identified a range of performance indicators to measure project effectiveness. These were bus patronage, Park & Ride patronage, bus satisfaction, bus punctuality, rail patronage, area wide traffic levels, congestion, air quality, cycling trip numbers and road safety. With one exception, where it was not possible to make a conclusion, the targets were met, and many were exceeded.

Through the Bus Strategy, we will consider future opportunities for the concessionary travel scheme across the West of England.

The A4 corridor, which runs through Saltford, is one of the busiest routes in the region. The JTS notes that bus priority on the approaches to Saltford would improve bus journey times and punctuality through the village and benefit longer distance journeys along the A4 corridor between Bath and Bristol. A bypass for Saltford has been considered previously to reduce congestion through the village and enable road space reallocation to public transport.

We will undertake further work to assess options to provide bus priority on the approaches to Saltford before a decision on a Saltford Bypass is made. Consideration will be given to the potential conversion of bus priority measures in future to accommodate other forms of mass transit, such as light rail.

Most interchanges comprise two or more bus stops on-street. There is potential to improve the quality and availability of interchanges, as well as perceived reliability. We will prioritise improvements to interchanges for consideration and inclusion in scheme packages in transport programmes, such as GBBN2. GBBN2 will improve passenger experience, taking account of best practice in both the UK and overseas, by providing better bus services, targeted bus priority measures (and better enforcement), traffic signal upgrades, interchange upgrades, enhanced passenger information and integrated ticketing on core, urban and inter-urban corridors, complementing proposed metrobus and mass transit routes. New bus lanes and other priority infrastructure will need to prioritise road space for bus and metrobus services including the reallocation where necessary of road space from general traffic movement and parking, in order to reduce journey times and improve reliability. Investment in infrastructure will be complemented by operator investment in more, low and ultra-low emission vehicles, including vehicles powered by bio-fuel sources and/or electrically-powered.

We will deliver the Greater Bristol Bus Network 2 to provide further targeted enhancements to the bus network.

Other than a limited number of 24-hour bus routes in Bath and Bristol, local bus and train services do not run throughout the night. This restricts access to some employment opportunities (for example Avonmouth and Emersons Green) and deters shift workers from using sustainable travel.

We will work with local bus and train operators, and Department for Transport, to review the need for bus services to operate throughout the night.

Rail

We want to transform suburban rail services in the West of England with new and high frequency turn up and go services, new lines and new stations.

Stations will be brought up to a new high standard with improved passenger facilities and levels of accessibility, making them step free to enable all passengers to travel by train. Modern ticketing, fully integrated with local bus services, will make all journeys seamless.

The branding of services, information and stations will be made consistent, where possible. This will provide passengers with the confidence they are using an integrated network of fast and frequent services. This could be extended across other modes to provide one transport network, be it buses, trams, trains, ferries, cycles or walking all under the one brand.

Section 7:
Connectivity within the West of England continued

Our proposed and well advanced MetroWest programme will deliver by 2023/24:

- Half hourly services on the Severn Beach to Bath Spa and Westbury Lines. This is forecast to generate 0.6 million new passengers a year
- Reopening of the Portishead Line in 2024, with initially an hourly service (half hourly aspiration) to Bristol Temple Meads and new stations at Portishead and Pill. This is forecast to generate 0.4 million passengers a year
- Re-opening of the Henbury Line with new stations at Henbury and North Filton to serve Cribbs Patchway New Neighbourhood (5,700 new homes) and if approved the new Bristol Arena. This is forecast to generate 0.4 million new passengers a year
- New station at Ashley Down on the Filton Bank
- Half hourly services between Bristol Temple Meads and Yate (3,000 new homes) by 2022, with possible extension to Gloucester. This is forecast to generate 0.25 million new passengers a year
- Stations to be brought up to a new MetroWest high standard of passenger facilities, with step free access
- New station at Portway, part funded by the New Stations Fund, to serve the adjacent Park & Ride site
- New station at Charfield funded through the WECA Investment Fund to support housing growth
- MetroWest services to be included and funded by the Department for Transport

To date, over £26m has been invested by the West of England in developing MetroWest. It remains our rail priority.

We will deliver passenger rail service and capacity improvements, station upgrades and new stations, including MetroWest Phases 1 and 2.

Building on MetroWest we want to see new turn up and go style services alongside enhanced routes across the local network. We will work on:

- Three trains per hour on the Severn Beach Line
- Four trains per hour for local stations between Bristol Temple Meads and Westbury
- Two trains per hour on the Henbury Line with one of these services going to Yate/Gloucester via Bristol Parkway
- Strategic rail-based Park & Ride and parkway stations
- Enhanced services on the Cardiff to Portsmouth, Bristol to Taunton/Exeter including Yatton and Nailsea & Backwell, Bristol to Yeovil and Weymouth, Bristol to Gloucester/Cheltenham and Bristol to Swindon routes
- New Bristol to Oxford via Bath Spa service with links to East-West Rail
- Additional stops at Worle (as the gateway and interchange for Weston-super-Mare and Bristol Airport) and Bridgwater (for Hinkley Point C).
- New carbon neutral fleet of rolling stock to meet current and future demand
- Station enhancements including longer platforms to support housing and employment growth

Through the Great Western, Cross Country and South Western and Wales & Borders Franchises, Western Gateway Rail Strategy and the joint WECA and Network Rail Strategic Rail Programme we will work to secure new and enhanced services.

Bristol East Junction remodelling remains key to our plans, enabling MetroWest services and providing the capacity to run more trains. We also recognise the importance of platform and concourse and interchange works at Bristol Temple Meads as part of the Temple Quarter Master Plan to improve capacity.

Temple Meads, as highlighted in Section 6, acts as a critical transport interchange for central Bristol, the West of England and wider region, providing interchange with the mass transit and metrobus networks.

We support the proposals for Bristol East Junction and the redevelopment of Bristol Temple Meads station and surrounding area.

During the life of JLTP4 and the Strategic Rail Programme, we will consider extending services beyond Henbury and new stations at Charfield, St Annes Park, Saltford, Ashton Gate and Constable Road, and new links to Thornbury, Pilning and Bristol Airport. We will also work with planning colleagues to review the need to safeguard disused rail lines where they could have a future role to play.

We will consider how new technologies can help deliver rail schemes, including options for light rail and tram trains, and how infrastructure costs can be reduced and affordable modern services can be delivered.

We will work with train operators, the Severnside Community Rail Partnerships and others to promote rail travel and improve facilities at stations, including ticketing and perception of safety and security.

Improve the availability and accessibility of accurate travel information and ticketing

Providing a single accessible portal for clear, comprehensive and reliable information on travel options is essential for achieving seamless door-to-door journeys. It provides people with the confidence to travel by public transport and active travel modes, particularly for journeys made less regularly. It will also help to overcome misconceptions relating to service frequency, fares and journey times by public transport, bicycle or foot.

Case study: Mobility as a Service in the West Midlands

In 2018, a monthly subscription 'Mobility as a Service' was launched in the West Midlands, called Whim. Working in partnership with the West Midlands Combined Authority, Whim offers a single access point, via a smartphone app, to multiple transport options including local buses and trains, car hire, taxis and cycle hire. Reflecting the market offer for using mobile phones, users can either subscribe on a periodic basis to receive access to these services for a fixed fee, or use the app for pay-as-you-go purchases on a journey-by-journey basis. Three options are currently being offered in the West Midlands region; pay-as-you-go, a standard monthly package including unlimited public transport and capped daily car rental rates, and a premium monthly package that includes unlimited public transport, taxis (within a 5km radius of the user's location) and rental cars. Access to shared bicycles will also be available later this year.

Participating companies include bus operator National Express West Midlands, taxi app Gett, car rental company Enterprise and cycle hire provider Nextbike, which will be launching in Birmingham later this year. The Combined Authority are keen to maximise travel options without the need to own cars, which on average (worldwide) are parked up unused for about 96% of their lifetime.

Whim was first launched in Helsinki, where it has 20,000 registered users, who receive a number of points which can be used as they like for a combination of taxis and car rental trips each month, supplementing public transport and cycling..

Section 7:
Connectivity within the West of England continued

Information needs to be available in advance of the journey, as well as being updated regularly 'on the move'. Bus and rail passenger information needs to be provided in accessible formats, including audio and visual announcements at stops and on-vehicle. Information provision and digital services is an area we are innovating in and is developing rapidly, including Mobility as a Service. We are ahead of a lot of cities/ regions and want to continue to develop provision, recognising the role this could have in encouraging behavioural change.

Quality information will continue to be provided online, through the travelwest website, as well as through reliable journey planning smartphone apps, such as UK Bus Checker. Opportunities to provide further information will be investigated, such as through Google Maps and citymapper. Citymapper can provide live running information and fares for buses and trains, station or stop progress alerts while on the move, and calories burnt for journeys by bicycle or foot.

We will work with application developers to ensure as much travel information as possible is provided for different journey options, including in rural areas, building on the Government's commitment to improve real time information in rural areas. We will work to ensure that information already available will be built upon and combined in one place.

Transport operators and providers will be required to make data they collect from app and website usage 'open', for use by others to inform and tailor future service and information provision.

Opportunities to enhance existing hard-copy information provision will be considered, ensuring it is as up to date and relevant as possible. Information provided in leaflets, timetables, at libraries, leisure sites, large healthcare sites, major supermarkets and transport interchanges, will ensure those who cannot access information online can still get the information they require.

We have a statutory duty to provide local bus service information (including Real Time

Information). Existing strategies will be reviewed, and a Bus Information Strategy formulated to include updated proposals for:

- Provision of timetable information at bus stops and online
- Real Time Information provision and monitoring
- Service information through Traveline, the West of England travelwest website, and regular social media updates

We will prepare a Bus Information Strategy to update and replace the existing local authority documents, setting out the expected standard for bus information.

The availability and use of `smarter' and integrated ticketing needs to expand. Smarter ticketing and payments can speed up bus dwell times at stops reducing journey times and improving reliability. The use of mobile phone apps has greatly increased the proportion of passengers using smart tickets, along with the greater availability of the West of England TravelWest travelcard. Integrated ticket products already exist, but usage is currently low and smart applications need to improve. WECA is allocating funding to widen the rollout of smart and integrated ticketing products, including multimodal products.

Work will continue to develop an integrated ticketing scheme that is flexible and easy-to-use and the need for further statutory ticketing schemes, and their revenue cost implications, will be assessed. We are currently moving towards the widespread adoption of contactless bank payments across bus operators, with operator products being accommodated on the travelwest card. This functionality will facilitate a connected transport network that runs as smoothly and efficiently as possible and forms a strong foundation for developing future mobile and contactless ticketing scheme options where customers are automatically charged the best fare available.

To enable and achieve 'seamless door-to-door journeys' across the West of England, we will work to roll-out a universal, multi-operator smarter ticketing and payments and explore the possibilities of its use across different transport modes.

W2. Provide for journeys where public transport is not an option

This policy contributes towards the delivery of the following objectives and outcomes:

1-3	1-3	1,2,5	2-4	1,2

The main interventions that will support the delivery of the policy, are:

- Provide Park & Ride and sharing schemes to minimise the impact of single occupancy vehicles
- Recognise the needs of motorcycle and moped users

Provide Park & Ride and sharing schemes to minimise the impact of single occupancy vehicles

The existing Park & Ride services located within the West of England successfully intercept thousands of vehicles on a daily basis that would otherwise be entering our already congested city centres and can act as transport interchanges.

The West of England authorities recognise that for some people the private car is often the only realistic mode of travel. Park & Ride facilities provide the opportunity for people living outside urban areas whose only realistic option is to drive and who do not have easy access to public transport near to where they live, to transfer from private car to public transport for onward journeys into urban areas. By intercepting traffic, Park & Ride releases highway capacity in central areas to enable transfer of road space to walking, cycling and public transport.

Section 7:
Connectivity within the West of England continued

Building on work in the JTS, new and expanded Park & Ride sites will be focussed on the main arterial routes into Bristol and Weston-super-Mare. The impact of any new Park & Ride provision on the operation of the SRN will be assessed, along with the impact on overall journeys made.

We support the concept of a ring of Park & Ride locations around the urban areas, to help tackle traffic and air quality problems in central areas.

In Bath, the priority is to increase travel options on the arterial routes that enter our main urban areas to reduce single occupancy car use. Further expansion of existing sites will also be investigated contributing to carbon reduction in the congested city centre.

In Bath we will explore and support options for increasing travel choices and reducing single occupancy vehicle use into our urban areas. We will investigate further expansion and improvement of the existing Park & Ride sites at Newbridge, Lansdown and Odd Down.

We will deliver the Freezing Hill junction upgrade and improvements at two other junctions along the route between the A420 and Lansdown Park & Ride.

In the short-term, the priority in Bristol is to plug the gaps in existing provision, particularly to the north of the urban area. An M32 Park & Ride site would intercept the largest number of trips into the city, and have the most beneficial impact on congestion, air pollution, and road safety. It would also help unlock the transformation of Bristol city centre, enabling major public realm and transport improvements outlined in the City Centre Framework.

We support delivery of an M32 Park & Ride site.

Other new locations and sites being considered for expansion, include:

- A4 Portway expansion
- A38/A4174 South Bristol Link new site
- A4018 near Cribbs Causeway new site
- A38 North between Junction 16 and Thornbury new site
- A432 new site near Yate
- A420 /Ring Road new site(s) to connect to the East Fringe mass transit scheme
- A4 Brislington site relocation to Hicks Gate
- A37 Whitchurch new site to connect to metrobus
- A370 Long Ashton expansion

Opportunities for additional sites could come forward as part of any future review of the JLTP4.

We will support the delivery of new or expanded Park & Ride sites, where appropriate.

A new Park & Ride site to the east of Weston-super-Mare, potentially located near to the A370/A371 junction, will be investigated. This site could be served by Weston metrobus services, to provide a high frequency rapid service to the town centre.

In North Somerset, we will investigate a new Park & Ride site to the east of Weston-super-Mare, potentially located near to the A370/A371 junction.

The performance of Park & Ride sites will be dependent on restricting parking provision in central areas and managing the cost of parking, to ensure that Park & Ride is the more attractive option compared to driving. The Park & Ride sites will be planned so that traffic impacts are managed around each site and any abstraction from existing bus and rail services is minimised.

The use of Park & Ride sites will be monitored as we seek to understand the demand for later opening of sites into the evening. These could potentially be served by passing bus services, rather than dedicated Park & Ride services. This will be considered further as part of the Bus Strategy.

In the short to medium term, the new and expanded Park & Ride sites will be served by bus, metrobus and rail. Informal rail based Park & Ride already occurs, including at Bristol Parkway, Keynsham and Nailsea & Backwell rail stations, which will be retained.

Rail-based Park & Ride will continue to be explored as part of the MetroWest programme of suburban rail enhancements.

Improved signage and Variable Message Signs on the approaches to Park & Ride sites will increase awareness and usage of the sites, as will the quality of the journey to/from the site and the ease and speed of interchange.

Complementary uses for existing and new Park & Ride sites will be explored, with opportunities for sites to provide Park & Cycle or Park & Stride, overnight lorry parking, coach parking, freight consolidation functions, community uses, renewable energy generation, or even acting as bus depots. Any complementary uses would need to consider potential impacts on local communities and the local environment. Operators would need to be involved, as some proposals may require a parking charge to be introduced.

In the longer-term, we will explore the potential of new and expanded Park & Ride sites linked to mass transit routes, as well as exploring the potential for sites to act as transport interchanges which could include improved links to public transport, substantial increases in cycle parking, cycle hire facilities, improved wayfinding infrastructure to facilitate walking, innovative last mile freight solutions and access to electric charging points.

Informal on street parking is already linked to established radial corridors to Bristol and Bath, where commuters park on radial bus corridors and catch bus services into city centres. This often takes place where there is a frequent bus service and a rural catchment area with limited bus provision, for example in Radstock and Farrington Gurney. However, in some locations parking can cause congestion and blight local neighbourhoods.

We will investigate providing off-street parking to create links to our urban centres on bus corridors at suitable locations, to minimise potential impacts on surrounding areas.

Park & Share, where drivers meet at key places on the road network, one of the vehicles is parked and people continue the journey to the destination in one car, will also be considered. At present, some Park & Share activity takes place around Tormarton (M4 J18), Falfield (M5 J14) and on the A466 outside Chepstow. In some cases, inappropriate parking causes problems in local areas.

We will investigate where Park & Share facilities could be formalised, to encourage car sharing whilst better managing the impacts in local areas.

Car share schemes and car clubs have a role to play where alternative modes of transport are not available. There is a need to coordinate service provision to make services more responsive to people's needs and continue to support informal arrangements to widen its appeal. Car clubs can help to manage parking demand, encourage households to dispense of their second car and generally encourage alternatives to privately owned cars. Further benefits can be realised if the car club vehicles are low emission.

We will investigate opportunities to increase the use of car sharing through technology, including via social media, and implement measures as appropriate.

We will support the uptake and expansion of a car club network of low emission vehicles.

Section 7:
Connectivity within the West of England continued

Case study: Mobility Stations

The city of Cologne in Germany has implemented a number of multimodal hubs across the city known as mobility stations, which is a concept that could be developed across the West of England. Mobility stations are multimodal interchange points that provide first and last mile solutions to connect communities to frequent public transport services and provide integrated transport options.

We have frequent public transport services on our corridors but people not aware of or cannot easily access them. Currently the connections across the city are not legible, giving a poor perception of the public transport offer in the West of England.

Each neighbourhood could have a mobility station of varying scales containing clear branding, clear wayfinding and clear, integrated travel information. At larger interchange points such as P&R sites, metrobus stops, train stations and corridors with frequent bus services facilities at the mobility stations could include:

- Shared dockless bike hubs
- Micro freight consolidation centres
- EV charge points
- Shared car club vehicles
- Secure, pre-bookable cycle parking lockers
- Pre-bookable car parking
- Trailers or cargo bikes to hire to carry shopping
- Demand responsive transport, such as first/last mile taxi services to connect to neighbourhoods
- Combine 'mobility as a service' operators at mobility stations to ensure maximum usage and cluster mobility options for citizens

In every neighbourhood similar options could be provided at mobility stations, depending on the space available to provide variety to make it easier for residents to connect to frequent public transport services and to reduce car use for local trips.

In public consultation, there was strong support to improve the existing public transport offer and this could provide a solution to make the most of our existing infrastructure with little additional investment. Mobility stations can also address the lack of orbital connections between neighbourhoods by providing clear wayfinding to show options to connect easily to mobility stations in other neighbourhoods.

Recognise the needs of motorcycle and moped users

Motorcycles and mopeds can offer an affordable means of transport for trips where public transport is limited and walking and cycling unrealistic. They have a role to play not just at the within the West of England scale but also at the local level, where they can provide a space-efficient alternative to driving, where walking, cycling and public transport trips are not possible. They can provide a more economical alternative to private car use and enable access to opportunities and flexibility that cannot otherwise be gained.

Greater levels of information about facilities for motorcycle users will be provided, including clear signage of facilities on the approaches to towns and cities, as well as ensuring their needs are considered during design of new schemes and infrastructure. This includes road safety, where motorcyclists are disproportionately highly represented in road safety statistics. Road safety camera enforcement provides an opportunity for driver education and road safety campaigns need to be targeted towards improving motorcyclist safety.

The increased provision of secure parking in well-lit areas will be provided wherever possible, particularly at public transport interchanges and town centres. Opportunities to allow motorcycles in areas currently restricted to public transport and pedal cycles will be investigated, and the use of bus lanes to provide diversion from congested areas of traffic in urban areas will continue to be permitted.

We will support the role of motorcycle and moped users, ensuring facilities and parking are provided and clearly identified in appropriate locations.

W3. Use, as appropriate, measures and technological advances to influence and better manage the demand of private car use

This policy contributes towards the delivery of the following objectives and outcomes:

1,5	1,4,6	1-5	2,3

The main interventions that will support the delivery of the policy, are:

- Use technology to keep traffic moving
- Embrace technology to improve cleaner travel options
- Use, as appropriate, measures to influence and better manage the demand of private car use

Use technology to keep traffic moving

To address congestion we need to do more than just improve mode choice. On some of the congested routes in the West of England queueing and delay can already be severe. Future growth cannot be dealt with by continuing to widen roads as space is not available.

The role of technology is likely to become increasingly important in keeping traffic moving. In a few certain circumstances it might be appropriate to consider the use of charging mechanisms to optimise network operation and ensure trips can continue to be made.

Intelligent Transport Systems (ITS) are used to inform road users of disruptions, and maximise the efficiency of traffic signals to keep the highway network operating as efficiently as possible.

Section 7:
Connectivity within the West of England continued

Smart Motorway systems use technology to actively manage the flow of traffic. Managed by HE, these are used on the SRN, including the M4, M5 and M32 motorway network through the West of England.

After a number of incidents, concerns about the safety of Smart Motorways have emerged. As of February 2020, the DfT and Highways England are undertaking a review of the safety of Smart Motorways. Whilst we wait for an outcome of this review, the West of England does not support the progression and construction of new Smart motorways in the region.

We will work with Highways England to implement Smart Motorway schemes on the M4 between Junctions 18 and 19* and identify and develop improvements to the region's strategic road network, complementing the delivery of new and improved junctions.

The strategic transport network will continue to be monitored by HE, with the transport networks of Bristol, B&NES and South Gloucestershire monitored by their own traffic monitoring centres. North Somerset manages its own traffic signal network and has aspirations to improve monitoring functions, should both demand and resource allow it. Releasing open source data to transport network operators, including HE, will help to ensure that users of the network enjoy better journeys.

There is an increased role for technology in improving knowledge of available parking spaces, thereby reducing levels of driving around searching for a free space. The development of apps, such as Parkopedia, enables drivers to access real-time parking availability and tariffs which, with the installation of kerbside bay sensors, can include on-street spaces. These, in turn, can support more efficient use of local parking provision.

** schemes to be progressed in the light of the outcome of the safety review by Highways England and the DfT*

We will continue to work with Highways England and other key stakeholders to explore and develop innovative measures to improve the efficiency of the transport network, including car parking, through technology.

Embrace technology to improve cleaner travel options

As discussed in Section 4, the introduction of technological improvements will present the West of England with challenges and opportunities. Connected Autonomous Vehicles (CAVs) and Mobility as a Service (MaaS) are currently at early stages of development and it is not yet clear how we should be responding; however, not being involved in the mobility environment could result in missed opportunities and leave the West of England behind other areas of the country. CAVs are likely to come in a variety of forms; from small delivery robots, campus style pods, cars, taxis and even larger communal transport and lorry platoons. Different types of vehicles will require different approaches. Local, sub-regional and national Government will need to consider how to manage these and who is responsible for which element.

The fundamental transport issues, and the need to prioritise sustainable and healthy transport, are likely to remain. However, there are a range of new potential issues raised, including:

- Conducting appropriate sensitivity testing in the development of long-term major schemes to explore the potential impacts of CAVs
- Ensuring that the policy framework and the delivery of any necessary infrastructure keeps pace and responds to the needs of increased levels of mobility associated with advances in technology
- Encouraging the high-tech jobs associated with driverless cars and new technologies
- Providing a test bed for CAVs, enabled by high speed broadband and open data, particularly along identified key transport corridors
- Encouraging shared forms of ownership, driverless buses, and shared CAVs
- Protecting and enhancing the commercial viability of existing public transport services and working with them to adapt to changes
- Responding to potential equality issues to ensure people that do not use CAVs are not disadvantaged by their uptake
- Potential unemployment impacts because of less demand for drivers (e.g. for taxis, deliveries, buses)
- App based MaaS products should provide authorities with data obtained to maximise the benefits. For example, a condition of licencing Uber taxis could include a requirement to openly provide travel data.

There will be many different players involved in developing, promoting and ownership of CAVs. The technology adoption is likely to be both incremental, with small upgrades to existing technologies, as well as more disruptive with offers made by new technology players (such as the launch of Google or Apple), where residents will be offered completely new products. It will be important to watch developments closely and be able to respond to changing technology to optimise outcomes in line with this plan.

We will produce a strategy on CAVs and MaaS that clearly sets out our position and how we can harness technology to deliver our objectives.

We will set up a technology consortium, involving the private sector, to oversee how this technology is introduced.

Use, as appropriate, measures to influence and manage the demand of private car use

The high demand placed on the transport network across the West of England needs to be managed to ensure movement is efficient and journey times are reliable.

For some, driving a car is essential for travelling around the region. This may be due to mobility impairments, the nature of work patterns or having to transport bulky or heavy items. However, for many people who currently use their cars there will be opportunities to switch at least some journeys to walking, cycling or public transport. The policies and interventions set out in this plan enable and encourage the increased use of more sustainable and active modes of travel.

To influence the demand of drivers on the transport network who have alternative ways to travel, there is a need to consider the implementation of demand management measures, which will be determined by the appropriate authority. Measures to influence demand could include:

- Management of parking provision, such as increasing or introducing charging, and waiting restrictions
- Re-allocation of road space to sustainable transport modes
- Road user charging, such as charging to drive into or through specific areas where alternatives to driving are available with the revenue reinvested in public transport, cycling and walking
- Workplace Parking Levy with the revenue reinvested in public transport, cycling and walking

Section 7:
Connectivity within the West of England continued

The JLTP4 sets out objectives that seek to address poor air quality and take action against climate change yet the presence in the document of some major schemes that involve constructing new road infrastructure could be seen as contradictory to this. As such, it is important to clarify the principles for new road construction as part of a wider package of measures to improve efficient movement around the West of England and manage growth.

We know that the levels of car traffic and freight are high and that current travel habits need to change in order to accommodate the growth that will be seen across our region. We also know that this growth is needed to continue to support our economy and that even the most sustainable growth may create some car and freight trips.

We must start planning how we can move more people in more efficient ways in order to help tackle congestion and therefore meet our objective to address air quality and take action on the climate emergencies we have declared. Public transport and bikes carry more people with less demand on road space than cars carrying individual people. But in order to ensure cycling is safe and buses are not caught in congestion, we need to provide infrastructure for this, and existing road space is not enough.

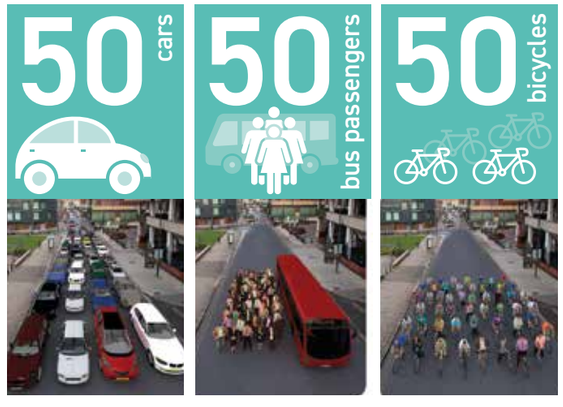
Our approach for new infrastructure in the West of England is to balance the needs of the environment, our existing communities' health, inequalities and their need to travel, and the economy. This will require developers to mitigate the traffic impact from developments and will enable significant progress to be made in combatting poor air quality and addressing our climate emergencies.

This approach will also help us to manage congestion and work towards reallocating space on existing roads to more sustainable modes of transport. Road space is finite and we must make the most efficient use of it as possible in order to improve accessibility around the West of England.

JLTP4 promotes a balanced transport network where each mode of transport plays a role in providing connectivity. That is why constructing new multimodal links forms part of our overall package of transport measures, enabling the reallocation of roadspace to more efficient travel choices wherever possible and ensuring that people are able to move around the network safely, efficiently and as sustainably as possible. If a new transport link is required, we will need to reduce exposure of people to environmental pollutants such as noise and air pollution, in order to reduce the harmful effects of additional road usage or upgrading local and strategic road networks.

Wherever possible, we will look to reallocate road space to modes of transport that carry people more efficiently. This can be achieved by converting a lane for general traffic into a bus lane or cycle lane. This approach makes buses more reliable and cycling safer, reduces capacity for general traffic and, as a result, can make driving on the most congested corridors the least attractive option in terms of journey time. This will encourage private car users to switch to alternative modes.

Street space



Parking controls can encourage trips within urban areas to transfer to active modes or public transport. By reducing commuter parking in town and city centres, local economies can be improved by increasing the turnover of the limited number of spaces that are available. The above parking controls will allow progress towards the West of England becoming carbon neutral by 2030 and also improving air quality. The potential for emerging technology in improving car park and kerb management will be considered through, for example, the reservation of on-street parking spaces (including EV charging points). Parking policies will continue to accommodate those who are unable to use alternatives modes of travel to access urban areas.

Through the development of local parking strategies, we will continue to manage parking to control future traffic demand, including policies for on-street parking, off-street parking and residential parking schemes where appropriate. The design and location of new developments and at workplaces, as well as the numbers of spaces, will help to manage demand and reduce the dependency on the private car. All day parking will be controlled in a way to discourage users who could transfer to lower carbon travel choices.

Case study: Improved parking management in B&NES

The issue of car parking is a complex and, multi-faceted issue and has become an increasingly important aspect of both transport and land use planning. As such it must be integrated and coordinated with the various other aspects of urban policy in order to effectively manage levels of demand. This is necessary in order to promote and support:

- Lifestyles that are less car dependent
- Development that is more sustainable in terms of air quality
- Transport provision that is more socially inclusive
- Places that are more attractive and user-friendly

Control over the availability of parking spaces is a key tool in limiting car trips, and is presently the most readily available and widely accepted method of managing demand. It has been proven that strict control over public parking can have a major impact in terms of travel choice especially when linked to the provision of realistic alternatives such as improvements to public transport services.

Bath and North East Somerset Council have recently adopted a parking Strategy for the district that sets out a long-term plan for managing parking across Bath & North East Somerset. This is part of a package of transport improvements to help meet rising demand and reduce the impact of traffic on local people and the historic fabric of Bath as a World Heritage site. The parking strategy helps improve the quality of life of the people of Bath and North East Somerset by establishing a balance between the social, economic, cultural and environmental needs of the whole community. In particular, the

The Parking Strategy supports the need to reduce the level of intrusion of vehicles into urban centres, reflecting concerns about the impact of traffic congestion on the environment and air quality, as well as the need to protect the historic fabric of the World Heritage Site in Bath.

Section 7:
Connectivity within the West of England continued

Road user charging and Workplace Parking Levies can manage the demand of private cars on the highway network with the revenue generated reinvested in public transport, cycling and walking. Extensive feasibility and consultation work, including with the public and businesses, would form part of any further consideration of demand management measures, including a road user charging scheme. As part of any scheme development, assessments would be undertaken to ensure that charging would not result in creating a barrier to employment or education opportunities, particularly for those who are unemployed or on low income. Those with disabilities and other mobility impairments will be considered for exemptions. Work would be also required with partners within and beyond the West of England, including Highways England. As the SRN will fall outside any fiscal control, care will need to be taken in establishing such a scheme to address any unintended consequences for the remainder of the highway network, including the SRN and its impact on business.

A Workplace Parking Levy means employers are charged a fee per private parking space on their site. Employers may choose to pass this charge on to their staff, which can encourage staff to consider alternative ways of travelling to work. Previous assessments undertaken for the West of England show there is potential for a Workplace Parking Levy to deliver an estimated 2% reduction in trips. Coupled with a road user charging scheme, the impact on the reduction of trips could be far more significant.

We will support the further investigation and potential future implementation of appropriate parking and road user charging policies, if initial consultation and feasibility work suggests they could influence and better manage the demand and impact the use of private vehicles in the West of England.

Funds raised through charging schemes would be reinvested in sustainable transport measures across the West of England, to improve the provision of realistic alternatives to the use of the private car. More details on charging schemes can be found in Section 10: Funding and implementation.

The West of England authorities will continue to work together to identify and agree a coordinated approach to parking and/or road user charging, to manage the impact on competing commercial and business centres.

Feasibility studies have been carried out to investigate the impacts and extent of charging in Clean Air Zones in Bath and Bristol (see Section 8: Local connectivity). Final plans are likely to include introducing charges or restrictions for the most polluting vehicles entering these areas. This could help contribute towards improving air quality in our most congested areas. However, as with all schemes that seek to charge users of the transport network, significant objection is often generated, which will need to be carefully managed.

We will support ongoing work on Clean Air Zones, and proactively work to manage objections.

W4. Improve resilience of the network, providing increased reliability

This policy contributes towards the delivery of the following objectives and outcomes:

1,2,4,5	4	2,3	3

The main interventions that will support the delivery of the policy, are:

- Define, manage and maintain the Key Route Network
- Develop and improve network resilience through an ongoing commitment to highway maintenance
- Effectively manage the Major Road Network
- Effectively accommodate development sites and associated trips

Define, manage and maintain the Key Route Network

The West of England Combined Authority has a duty to define a Key Route Network (KRN) within its area. The KRN will clarify a priority highway network for the accommodation of multimodal, passenger and freight movements, help guide the prioritisation of investment in the highway (including maintenance) and complement the transport major scheme programme.

Consideration is being given to the criteria for the KRN and its implementation and operational protocols, including the multimodal nature of transport corridors (road, freight, port, airport, bus, metrobus, cycle and rail), key transport interchanges, major employment and housing areas, key movements of people and commuters, traffic volumes, network constraints, air quality and Clean Air Zone proposals.

The definition of the KRN will need to take account of principles around how movements should be accommodated and managed on the local network. This represents an opportunity for a fresh approach to the designation of corridors, and take account of the following issues as part of scheme design:

- The accommodation of strategic car and lorry movements on the most appropriate, defined corridors, to ensure efficient movement and to minimise congestion and inform a designated freight distribution network (see policy W5). This may include the omission of some corridors which have a current `A' road designation, and the inclusion of others currently not designated as `A' roads
- The designation and status of priority public transport corridors, including the potential to review the status of existing corridors in terms of accommodating through traffic movements and re-prioritise road space to more sustainable modes
- The appropriate balance and allocation of road space between different modes of passenger transport, and the balance of links based on their urban or rural environment and position within district centres
- Impact on air quality, particularly routes within Air Quality Management Areas (AQMA) and any forthcoming, designated Clean Air Zones
- Road safety implications, particularly for vulnerable road users (including taking account of designated 20 mph zones)
- Supply and management of parking and servicing of kerbside properties

Section 7:
Connectivity within the West of England continued

- The JLTP4's major scheme programme, including the linkages between radial and orbital links and opportunities to reallocate road space, and manage/restrict through traffic, on radial routes where through traffic is diverted away onto more appropriate roads
- Interaction with and inclusion of the MRN, and connections to the SRN and the rest of the local road network

The issue of wider connectivity will also be considered in the designation of the KRN. The West of England network accommodates strategic car and freight movements between the south coast ports and the Midlands, as well as movements from the South West Peninsula and South Wales to London. These movements are not only accommodated by the SRN but also on roads of a more local nature. The major scheme programme includes improvements to take account of these movements, to improve network efficiency, tackle bottlenecks and remove strategic movements from unsuitable routes.

A further key issue is resilience. Capacity is limited and an incident on the SRN can have severe implications across the region (and often much further afield), for private vehicles, public transport and freight movements, as well as having further road safety, economic and air quality implications as traffic is diverted onto unsuitable or congested links. One particular example is the M5 through North Somerset, where incidents, particularly in the busy summer months, have severe implications. This causes severe congestion, not just on the motorway but also on diversion routes and local roads in and between our towns. Resilience will form a key component in the designation of the KRN, as well as informing the major scheme programme.

We will define, manage and maintain the KRN, ensuring it considers the key issues of wider connectivity and resilience.

Develop and improve network resilience through an ongoing commitment to highway maintenance

A significant proportion of our total capital and revenue spending is allocated to managing and maintaining our transport assets ranging from carriageways, footways, cycleways and rights of way, to bridges, retaining walls, fences and barriers, verges, lighting, traffic signals, bus stops and other public transport infrastructure, street furniture and signage, car parks and Park & Ride sites and drainage infrastructure.

Growth in traffic levels has brought an increasingly widespread recognition of the importance of highway maintenance, and the high value placed on it both by users and the wider community. The impact of repairs and the need to access and maintain underground utilities beneath the highway has a detrimental impact on traffic disruption. There is significant public concern about the need to invest adequately and effectively in highway maintenance and the implications for safety and journey reliability.

To manage the network effectively we will:

- **Oversee the safe, effective and efficient use of the network in line with our duties under the 2004 Traffic Management Act and consider the needs of all road users**
- **Review our network management plans to ensure they are kept up-to-date and complementary**
- **Review road hierarchy through the KRN programme to consider which kinds of traffic should be directed onto the most appropriate routes, including heavy goods vehicles**
- **Adapt the network through engineering schemes and measures to ease congestion, improve safety and encourage sustainable transport modes**

- **Maximise the operational effectiveness of traffic signals and extend the use of Urban Traffic Control where deemed appropriate**
- **Maintain, manage and ensure best use of transport assets through a Joint Transport Asset Management Plan. This will include those key routes and corridors that form the KRN**
- **Develop and improve the network resilience, taking account of the impact of climate change**
- **Explore further with Highways England a strategy for the M32, which will consider options including declassification from motorway status and potentially unlock a new Park & Ride site along the M32 corridor**
- **Continue our firm commitment to maintain the network to the best standard possible, in light of increasingly constrained budgets for highway maintenance. This includes the 'whole-life' approach where we identify and repair roads before they are visibly damaged on the surface, wherever there is a financial or a maintenance benefit incentive to do so**

We are committed to better integrating traffic control systems across the region, and working with technology partners to better share network data and identify ways to manage the network.

We will implement the measures identified as part of the Better Bus Area scheme to coordinate and rationalise the information provided to bus operators in respect of planned road works.

To fulfil its potential, it is crucial the highway network is well maintained. This can make a significant contribution to key transport objectives, for example road safety, particularly with respect to cyclists, pedestrians and motorcyclists. Equally, a poorly maintained highway network can deter people from choosing active modes of travel, therefore increasing levels of congestion and be detrimental to the quality of the public realm.

A Joint Transport Asset Management Plan (JTAMP) sets out a framework for the delivery of sustainable maintenance. This could form the framework for the management of the transport infrastructure asset base to deliver agreed Levels of Service and Performance Management targets in the most cost-effective way. The JTAMP could consider the following sorts of issues:

- Customer Care: to involve stakeholders and communities and users of the highway network to confirm how best to deliver their needs
- Asset Information Management: establish inventory systems and procedures to collect and collate asset characteristics and condition assessments
- Transport Asset Management Framework: implement a clear and focused Plan, compliant with statutory obligations, defining clear highway maintenance objectives and outcomes and detailing `Life Cycle' planning, to ensure the most effective use and targeted maintenance of the asset over its operating life up to renewal/disposal. This will include appropriate consideration of both reactive and planned maintenance, at various stages throughout its life cycle. Consideration will be given to available funding and establish/maintain contingency plans for unplanned events and emergencies
- Work Planning and Service Delivery: adopt a policy for sustainable development compatible with predicted growth and planning for resilience. Identify maintenance implications arising from new and improved infrastructure projects and plan future maintenance, implement/maintain an effective process of risk management and deliver an effective system of inspection

Section 7:
Connectivity within the West of England continued

- Use of new street works powers (including the New Roads and Streetworks Act and the Traffic Management Act) to improve the management of works on the highway network

We will look to produce a JTAMP for the West of England area to provide a framework for delivering sustainable maintenance.

Effectively manage the Major Road Network

The Department for Transport is designating a Major Road Network (MRN) to sit between the Strategic Road Network (SRN) and the local road network. It will provide the opportunity for a consistent and coherent network with a better balance of investment between the SRN and MRN and clarify their complementary roles and requirements.

To give the economy a stronger boost, unlock housing and relieve communities overwhelmed with traffic, there is a strong case for increasing investment on important roads managed by local authorities. Our approach to the MRN will, therefore, take into account the emerging KRN proposals and principles, as well as future growth locations for housing and jobs and include key urban corridors. Public transport will be one of the key principles for the MRN, as these roads carry large numbers of people on buses and other modes.

This recognises that public transport schemes are generally more effective in the long-term at reducing congestion than road widening schemes. Resilience schemes will be included where they have a demonstrable beneficial impact for the economy.

We recognise that there will be additional MRN capital infrastructure and this will have an impact upon maintenance budgets and requirements.

The West of England will work closely with the Department for Transport on proposals for the MRN in our area.

Case Study: Cribbs Patchway New Neighbourhood Infrastructure Development Plan

Part of the Cribbs Patchway New Neighbourhood Infrastructure Plan includes a commitment from South Gloucestershire Council to forward fund up to £12m to ensure that infrastructure is comprehensively planned, phased and delivered. This demonstrates the Council's commitment in ensuring that the right infrastructure is available at the right time to allow people to make more sustainable travel choices.

Effectively accommodate development sites and associated trips

We engage with developers early in the planning process to ensure they design their sites to match the priorities of the local planning authorities and contribute proportionately to identified transport improvements and mitigations. This includes the provision of highway links into the existing network. Regular update meetings with developers of strategic sites give the West of England authorities the chance to outline transport network priorities and requirements through site design and help to iron out issues to ensure a smooth planning process.

It is essential that potential transport opportunities are used to influence decision making at the very earliest stages of land use development planning (see Section 9: Neighbourhood Connectivity).

Accessibility – with an emphasis on developments being encouraged in areas served by, or providing greatest opportunity for, trips to be made by passenger transport, walking and cycling – will continue to be balanced with the need to deliver wider objectives. This could include supporting growth on strategic transport corridors or addressing local issues.

S106 contributions and Community Infrastructure Levy (CIL) will continue to be used to fund the delivery of mitigations and improvements as soon as possible. Site-specific mitigations will be via the S106 process and the more strategic improvements via CIL. Transport assessments will outline the effects of medium & major development sites on the local transport network and idenitfy mitigations, to be funded by developers. These assessments will include testing the effect of development-caused car use and expected travel patterns on nearby rural transport networks, with mitigations to allieviate and discourage extra trips on inappropriate routes in sensitive areas.

Given the evidence from the JTS, the focus of the JLTP4 is on achieving a substantial shift to more sustainable modes, that carry more people more efficiently. However, large numbers of cars will remain on the network given the planned growth across the region. Significant investment will be required to:

- Unlock new development, including strategic employment locations and clusters
- Tackle congestion blackspots
- Support the ambitions for changing people's travel behaviour, through enabling reallocation of road space to walking, cycling and public transport on congested urban corridors and directing traffic to more suitable corridors, where appropriate

We will design new and improved road infrastructure to support the needs of pedestrians, cyclists and public transport users – including multimodal transport corridors – to support the ambitious growth proposals in the area and to unlock the economic potential of areas including South Bristol.

Case study: South East Bristol Orbital Low Carbon Corridor

The JTS identified that there is poor infrastructure and public transport service facilitating orbital movements around south east Bristol and the surrounding area. The lack of any orbital connection is forcing people to drive along the A4 and use unsuitable local roads in residential areas. This adds more traffic to the already heavily congested A4. This makes it more difficult to reallocate road space to transformational and sustainable modes such as Mass Transit and other low carbon travel options. It also results in high flows and congestion on the Bath Road, A4174 West Town Lane, A37 Wells Road, Whitchurch Village, Queen Charlton and Keynsham.

Options were considered as part of the B&NES Local Plan consultation. Officers across the West of England have met with residents and the community to go through various alternative options and have taken ideas and comments away to develop in more detail when further work on the corridor progresses. Further detailed engagement and consultation will continue with the residents of South East Bristol and Whitchurch Village to explore options that address the lack of orbital connectivity, developing plans that are suitable, deliverable and acceptable to the community. We are committed to addressing the orbital connectivity issue. Our first priority will be to do so through public transport, cycling and walking through a step change in sustainable transport provision.

Comments received through the JLTP4 consultation raised concerns that residents felt that plans are well developed, however only initial modelling options have been assessed at this stage and we have much more to do, in consultation with the local community, to develop the plans and any future alternative infrastructure solutions further.

Section 7:
Connectivity within the West of England continued

Case study: Banwell Bypass

The Banwell Bypass has recently won funding from the Ministry of Housing, Communities & Local Government through the Housing Infrastructure Fund (HIF) to build a bypass to the north of the historic village of Banwell.

The bypass has been a long-standing aspiration of North Somerset Council and until now, years of local campaigning had been unable to secure the funding required to deliver this major quality of life improvement for Banwell which sits at the foothills of the Mendips Area of Outstanding Natural Beauty (AONB).

The bypass, which will pass to the north of Banwell village, will link the A371 and A368. These two A roads currently meet in the narrow village centre, in the heart of the Banwell Conservation Area. The historic narrow streets of West Street, East Street and Church Street are inappropriate and are of insufficient widths to accommodate cars passing each other, let alone when HGVs, coaches and school buses meet. As a result, air quality is poor and the perceived safety of pedestrians and cyclists even worse. Congestion has been a problem for decades with moderate worsening of queueing over the past 15 years. All of this has limited the economic and social vitality of the village centre.

The bypass will provide numerous benefits, including providing significant improvements to air quality and public realm in the centre of the village, improved access to the residential and employment growth to the north-west of the village, supporting the delivery of Weston Villages; and improving local and regional connectivity for longer trips. The bypass will also enable pedestrian improvements in the centre of the village, helping to promote more sustainable modes of transport wherever possible, improving accessibility and the quality of life for Banwell residents.

We will work to ensure that all highway improvement and traffic management schemes consider potential improvements to bus infrastructure and incorporate features in design, wherever possible.

We will work with Highways England to provide a new Junction 21A on the M5 motorway south of the existing J21. This will be supported by a new multimodal corridor connecting the new junction with the A38, with a bypass for Banwell in the short to medium term and potential highway improvements at Sandford and Churchill in the medium/long term. Major improvements to the A38 between Langford and South Bristol will further improve connectivity. The scheme will improve links to the airport and improve resilience of the Strategic Road Network and locally will improve access to potential housing & residential growth.

We will work with Highways England to deliver improvements to Junction 14 of the M5, increasing capacity and enabling enhanced access to national networks.

We will deliver a new road link from Yate to a new M4 Junction 18A, to enable traffic from Yate to directly access Emersons Green and the east of Bristol.

We will deliver the following highway schemes to provide access to new development sites and accommodate associated vehicle trips:

- **Multimodal corridor improvement (highway, metrobus, strategic cycling route) between Bristol and Nailsea, continuing to Clevedon/M5**
- **A4 to Avon Mill Lane improvements, Keynsham**
- **Winterbourne and Frampton Cotterell Bypass, to enable road space reallocation to provide a multimodal corridor along the A432 between Yate and the North Fringe of Bristol**
- **A371 and Wolvershill Road/Churchland Way Link (North South Spine Road), Weston-super-Mare**
- **Herluin Way to Locking Road Link, Weston-super-Mare (to replace two current road bridges with a single one and enable double-tracking of the railway)**

W5. Enable business clustering and the efficient movement of freight

This policy contributes towards the delivery of the following objectives and outcomes:

1,2,3,6	1,5	1-5	3,4	2,3

The main interventions that will support the delivery of the policy, are:

- Support the delivery of Enterprise Zones/ business clustering
- Balance the requirement for distributing goods, with mitigating the adverse impact of vehicles

Support the delivery of Enterprise Zones/ business clustering

The clustering of businesses can have a number of proven benefits, including trade and business between them improving, due to reduced transport costs and more immediate supply of goods or service. It is also more convenient for customers travelling to businesses or services to be able to access multiple services on one site. Increased business through footfall is normally higher when businesses cluster too, with impulse buying far greater.

These benefits can have significant positives for the transport network and public realm. Reduced travel distances between businesses result in a lower demand for trips on the transport network for both freight and delivery journeys, as well as staff and customers. The potential lower demand on the transport network can, in turn, improve connectivity by improving journey times, congestion and air quality. It can also result in a higher demand for public transport services to serve large employment sites, boosting public transport usage. Schemes to improve walking and cycling access are also more effective when linking to employment clusters.

Business clustering offers significant benefit to local communities as they consolidate infrastructure, unlock key development sites, attract business and create jobs. Business rates collected from these clusters can be used by local enterprise partnerships or planning authorities to reinvest in the local economy and infrastructure.

To strengthen existing multi-business sites or to encourage further clustering, business clusters can be formalised as Enterprise Areas (EAs) or Enterprise Zones (EZs). The West of England actively promotes designated EAs/EZs across the region, including at Avonmouth/Severnside, Bath City Riverside, Somer Valley, Bristol Temple Quarter, Emersons Green, Filton, J21 (Weston-super-Mare) and at South Bristol. There are also

Section 7:
Connectivity within the West of England continued

Case Study: Avonmouth/Severnside Enterprise Area (ASEA)

The ASEA, at 650 hectares, is the largest brownfield industrial development site in Western Europe. It is located between Bristol and the River Severn, immediately adjacent to the M5 and M49 motorways and consists of two main areas of economic activity – Avonmouth to the south within the Bristol boundary and Severnside to the north in the South Gloucestershire boundary. In Avonmouth, over £400 million has been invested in the Port of Bristol in recent years and it is the closest port to the main centres of UK population, with 45 million people (over 70% of the UK population) living within a radius of 300 kilometres. Royal Portbury Dock is a key component of the wider port in Bristol, handling ships of up to 130,000 tonnes deadweight and is conveniently linked by motorway and rail routes. In addition, Bristol Airport is in close proximity, connecting the sub-region to North America, Europe, the Middle East, Asia and Africa.

ASEA is particularly well suited to large scale warehousing, storage and logistics use with an open planning consent in place over a large proportion of the area that encourages development to come forward quickly and easily. Highways England are delivering a new junction from the M49 that will provide direct access into the heart of the development area. Recently a number of large scale distribution operations have come forward creating over 5 million sq ft of Regional Distribution Centre floorspace. There is another 2 million sq ft of logistics floorspace in the pipeline to come forward within the next few years, and space for another 5 million sq ft to follow on.

Commuting by workers to ASEA is predominantly by car for a number of reasons. The nature of large amounts of the business uses requires 24-hour work and therefore workers are on shift patterns that are often out of the usual business hours. As such, access by public transport services is often not realistic due to levels of services out of usual business hours. ASEA is geographically close to Lawrence Weston, a socially deprived neighbourhood that has high levels of unemployment, however the transport links between the two areas are poor and unsafe. Currently the only realistic access is by car, ownership of which is less likely for those who are unemployed. Despite being conveniently linked to motorway and rail routes, congestion and capacity problems cause connectivity issues.

The removal of the Severn Bridge tolls and the opening of the new junction from the M49, will leave fewer barriers to travel by car to ASEA from South Wales. Whilst this opens up opportunities for a new labour market to access the jobs that are expanding in the area, it also increases the opportunity for more people to drive from further afield, increasing the number of vehicles accessing the area and therefore increasing the negative impacts of congestion.

multiple priority growth locations across the region, offering further opportunities for clustering.

EZs are areas designated for businesses to locate to, encouraged by a range of measures to make it more attractive for business, such as tax breaks or business rate discounts. The process for applying for planning permission is normally simplified if businesses apply to locate to a designated EZ. EZs in the region will act as significant traffic generators, in terms of freight and employees, and have different needs and impacts on the transport network in the West of England. We are working with both sites to ensure sustainable economic growth can be achieved.

We will develop a joint strategy for movement in the Avonmouth/Severnside Enterprise Area that ensures it develops to the benefit of the West of England, supporting freight, workers and associated access requirements.

Balance the requirement for distributing goods, with mitigating the adverse impact of vehicles

Road freight is the most common way to distribute goods in the West of England. However, congestion on the network results in unreliability and delivery problems and impacts on other users of the network. We need to effectively manage the movement of freight, encouraging a shift from partially filled, heavily polluting road vehicles to fewer, fuller, cleaner vehicles and seek to transfer road freight to alternative methods such as rail and water.

We will progress an ambitious programme to improve the efficiency, and reduce the impact, of freight movements and produce a Freight Strategy for the West of England.

Case Study: Temple Quarter Enterprise Zone (TQEZ)

TQEZ is at the heart of Bristol City Centre, adjacent to Bristol Temple Meads rail station. The adjacent area of St Philips Marsh is well established as an industrial estate. The vision is to create a new quarter of the city centre for working, living and leisure and has attracted many digital and creative industries, and is home to the enterprise hub at the Engine Shed.

There is a target to provide 22,000 jobs within the TQEZ over the lifetime of this plan. Major investment has been made in transport infrastructure to enable movement to the TQEZ by sustainable modes from across the West of England, providing opportunities of employment and enterprise for our residents.

Freight movement around the TQEZ is currently mixed, due to the industrial sites in St Philips Marsh, which generates HGV movements, and the contrasting digital technology sector in the TQEZ, which generates fewer HGV movements but still experiences high levels of small deliveries in vans. With limited options to bypass Bristol City Centre, the TQEZ experiences high volumes of through traffic, including freight vehicles, adding to an already heavily congested network in Bristol city centre. The vision for the TQEZ is to be sustainable in its operation, including seeking new ways to reduce the impact of freight movement.

Section 7:
Connectivity within the West of England continued

There are several key areas of intervention.

Routing, management and information

A designated core network of preferred freight routes will be developed in partnership with operators, through the establishment of a Strategic Freight Network. Through this, freight will be proactively managed on the highway network, in a way that minimises impacts on local communities and other road users. Operators will be encouraged to use HGV satellite navigation systems and consider more off-peak movements, including for refuse vehicles. Highway Authorities will seek to maintain clear signage, provide better enforcement of suitable routes and weight restrictions.

We will seek to establish a Strategic Freight Network to better manage freight movements.

To improve air quality, reduce carbon and create better places in central areas and certain corridors, traffic movement restrictions will be sought in some areas, including through measures in any forthcoming Clean Air Zones. Access could be provided to a group of streets, or zone, from a small number of access points.

We will seek to restrict through traffic movement for heavy vehicles and most polluting goods vehicles in the central areas of Bristol and Bath.

Currently the M4 has two bridges with restrictions close to Junction 19, which results in vehicles diverting onto the Bristol Ring Road and the A420 through Wick, to rejoin at Junction 18.

We will work with HE to address restrictions affecting the carriage of abnormal indivisible loads.

Rail and water

To reduce the impact of freight on the already congested highway network, work is required to encourage a shift for a range of goods from road to rail and water.

The creation of a multimodal freight distribution centre in the Avonmouth area will be investigated, linked to the Freight Consolidation Centre, offering good access to rail and motorway networks.

Improvements to the loading gauge on our core rail routes to increase rail freight capacity, by increasing the number of containers that can be accommodated on freight train paths, is supported. The potential to use passenger trains to carry freight and improve options for first and last mile logistics from rail stations, will be investigated including the rail served former waste terminal at Westmoreland Road (Bath), Barrow Road (Bristol) and a passenger train freight pilot at Bristol Temple Meads.

We will work with Network Rail to investigate further movement of freight by rail and improve options for first and last mile logistics from stations.

Network Rail's proposals for loading gauge enhancements to W10/W12 Didcot to Cardiff and W8 Bradford-on-Avon to Bathampton Junction are supported.

The water courses throughout the West of England could offer the potential to carry freight, with electric vehicles or cargo bikes connecting to city centre locations for the first and last mile. This could offer opportunities for cleaner and less disruptive forms of freight delivery.

We will work with partners, including freight operators and waterway authorities, to investigate the potential of using waterways to carry freight

Case Study: Intercity Rail Freight

Passenger trains can be used to transport freight between cities. Benefits include fast and reliable services, sustainable onward travel options from rail stations, running to a timetable making first/last mile integration easier, and carbon reduction by reducing highway freight movements.

Case Study: Virtual loading bays

Virtual loading bays can provide a solution to manage kerb space. Spaces where loading is normally prohibited can be reserved in advance, enabling the authority to prepare traffic management for the space to be used at a specific time, for a specified period. This enables vehicles to get as close as possible to delivery points, reduces congestion and smooths traffic flows, as the driver knows exactly where to park on arrival.

and use of electric or cargo bikes in town and city centres.

Loading and parking

Pedestrian movements, cycle lanes, route hierarchy and public transport reliability, including the management of delivery times on core routes and town centre areas and appropriate enforcement, can all impact on the ability to efficiently deliver freight.

We will review parking and loading restrictions, particularly in sensitive areas, ensuring loading bays are suitably located

Consolidation

The first urban freight consolidation scheme in the UK commenced in Bristol in 2004. The scheme has 157 retailers on board removing just over 20,000 HGV trips from Bristol and Bath since 2011 (DHL Monthly Review, 2017). Through a grant from the Office of Low Emission Vehicles (OLEV) as part of the Go Ultra Low project, we are seeking to enhance the freight consolidation offer with micro consolidation centres, using electric cargo bikes, small electric vans and other appropriate sustainable modes to serve narrow streets in Bristol and Bath, which are more appropriate to the environment than larger vehicles.

Case Study: Consolidation hubs

The rise in ecommerce has resulted in an increase in the movement of light goods vehicles to homes. We want to reduce their impact by providing localised places where parcels can be dropped to allow customers to walk or cycle to collect them, without the requirement for light goods vehicles to circulate our residential areas. This can be easily introduced to new developments, where the consolidation hub for residents' parcels can be incorporated into the masterplan from the outset. We are beginning to see a rise in parcel collection/ drop off points located in local shops and transport interchanges, therefore it is also possible to provide localised parcel hubs in established neighbourhoods. By removing unnecessary circuitous trips by light goods vehicles, the freight operator becomes more productive and the negative impacts of motorised traffic on our local streets is reduced.

By building a network of committed local shops and businesses and keeping the cost to freight companies as low as possible the Dutch city of Nijmegen has developed a working model for last mile delivery of freight transferring goods at a series of hubs to smaller more nimble vehicles and electric cargo bikes in the city centre.

The challenge is to develop a freight consolidation centre that is commercially viable, and can be run at a profit with only a small initial subsidy from the public sector. To encourage more efficient movement of freight using fewer, fuller and more appropriate vehicles, collaboration with industry, local authority and further education establishments is required.

Section 7:
Connectivity within the West of England continued

We will investigate opportunities to either expand the existing freight consolidation scheme, or introduce new facilities, to cover urban centres, by working with industry, local authorities and further education establishments.

We will introduce an online resource to advertise spare capacity in vans already travelling to congested areas to reduce the need for additional vehicles, particularly for smaller retailers or market traders.

Micro-consolidation of freight allows the pooling together of deliveries into a centre for a small area. Loan cargo bikes for businesses to hire to make short deliveries across congested areas will be investigated, so businesses can trial the scheme and realise the benefits. The use of rail stations and Park & Ride sites as delivery hubs for customers to collect and return parcels will also be investigated. By coinciding with an already planned journey, this would reduce the need for LGVs to travel to customers at workplaces/more central locations.

We will work with delivery companies and transport interchanges to identify options for loan cargo bikes and freight micro-consolidation.

Embracing innovation

Through our existing and developing partnerships, we will be at the forefront of embracing innovation, particularly using lower emission and automated freight vehicles.

We will support emerging technologies for improving the efficiency of freight movement, including planning for and managing the impact of CAVs and drones.

Planning conditions

To influence future freight movements, a set of planning conditions will be developed to guide local policies, that:

- Enable a reduction in the negative impacts of freight in future developments by using Construction Management Plans and Delivery Management Plans through the planning system
- For new developments that require a travel plan, include a focus on minimising trips for deliveries and servicing to reduce the impact of freight activity associated with the operation of the site, including investigation of consolidation, out-of-hours deliveries and details of loading locations
- Require new developments to incorporate good quality on site loading facilities

We will develop and apply local planning conditions to influence future freight movements.

Case Study: Embracing innovation

Opportunities and impacts from new connected autonomous vehicle technologies are being considered through the ROBOPILOT autonomous light commercial vehicle project and the CAPRI autonomous POD fleet project. South Gloucestershire Council is a collaborator in these Innovate UK funded R&D projects to facilitate demonstrations of autonomous vehicle technology on our highway network and in campus environments, respectively. The learning from these projects can be used to help inform the council's own aspirations around supporting autonomous technology, in both highway and non-highway environments. New modes of transport (especially for first mile/last mile) will increasingly utilise such technologies, potentially creating more efficient, safer and economical ways for businesses, visitors and commuters to travel.

Section 8:
Local connectivity

Local challenges

Car use is very high in many rural and outer urban areas, as well as certain parts of urban areas, often reflecting the limited travel choices available. Although walking and cycling are relatively popular compared with other UK cities, many parts of the network have limited infrastructure facilities. The gradual loss of local shops and services due to competition from out of town retail and leisure complexes, and e-commerce has reduced the number and type of facilities available in many local communities, meaning many people need to travel further to access essential services, education and employment.

Building on the general West of England challenges identified in Section 2, more specific challenges for local connectivity have been identified, as follows:

- There are heavy flows on roads connecting towns, including the A370, A38, A36, A46 and A432
- Actual and perceived road safety and security concerns influence how people choose to travel
- There is a lack of knowledge and confidence around cycling and using public transport
- Local services and transport options are limited in many rural areas
- There are areas of poor air quality on the highway network, with AQMAs in central Bristol and Bath, in some urban areas in South Gloucestershire, and in some towns and villages in B&NES

Local policies and interventions

Local connectivity in the West of England will support delivery of the JLTP4 objectives, by focussing on these policies:

- L1: Enable walking and cycling, 'active modes of travel', to be the preferred choice for shorter journeys
- L2: Reduce the number and severity of casualties for all road users
- L3: Encourage residents and employees to make more sustainable and healthier travel choices
- L4: Support opportunities for all sectors of the population to access the services they require, wherever they live
- L5: Support the identification and implementation of measures that will improve air quality

It should be emphasised, as illustrated in Figure 5.2, that interventions for local connectivity are not limited to L1 to L5 above, as both bus and rail trips routinely cover local connectivity and their policies which are covered in Section 7 are also relevant.

Section 8:
Local connectivity continued

L1. Enable walking and cycling, 'active modes of travel', to be the preferred choice for shorter journeys

This policy contributes towards the delivery of the following objectives and outcomes:

2,3	1-5	1-3	1-4	1-4

The main interventions that will support the delivery of the policy, are:

- Provide an attractive, safe and usable walking and cycling network
- Provide schemes to support the uptake of cycling

Provide an attractive, safe and usable walking and cycling network

Walking and cycling (including the use of e-bikes) can reduce the negative impact of congestion on the local economy, as they offer the most reliable and consistent journey times. Active travel also contributes to increasing physical activity, which has many benefits for both health and wellbeing for all ages. To make active modes of travel the preferred choice for shorter journeys, work will continue with walking and cycling groups, charities, and wider sustainable transport supporters to build on and develop best practice that can be shared across the West of England.

We will work with partners, charities and the voluntary sector to develop and implement best practice design to make walking and cycling the preferred choice for shorter journeys.

Cycling also has a significant, and growing role to play for many journeys, including commuter trips, journeys to school, and leisure trips. Major roads currently provide a physical and perceived barrier to walking and cycling, discouraging these active travel modes. Many people are concerned by road safety (as a result of the lack of crossing points), air quality and indirect journeys resulting in long journey times due to the barriers caused by major roads, such as the M5 at Junction 21 at Weston-super-Mare and at M5 Junction 17 Cribbs Causeway.

Current adopted Local Plans include a set of safeguarded sustainable transport routes, many of which follow the route of former railway lines. This network of safeguarded routes, once developed, will provide safe, convenient and efficient infrastructure which encourages and facilitates walking and cycling, and which minimises reliance on, and discourages unnecessary use of private cars, especially for local trips.

Off-road routes including the Bristol and Bath Railway Path and the Strawberry Line, as well as the on-road Avon Cycleway circular route, are well used, playing a part in improving the health and well-being of residents while reducing the number of vehicles on our roads.

We will continue to safeguard those sustainable transport routes and off-road cycle routes identified in the Local Plans for each of the West of England authorities, and will seek to develop these routes as part of a network of sustainable interurban transport routes.

To encourage citizens to change the way they travel from private car to more active modes, there needs to be good quality physical infrastructure connecting key destinations including schools, workplaces, and health facilities.

The priorities of walking and cycling infrastructure for the West of England will be shaped by a vision for investment in strategic infrastructure to develop walking and cycling packages, public realm as well as a West of England wide Local Cycling and Walking Infrastructure Plan (LCWIP).

An LCWIP consists of a package of walking and cycling routes which are defined using a specific methodology set out by the Department for Transport which identifies routes with a potential for high usage at a local level of connectivity. LCWIPs will also set out a programme of infrastructure improvements and the scale of investment in the walking and cycling environment that would be required to bring preferred routes up to a standard that meets the latest best practice and is suitable for all users. Interventions will be prioritised over the short (typically <3 years), medium (typically <5 years) and long (typically >5 years) term.

We will develop our Local Cycling and Walking Infrastructure Plan, which will be reviewed on a regular basis.

A suite of other walking and cycling schemes and strategies sit alongside the Local Cycling and Walking Infrastructure Plan as regional priorities. They include:

- **Greater Bristol Walking and Cycle Network: Strategic cycle routes to comprise key corridors, orbital and cross city routes as outlined in Bristol Cycle Strategy. This integrated strategic cycle network will connect key destinations across, and adjacent to, the Bristol urban area, including North and East Fringes, and connections to Whitchurch and Long Ashton. This will be supported by better pedestrian facilities to serve the Bristol urban area.**
- **Interurban cycle routes: Strategic cycle routes to Thornbury, Yate and Coalpit Heath from the North and East Fringes, linking into a network of routes into Bristol.**
- **A38 Corridor improvements between Thornbury and the Bristol boundary.**
- **Weston-super-Mare Cycling and Walking Network: Better pedestrian and cycling facilities to serve the town. Completion of a network of legible, attractive and safe strategic cycle routes in Weston-super-Mare, with a focus on east-west routes from Worle and Weston Villages into the town centre.**
- **The North Somerset Coastal Towns Cycle Route & Strawberry Line Extension: to provide a continuous cycle route from the Somerset coast at Brean, connecting the three North Somerset coastal towns, with onward links to Bristol. This will avoid the severance caused by the M5 and also the A370, and will save 4 miles on the current cycle linkages between Clevedon & Weston-super-Mare. In progress are further linkages from Clevedon to the strategic cycle network, through the long-standing ambition to reopen the former railway line to Yatton Station (with onward rail access) as a shared-use path (known as the Strawberry Line Extension) and within Somerset onward segregated cycle linkages to Wells in Somerset.**
- **Bath Cycle Network and City Centre Package: Completion of a continuous and integrated network of infrastructure to provide strategic cycle routes, comprising key corridors and cross city routes, complemented by improved permeability and investment in public realm in the city centre.**
- **Bristol City Centre Movement Strategy: public realm enhancements, improvements to the pedestrian network, continuous and integrated cycle network in Bristol city centre and link with the wider strategic improvements to be delivered by West of England's LCWIP.**

Section 8:
Local connectivity continued

All walking and cycling infrastructure schemes will be designed in line with best practice design guidance. This includes mitigations required from the Habitats Regulations Assessment (HRA).

HRA Mitigation: North Somerset Coastal Towns Cycle Route

The current proposals for the Weston-super-Mare to Clevedon section of the North Somerset Towns Coastal Cycle Route, adjacent to Weston-Super-Mare, shows the route occurs directly adjacent the Severn Estuary SPA and Ramsar. This could potentially result in the loss of habitat used by birds, particularly waders. It is understood that the proposed route is indicative at this stage and therefore without further information there is a risk of an adverse effect on the integrity of the Severn Estuary SPA and Ramsar site. A project level HRA would therefore be required to screen the potential effects of this scheme once further details are available. If an LSE is screened-in during a project level HRA then an Appropriate Assessment should be undertaken. This project level Appropriate Assessment would need to demonstrate that no adverse effects will occur on this European Site before the scheme is granted permission and allowed to go ahead. The Appropriate Assessment should include moving the route away from sensitive habitat used by bird populations associated with the estuary.

The Sustrans Bike Life study has identified that nearly twice as many men than women cycle at least weekly in Bristol, which is a significant gap that needs to be closed. Personal security, feeling safe and respected in public places are key issues identified by women. To increase the uptake of cycling, and particularly enable more women to cycle, interventions could include:

- Prioritising road safety, with protected, but direct, cycle routes
- Addressing all local journeys, including trips to school and work
- Training/engagement programmes to increase confidence
- Reaching out to women's/parenting groups to integrate them in new infrastructure planning

Other interventions that could increase the number of people cycling, include:

- Focus more on secure storage, at homes (including on-street e.g. hangers), workplaces and other destinations
- Acting to remove perceived barriers to cycling
- Encouraging take up of e-bikes

We will work with partners to deliver opportunities that support all abilities into cycling, using the All Ages and Abilities (AAA) cycle network concept.

Case Study: Odd Down Cycle Circuit

Following a £600,000 grant from British Cycling, B&NES developed a cycle circuit at Odd Down in Bath. The 1.5km Closed Road Cycling Circuit at Odd Down Playing Fields opened in April 2013, enabling enthusiasts to learn, train and enjoy cycling without having to negotiate Bath's busy roads. Odd Down Cycling Circuit has been specifically designed to introduce and develop opportunities for cyclists to train at all levels, and is one of only 17 specific closed road cycling circuits in England.

Bidding opportunities for walking and cycling connectivity schemes often arise at short notice and require 'shovel ready' evidenced based schemes backed up by local support to secure funding. The development of a package of walking and cycling schemes, which incorporates our LCWIP will put the West of England in a strong position to capitalise on any future funding opportunities that arise from Government or new development.

We will work with key housing developers, employers, education providers and leisure sites from an early stage of planning to ensure that funding for walking and cycling infrastructure forms part of the design from the outset. This will ensure that new developments prioritise walking and cycling.

Case Study: Brean Down Way

North Somerset Council opened the first leg of its flagship Coastal Towns Cycle Route in July 2017. The three-mile Uphill to Brean section has been an exemplary example of working with a very wide range of partners, volunteers and funding sources, and the determination to make a long-held ambition happen. It was jointly led by North Somerset Council and national cycling charity, Greenways and Cycleroutes Ltd. It also involved the Environment Agency, Wessex Water, Natural England, Somerset County Council, Sedgemoor District Council and their contractors, Brean Parish Council, the National Trust and landowners.

The route continues for three-miles to the tip of Brean Down, which used to look close to Weston-super-Mare, but the barrier of the River Axe and poor connecting paths meant holiday makers and residents had to drive, take two buses, or cycle the busy, narrow and circuitous Accommodation Road, which was also three-miles longer.

Since the opening of the route in July 2017 up until the end of December 2017, there were over 47,000 pedestrian and cycle users on the route. Almost all the active travel journeys are new leisure trips, which were not possible or desirable before. The route won the Highway Partnership Award at the Institute of Highway Engineers (IHE) South Western awards on 10 May 2018.

Section 8:
Local connectivity continued

Opportunities will be taken to reallocate road space to improve conditions for pedestrians, cyclists and equestrians through the provision of safe, direct and well-lit routes. This will be prioritised in locations where the potential for mode shift is greatest, or where space is made available because of development or redesign.

Transport policies have traditionally focussed on predicting future demand to provide capacity (predict and provide). In more recent times this could better be described as predict and manage. A new approach has been developing which seeks to decide and provide. There is a finite amount of road space and we need to decide which forms of transport are prioritised.

All walking and cycling infrastructure needs to be maintained to a high standard. This includes addressing issues such as potholes, which can be particularly hazardous for cyclists. Priority routes should be free from vegetation and other natural obstructions, and obstacles such as unlicensed street furniture and vehicle parking. An attractive network, with consistent surfacing, will be more appealing to those who may use active modes.

We will work to maintain footpaths and cycleways to an acceptable standard.

The scale of investment in walking and cycling infrastructure provides a hook for our combined initiatives, addressing the 'structural' barriers preventing the wider uptake of active travel options. Relationships with internal partners, such as public health and air quality, and external partners, including the NHS and local sport or active travel organisations, along with public transport operators, are required to maximise available funding. Partnership working will take place by holding regular and attending engagement and forum events, and creating consortiums that meet quarterly or bi-annually for ongoing projects.

We will continue to work collaboratively with internal teams and in partnership with external organisations to promote the benefits of cycling to health and the environment, further encouraging behaviour change.

Perceptions of danger are a major factor in attitudes to cycling, with many people hesitant to cycle because of the fear of heavy or fast traffic. Fear of injury currently deters many people from making healthy and sustainable travel choices.

We will improve and increase cycle education and training for all road users, to reduce cyclists' fear of being injured, and both the perception of risk and incidence of cycle injury.

Case Study: Hambrook Junction

An innovative Cycling Ambition Fund scheme has provided a straight through crossing of the A4174 Ring Road for cycle traffic or 'Parallel signalled cycle crossing'. The crossing is separate from the adjacent provision for pedestrians and allows cycle traffic to cross the Ring Road in a single phase, thereby reducing delays for cyclists. It utilises innovative above ground detection of cyclists to trigger a change in the signals. The new layout provides an important link to the employment areas and educational establishments around the ring road, for the local communities. In March 2016, the scheme was recognised as an 'exemplar case study' in good practice guidance published by the DfT.

Case Study: Bristol Family Cycling Centre

The Bristol Family Cycling Centre (a partnership for 3 years with British Cycling) at Hengrove opened in Spring 2016 on the site of the former Whitchurch athletics track. It gives people of all ages and abilities the chance to ride, or learn to ride, in a traffic-free environment. The centre provides entry level cycling to a new generation of cyclists – starting with balance bikes of different sizes, through to 2, 3 and 4 wheelers, companion bikes, wheel chair bikes and hand-cycles, making cycling accessible to all.

There were 12,355 attendances in 2017-2018.

Provide schemes to support the uptake of cycling

Cycle training can significantly improve confidence, as well as safety. Involving whole families in training together can develop skills which can be used for either leisure or school/commuter trips. Support of existing cycling training programmes will be continued, wherever possible.

Cycle hire schemes are becoming increasingly important to facilitate and encourage cycling, especially for people who do not own, or have immediate access, to a bicycle. These schemes enable residents and visitors to explore with freedom, contributing to our economy without negatively affecting air quality. Cycle docking stations are likely to become commonplace at our busiest transport interchanges and will help to facilitate sustainable travel for door-to-door journeys.

We will continue partnership working with third-party providers of cycle hire schemes to ensure a smooth operation that benefits residents and visitors.

Cycle parking needs to accommodate a wide range of bicycle types, including folding, tandem and bike trailers, and be located where there is natural surveillance, wherever possible. This includes cycle parking at public transport interchanges and some bus stops, where parking and hire schemes provide for onward travel. Other facilities, such as showers and lockers, can also be provided by offering grants to match fund inputs made by site owners/operators.

We will work with employment site operators, education providers and leisure sites to provide advice and guidance about what facilities to support cycle parking would work at their site.

We will continue to provide funding for covered and secure cycle parking and promote 50% match funded grants to deliver facilities.

We will seek to increase provision of secure on street cycle parking for residents.

National and local events including National Bike Week, charity sporting events and guided walks have a role to play in increasing the uptake of cycling and walking.

We will support the wider promotion and provision of national and community-based cycling and walking activities.

Electric bikes have an increasing role to play by enabling sustainable transport for longer journeys, where topography is challenging, and for ageing or sedentary populations. The Access WEST programme currently funds an electric bike loan scheme which allows those working, living and studying in the West of England the opportunity to try out electric bikes on a 'try before you buy' basis. We support the Go Ultra Low West Programme, funded by Central Government's Office for Low Emission Vehicles (OLEV), to introduce an electric bike share scheme into Bath to increase e-bike usage among residents. In addition to the provision of the bikes, charging points and other supporting infrastructure needs to be provided.

Section 8:
Local connectivity continued

Case Study: North Somerset Council electric bikes for businesses.

Since 2017 North Somerset Council has had as fleet of electric bikes that are available to loan out for free to businesses. To date the popular e-bikes have covered in excess of 2310 miles and at the end of the loan period, 1 in 4 businesses have gone on to buy their own e-bike.

Alongside cutting carbon emissions, participating businesses have reported reduced spending on mileage claims and business travel, as well as health benefits for their staff.

Many staff have also been inspired to purchase personal e-bikes for commuting. One of the staff who frequently used the e-bike at one of the participating businesses, said: "Since I've had the opportunity to use the e-bike I've decided to sell my car and buy a bike instead."

Locations where this is required will be agreed with employers and other service providers.

We will investigate and implement future initiatives to support further take up of electric bikes.

The REPLICATE project – looking at how smart technology could be used to enable greater sustainable mobility – is trialing a connected network of electric bicycles and electric cars in Bristol, following the introduction of a similar scheme in Exeter. Exeter saw the first on-street, city wide, public hire electric bike network in the UK and the first with a common smartcard for electric bikes and car club cars. Bristol is looking to pilot similar opportunities through the REPLICATE project.

Case Study: REPLICATE

The REPLICATE project (Renaissance in Places with Innovative Citizenship And Technology) is a European research and development project that aims to deploy integrated energy, mobility and ICT solutions in city districts. In Bristol, the Ashley, Easton and Lawrence Hill Neighbourhood Partnership area was chosen as the target district. Among other things, the Bristol pilot explores how smart technology could be used to enable greater sustainable mobility to increase health and wellbeing as well as enable better access to training and employment, and engage citizens in their energy use and travel patterns to change behaviour. Some of the interventions being piloted include e-bikes, electric car club vehicles, an on-demand electric transport service, electric vehicle charging infrastructure, and personalised mobility applications.

Partners: Bristol, Florence (Italy) and San Sebastian (Spain). There are also a number of other 'follower' cities that will look into replicating interventions in their cities including Essen (Germany), Lausanne (Switzerland) and Nilufer (Turkey). In addition to this, there are also a number of 'observer' cities such as Guangzhou (China) and Bogota (Columbia).

L2. Reduce the number and severity of casualties for all road users

This policy contributes towards the delivery of the following objectives and outcomes:

2-5	1-4	1-4

The main interventions that will support the delivery of the policy, are:

- Consider the needs of all road users in the design of transport and highway schemes, particularly vulnerable road users
- Deliver road safety education and skills training to equip people with the knowledge and skills to travel in a safe and sustainable way
- Work in partnership to build safer communities

Consider the needs of all road users in the design of transport and highway schemes, particularly vulnerable road users

The needs of all road users are considered in scheme design, and this will continue to be a priority. There is a focus on the needs of pedestrians, cyclists, equestrians and motorcyclists, as well as children and older people, who are most likely to be killed or seriously injured in collisions. Road safety is considered at all stages of the design process for transport and highway schemes, from concept to construction.

We will carry out road safety audits of schemes in accordance with the most up to date policies, and design schemes in a way that take account of local and national policies and best practice.

Remedial engineering schemes will be targeted at improving the safety of vulnerable road users, in both urban and rural areas. Where appropriate, partners from different vulnerable user groups, such as groups supporting those with sight, hearing or mobility impairments, will be involved during design to ensure specific needs are taken into consideration.

We will take the specific needs of vulnerable road users into consideration during design, by working with partners from different user groups.

Deliver road safety education, skills and training to equip people with the knowledge and skills to travel in a safe and sustainable way

Road safety continues to remain a statutory responsibility of local authorities, and each authority has their own road safety strategy. A key way of improving safety is by delivering a programme of education, training and publicity.

A proactive approach to road safety education and training will continue to be adopted, based on best practice and national guidelines. This will continue to be delivered in priority neighbourhoods, schools and to vulnerable road users. Work on road safety initiatives to reduce personal injury collisions by promoting campaigns which focus on pedestrian and cycle safety, child car seat safety, young drivers, motorcycle training and older road users, will also continue. Casualty data will be assessed, and a focus will be put on areas where there is an identified need or target group where skills can be improved.

We will review the programme of road safety education delivery, updating our approach with emerging best practice and seeking alternative ways to fund this critical skill provision.

Section 8:
Local connectivity continued

Case study: Bikeability

Bikeability is the 'cycling proficiency' test for the 21st century, designed to give the next generation the skills and confidence to ride their bikes on today's roads. Training is organised through schools and available to other residents through subsidised sessions provided by local authorities or other providers.

Bikeability offers three levels: Level 1 is in a protected environment, Level 2 on street with Level 3 exposing cyclists to more challenging roads and traffic situations.

Since 2011, the West of England authorities have delivered in excess of 55,000 adult and children Bikeability training sessions.

Work in partnership to build safer communities

Political commitment, public support, cooperation across partners and coordination are essential ingredients in building safer communities. The term 'Safe System' represents the current best practice strategic thinking in road safety. This approach to road traffic injury prevention means addressing the unsafe behaviours of drink-driving, distraction (e.g. texting), and speeding, which have become part of the culture for many, and contribute towards deaths and injuries, as well as fear among pedestrians and cycle users. These behaviours can reduce the use of active modes of travel, transferring them to car use e.g. for the school journey.

Case study: Safe Systems Road Safety Plan, Bristol

In 2015, Bristol City Council published its Safe Systems Road Safety Plan. The plan demonstrated that poorer communities are at disproportionate risk of injury on roads, with children being up to six times more likely than children from the wealthiest communities to be impacted. Efforts were focused on reducing injuries within poorer communities, including lower traffic speeds and targeted traffic-law enforcement.

Working with the Police, other services and communities is important in delivering multi-faceted interventions to reduce both the risk of road traffic injury and the fear of injury. Educational work to support safe routes to schools is being enhanced. On-going work to improve air quality in the city will include information to the public e.g. about in-car air quality and other health issues.

The knowledge and experience of Avon and Somerset Police, Avon Fire and Rescue and other partners will continue to be used to deliver speed management systems to support casualty reduction and improve quality of life where there is evidence of speeding. Measures include:

- Interactive speed reminder signs
- Community speed watch
- Mobile speed enforcement

As technology continues to evolve, work will be required with developers to ensure advances, such as driverless vehicles, are not permitted on our roads without appropriate safety measures being taken. We also support the use of black boxes and cameras on vehicles, in appropriate circumstances, to maximise safety.

We will continue to work in partnership with Avon and Somerset Police, Avon Fire and Rescue and other partners, including those developing new technology, to build safer communities.

Fleet cars and vehicles used by car clubs can have an occupational road risk around them. Support will be given to disseminate best practice and minimise and manage risks associated with this type of car use, by working in partnership with providers.

We will work with fleet car and car club providers, to identify and implement processes that maximise the safety of users.

Case study: Highways vehicle fleet – road safety systems analysis

North Somerset Council's highway vehicle fleet, consisting of approximately 50% petrol/diesel vehicles and 50% electric vehicles, are all fitted with equipment to improve the safety of officers driving the vehicles and other users of the highway.

Each vehicle is connected to a braking and acceleration monitoring system, which can be viewed retrospectively in the vehicle booking management system. When braking or acceleration is deemed to be close to or outside of set safety parameters, then the vehicle driver will be alerted and be urged to amend their driving behaviours to fall within the parameters, or otherwise receive mandatory re-training to improve their safety ratings.

Forward-facing dashboard cameras are also fitted in each vehicle, recording every movement on the highway in view. Footage from these cameras are used when an incident or close shave occurs on the highway, with driver performance (or that of other vehicles and highway users) analysed to improve behaviours to avoid future similar occurrences.

This post-driving trip analysis allows users to drive the highway vehicles in the safest way possible, to improve road safety on the North Somerset highway.

Section 8:
Local connectivity continued

L3. Encourage residents and employees to make more sustainable and healthier travel choices

This policy contributes towards the delivery of the following objectives and outcomes:

1-3	4,5	1-3	1	2-4

The main interventions that will support the delivery of the policy, are:

- Support travel planning with developers, education providers and individuals
- Support travel planning with businesses and employment sites
- Encourage mode shift through grants, incentives and rewards
- Maximise awareness of sustainable and active travel choices and the benefits these bring

Support travel planning with developers, education providers and individuals

We know that encouraging the use of walking and cycling at 'transition points', when people are making a change in their lives such as moving house, is likely to have a more lasting impact than proposing a change when routines are established. Walking and cycling infrastructure is required when new facilities are opened, and needs to be supported with information to promote and inform potential users of door-to-door travel options from when they arrive.

With the level of growth planned in the West of England, engaging with residents when they move home will be a real opportunity to have an impact on future travel behaviour. We are increasingly delivering residential travel planning on behalf of developers of new homes, enabling us to influence the quality and consistency of engagement with residents as they move home.

Personalised Travel Planning (PTP) provides people with the information, advice and motivation they need to walk, cycle and use public transport more often. It can break down the perceived barriers to using sustainable transport and provide attractive and reliable information on the alternatives.

We will target travel planning engagement with citizens who are at a transition point in their life and who are making new journeys before travel habits have been established.

We will continue to provide PTP at events and on the doorstep, as part of a package of measures to support and encourage active travel and mode shift.

Case Study: Travel information guides and personalised travel planning services

Through a combination of the Access West programme and Section 106 funding from developers, South Gloucestershire have been developing site specific travel information packs for residents when moving into a new development. The packs include travel information guides showing the sustainable transport options available in the local area, offers of support to try new ways of traveling such as loan bikes and/or bus tickets, as well as a range of travel leaflets and incentives.

The packs are assembled on the doorstep as a personalised travel planning service, so are tailored to residents' specific needs.

Travel plans will continue to be secured for new developments through the development control process, and we are developing guidance to improve the quality of Travel Plans submitted. Travel plan S106 contributions are a regular feature of a very high proportion of approved development sites.

We will enforce required contributions and explore the possibility of new supplementary planning documents (SPD) to secure the necessary resources.

We will continue to agree S106 funding from developers towards effective and lasting travel planning and developing supplementary planning documents, if required, to ensure appropriate funds are received.

We will support developers in the production, delivery and monitoring of travel plans, if required, and secure the contribution of further funds for transport improvements if mode share targets are not met.

We are continuing our work with schools to encourage children living within walking and cycling distance to choose these modes of travel to school. In particular, we target young people at the transition point between primary and secondary school, providing them with the skills to use active modes to travel to their new school. By working with schools to develop travel plans for staff and children, the safe use of active modes will be encouraged. Instilling these behaviours at a young age means they are more likely to remain into adult life.

Education and training for school aged children will make active travel safer and teach the benefits of walking, cycling and scooting. We are currently supporting schools in communicating the impact of poor air quality, by monitoring NO_2 at 50 schools in Bristol.

We will continue our active engagement with pupils and staff to promote road safety and active travel.

We will continue to engage with primary and secondary schools to deliver a combination of skills training (including pedestrian training and Bikeability), incentives and route planning sessions.

Case Study: Modeshift Stars

All West of England Authorities support school travel planning by encouraging schools to adopt the Modeshift Stars scheme. This is an award scheme established to recognise schools that have demonstrated excellence in supporting active and sustainable travel. It allows schools to identify travel and transport issues and helps them to respond to them. It provides the necessary categories to create a national standard travel plan, which is accessible online.

The following numbers of primary school children and staff in North Somerset have been involved in the following Modeshift Stars initiatives between 2012 and 2017: Air Quality (1,430); Cycling (601); Public Transportation (1,604); Road Safety & Training (4,845); Walking (7,003).

In 2019 Bathampton Primary School became the first school within Bath and North East Somerset to be presented with a gold award for reducing car journeys.

Engagement by schools with the Modeshift STARS scheme has continued to grow throughout 2018, 2019 and 2020.

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Local connectivity continued

Case Study: Travel to Work Survey

Since 2011 South Gloucestershire has undertaken an annual survey of commuting patterns, with Bristol City Council joining in 2014, and B&NES and North Somerset from 2016. All organisations with more than 30 staff are invited to participate, and receive a detailed report showing their unique travel patterns to support continued engagement and influence staff travel.

On a sub-regional level, this data has shown a downward trend for commuting by single car occupancy, with accompanying increases in all sustainable modes of travel, including walk, cycle, bus and train. This data forms part of an independent evaluation of the many measures undertaken to support sustainable transport in the West of England. Together with a comments report, this is used by the authorities to identify key areas of improvement in their transport systems.

Participation in the survey has increased year on year up to 2017, when more than 21,000 people took part.

Support travel planning with businesses and employment sites

We recognise sustainable economic growth relies on an efficient and reliable sustainable transport network. Business needs can vary greatly, depending on type of work and location. Working in partnership with businesses, and ideally having a single point of contact in an organization in the form of a 'travel champion' enables an understanding to be gained of needs and site-specific issues. Measures, interventions and ongoing support can then be tailored to their motivations, supporting their sustainable economic growth.

Case Study: School Travel – Access Fund

The Access Fund is being used to work with schools from March 2017 until March 2020 to increase rates of active travel, focussing on increasing pupil walking rates by 10%.

Bristol City Council have identified schools and recruited 'Active Travel Champion' staff members in each one. The team have worked intensively with schools to implement the 'WOW Walk to School Challenge', involving pupils tracking their travel daily on an app, and earning badges for travelling actively each month. The team have also run a range of engagement activities, ranging from educational classroom sessions and assemblies, to scooter training, 'Car Free Days' and 'Park and Stride Events'.

During Year 1 of the Access Project, 57 Schools were engaged and 373 engagement activities were delivered. Engagement is resulting in an increase in active travel trips to school, including walking, scooting and park & stride. The aim is to continue recruiting new schools, alongside engagement with existing schools, to ensure active travel is embedded in each schools' ethos, and walking, scooting & cycling rates continue to rise.

We are actively engaging with over 600 businesses to deliver a range of initiatives that encourage sustainable commuting. We are providing advice to support the uptake of more active modes of travel and promoting the benefits of this, including the resulting reduction in absenteeism through a healthier workforce and improved staff retention. This can help solve car parking issues, for those who have no alternative but to travel by car.

Evidence suggests that when employers have a travel plan in place, single occupancy car trips could be reduced by between 4% and 18%. This range is dependent on the intensity of measures to encourage the use of sustainable transport modes, as well as external 'push factors', such as localised congestion.

We actively promote a flexible working culture. This includes encouraging employers to offer greater flexibility in working hours, allowing employees to travel into the office out of peak times, resulting in less of a 'peak' on the transport network. We also encourage reducing the need to travel, by allowing employees to work from home.

Work will continue with both existing businesses and those that are moving into the area or to new development sites to gain a full understanding of their transport needs. This requires an appreciation of both employee travel needs, as well as those required for operating the business e.g. deliveries. For new employment development sites, we recognise the need to offer a range of travel options to enable more people to use sustainable modes of travel.

We will work with those developing economic and land use policies, to provide a joined-up approach between economic and transport planners.

We will continue to tailor our engagement with businesses according to their motivations and site-specific issues, in addition to promoting flexible working hours and reducing the need to travel, by home working.

We will encourage areas to build upon the example set by North Bristol SusCom, developing best practice, sharing ideas and giving businesses a voice.

We will continue to take part in sustainable travel forums for businesses and organisations, giving them a voice to influence and shape transport policy and investment within the region.

Case study: North Bristol SusCom

North Bristol SusCom is a group of leading employers working together to reduce congestion and support the development of a fully integrated, sustainable transport network for North Bristol. They know that combatting traffic congestion, and increasing the viability of walking, cycling and public transport, is vital for the long-term prosperity of our businesses and the health and well-being of our staff.

SUSCOM lead by example, taking a co-ordinated approach to managing traffic impact and supporting 40,000+ staff and 30,000 students to reduce the number of short car journeys made. North Bristol SusCom encourages car sharing, walking, cycling, bus and rail as preferred ways to travel to work and around the area on business. They also support home working, and if journeys need to be undertaken by car, electric vehicles and car sharing are promoted.

Encourage mode shift through grants, incentives and rewards

Match-funded employer grants, which originally started under the Local Sustainable Transport Fund, will continue to be offered via the Access WEST Fund. Employers can apply for a match funded grant to implement infrastructure on their site to facilitate and promote sustainable modes. Examples include cycle storage facilities, Real Time Information screens within their premises and the marking and signing of bespoke car-share spaces within their premises.

It is important to incentivise and reward individuals to reinforce positive travel choices. The annual travel challenge will continue and there is an aim

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Local connectivity continued

to increase the number of participants who are motivated and encouraged to change their travel behaviour for a given period for a potential reward. The success of businesses who have implemented sustainable transport initiatives will be celebrated, by hosting sustainable travel awards, where accreditations for travel plans will also be presented.

We will continue to offer grants, incentives, rewards and awards to businesses and individuals, to encourage the use of non-car modes of travel, building and refreshing schemes based on best practice.

Maximise awareness of sustainable and active travel choices and the benefits these bring

The most fundamental issue in behaviour change is increasing people's motivation to change their existing thinking or habits. Traditional policies that are proven to be most effective at reducing congestion such as demand management tools are often expensive and unpopular even though they will generate revenue to reinvest in alternatives.

An alternative is to put in place measures that encourage individuals towards making more environmentally beneficial decisions around how they choose to travel. Such interventions can provide credible and cheaper alternatives to traditional price or supply side interventions. In particular, carefully considering what and how the various transport options are made available and how information and incentives are presented to individuals can help ensure that the more healthy and sustainable transport options become the preferred options.

Additional engagement needs to include a comprehensive range of high-level promotion, self-select information and services, personalised services and advice, social marketing and opportunities to participate to maximise delivery of effective change. We need to continue to develop and refresh trip planners and other digital tools to keep abreast of advances, not just reacting to them.

Case Study: GKN match funded grant

Based in Filton, employer GKN employs 2500 people. With match funding grant from Access WEST GKN installed 3 heavy duty bicycle maintenance stands with tools and an E-Bike charging locker. The maintenance stands are so well used that a further 3 are due to be installed in the coming year. GKN are looking to revise the Bike to Work scheme to increase the limit from £1,000 to enable employees to invest in E-Bikes.

A major media/information campaign will be undertaken using local radio and social media, to inform the public about their travel choices and the impact of these choices. Advice will be sought from our partners on how bad news messages, such as the harm caused to the environment by driving, can be delivered in a way to grab people's attention and encourage them to consider more sustainable travel modes.

This social marketing will increase awareness about the role everyone must play in making the West of England a better place to live, work and visit.

We will seek advice from our partners, including Living Streets, Sustrans and the NHS, to understand the key drivers for successful media campaigns.

> **It is important to consider patient's access to healthcare through a range of transport options. We are aware that the provision of hospital services is changing with an increase in people travelling from a wider catchment to hospitals in Bristol and outside the West of England.**

We will work in partnership with the Clinical Commissioning Groups in the West of England to help plan transport to best enable people to access healthcare services sustainably wherever possible.

We will use social marketing to maximise the reach of information campaigns to influence travel choice, building on best practice and experience from other sectors.

Information and events will continue to be provided for West of England residents, ensuring active modes of travel are at the forefront of their minds when choosing how to travel. Area wide events, such as Bath Cyclefest, which was shortlisted for a Modeshift award for a Community Sustainable Travel Initiative in 2017, will be used to motivate and engage with communities. Work with other service providers and organisations who engage with communities will continue, enabling us to 'piggy back' on their events, such as health campaigns. This provides an opportunity to gain opinions and insights from people who would not normally attend a transport event.

We will use events, including those run by other sectors, to maximise awareness of active travel and associated benefits.

The travelwest website (www.travelwest.info) is the one stop shop for all travel information, which prioritises walking, cycling and public transport options in the search results. This will continue to be promoted as a journey planner, alongside the Better by Bike website, as the dedicated portal for cycling information, providing practical advice, downloadable maps and information about routes and events.

The travelwest website and journey planner will continue to be developed, maintained and promoted to support sustainable travel choices.

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Local connectivity continued

L4. Support opportunities for all sectors of the population to access the services they require, wherever they live

This policy contributes towards the delivery of the following objectives and outcomes:

3	2-5	2,3	1,4

The main interventions that will support the delivery of the policy, are:

- Support those without a private car, who need to travel, in accessing the services they require
- Promote the role of technology in accessing services and employment
- Support the role of taxis and private hire vehicles
- Support the role of demand responsive and community transport

Support those without a private car, who need to travel, in accessing the services they require

Poor accessibility is most commonly associated with more rural areas, which are sparsely populated and have limited services. However, ensuring access to goods, services and information in urban areas is equally important. Congestion, combined with an already well used public transport network and rising costs of transport services, can impact on opportunities available to populations in towns and cities across the West of England.

Young people in rural areas can have difficulties accessing further education, training, employment, evening entertainment, advice and other services. As a result, they can find themselves isolated. Limited opportunities, combined with a lack of affordable housing, is contributing to some young people moving away from rural communities. The cost and low availability of public transport in rural areas is a significant challenge for young people and can act as a barrier to their progress into employment. For many of these young people, having a driving licence and being able to afford a car is essential, but may be considered as 'forced car-ownership' given the lack of choice. Insurance costs can be prohibitive, and there is a real risk that other basic household budgets are cut to own and run a motor vehicle.

The consequences are reflected in the social and economic structure of rural areas, with some job-seeking younger people needing to move away, and local jobs largely being taken by people with access to private transport. In the long-term, this can impact on the demographic structure of rural communities.

It is not only young and older people who struggle with poor connectivity in rural areas. A lack of safe footways, cycle provision and crossing points connecting people and local services act as a barrier not only to safety and active travel, but also to mental health and productivity. As a result, people in rural areas often have little choice but to use their private cars. This has financial implications for those who would prefer not to drive and environmental implications for air quality and carbon emissions.

Transport can be a significant factor in the exclusion and isolation of many low-income families and act as a barrier to the take up of employment, education and lead to missed health appointments. For some households the costs associated with owning and running a car are prohibitively high, making them dependent on public transport for longer journeys. Lower population densities in rural areas mean that bus routes tend to be longer, serving fewer potential passengers along the route, leading to higher operating costs and lower revenues. This can often result in rural areas having a limited and heavily subsidised public transport service.

Other groups that often report becoming isolated include parents without a car, people out of work, the long term ill, carers and people with disabilities and non-visible disabilities and conditions, including mental health issues. There is a growing elderly rural population who find themselves isolated and having to rely on family and neighbours to help them. Improvements in accessibility are required to help older people maintain their access needs and reduce the need to drive in old age.

We will work with our partner organisations to assess whether people are able to reach key services and activities safely, reliably, affordably and with relative ease by public transport and produce an action plan to identify how to improve any existing gaps in provision, to enhance accessibility.

To retain accessibility to key services in less populated areas, we will work with service providers and other partners, including the voluntary sector, to investigate options that change the way services are delivered, such as providing multi-service hubs, and other innovative and cost-effective measures.

Case study: Wheels to Work in the West of England

The Wheels to Work West project, part of the DfT funded Access WEST programme, spans the West of England. The project provides support for those in need to travel to job and training course interviews, new roles, job placements and voluntary positions, with the aim of promoting greater access to work and skills.

The scheme encourages cycling through the provision of loan bikes and discounted bike sales, and public transport through the provision of First Bus m-tickets (day, week and month tickets) and paper Avon Rider tickets – which can be used for a variety of different bus operators. In addition, participants can access a range of other offers including adult cycle training and dedicated travel advice to help them plan their journey to a place of work, volunteering or training.

The four authorities work closely with a range of partner organisations across the public, private and third sector to deliver the Wheels to Work West project including: Department for Work and Pensions Job Centre Plus, SGS College, Weston College, Southern Brooks, Alliance Homes, Sovereign Housing, Creative Youth Network, Curo, Julian House, LifeCycle UK amongst others, with new partners added on a regular basis.

The overall target for the Wheels to Work West project is to provide benefit to 5000 people seeking work, skills or training across the West of England region by the end of March 2020.

Section 8:
Local connectivity continued

Case study: Total Transport

North Somerset Council was awarded funding from the Department for Transport for a Total Transport project to run between April 2015 and April 2017. The aim was to review passenger transport provision and develop a proposal for implementing service integration. Numerous proposals were identified, including: using rail to transport students from Yatton to Backwell School, combining community meals with home to school taxi routes, and integrating home to school transport with local bus services.

To deliver these changes, a new Integrated Transport Unit (ITU) was created in January 2017, bringing together staff delivering public transport, community transport, home to school transport and fleet management, directed by the Transport Commissioning Board. This provides a strategic overview of transport commissioning across the council. Medium-term financial plan savings of £600,000 were initially identified over three years. So far, £60,000 of savings were delivered in 2017/18, and £291,000 savings have been declared for 2018/19.

B&NES Council was also awarded Total Transport Fund funding in 2015. B&NES used the funding to consider how passenger transport (public transport, home-to-school transport, community transport and non-emergency patient transport) in the Chew Valley area could be better integrated to get a more coordinated and efficient network and better connect people with the facilities they need. Recommendations were made on how existing passenger transport provision could be improved, but implementation would have imposed an unacceptable cost burden.

South Gloucestershire Council used the Total Transport Fund to help understand the challenges and issues facing access to health services particularly from rural areas. The baseline data identified there was some duplication of transport provided by community transport and the potential to make more of 'spare' capacity (empty seats). A feasibility study was undertaken to explore options to improve the efficiency of community transport and make greater use of spare capacity. The proposal was to provide a shared software membership/ booking system, dedicated shared webpage and possibly a dedicated helpline. Unfortunately, no follow-on funding was available, so the proposals have not been taken any further.

Promote the role of technology in accessing services and employment

Access to the internet can be an alternative to making a journey. The past decade has seen considerable and widespread changes in the availability and use of the internet to access goods and services. The Broadband Delivery UK project has provided universal access to basic broadband, which has revolutionised quality of life and meant people can now access almost any goods and services without the need to travel. It has had a profound impact on the way in which we now choose to consume our goods and services.

Whilst broadband services are now available across the West of England, there is widespread variation in the quality and speed of broadband services, with generally lower speeds in rural areas. We recognise that improved broadband coverage will help facilitate greater home working and relieve pressures on the transport network, particularly by avoiding the need to make journeys during peak periods. Homeworking can also allow those who are unable to travel to work, to access employment without the need to travel.

We will work with the Government and internet service providers to encourage them to increase existing levels of investment in broadband, 4G, 5G, and any other emerging internet access technologies, in all areas of the West of England.

We recognise that although access to the internet is now readily available in most areas, some sectors of the population do not have the skills to be able to benefit or consume services in this way. Training is needed for those who own, but are not confident using, computers and smart phones.

Training and internet accessibility is key for understanding information about journey options, such as distance, cost, time, energy used; checking timetables; accessing journey apps; and for purchasing slightly cheaper bus tickets and other tickets conveniently. The wider benefits this will bring to the West of England should not be underestimated.

We will work with skills providers to ensure training is available for those who would like to access services on the internet, so they can gain the skills and confidence to do so.

Support the role of taxis and private hire vehicles

Taxis and private hire vehicles have a role to play in providing accessibility to different sectors of the population. They can be cheaper than car ownership and play a role as part of a longer-journey using public transport, for example by providing links to and from rail stations, as well as some complex home-to-school transport journeys. Taxis and private hire vehicles provide a necessary service to those who are physically unable to access public transport and require a door-to-door service.

We will work with taxi operators to review charging policies, ensuring taxis are fair, competitive and accessible for all.

We will work to ensure the provision of adequate centralised taxi waiting and drop off facilities in city and town centres, and work with taxi operators to ensure that services are available to all as an alternative to the private car.

The emergence of on-demand taxi services, such as Uber, illustrates how traditional taxi provision may be unappealing to some segments of the population, as more demand responsive transport becomes increasingly popular. Mobile phone and web communications are enabling individuals to link with cars for specific journeys, providing a reliable and affordable alternative to traditional taxi or bus use.

Shared taxis can bolster existing public transport provision during busy periods such as the morning and evening peak hours, filling gaps in the public transport network by serving remote locations that are currently not served by public transport. By encouraging the use of electric vehicles as part of taxi fleets, taxis can not only contribute to removing traffic from our roads and reducing congestion, but also improve air quality.

We will continue to support the introduction of shared use taxi schemes that support the local bus network and provide flexible attractive alternatives to those who would otherwise drive.

On-demand services, which may be through a shared, cross-region, multi-operator system or application, could assist local operators in keeping up with technological advancements and continue to remain competitive, enabling local economic growth. A shared system could involve journey options from existing on-demand services such as Uber, to provide a fair and competitive, accessible system across the West of England. This would enable users to choose the fastest and cheapest taxi services for their desired journeys.

Section 8:
Local connectivity continued

We will continue to work with local taxi operators to encourage them to look at adopting on-demand services through smartphone technology.

Support the role of demand responsive and community transport

Community transport encompasses a range of transport services - such as dial-a-rides, community-owned buses, group minibus hire schemes and voluntary car scheme – that supplement commercial public transport services. Most community transport is demand-responsive and offers door-to-door transport for members of the schemes. It relies heavily on volunteers and is predominantly focussed on local communities. Most schemes were set up as local initiatives to meet local transport needs.

There is no statutory duty on local authorities to support community transport, but it is widely recognised that the sector plays a vital role in helping people to live independently and play an active part in community life – particularly those who find it difficult to access mainstream public transport. Local authorities provide guidance, assistance and funding to schemes, but administration and service delivery are carried out by the schemes themselves. Local and central Government make grants available occasionally for new vehicles – subject to State Aid rules.

In addition, community-owned buses can operate scheduled bus services within the scope of regulations that protect commercial operations.

Community transport operations in rural areas are faced with the same dilemma that rural bus operators face, i.e. the sparsity of population and dispersed nature of settlements give rise to higher operating costs and lower revenue than urban operations.

Community transport will play an increasingly important role in filling a gap for commuters, as well as for social/mobility needs. However, there is also a role for such services in providing the first and last mile journeys for tourists who are visiting the fantastic cultural offer of our historic market and seaside towns and villages, as well as the stunning natural environment in the West of England. Dwindling commercially operated bus services are leaving a lack of access between the major public transport corridors and the villages, towns and rural areas situated away from these main transport services.

Another well-established form of demand-responsive transport is a shared taxi scheme, under which travel in specific areas can be coordinated and tailored more to specific needs than is possible with a fixed bus route. The growth in app-based taxi booking creates tremendous opportunities for expanding the role of shared taxi services in urban and rural areas - although trials so far have not generated the volume necessary for a sustainable commercial operation.

We will continue to support and encourage community and demand responsive transport schemes, working with providers and the voluntary sector to improve information and facilities, and to coordinate service provision. Subject to funding, we will support new initiatives that make use of emerging technologies to develop community and demand-responsive transport.

Case Study: Felton and Winford Community Bus

In 2015, the villages of Felton and Winford were left without public transport when the local bus operator withdrew services. With declining revenue support budgets, contract prices to operate a replacement service were unaffordable. Low passenger numbers and the rural nature of the area were not attractive to commercial operators.

As an alternative, North Somerset Council commissioned a community bus service, working with the parish council and a local community transport operator. The service operated with a minibus, which was sufficient to cater for the passenger numbers in the area and suitable for navigating rural roads. Felton and Winford are close to Bristol Airport, so the service operated to and from the airport only. This enabled passengers to access the high-frequency Airport Flyer service into Bristol city centre, and other local bus services.

The community bus began operation in August 2015 and, with a dedicated driver and vehicle, quickly became part of the local community. Local residents took ownership of the service, promoting it locally by word-of-mouth. The service operated for almost three years, until May 2018, when developer funding from Bristol Airport saw the return of a local bus service to the area. At this point, the community bus and driver were redeployed to another community in need (Worlebury area in Weston-super-Mare).

L5. Support the identification and implementation of measures that will improve air quality

This policy contributes towards the delivery of the following objectives and outcomes:

6	5,6	1-5	1	1-4

The main interventions that will support the delivery of the policy, are:

- Support ongoing work to manage the impact of transport on air quality and climate change
- Support ongoing work on Clear Air Zones and the UK extensions Air Quality Plan
- Support work on Zero and Low Emission Vehicles

Support ongoing work to manage the impact of transport on air quality and climate change

Poor air quality has significant impacts on human health, which risks holding back economic growth due to the impacts of poor health on productivity. It is damaging the natural environment and negatively impacts on the prosperity, quality and perceived quality of the region. There is increasing public recognition that air pollution is associated with adverse health impacts throughout the human life cycle, contributing to heart disease, stroke, chronic obstructive pulmonary disease and lung cancer. Particulates are known to have negative health impacts, even at very low concentrations.

Section 8:
Local connectivity continued

Levels of nitrogen dioxide (NO_2) have started to fall in recent years. However, despite cleaner new vehicles replacing older ones, the contribution from road vehicles has fallen at a lower rate due to an increased share of diesel vehicles. Although the average emissions per vehicle is much higher for heavy goods vehicles and buses, the high number of diesel passenger and light goods vehicles on the road means that these are the biggest contributors to overall pollution.

Air pollution levels in parts of Bristol, B&NES and South Gloucestershire continue to exceed Government standards for NO_2. Consequently, central Bath, Keynsham, Saltford, central Bristol, Kingswood and Staple Hill have active Air Quality Action Plans. Air Quality Management Areas have also recently been declared at Temple Cloud and Farrington Gurney on the A37.

We will support the preparation of Air Quality Action Plans and delivery of specific measures identified to improve air quality.

Tour buses, often open top, operate in Bristol and Bath. They operate as registered bus services to a fixed timetable and form part of the 'visitor experience', making a positive contribution to the local economy. However, these services need to be regulated to minimise any detrimental impacts such as exhaust pollution, noise pollution, road dangers, unnecessary traffic congestion and visual intrusion.

We will work with tour bus operators to develop an upgrade plan to operate ultra-low or zero emission vehicles in city centres.

In addition to NO_2 emissions, road transport is one of the largest sources of carbon dioxide (CO_2) emissions, which contributes to climate change. Although progress has been made in reducing overall emissions since the last Local Transport Plan was prepared, the share of emissions from transport has increased in the West of England. Further action is needed to meet the West of England's aim to be carbon neutral by 2030.

Case study: Tour buses in Bath

Tour bus services in Bath carry up to 3,000 passengers per day at busy times. Prior to 2005, Bath had four open top bus operators running tours in the city and there was a demonstrable impact on the quality of life for residents and visitors alike. The low costs of entry into the market and high rewards led to a situation of over-supply. Following a Public Inquiry held by the Traffic Commissioner, Traffic Regulation Conditions were introduced which strictly regulated open top tour buses in Bath. These have been highly successful in reducing the detrimental impacts of the services. Long-term investment by Bath Bus Co, with assistance from the DfT and supported by B&NES, has resulted in a fleet of low emission vehicles being operated in Bath. This makes a positive impact on air quality in the city, when compared to the alternative of visitors seeing sites by car or coach.

Support ongoing work on Clean Air Zones and the UK Air Quality Plan

To improve air quality, the Government has requested councils across England – including B&NES, Bristol City and South Gloucestershire – to achieve compliance with NO_2 limits 'in the shortest possible time'. This is part of the UK Air Quality Plan. There are hotspots in Bath, Bristol and South Gloucestershire where concentrations of NO_2 (caused by vehicle emissions) exceed the acceptable national and European limit of 40µg/m^3.

Although most of the schemes in the JLTP4 will have positive impacts on air quality, the local authorities are also responsible for developing innovative Clean Air Plans that will achieve statutory NO_2 limit values in a way that best meets the needs of their communities and local businesses. This will include Clean Air Zones (CAZ) which are defined geographic areas where targeted action is taken to improve air quality, deliver health benefits, and support economic growth. Clean Air Zones may include both non-charging and charging measures. Businesses cases are under development and will be submitted to central Government to propose options to achieve the required standards within the shortest possible time.

A decision on Clean Air Zone proposals will be taken by each local authority and the Government's Joint Air Quality Unit, upon completion of business cases.

We will support ongoing work in the development of CAZs.

Measures currently underway to improve air quality and climate change include:

- The Clean Vehicle Technology Fund provided funding to retrofit 42 Euro V classification buses with Thermal Management Technology to improve their environmental performance, whilst the Clean Bus Fund provided £0.5 million funding to retrofit 35 of the sub-region's most polluting bus services with selective catalytic reduction technology to improve their rating to Euro V and Euro VI standard. In 2018, Bristol City Council, South Gloucestershire and B&NES were successful in a £2.2m bid to Government to retrofit a further 81 Euro IV and Euro V buses, to bring them to Euro VI standard.

  Most recently, Bristol City Council and Bath and North East Somerset Council secured £2.48 million from the DfT to help retrofit 166 buses on routes into Bristol and Bath, reducing the amount of nitrogen dioxide and other pollutants by up to 94%.

- B&NES successfully received funding through the Green Bus Fund in 2012 to replace the existing Park & Ride buses in Bath with less polluting hybrid buses.

- Bristol City Council and South Gloucestershire Council successfully bid for around £5m funding from government. Through a partnership with First Bus, this funding helped to unlock more than £30 million investment, when match-funding was taken into account. This enabled the introduction of 110 new gas-powered buses into the sub-regional fleet.

- Bristol City Council in partnership with First Bus is in the process of trialing two hybrid electric buses that automatically switch to electric mode when entering an Air Quality Management Area.

- Bristol City Council received Early Measures funding from the Clean Air Fund for £1.1m to improve cycle accessibility in South Bristol and support taxi operators to move to low emission vehicles.

Section 8:
Local connectivity continued

Clean Air Zones

The Government defines a Clean Air Zone (CAZ) as an area where targeted action is required to improve air quality. Resources are prioritised and coordinated to shape the urban environment in a way that delivers improved health benefits and supports economic growth.

In the designated CAZ area, measures to reduce vehicle emissions and cut pollution may be introduced, with the aim of improving everybody's health. CAZs may include charging and/or access restrictions on vehicles to limit the most polluting vehicles using certain roads at certain times. The most polluting vehicles may include some buses, coaches, private hire vehicles and taxis, as well as heavy goods vehicles, light goods vehicles and cars.

CAZs will be supported by complementary measures to encourage more active and sustainable travel and accelerate improvements in vehicle fleets. This could include better bus priority, bus stop facilities and live information, more secure cycle parking, electric cycle hire, and new or improved cycling and walking routes.

Clean Air for Bristol

BreATHe
A Clean Air Zone for Bath

Support work on zero and low emission vehicles

With continued improvements in vehicle emissions standards and the replacement of older vehicles, air quality is likely to improve and CO_2 emissions to decrease over the longer-term. The future uptake of electric vehicles and other types of low emission vehicles will be critical in helping to deliver reductions in harmful emissions, although it is recognised they still contribute to congestion and poor air quality, due to brake and tyre dust.

Zero emission vehicles are fully electric and wholly driven by an electric motor with no combustion engine, meaning they do not produce any exhaust emissions. At present, most zero emission vehicles have a range of approximately 100-150 miles, however it is expected that this range, and the take up of these vehicles will increase as battery technology improves. Low emission vehicles are plug-in hybrids, which are powered both by an electric motor for a limited range, followed by a conventional engine that is used once the battery has been depleted.

The West of England has placed significant investment in Ultra Low Emission Vehicles (ULEVs) through the Local Sustainable Transport Fund and Rapid Charging Points scheme, including the 'Source West' project that promotes the introduction of electric vehicles into South West England. This provides information on electric vehicles, including an energy usage cost comparator and an app providing a secure payment interface.

The Government has launched its Road to Zero Strategy, with the ambition to see at least half of new cars to be ULEVs by 2030. Despite recent investment, there is a need for more funds to be dedicated to improving electric vehicle infrastructure. Recent research identified that by 2020 there will be more than 1 million electric vehicles on roads in the UK, creating demand for an additional 83,500 charging points. This is an increase of 83%, from the current number of 16,500 charging points.

Case study: Electric vehicle funding and metrobus ULEV buses

The Office for Low Emission Vehicles (OLEV) awarded £7million of funding over 5 years to promote the uptake of electric vehicles (EVs) across the region, following our Go Ultra Low West bid. As a result, EV purchases in the region will rise to 5,000 new registrations per year by 2020.

The metrobus project will see over 50 new ULEV buses brought into service within the West of England. The gas-powered vehicles will be modern, low emission and expected to reduce carbon emissions and fuel consumption by 25 per cent, compared to a standard bus.

Together with sustained investment in active and sustainable modes of travel, low emission vehicles have a pivotal role to play in improving local air quality and addressing climate change.

We will continue to progress work on low emission vehicles in the short-term and:

- Identify and address any barriers to the uptake of ULEVs, especially in those areas which have been declared Air Quality Management Areas or CAZs
- Introduce policy measures to encourage EV uptake
- Through metrobus, continue to support the introduction of low emission buses, through Statutory Quality Partnership Schemes or other measures, including Clean Air Zones
- Provide advice, support and training to other private and public-sector organisations, including businesses, to encourage the introduction of ULEVs
- Maximise CO_2 reductions from the transition to ULEVs, by promoting ULEVs to run on renewable energy and to act as batteries for the electricity grid, helping to match energy supply from renewables with energy demand
- Through changes to existing parking standards include a requirement for new developments to provide greater levels of electric vehicle charging infrastructure for residential, commercial and industrial developments

Case study: Weston-super-Mare Town Centre Regeneration Supplementary Planning Document (SPD)

The SPD requires at least 10% of the total parking spaces at new builds to include superfast charging points with a minimum of 1 space. In addition, to future-proof car parking areas passive provision is to be included to support the provision of charging points for 40% of spaces in the longer term.

Section 8:
Local connectivity continued

Support will continue to be provided on work being undertaken through the existing Ultra-Low West programme, ensuring the region is at the forefront of providing facilities for EV owners. Across the West of England, the funding will be used to:

- Increase the number of charge points through a regional charging network. This would include public, business and car club charge points
- Deliver more EV-capable car club bays
- Convert at least 20-25% of the four West of England councils' light vehicle fleet to EV – approx. 100 vehicles
- Build 4 rapid charging hubs at high-profile locations across the region which would allow EV owners to charge their car in 30 minutes or less
- Expand the low-emission Freight Consolidation scheme to reduce the number of heavy-goods vehicles entering the city centre and link this with micro-consolidation and 'last mile delivery' for small and medium-sized businesses

Work will also continue to:

- Give greater consideration of low emission strategies within future planning documentation and define specific policy measures to encourage EV uptake, such as a West of England Electric Vehicle SPD and through Local Plan policies
- Promote ULEV taxis through improvements to infrastructure, grants and other take-up incentives
- Formulate a strategy to overcome barriers to the provision of ULEV infrastructure

We will support ongoing work, as appropriate, in the development of zero and low emission vehicles, including the necessary infrastructure including a regional electric vehicle charging network.

Section 9:
Neighbourhood connectivity

Neighbourhood challenges

Vehicle speeds, the volume of traffic and the pollution levels generated on main roads can often feel excessive for residents and impact negatively on those pedestrians, cyclists and equestrians who share the same space. This can significantly impact on the level of interaction within communities located in these areas. Those who live on streets with higher traffic levels are likely to have fewer social interactions within their neighbourhood.

Building on the general West of England challenges identified in Section 2, more specific challenges for neighbourhood connectivity have been identified, as follows:

- The dominance of traffic restricting the ability to reprioritise road space to other modes and improve public realm
- Perception of safety and security issues deterring use of active modes
- Lack of knowledge on making seamless door-to-door journeys by modes other than the private car, resulting in more private car trips being made in neighbourhoods than necessary

Neighbourhood policies and interventions

Neighbourhood connectivity in the West of England will support delivery of the JLTP4 objectives, by focussing on these main policies:

- N1: Use master planning and local design to create better places
- N2: Facilitate the use of active modes for all short trips, including the first and last mile of longer journeys

The policies will be delivered by focussing on specific interventions.

N1. Use master planning and local design to create better places

This policy contributes towards the delivery of the following objectives and outcomes:

5	1-3	3	1	1-4

The main interventions that will support the delivery of the policy, are:

- Improve the quality of streets and public realm
- Prioritise walking, cycling and public transport into new developments
- Provide clear wayfinding and signage
- Improve and maintain Public Rights of Way

Improve the quality of streets and public realm

Major roads can provide a barrier to accessibility in neighbourhoods, segregating residential areas, services and facilities. There is growing recognition that high levels of car use and congestion are not conducive to the creation of vibrant and attractive urban areas and have a determining impact on how people choose to travel the first and last mile. High quality public streets and spaces, that allow people to move more seamlessly, are an essential part of successful urban environments and how people choose to travel for longer trips.

New developments

Through the planning process, new developments will be required to fully embrace, nurture and respond to the distinctive characteristics and features of the area surrounding them. This will support the protection and enhancement of the diverse range of places within the West of England.

Section 9:
Neighbourhood connectivity continued

We will look to ensure that new developments are designed to:

- **Positively contribute to an area's character and identity, creating or reinforcing local distinctiveness**
- **Provide safe and welcoming public space that promotes walking, cycling and convenient transition to public transport**
- **Strengthen physical connections with surrounding areas and key destinations**
- **Create vibrant resilient and healthy communities**

Urban Living, a central plank of regional and local planning, requires the creation of compact, high density, characterful urban areas where people can live, work and socialise with good access to public transport. For major development sites these attributes will be considered at an early stage through master planning and Local Plan policies.

Community participation and Neighbourhood Plans

To thrive, neighbourhoods need to be places that enable people to be safe, healthy and interact with their neighbours. Neighbourhoods need to facilitate community participation, enabling easy access to facilities, like shops and schools, for all sectors of the population.

Neighbourhood Plans can be prepared to promote greater community ownership, cohesion and pride. They can give neighbourhoods greater control over improvements to transport, connectivity and community facilities. This enables communities to shape the future of their neighbourhoods and provide a consistent basis for what development and transport proposals would be welcomed.

It will be important to improve and strengthen connectivity in our towns. With proposed local plan development and major transport improvements in and around towns such as Keynsham, Nailsea, Thornbury, Weston- super-Mare and Yate and Chipping Sodbury we will work with Town and Parish councils to deliver a strategic approach to transport improvements.

We will openly work with town and parish councils, informed by residents and neighbourhood groups, to develop Neighbourhood Plans.

Crucially, adopted Neighbourhood Plans can secure funding for identified transport and access proposals via the Community Infrastructure Levy (CIL). Areas with Neighbourhood Plans receive a greater share of CIL income, which can, at the discretion of that local area, be spent on transport and access improvements. As local authorities work with communities to develop the plans, it ensures that holistic, joined up thinking is behind the improvements that work for the benefit of all.

Improvements that could encourage pedestrian and cycle activity and provide safer, more sustainable neighbourhood journeys can be identified with support from local active travel groups (including Sustrans) and by working with town and parish councils and designated neighbourhood planning areas. These could include improved footways, cycleways, crossing points, traffic calming measures and improved bus stop infrastructure and access. With more people able to access local facilities, including open areas and parks, and businesses via walking and cycling, the perception of local areas will be improved as more people are out and about, with resulting impacts on improving public health.

We will provide support to neighbourhoods in identifying improvements for inclusion in their Neighbourhood Plans.

Case study: Highway Sustainable urban Drainage System (SuDS), Bristol

A pilot highway SuDS scheme was designed in partnership with Sustrans and in close consultation with the local community. The scheme saw the construction of four highway SuDS 'pods' and a storage basin. The SuDS pods effectively replaced existing nearby gullies and were constructed to accommodate highway runoff and store water beneath the ground before releasing it slowly into existing sewers beneath the road. The benefits of SuDS systems are that they slow the flow of water in the sewer network, which increases their capacity and reduces flood risk.

The pods are topped by soil and plants, so they clean the water and increase local biodiversity, as well as creating a more visually attractive environment. They also act as traffic calming, which is important given their location outside a primary school. The detailed designs of the pods were completed by internal BCC teams and have been adopted by BCC as Highway Authority.

Design guidance documents and Supplementary Planning Documents

The growing importance of improving our streets and places has been recognised through the development of bespoke design guidance documents for the cities of Bath and Bristol. Bristol's draft City Centre Framework sets out a vision for how people will move around Bristol city centre and how their movement experience will be improved. Likewise, Bath's Public Realm and Movement Strategy seeks to revitalise the economic, social and cultural wellbeing up to 2026 and beyond, by putting forward a plan to transform streets and spaces across the centre, and by rebalancing the movement hierarchy.

In Bath, the Council adopted the Public Realm and Movement Strategy for Bath City Centre in March 2010. The strategy forms a key component of the Council's Future for Bath Vision which seeks to revitalise Bath's economic, social and cultural wellbeing up to 2026 and beyond. The strategy was founded on a thorough appreciation of the historic development and design values of the city and puts forward an incremental plan for transforming the public realm and in doing so creates a canvas for a more animated and inclusive public life. Following the successful adoption of the strategy other authorities have produced their own similar strategies that set out how progressive improvements to the public realm help to underpin a coherent long-term vision and delivery plan for the revitalisation of our historic environment.

Case study: Weston-super-Mare public realm and pedestrian and cycle improvements

In October 2017 NSC was granted £2.95m National Productivity Investment Fund money from DfT, and £1.5m from the LEP's Local Growth Fund, for a series of WsM town centre public realm and pedestrian/ cycle improvements (Phase 1), with an integrated bus interchange coming as a second phase (Weston Town Centre Transport Enhancement Scheme). The bid was successful as reducing traffic dominance and improving public space via pedestrian/ cycle improvements is recognised as key in unlocking key town centre regeneration sites and attracting high-quality residential and employment developments.

Section 9:
Neighbourhood connectivity continued

We will support the implementation of local design guides to improve streets and places.

B&NES adopted their Placemaking Plan in July 2017, which includes a multi-faceted approach to the planning, design and management of new development and spaces. North Somerset Council have an adopted Weston-super-Mare Town Centre Supplementary Planning Document (SPD) that sets the agenda for the regeneration of the town centre. This includes design codes and a context of regenerating and improving town centre space. Higher density developments with more relaxed parking standards are encouraged, to improve town centre space for active travel modes and reduce traffic dominance to bring benefits for people and businesses.

Improved opportunities to travel by active modes will enable people to access local shops and businesses, supporting the viability of these services. Providing sufficient parking outside of central areas and encouraging people to walk reasonable distances, 'Park & Stride', will reduce the number of cars and support the rebalancing of the network in favour of active modes. Improving the street environment for all road users will ensure our urban areas remain or become attractive, vibrant places to live, work and visit. This will enhance the attractiveness, appearance and safety of these centres to make them attractive to businesses, shoppers and the community.

Case Study: Bristol public realm improvements

In Bristol, public realm schemes have been used to reclaim areas of the city centre from motor transport. This has created improved public spaces and places, with wide-reaching benefits. For example, to protect the historic environment, major roads adjacent to the Cathedral and through the Grade I listed Queen Square were removed in the 1990s. The metrobus scheme has led to the removal of traffic from key sections of Bristol city centre, improving the public realm and creating an improved setting for the cenotaph. The Temple Gate scheme will remove road space from private cars, but improve public transport interchange and provide better access to Temple Meads Station.

Case Study: Bristol retailers

A study in Bristol found that retailers on a local high street overestimated the proportion of shoppers arriving by car by almost double at 41% compared with the actual proportion of 22%. The retailers also underestimated how far pedestrians had travelled to get to the high street; over 60% lived within 1 mile. As well as the benefit of improved public realm, the study showed that pedestrians generally visited more shops than those arriving by car.

Feeling safe is an important factor for people in deciding their transport choices, such as whether they feel safe waiting at a bus stop at night. This has gender equality implications, as it is well-reported that women often feel less safe than men being out alone after dark. This means that for everyone, the design of walking and cycling routes, the siting of bus stops, cycle parking and other transport interchanges, especially in the inner city and in rural areas, is an extremely important consideration in planning to encourage the shift to more sustainable travel choices.

We will invest in our public places and rebalance transport and movement systems in favour of pedestrians, cyclists and public transport users. This includes delivery of public realm improvement packages in Keynsham and in Midsomer Norton and Somer Valley, including links to the Somer Valley Enterprise Zone.

As well as its role in enhancing places by making them more accessible, transport can equally harm the quality of a place. It has, and will continue to have, an impact on the built, historic and natural environment.

Improvements to some of the area's historic streets and settlements will hopefully become possible by reducing the volume of traffic using those historic streets and spaces. The management of the highway network, particularly in areas of historic significance, needs to continue to be undertaken with the context of the historic built environment and include reducing the impact of signage, road markings and the impact of traffic calming. Infrastructure should be designed sensitively to reduce visual impact and to include effective landscaping scheme to soften any major structures. Any new infrastructure should take account of the same design criteria required for new developments.

Where possible, the public realm in these areas will be enhanced to both protect important buildings and locations, in tandem with working to improve public spaces, and address the impacts of noise. The development of strategic transport related initiatives needs to ensure that the historic environment is recognised and taken into consideration.

Excessive noise pollution caused by high volumes of motor traffic has been linked with an increased risk of heart attack, obesity, impaired sleep and mental health problems. People living in areas with high traffic noise are 25 percent more likely than those in quieter neighbourhoods to have symptoms of depression. Noise management measures that might be appropriate, feasible and affordable are likely to include renewal of carriageways, targeted maintenance, noise barriers, speed limits and road hierarchy reviews.

We will work with DEFRA to support them in the identification of appropriate mitigation measures to protect the quietness of open spaces, and provide our partners, including Highways England and the rail industry, with these aspirations to guide them in tackling noise as part of management plans.

Transport can make a positive contribution to the natural environment, by using green infrastructure as part of scheme design. Green infrastructure is a planned network of green spaces and corridors in and around our towns and cities, which are designed to protect and enhance local communities, wildlife and the environment. The West of England's emerging Joint Green Infrastructure Strategy (JGIS) provides context for green infrastructure delivery and supports individual Local Plan approaches to green infrastructure. Existing guidance suggests cycle ways, paving and parking should consider permeable construction first, then look at providing green infrastructure alongside the route, before considering traditional drainage. This brings benefits to communities and the natural environment.

We will work to ensure transport scheme design and upgrades contribute to the creation of increased levels of resilient green infrastructure, in line with the emerging JGIS.

Prioritise walking, cycling and public transport into new developments

Higher development densities and a mix of land uses can encourage more local travel patterns and reduce journey lengths. Urban Living is a central plank of regional and local planning,, optimising opportunities for development in urban areas and previously developed land. By working with those developing these polices, we can drive the sustainable delivery of developments and provide the opportunity to minimise the need to travel and allow safe and convenient access to

Section 9:
Neighbourhood connectivity continued

services by walking, cycling and public transport. Developers will be engaged with right at the start of the planning process to achieve this. This will include, where appropriate, the encouragement of new housing with car-free areas (with car parking, where required, located outside of the living areas) to encourage more social interactions and walking. All new developments will need to cater for all levels of mobility however, to not exclude those with mobility impairments.

We will continue to encourage new developments in locations that are accessible by existing walking, cycling and public transport networks, and discourage proposals that fail to actively encourage mode shift away from the private car.

We will require developers to make developments 'bus friendly' by reference to guidance published in 2017.

We will engage with developers at the start of the planning process to ensure key services to be provided on site, based on the thresholds included in guidance, are high-quality, but also in the best location to maximise their accessibility via active travel modes and public transport.

For smaller development sites that do not require the provision of on-site facilities or services, there will be a stronger emphasis on working with developers for transport improvements and mitigations to include high quality, direct walking and cycling linkages to off-site local facilities.

Accessibility is maximised through a consistent walking and cycling-focused street pattern, ensuring the necessary safe and direct cross-site permeability that makes active travel attractive. Clear priority for pedestrians and cyclists at junctions should be incorporated, wherever possible. With integrated on-site provision and access, more trips are retained within local areas so people are not forced to travel to access basic services, thereby encouraging the use of more active modes. The improvement and expansion of our walking and cycling network, including strategic cycle routes, is critical to providing access to local services and to ongoing economic growth.

We will work with developers to ensure they are using existing street design principles, but increasingly focus on providing an attractive, integrated network that offers segregated areas for active modes, if required.

We will work with developers to ensure the high-quality walking and cycling infrastructure provided on-site does not stop at the site boundary, but integrates into the wider walking and cycling network, facilitating seamless onward active travel for the necessary journeys between villages, towns and city neighbourhoods.

In the interests of limiting safety implications and maintenance liabilities both during and after construction, local planning authorities will engage with developers over construction materials of the walking and cycling network improvements. The individual pedestrian and cycle strategies of the West of England authorities will also provide further design guidance and principles.

Provide clear wayfinding and signage

The design of transport schemes and new infrastructure will consider the needs of walkers, cyclists and equestrians. A simple and intuitive approach to wayfinding and signage will be adopted, including for Public Rights of Way such as bridleways and restricted byways. Signage and infrastructure for pedestrians and cyclists will be designed to be sympathetic to local distinctiveness whilst remaining clear, visible and informative.

Streets and places often suffer from a proliferation of traffic and directional signs. The approach will be used in the design of new schemes and the improvement to existing streets and places. Technology offers further opportunities to reduce the number and type of signs and influence the way people get directions to move around. Smart phones and interactive maps can play a significant role going forward, and innovations and emerging technology will be built on, as discussed in Section 5, to maximise the benefits this can bring.

We will develop an approach to signage that focusses on consistency and minimises duplication, building on opportunities offered by technology, as they arise.

Improve and maintain Public Rights of Way

Public Rights of Way have a role to play in providing access for pedestrians, cyclists and equestrians. Rights of Way Improvement Plans (ROWIP) are central in supporting the maintenance of Public Rights of Way, which offer recreational use across the West of England, as well as identifying actions to improve network connectivity and safety, including making the network easier to use and follow.

We support the safeguarding of Public Rights of Way in development in terms of their utility, amenity and safety. Any new routes proposed or being reviewed should be designed for use by pedestrians, cyclists and equestrian users, unless evidence deems a class of use as inappropriate in a specific location.

In identifying and developing new Public Rights of Way or active travel routes, the needs of pedestrians, cyclists and equestrian users will be considered and provided for, wherever possible.

Case study: Public realm improvements in Bath

The High Street Public Realm Improvement Scheme in Bath was completed in June 2013. The High Street did not provide a welcoming or enjoyable experience for pedestrians or bus users. The combination of narrow footways, busy bus stops and high footfall often resulted in overcrowding. The new scheme created a more pedestrian friendly environment, through the expansion of pedestrian areas, new street furniture including bus shelters, wayfinding signage, cycle stands and the improved signalised crossings. Together, the measures have created a more pedestrian friendly environment, enhanced the streetscape and afforded better access to public transport.

Pedestrian improvements to Stall Street and Lower Borough Walls in Bath were completed in late 2015. This busy thoroughfare carried around 25,000 pedestrians per day. By cutting vehicle traffic, the space is now more pleasant for local people and visitors to shop and socialise. Drawing on the same guiding principles as the High Street scheme, new traffic restrictions were implemented during core shopping hours. This was combined with improvements to the public realm through the use of shared space to make the area much more pleasant for pedestrians and cyclists.

Section 9:
Neighbourhood connectivity continued

N2. Facilitate the use of active modes for all short trips, including the first and last mile of longer journeys

This policy contributes towards the delivery of the following objectives and outcomes:

2	1	1	1	1

The main interventions that will support the delivery of the policy, are:

- Work with residents and communities to identify barriers to accessibility
- Support the provision of safe crossings and speed reduction in appropriate locations
- Improve actual and perceived personal security

Work with residents and communities to identify barriers to accessibility

The first and last mile trip concept is particularly relevant in neighbourhoods, as mode choice for longer trips is likely to be determined by the choices available to travel the first mile i.e. from home. The first and last mile of longer journeys to key destinations such as employment and leisure sites should be targeted for switching to active modes. This will be supported by, and build on the benefits being generated, from shorter trips being made by non-car modes.

Reducing the number of neighbourhood car journeys can have wide reaching benefits. Journeys within neighbourhoods are short, and for pedestrians, most neighbourhoods already have an extensive network of footways and Public Rights of Way. Fewer car journeys can increase the attractiveness of other modes, such as the use of scooters, particularly by younger children, to access local destinations. The importance of reduced traffic on equestrian links, can also not be overlooked in some areas.

Where traffic levels can be reduced through enabling more shorter journeys to be made by foot or bicycle, opportunities can be taken to provide public realm improvements. It also enables roads to more effectively accommodate the longer, more difficult trips that are necessary via public transport and the private car. Parking and traffic speeds can be more effectively managed, so they do not harm or hinder local neighbourhood access and facilities. Opportunities will also be taken, where appropriate, to create 'road cells' in residential areas, where groups of streets are closed with limited access points/one way (with contraflow for cyclists), or bus gates, residential traffic restrictions to manage rat-running and provide a quieter space for residents, pedestrians and cyclists. The removal of through traffic and increased permeability will provide more direct routes for trips by foot and bicycle.

We recognise that availability of public transport is not feasible in all neighbourhoods. However, support will be provided to public transport services penetrating neighbourhoods, wherever feasible. Integrating and promoting different types of public transport can also enable better door to door connections from the neighbourhood level, such as the use of ferries to reach key destinations throughout Bristol city centre. Walking and cycling to/from public transport services can play a large role in encouraging physical activity and improving health. Knowledge and accessibility to legible information are required about how to travel without a private car, supporting equal access opportunities for people in all neighbourhoods. Another measure that we will consider is the creation of Low Traffic Neighbourhoods. This is a similar concept to TfL's Liveable Neighbourhoods as described in the Waltham Forest case study. In Low Traffic Neighbourhoods motor traffic is either discouraged or removed, typically resulting in reduced traffic speeds, and quieter and safer feeling streets. This change to the physical environment enables and encourages residents and visitors to switch to more healthy and active modes such as walking and cycling.

We will support and promote opportunities for first and last mile trips being made by non-car modes.

Case study: Low Traffic Neighbourhoods: Waltham Forest Mini-Holland

The London Borough of Waltham Forest, through its Liveable Neighbourhood project, has bucked the trend of worsening air quality, and over the course of a decade, reduced the number of residents exposed to dangerous levels of nitrous oxides by 85%. The council engaged closely with residents and businesses, involving them as closely as possible with the project through design workshops, drop-in sessions, and door-knocking. Changes on the ground in Waltham Forest have involved giving pedestrians and cyclists priority and junctions, with widened pavements and segregated cycle tracks, and removing the opportunities for rat-running through residential streets.

Although there was some initial resistance to the changes, Waltham Forest is seeing significant behaviour change, with more people from a range of backgrounds starting to cycle, and increased life expectancy for the borough's children. While schemes to prevent through traffic were initially divisive, follow-up evaluation of the schemes revealed a change in attitudes, and local businesses have flourished since through-traffic bans were introduced.

Support the provision of safe crossings and speed reduction in appropriate locations

To provide safer roads for all modes, evidence-based guidance will be developed to determine appropriate speed limits according to road features and function and encourage increased enforcement. Those roads with highest risk, particularly for walking and cycling, will be identified and schemes to manage speed and traffic volumes where there is evidence of safety problems will be prioritised.

We will design and maintain our highway network to reduce the risk of collisions occurring.

Reduced traffic speeds can improve the actual and perceived safety of roads, and influence decisions about mode choice. In neighbourhoods where speeds are identified as a factor in deterring people from walking and cycling, community participation will be encouraged to identify interventions that will support residents in walking and cycling, enhancing accessibility. This may include speed reduction measures, particularly close to local services; more cycle provision to create a wider network of safer routes; and measures to address areas with a high-risk or incident of collisions.

We will support the provision of safe crossings and speed reduction in appropriate locations.

In 2013, the Department for Transport (DfT) issued guidelines for the introduction of 20mph speed limits. Both Bristol City Council and B&NES have introduced 20mph limits, primarily along residential roads. 20mph limits consist of a speed limit change to 20mph, opposed to 20mph zones, which are accompanied by some form of traffic calming measures. Alongside the introduction of 20mph limits it is important to work alongside the Police to ensure continued enforcement.

Following the introduction of 20mph limit schemes, Bristol City Council commissioned a review into their effectiveness which was carried out by the University of West of England. The review found

Section 9:
Neighbourhood connectivity continued

Case study: 20mph speed limit roll out in Bristol

The 20mph speed limit roll out started in 2010, with 2 pilot areas. Wider roll out took place in 2014, and was completed in September 2015. 20mph limit was introduced as part of a wider package of transport measures aimed to improve road safety, increase active travel and create more pleasant communities. Other measures include bus improvements, cycle infrastructure improvements, local safety schemes and major transport schemes such as metrobus and rail improvement.

The roll-out of 20mph speed limits across Bristol's residential streets and some local high streets is a signs-only based intervention. This relies on driver adherence to the posted '20mph' speed limit denoted by speed limit signs on entry to the limit area, and repeater signs within the area (complying with DfT requirements). 20mph zones are different because these include physical traffic calming measures. The 20mph speed limits are legally enforceable, like any other speed limit.

Lowering the speed helps make streets safer for all roads users, as those hit by a car at 20mph are far more likely to walk away with bruises and minor injuries than those hit at 30mph. It also helps to increase cycling and walking, by making communities more pleasant places to live and reduces anti-social road noise. Slower speeds on roads help to make walking or cycling more attractive options. 20mph is part of a broader package of measures aimed to give children more confidence to walk, scoot, and cycle. Other measures include bus improvements, travel plans for schools and business, local safety schemes all of which will help increase active travel which is great for your health.

In February 2018, the Bristol Twenty Miles Per Hour Limit Evaluation (BRITE) study, carried out by the University of the West of England (UWE), assessed the impact that 20mph speed limits may have had since they were introduced in 2014 and 2015. The results showed there had been a reduction in road speeds and fatalities following road collisions since the lower speeds were introduced. It found the city has seen a reduction of 4 deaths, 11 serious injuries and 159 slight injuries each year, and the level of active travel in Bristol has increased, with more people walking or cycling for 10 minutes or more in their local area most days.

Over 94% of the roads surveyed had seen slower speeds, with drivers on all 20mph roads driving, on average, at speeds less than 24mph. Day speeds were found to have reduced by an average 2.7mph, with night speeds falling by an average 2.4mph. Previous statistics suggest that with every 1mph reduction in speed, the risk of a fatal or serious injury caused by a road collision falls by 6 per cent.

that the 20mph limit schemes have led to 'very promising' improvements in road safety (see case study below). Bristol City Council has since committed to carry out its own review of the effectiveness of 20mph speed limits.

The Department for Transport is currently undertaking their own research into the effectiveness of introducing 20mph speed limits on roads.

Improve actual and perceived personal security

The perception of risk surrounding personal security is an important influence for journey planning. Fear and apprehension about personal security can affect all aspects of travel choice, such as route, the mode of transport used and the time of journey, and whether to travel at all. If we are to achieve the step change in active travel and public transport usage we are aiming for, personal security considerations need to be explicitly incorporated into decisions concerning the design, planning, operation and management of transport systems. This has become increasingly pertinent, following terrorist attacks targeting or using transport.

We will use natural surveillance and careful design when improving our streets and public places, to increase the numbers of individuals on our streets and make them feel safer.

Crime prevention officers will be involved as early as possible in scheme designs. This will ensure factors such as lighting, clear lines of sight and CCTV are included, based on local knowledge and in the context of existing crime factors in the vicinity.

Work will continue with the police on a 'secure by design' project. This incorporates security into the design of streets and places, rather than having to add features to improve security later. Advice will also continue to be sought on the measures required to protect against errant vehicles. This will include identifying locations and instances where there might be a need for measures to protect against vehicles used as weapons.

We will work with crime prevention officers and the police to ensure security considerations are incorporated in our scheme designs.

Section 10: Funding and implementation

Introduction

This Joint Local Transport Plan is intentionally ambitious. It will require an unprecedented level of both capital (one-time investment of money to deliver assets) and revenue (day to day running costs) funding, with a large acceleration in spending from current levels. Although long-term aspirations to transform the way we move around the West of England will be costly to deliver, costs of active travel measures are comparatively low and could contribute towards meeting our objectives in the shorter term.

The total cost of delivering the schemes set out in the Joint Transport Study (JTS) Transport Vision was estimated to be at least £8.9 billion in future outturn prices. The programme is equivalent to expenditure of £450-600 million per annum, which is a step change from historic and current spend.

The JTS assumed the four-line mass transit network would cost approx. £2.5bn to deliver, and if there is a need to deliver some sections underground, this cost will rise further. The delivery of modern tram and light rail systems in Birmingham, Edinburgh, Greater Manchester, Newcastle, Nottingham and Sheffield demonstrate that mass transit systems can be funded and delivered in UK cities outside London and provide examples for how such interventions can be funded.

The Devolution Deal for the West of England includes guaranteed funding of £1bn infrastructure investment over 30 years, equating to £30m a year, which is unprecedented for the area and this certainty of funds will help to unlock further financing opportunities.

Current situation

There is an increasingly strong case for infrastructure investment to improve society and support economic growth, but the Government is facing competing demands from different parts of the UK. It will be critical for the West of England to make a compelling and collective case for investment, through working in partnership with transport operators and providers, other delivery agencies and wider stakeholders. Our success depends very much on this partnership approach.

Evidence shows that investment in the West of England is lower than in other parts of England. The National Infrastructure Pipeline shows that £18 billion was programmed to be spent on transport in the UK in 2016/17, equivalent to 1% of UK GDP. If this benchmark is applied to the South West of England, this would be equivalent to around £1.4 billion per annum. However, analyses show that spending in the South West was around £390 million in 2015/16, dropping to around £300 million between 2015/16 and 2020/21 (or £540 million per annum including the A303 Stonehenge tunnel). This is less than half the expenditure that could be expected in the region, if the national 1% benchmark were to be applied.

The Government has made a commitment to increase the proportion of national GDP spent on economic infrastructure to prepare the country for the future. The West of England is the most productive part of the South West and is one of the UK's best performing city regions. However, there has been historic under investment that has contributed towards current transport challenges. There is, therefore, a strong case for increased investment to support the continued growth of the area.

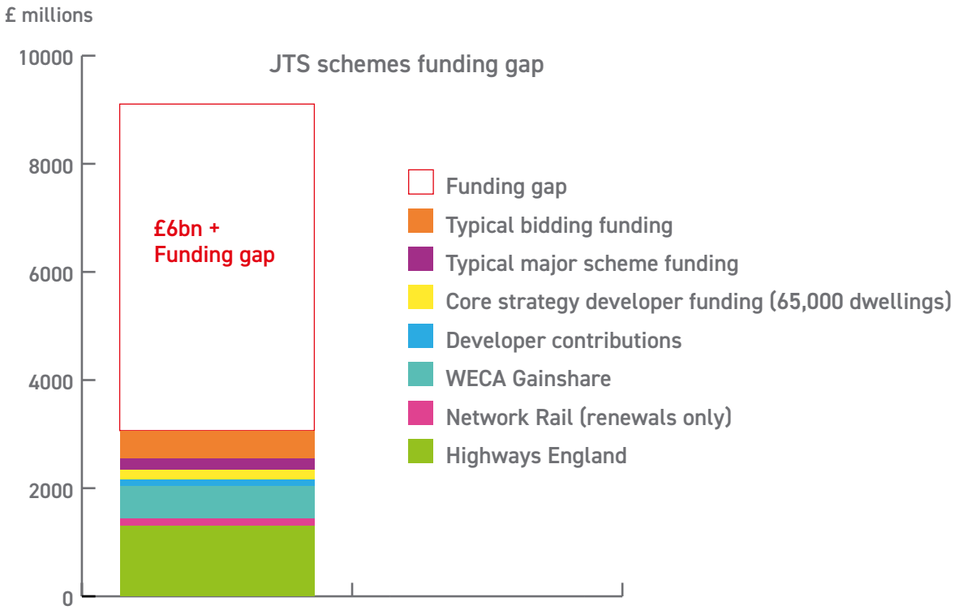
There has been a consistent lack of long-term revenue funding, with projects and programmes such as Local Sustainable Transport Fund (delivering travel behaviour change), running for a maximum of four years. Revenue budget pressures are likely to continue. We will look to address this through the potential funding sources below.

Section 10:
Funding and implementation continued

The funding gap

Figure 10.1 shows the scale of the funding gap. This is based on current levels of funding for the JTS Transport Vision. It shows at least a £6bn funding gap to deliver the JTS Transport Vision schemes. It is important to note that the JTS Transport Vision cost does not include all the schemes/policies within this JLTP4 and assumes a £2.5bn cost for the mass transit network.

Figure 10.1: JTS schemes funding gap



Note: Scheme cost estimates as of spring/summer 2018

A number of assumptions have been made about potential funding sources, which have been used to prepare Figure 10.1:

- Typical bidding and major scheme funding was calculated using the approximate income from these streams over the past 10 years
- Developer contributions of £3,000 per dwelling. This is an assumed average across the region, and actual contributions are likely to vary significantly based on the location and specific site condition
- Not all WECA gainshare funding will be spent on transport
- Approximately half of total bidding, major scheme, and WECA Gainshare funding will be spent on mitigating the impact of future growth and half will be spent on improving existing conditions and mitigating the impact of existing Core Strategy growth (approx. 60,000 dwellings)
- Network Rail fund renewals (maintenance) only
- Highways England fund all improvements on their network including Smart Motorways and new junctions. This assumption is likely to be overly ambitious and a significant local contribution will be needed towards Highways England schemes

Additional sources of funding

It is of note that there are areas of JLTP4 which are currently being delivered through grant funding from central Government, which local authorities may not be able to continue delivering with increasing pressures on revenue budgets. A key area that could be affected is the behaviour change work taking place with businesses, schools and communities through the Access WEST Programme, which will conclude in March 2020, with a view to extending the programme through future funding sources.

We will ensure we are kept both well informed and well prepared for new short-term funding sources from central Government and other partners, to continue to deliver existing work, as well as the new interventions contained within JLTP4.

However, it is unrealistic to assume that central Government will entirely fill the funding gap, particularly given competing demands for funding, and local sources of significant additional funding will be needed to deliver this JLTP4.

Raising additional local income will involve some difficult decisions. Potential local funding options that could be considered are:

- Community Infrastructure Levy – a planning charge for new development to pay for local infrastructure
- Highways England Shadow Toll – funding from Highways England for schemes that reduce pressure on the Strategic Road Network
- Council Tax Precept – increasing council tax for residents of the West of England
- Business Rate Supplement – increasing rates for businesses in the West of England
- Workplace Parking Levy – employers are charged for having private parking spaces. This charge can be passed on to employees who use the spaces
- Road Pricing, for example congestion charging to drive into specific areas
- Revenue raised from Mass Transit services
- Clean Air Fund and CAZ Implementation Fund
- Public Health funding

Not all measures could/should be implemented together. For example, a business rate supplement and Workplace Parking Levy both impact on local businesses. Local contributions are likely to provide less than half the funding gap, particularly

Section 10:
Funding and implementation continued

as only a sub-set of the local funding options could be implemented.

The introduction of charging mechanisms, such as road pricing covering the Bristol and Bath urban areas, would raise a significant amount of revenue. This would help fill the funding gap and raise revenue for infrastructure delivery, but would be extremely challenging to deliver. Phasing will need to be considered carefully in order to ensure that effective alternatives to private car use are implemented in tandem with the roll-out of any charging mechanism.

The responses to our consultation simulator points allocation exercise demonstrated the highest level of support for the introduction of road pricing as a means of raising revenue for transport improvement, with council tax increases showing the lowest level of support. Feasibility studies and consultation will be carried out to determine the nature and extent of any charging mechanisms that could be used in the West of England. This will support the achievement of the JLTP4 objectives, particularly sustainable and inclusive economic growth, whilst not negatively impacting on the needs of our people and places.

Case study: Nottingham Workplace Parking Levy

Nottingham introduced a Workplace Parking Levy in 2011. It levies a charge to employers that have 11 or more private parking spaces on their site. Over £61m has been raised in revenue since charging began. The administrative costs of running the scheme take less than 5% of the revenue raised, meaning a large amount is reinvested in transport improvements in the city. The funding has contributed to doubling the size of the tram network and redeveloping the city's rail station to supporting the electric bus network. The revenue raised has also been used as match funding to bid for funding from other sources. Workplaces that are required to pay the charge are offered grants to enable staff to cycle to work.

The levy scheme has resulted in a 4.5% increase in bus and tram patronage, building on already high levels. There were forecasts of businesses deserting Nottingham for other cities nearby, however in 2017 it was reported that Nottingham has one of the fastest growing economies of any UK city. The UK Powerhouse City Growth Tracker from Irwin Mitchell and the Centre for Business & Economic research shows that Nottingham's year-on-year economic growth figure of 2.5% is on a par with Greater Manchester and higher than Birmingham, Bristol, Leeds, Liverpool, Newcastle and Sheffield.

Section 11: Major schemes and summary of interventions

Major schemes

The West of England's Joint Transport Study (JTS) sets out an ambitious vision for transport to 2036, identifying a programme of transport packages that will transform the travel choices available to our residents and visitors. These, along with other schemes, are being taken forward as our major transport schemes programme to support the delivery of the JLTP4.

The region has made significant achievements during the seven years of JLTP3, spending over £500m on the delivery of transport projects, including a number of major schemes such as the Greater Bristol Bus Network, the launch of the first three metrobus routes, and the completion of the Bath and Weston-super-Mare Transport Packages. Significant investment towards a number of major schemes has also been made by Highways England (including into the expansion of Smart Motorways on the M4 and M5) and by Network Rail (including electrification).

This major transport schemes programme is our most ambitious yet, continuing and expanding on scheme delivery during JLTP3. It includes schemes set out in the JTS, which in total have a value of at least £8.9 billion over twenty years, and which were assessed as being necessary to counter the extent of forecast growth in car commuting over this period. It will require a step change in investment to provide transformational infrastructure that responds both to the existing transport challenges, and our Core Strategy growth. Investment will also be required to address future transport challenges including the increased demand for travel associated with the growth and housing to be identified through future strategic planning. The packages have a strong focus on encouraging active and sustainable transport as a preferred choice for more people.

Transport schemes take time to deliver. We will invest early to create network capacity in the short term, whilst continuing to work on the longer term, more ambitious schemes. Priorities and timescales for delivery will depend on available funding and bidding opportunities from Central Government, as well as the timing of new development sites.

We will work with our transport delivery partners, Network Rail, Highways England and bus and train operators, to implement key rail, bus and road schemes that are within their delivery remit. In summary, our programme will:

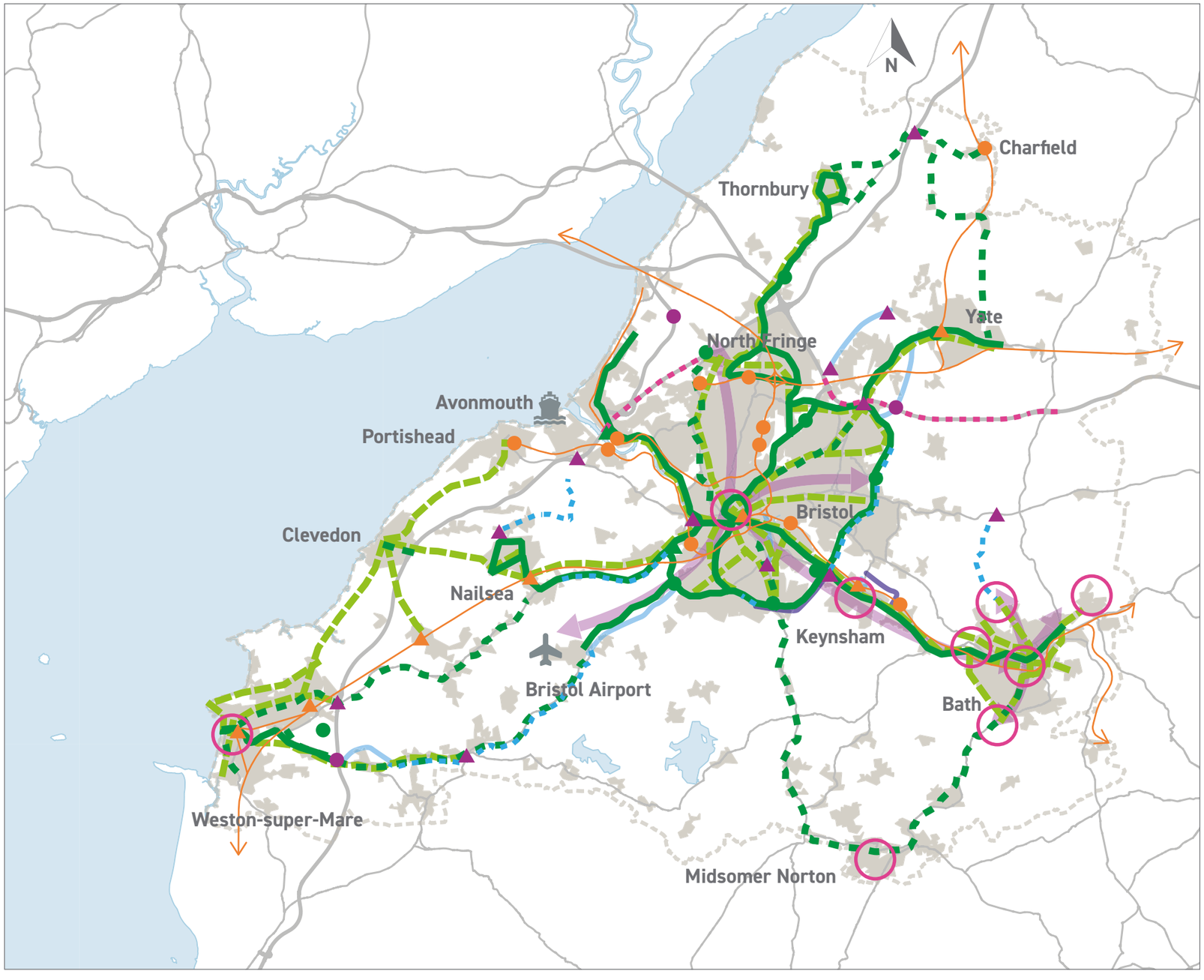
- Explore potential **transformational infrastructure** schemes to address our existing challenges
- Ensure the core of our future transport programme demonstrates that the **requirements of future growth** will be met
- Show that we can **deliver in the short-term** as well as advancing a transformational longer-term programme
- Be delivered in **partnership with our transport partners** with responsibility for the strategic road and rail network

The major transport schemes set out in this section are those costing over £10m, many of which are unaffordable from our existing, regular funding sources. The current situation and the various challenges and opportunities for funding are discussed in more detail above in Section 10: Funding and implementation.

Figure 11.1 presents, in diagrammatic form, the schemes included in our major schemes programme, which are at very different stages of development. Tables 11.1 to 11.6 provide a summary of the type, cost range, and delivery timescale of each scheme. The definition of categories within each of the summary tables is provided in Appendix 3.

Section 11:
Major schemes and summary of interventions continued

Figure 11.1: JLTP4 major schemes



- public realm and sustainable transport improvements
- improved junctions
- new junctions
- improved road
- new road
- transport infrastructure
- smart motorway
- cycle routes
- improved rail station
- new rail station
- rail improvements
- metrobus
- other bus route improvements
- mass transit
- expanded Park & Ride site
- new Park & Ride site

Alignments and locations are for illustrative purposes and subject to feasibility studies and consultation.

Section 11:
Major schemes and summary of interventions continued

All proposed transport schemes will be reviewed on an ongoing basis against the emerging evidence base for meeting our jointly stated ambition of carbon neutral emissions by 2030. This will be looked at in the context of the proposed physical infrastructure, the mode of transport using any new infrastructure, its effects on the wider transport network and environment in the West of England, future spatial planning and emerging technology. We will also continue to lobby government to give clarity on national targets for decarbonisation of transport and energy to be embedded in local transport policy and projects.

Transformational

To provide realistic and attractive alternatives to the private car, a fully integrated public transport network will be developed. This includes improvements to the bus network, an expanded metrobus network, new Park & Ride sites and enhanced rail services.

There are, however, corridors with very high passenger flows where there is limited spare capacity to accommodate increased passenger demand. These corridors are:

- Bristol city centre to East Fringe
- Bristol city centre to North Fringe
- Bristol city centre to Bristol Airport
- Bristol city centre to Bath
- Bath corridors and the city centre

Transformational infrastructure in the form of mass transit (e.g. light rail, tram, tram-train or underground) is identified for these corridors. This is necessary to provide a step change in the capacity and quality of public transport on the busiest corridors, that can respond to the significant forecast increase in trips across the region. It will also provide a more attractive alternative to trips by car. In some locations, it will be very challenging to achieve on-street running, particularly on routes through East Bristol, North Bristol and through some parts of South Bristol and on the Bristol to Bath corridor. Feasibility work has commenced to investigate how potential mass transit corridors could be delivered.

The total cost of delivering our transformational major schemes package is £3bn-£5bn. A summary of the type, cost and timescale of each scheme is provided in Table 1 below. Further detail on the schemes can be found in Appendix 3.

Our mass transit network will take between 10 and 20 years to deliver. Prior to the delivery of this network we will continue to expand our metrobus rapid transit network, which will see the opening of several new routes across the region. In the meantime, transport connectivity to these mass and rapid transit networks will be improved, through both metrobus and wider public transport schemes, cycling, walking and car-sharing initiatives.

Table 11.1: Transformational Major Schemes

Ref	Mode	Connectivity	Scheme	Cost	Timescale		
					S	M	L
T1	Public Transport	Within WofE	Mass Transit – Bristol City Centre to Airport	High			
T2	Public Transport	Within WofE	Mass Transit – Bristol City Centre to Bath	High			
T3	Public Transport	Within WofE	Mass Transit – Bristol City Centre to East Fringe	High			
T4	Public Transport	Within WofE	Mass Transit – Bristol City Centre to North Fringe	High			
T5	Public Transport	Within WofE	Mass Transit – Bath City Centre and corridors	High			

Early investment schemes (including committed projects)

Early investment schemes have been identified to ensure a programme of works can be delivered in the short, medium and longer term of the JLTP4 period up to 2036. Some packages have allocated funding whilst others have partial funding allocated for delivery of feasibility studies, for example.

Committed schemes in progress

Preparations for MetroWest Phases 1 and 2 continue to progress, which will significantly improve rail travel across the area. Significant works are taking place to improve access to Temple Quarter Enterprise Zone and work is progressing on investment in Bristol Temple Meads station. Delivery of highways and other access improvements will enable metrobus and cycling/walking links in the Hengrove and Lockleaze Urban Living developments. Also, delivery of a new M49 junction to improve access to Severnside, commenced in early 2019.

The total cost of delivering our package of committed early investment schemes is £500m-£1bn. A summary of the type, cost and timescale of each scheme being progressed is provided in Table 11.2 below. Further details can be found in Appendix 3.

Table 11.2: Early investment schemes in progress (committed projects)

Ref	Mode	Connectivity	Scheme	Cost	Timescale		
					S	M	L
C1	Freight	Beyond WoE	M49 Avonmouth junction	Low			
C2	Multimodal	Beyond WoE	Temple Quarter masterplan	High			
C3	Public Transport	Within WoE	MetroWest Phase 1	Med			
C4	Public Transport	Within WoE	MetroWest Phase 2	Low			
C5	Multimodal	Local	Hengrove Transport Package	Low			
C6	Multimodal	Local	Lockleaze Transport Package	Low			
C7	Public Transport	Local	Cribbs Causeway Metrobus Extension	Low			

Section 11:
Major schemes and summary of interventions continued

Schemes under development

A number of other early investment schemes in support of delivering the JLTP4 strategy are at an earlier stage of development. Table 11.3 summarises the type, cost and timescale of each scheme. The total cost of delivering our early investment schemes under development is currently estimated as £2bn-£2.5bn. Further details can be found in Appendix 3.

Table 11.3: Early investment schemes under development

Ref	Mode	Connectivity	Scheme	Cost	Timescale		
					S	M	L
E1	Multimodal	Beyond WoE	Bristol South West Economic Link (BSWEL)	High			
E2	Multimodal	Beyond WoE	East of Bath access improvements	Med			
E3	Highway	Beyond WoE	M5 Junction 19	Low			
E4	Public Transport	Beyond WoE	Passenger Rail Service and Capacity Improvements, Station Upgrades and New Stations Package	High			
E5	Highway	Beyond WoE	Smart Motorways: M4 J18-19	High			
E6	Highway	Beyond WoE	M5 new junction J21A	Med			
E7	Highway	Within WoE	A4174 Ring Road junction improvements including Wraxall Road (Longwell Green)	Med			
E8	Highway	Within WoE	Freezing Hill junction upgrade and whole route improvements	Low			
E9	Active Travel	Within WoE	Interurban cycle routes – including North Somerset Coastal Towns Cycle Route, and cycle links to Yate and Thornbury	Low			
E10	Highway	Within WoE	M4 Junction 18A to A4174 Ring Road	High			
E11	Multimodal	Within WoE	Metrobus – Bristol City Centre to Clevedon and Nailsea	Med			
E12	Public Transport	Within WoE	Metrobus consolidation package	Med			
E13	Public Transport	Within WoE	Sustainable travel package for Bath	Low			
E14	Other	Within WoE	Regional Electric Vehicle Charging Network	Med			
E15	Multimodal	Within WoE	Metrobus – Bristol City Centre to Severnside	Low			
E16	Active Travel	Local	Bath Cycle Network and City Centre Package	Low			
E17	Active Travel	Local	Keynsham / Midsomer Norton and Somer Valley Public Realm Improvements Packages	Low			
E18	Multimodal	Local	Weston-super-Mare Package 2	Med			
E19	Active Travel	Local	Weston-super-Mare Cycling and Walking Network	Med			

Table 11.3: Early investment schemes under development continued

Ref	Mode	Connectivity	Scheme	Cost	Timescale		
					S	M	L
E20	Multimodal Housing Infrastructure Bid	Within WoE	Banwell A371 / A368 Banwell Bypass	High			
E21	Multimodal Infrastructure Bid	Within WoE	South East Bristol and Whitchurch • A4 metrobus + Callington Road Link • Orbital metrobus • A37 Sustainable Transport • Hicks Gate Park & Ride/transport interchange • Hicks Gate Junction • South East Bristol Orbital Low Carbon Corridor • Local highway improvements	High			
E22	Multimodal Infrastructure Bid	Within WoE	Keynsham • Keynsham railway station • A4-A4175 corridor • Local highway improvements	Med			

Section 11:
Major schemes and summary of interventions continued

Joint Transport Study required schemes

Transport infrastructure identified through the JTS will be required to unlock and facilitate future development alongside maximising mode shift to active and sustainable forms of travel and public transport. Schemes will be developed through each local authority's Local Plan process.

These schemes are shown in Table 11.4. Further detail on the schemes can be found in Appendix 3.

Table 11.4: Joint Transport Study required schemes

Ref	Connectivity	Strategic corridor or location	Options	Cost	Timescale S	Timescale M	Timescale L
Local Plan schemes							
LP1	Within WoE	Yate and Coalpit Heath	• A432 metrobus, walking and cycling • Yate railway station improvements • Winterbourne and Frampton Cotterell Bypass • Local highway improvements • Coalpit Heath and Westerleigh Bypass	High			
LP2	Within WoE	Nailsea and Backwell	• Nailsea sustainable travel, rail station and local network improvements • Nailsea – Backwell A370 • Clevedon – Nailsea – Bristol Transport Corridor Improvements	High			
LP3	Within WoE	Thornbury, Buckover and Charfield	• A38 metrobus, walking and cycling • Charfield Station • M5 J14 • Local highway improvements	High			
LP4	Within WoE	Bristol Urban Area	• Bristol City Centre Framework • Local bus package (GBBN2) • Bristol walking and cycling package • M32 Park & Ride • A38(S)/A4174 Park & Ride • A4018 Park & Ride • A4 Portway and A370 Long Ashton Park & Ride expansion	High			
LP5	Within WoE	Weston-super-Mare	• Weston-super-Mare metrobus • Weston-super-Mare Park & Ride • Local bus, walking and cycling improvements • Local highway and junction improvements				
LP6	Within WoE	Churchill	• Local highway improvements • Local sustainable travel package				
LP7	Local	Banwell	• Sustainable travel package				

Other longer-term opportunities

To assist in delivering the JLTP4 strategy we have also identified a set of aspirational schemes for consideration in the longer-term. These, subject to review during the lifetime of the JLTP4 along with other new aspirational schemes, are shown in Table 11.5 below. The total cost of delivering our aspirational schemes is currently estimated as £0.5bn-£1bn.

Table 11.5: Other longer-term opportunities

Ref	Mode	Connectivity	Scheme	Cost	Timescale S	Timescale M	Timescale L
L1	Freight	Beyond WoE	Strategic Rail and Road Freight Package	High			
L2	Highway	Within WoE	A46 to M4 route improvements, Cold Ashton	Low			
L3	Public Transport	Within WoE	Bath Area Bus Network Improvement Scheme (BABNIS)	Med			
L4	Public Transport	Within WoE	Henbury Loop rail services	Med			
L5	Public Transport	Within WoE	Rail services to Thornbury	Med			
L6	Multimodal	Within WoE	M5 Junction 20 Local Highway Improvements	Med			

Section 11:
Major schemes and summary of interventions continued

Working with partners to build our current programme

There are a number of schemes outlined above that affect the motorway and major road network including new and improved motorway junctions, and other improved strategic highway links. Moreover, there are packages of rail network improvements including additional capacity and services, new stations and upgraded junctions, benefitting freight and passengers.

These schemes would be partly or fully funded and delivered by Highways England and Network Rail. Those schemes that will be delivered in partnership with these bodies are identified in Table 6.

Table 6: Schemes to be developed in partnership with Highways England and Network Rail

Highways England
South coast to M4 connectivity improvements
M4 Junction 18a to A4174 Ring Road
M5 Junction 14
M5 Junction 19
M5 Junction 19 & Junction 20 improved links for Nailsea/Backwell
M5 J21a and A38 corridor
M32 Park & Ride
Smart Motorways M4 J18 to 19
Network Rail
Charfield station reopening
Keynsham and Yate railway station improvements
MetroWest phase 1
MetroWest phase 2
Nailsea and Backwell railway station improvements
Passenger rail services and capacity improvements, station upgrades and new stations package

The schemes in Table 6 and other schemes (including those shared strategic priorities that are yet to be defined) will also be developed, where relevant, through working with neighbouring authorities and those further afield, through the South West Peninsula and/or the Western Gateway Sub-National Transport Body.

Summary of interventions

The following is a summary of interventions by level of connectivity; further details of these, including the actions, are set out in sections 6 to 9.

Beyond West of England

- Work with Bristol Airport to maximise the airport's transport connectivity as a local, sub-regional and regional transport interchange
- Enable improved transport connectivity with Bristol Port
- Maximise opportunities arising from improvements to the strategic road and rail network, and identify and support delivery of further changes
- Identify opportunities to manage the impact of Severn Bridge tolls removal
- Support the role of coaches for residents and visitors
- Manage and mitigate the impact of regular and infrequent events on the transport network

Within West of England

- Provide high quality and reliable mass and rapid transit
- Support and enhance existing public transport services
- Improve the availability and accessibility of accurate travel information and ticketing

- Provide Park & Ride and sharing schemes to minimise the impact of single occupancy vehicles
- Recognise the needs of motorcycle and moped users
- Use technology to keep traffic moving
- Embrace technology to improve cleaner travel options
- Use, as appropriate, measures and technological advances to influence and better manage the demand of private car use
- Define, manage and maintain the Key Route Network
- Develop and improve network resilience through an ongoing commitment to highway maintenance
- Effectively manage the Major Road Network
- Effectively accommodate development sites and associated trips
- Support the delivery of Enterprise Zones/ business clustering
- Balance the requirement for distributing goods, with mitigating the adverse impact of vehicles

Local Connectivity

- Provide an attractive, safe and usable walking and cycling network
- Provide schemes to support the uptake of cycling
- Consider the needs of all road users in the design of transport and highway schemes, particularly vulnerable road users
- Deliver road safety education, skills and training to equip people with the knowledge and skills to travel in a safe and sustainable way
- Work in partnership to build safer communities
- Support travel planning with developers, education providers and individuals
- Support travel planning with businesses and employment sites
- Encourage mode shift through grants, incentives and rewards
- Maximise awareness of sustainable and active travel choices and the benefits these bring
- Support those without a private car, who need to travel, in accessing the services they require
- Promote the role of technology in accessing services and employment
- Support the role of taxis and private hire vehicles
- Support the role of demand responsive and community transport
- Support ongoing work to manage the impact of transport on air quality and climate change
- Support ongoing work on Clean Air Zones and the UK Air Quality Plan
- Support work on zero and low emission vehicles

Neighbourhood Connectivity

- Improve the quality of streets and public realm
- Prioritise walking, cycling and public transport into new developments
- Provide clear wayfinding and signage
- Improve and maintain Public Rights of Way
- Work with residents and communities to identify barriers to accessibility
- Support the provision of safe crossings and speed reduction in appropriate locations
- Improve actual and perceived personal security

Section 11:
Major schemes and summary of interventions continued

Section 12:
Targets, indicators, monitoring

Background

Targets and indicators play an important role in JLTP4. They are designed to measure and monitor our progress towards achieving JLTP4's objectives, highlight where we are doing well and identify where we need to improve. Indicators need to strike the balance between being challenging but achievable; comprehensive but also practical to collect, analyse and report.

Our targets, indicators and monitoring cover the most ambitious transport programme the West of England has seen. They will reflect local priorities as identified in our key policy documents, such as our Core Strategies and Corporate Plans, covering the climate emergency and carbon reduction, air quality, sustainable economic growth, health and well-being, housing and social inclusion.

Developing indicators

Our range of JLTP4 indicators and how they will monitor progress against the five key objectives is set out in Table 12.1.

Monitoring indicators

It is important to have a robust, reliable and affordable method of monitoring progress against the indicators. This helps ensure comparability, transparency and crucially at a cost that local authorities can sustain; particularly in the context of significant budget cuts and an increasing strain on the already stretched local authority resources.

Robust monitoring procedures building on those established in JLTP3 will be put in place, informed by using set baseline data. To make the most use of existing data and limited resources several of the indicators for example congestion and modal share will be used to monitor more than one of the five JLTP4 objectives. An annual monitoring report against the targets and indicators will be published. A mid-term review will assess the suitability of the targets and based on performance some may be adjusted accordingly. This will set more appropriate targets for the remaining monitoring periods.

Table 12.1: Indicators against JLTP4 Objectives

✓ = direct impact ✓ = indirect impact

Indicators	Climate change & air quality	Sustainable & inclusive economic growth	Equality & accessibility	Health, wellbeing, safety & security	Better places
Road congestion	✓	✓	✓		✓
Bus satisfaction			✓	✓	✓
Air quality	✓	✓		✓	✓
Carbon emissions	✓	✓		✓	✓
Electric Vehicles	✓	✓		✓	✓
Road Safety			✓	✓	✓
Modal share	✓	✓	✓	✓	✓

Section 12:
Targets, indicators, monitoring continued

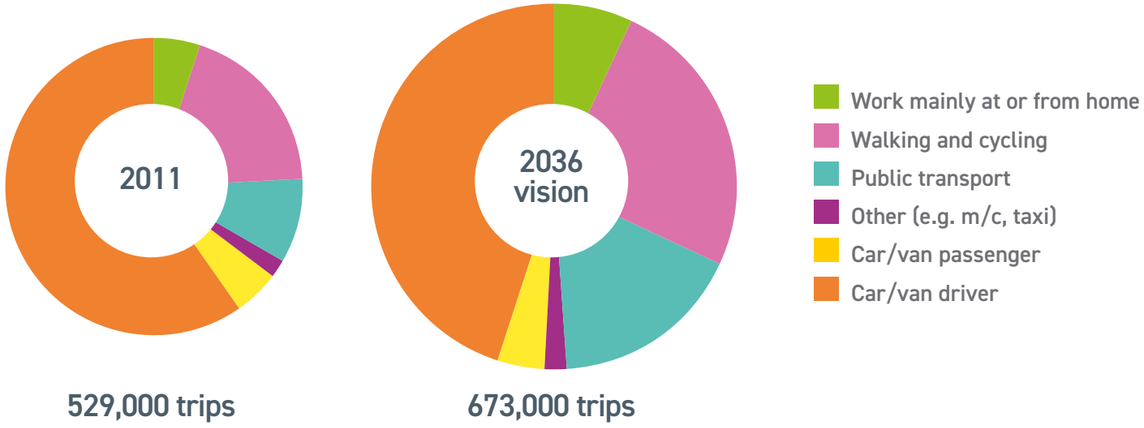
Modal shift target

The JTS set out how modal share is forecast to change by 2036 if all of the transport vision schemes were implemented. This is shown below and forms the JLTP4's initial modal share target. Car commuting is forecast to reduce from 59% to 45% (single occupancy), against a backdrop of forecast growth in housing and employment.

Early indications are that to become carbon neutral by 2030 a substantially greater modal shift will be required. To achieve this is likely to require a shift in national Government policy, far higher take up rates for electric vehicles, further engine efficiency improvements, carbon offsetting and potentially some form of congestion charge alongside our £9 billion programme of transport investment. Technical work will be undertaken to refine the level of modal shift and interventions required.

The monitoring periods and mid-term review points for the Plan period 2020 - 2036, assuming the plan is adopted in 2020, are:

- 1st Monitoring period mid-term review: 2022
- End of Monitoring period 1 review: 2024
- 2nd Monitoring period mid-term review: 2027
- End of Monitoring period 2 review: 2030
- 3rd Monitoring period mid-term review: 2033
- End of Monitoring period 3 review (and end of plan period): 2036



Risks associated with meeting targets

There are a number of risks that could hinder our progress towards achieving the targets, so we need ways to avoid or soften them. The main risks are those outside the direct control of the local authorities, but there are also internal risks that can be influenced by the authorities.

Possible risks include:

- Reduced funding affecting the ability of authorities to meet targets
- Escalating costs reducing the number of deliverable schemes within budget constraints
- Bus and rail fares increasing faster than the cost of using the private car
- Increasing cost of bus service provision limiting the expansion of services/frequencies
- A lack of investment in rail
- Major transport schemes delayed or not implemented
- Annual figures fluctuating due to small figures (in absolute terms), for example the number of children killed and seriously injured in road collisions
- A breakdown in the supply of data or cooperation with private sector or government departments causing a reduction or end to providing publicly available data, for example the DfT for congestion data
- Housing completion and employment provision rates fluctuating outside of local authority control
- Change in central Government policy shifting emphasis towards or away from areas monitored by in JLTP4, for example Government funding for road space reallocation schemes for cycle/bus provision
- Rise of CAVs and automated technology and uncertainty over timescales of technology brought in and how this affects travel choices
- Impact of Clean Air Zones on travel choices

The risks will be managed within the monitoring periods and will be identified and reviewed at the mid-term review point.

Summary of indicators

Listed in the table below are the targets, indicators and monitoring methods to achieve each JLTP4 objective and outcome. The seven indicators, with accompanying targets, are summarised below and are ordered according to when they appear in Table 12.2, and not on priority or importance. The targets are to be achieved by the end of each monitoring period unless specified otherwise.

Section 12:
Targets, indicators, monitoring continued

Table 12.2:

Targets & Monitoring: Indicators and Targets against JLTP4 Objectives

Objective: Take action against climate changes and address poor air quality

Outcome	Indicators	Monitoring Methods/ Datasets	Targets
NOx, particulates and carbon emissions are reduced	Air quality (statutory)	UA annual monitoring across designated air quality sites, update reports annually	Ensure levels of NO_2 across all of the WoE monitoring sites are below the annual mean air quality objective of 40µg/m^3 Target: NO_2 levels at all WoE monitoring sites are below the annual mean air quality objective of 40 µg/m^3
	CO_2 levels	UK local authority and regional CO_2 emissions national statistics (A roads, minor roads and transport other)	Transport in the West of England to be carbon neutral by 2030
Technological advances to improve air quality and monitoring are embraced	Electric Vehicle uptake	DfT Vehicle Licencing data – quarterly / annual data releases on ULEV uptake; Go Ultra Low project will also collect data on EV take-up and EV charging infrastructure	5000 registrations per year from 2020 in the West of England Ensuring 100% of new homes (where applicable) have a charge point available.

Table 12.2 continued:

Targets & Monitoring: Indicators and Targets against JLTP4 Objectives

Objective: Support sustainable and inclusive economic growth

Outcome	Indicators	Monitoring Methods/ Datasets	Targets
Improved efficiency and reliability on local, national and international transport networks	Road congestion	Average AM peak journey time on identified key corridors. DfT data on average delay on locally managed A roads by local authority Table CGN0502b	To achieve green (0-5% decrease) or amber (0-5% increase) in average AM peak journey time on A roads managed by the local authorities across each monitoring period
Access opportunities to employment growth areas and education is provided for all	Road congestion	Average AM peak journey time on identified key corridors (on routes to EAs and urban centres) DfT data on average delay on locally managed A roads by local authority Table CGN0502b	To achieve green (0-5% decrease) or amber (0-5% increase) in average AM peak journey time on A roads managed by the local authorities across each monitoring period
	Modal share	Household surveys	Use of JTS forecast modal share to 2036 - see Modal Shift Target section

Section 12:
Targets, indicators, monitoring continued

Table 12.2 continued:

Targets & Monitoring: Indicators and Targets against JLTP4 Objectives

Objective: Enable equality and improve accessibility

Outcome	Indicators	Monitoring Methods/ Datasets	Targets
Increased use of sustainable transport. Access opportunities to employment and growth areas and education is provided for all	Modal share	Household surveys	Use of JTS forecast modal share to 2036 - see Modal Shift Target section.
Improved efficiency and reliability on local. national and international transport networks	Road congestion	Average AM peak journey time on identified key corridors. DfT data on average delay on locally managed A roads by local authority	To achieve green (0-5% decrease) or amber (0-5% increase) in average AM peak journey time on A roads managed by the local authorities across each monitoring period
Increased use of sustainable transport	Bus satisfaction	Transport Focus annual survey	To increase overall levels of passenger satisfaction in the overall journey from a base of 85% (2018) to 95% (2036)

Table 12.2 continued:

Targets & Monitoring: Indicators and Targets against JLTP4 Objectives

Objective: Contribute to better health, wellbeing, safety and security

Outcome	Indicators	Monitoring Methods/ Datasets	Targets
Access opportunities to employment and growth areas and education is provided for all	Modal share	Household surveys	Use of JTS forecast modal share to 2036 - see Modal Shift Target section.
There is a continued reduction in the number of road casualties on the transport network	Road Safety (statutory)	Highways Road Safety statutory reporting on Killed or Seriously Injured (KSI)	A vision of zero avoidable deaths on locally managed roads by 2036. Not more than 160 KSI incidents per year by 2025. 0 KSI incidents per year by 2036.
Road safety for transport users is improved, particularly for those most at risk	Road Safety (statutory)	Road safety reporting – rates of collisions and KSIs by mode of transport	Target: retain proportion of casualties for 'Vulnerable Road Users' (motorcyclists, cyclists & pedestrians); Target: retain proportion in rate of child and 65+ casualties as % of all users
Personal safety on the transport network is improved, and there is less crime and fear of crime	Safety & Security on Public Transport	Transport Focus Bus Survey	20% increase in passenger satisfaction with personal safety on buses and waiting at stops

Section 12:
Targets, indicators, monitoring continued

Table 12.2 continued:

Targets & Monitoring: Indicators and Targets against JLTP4 Objectives

Objective: Create better places

Outcome	Indicators	Monitoring Methods/ Datasets	Targets
Access opportunities to employment and growth areas and education is provided for all	Modal share	Household surveys	Use of JTS forecast modal share to 2036 - see Modal Shift Target section.
There is a continued reduction in the number of road casualties on the transport network	Road Safety (statutory)	Highways Road Safety statutory reporting on Killed or Seriously Injured (KSI)	A vision of zero avoidable deaths on locally managed roads by 2036. Not more than 160 KSI incidents per year by 2025. 0 KSI incidents per year by 2036.
Road safety for transport users is improved, particularly for those most at risk	Road Safety (statutory)	Road safety reporting – rates of collisions and KSIs by mode of transport	Target: retain proportion of casualties for 'Vulnerable Road Users' (motorcyclists, cyclists & pedestrians); Target: retain proportion in rate of child and 65+ casualties as % of all users
Personal safety on the transport network is improved, and there is less crime and fear of crime	Safety & Security on Public Transport	Transport Focus Bus Survey	20% increase in passenger satisfaction with personal safety on buses and waiting at stops

Section 13: Environmental, equalities and health impact assessments of JLTP4

Introduction

The European Strategic Environmental Assessment (SEA) Directive (2001/42/EC) requires an environmental assessment to be undertaken of any plans or policies that could result in an impact on the environment. The overall aim of the SEA process is to ensure better protection for the environment, population and human health by making decision-makers aware (at an early stage of the JLTP4 development) the likely effects of the plan on the environment and by seeking to introduce measures that can be undertaken either to avoid adverse effects or to help improve the environment.

The SEA does not provide a detailed assessment of the schemes listed within JLTP4 but includes a broad assessment of the likely effects of the schemes as well as the overall plan.

As part of the SEA process, an Environmental Report has been prepared for JLTP4. This provides an assessment of "the likely significant effects on the environment". The Environmental Report includes a Habitats Regulations Assessment, Equalities Impact Assessment and Health Impact Assessment, as well as an assessment of how the JLTP4 option performs against alternatives; in this case the alternative options are determined to be 'Retention of JLTP3' and 'Without Plan' scenarios.

The SEA takes into account the requirements of the Paris Agreement through including climatic factors as one of the environmental baseline topic areas. Alongside this are the two SEA objectives to 'Reduce transport related carbon emissions in line with national targets' (SEA03) and 'Adapt transport network to effects of climate change and minimise the vulnerability of transport network to flood risk' (SEA04). For SEA03 the SEA noted that numerous policies within the JLTP4 will have a minor or potential major positive effect whilst for SEA04 strategic and major transport infrastructure schemes will have to be designed to take into the effects of climate change in line with national policy and best practice design.

Strategic Environmental Assessment (SEA) summary

The SEA process is undertaken in five key stages which are:

- Stage A – Scoping: Setting the context and objectives, establishing the baseline and deciding on the scope;
- Stage B – Environmental Assessment: Developing and refining alternatives and assessing effects;
- Stage C – Reporting: Preparing the SEA Environmental Report;
- Stage D – Consultation: Consulting on the draft programme and the SEA Environmental Report; and
- Stage E – Monitoring: Monitor the significant effects of implementing the plan or programme on the environment.

Environmental baseline

The SEA Directive and associated UK Regulations state that the SEA must consider the following topic areas:

- Biodiversity;
- Population;
- Human health;
- Flora and Fauna;
- Soil;
- Water;
- Air;
- Climatic factors;
- Material assets;
- Cultural heritage, including archaeological and architectural heritage;
- Landscape; and
- The interrelationship between these factors.

Section 13:
Environmental, equalities and health impact assessments of JLTP4 continued

SEA Objectives and key findings

The Scoping Stage, which included statutory consultation with Natural England, Historic England and the Environment Agency, provided the baseline information on the topics listed above and identified the SEA Objectives listed below. SEA Objectives are a way of strategically assessing whether the JLTP4 has an effect on environmental and social aspects.

The policies and interventions (interventions comprise activities and new schemes) within JLTP4 were assessed against the SEA Objectives. The key findings of this assessment in terms of potential significant effects are summarised at Table 1 of Appendix 1: Summary of Environmental Report.

The SEA Regulations require that mitigation measures are considered to prevent, reduce or offset any significant adverse effects on the environment of implementing the plan. The measures are known as 'mitigation' measures. Table 1 also sets out the key mitigation measures proposed for adverse and uncertain impacts.

The SEA Objectives (SEAO) are listed below:

- SEAO 1: 'Improve accessibility for a growing and ageing population'
- SEAO 2: Reduce transport related air pollution'
- SEAO 3: 'Reduce transport related carbon emissions in line with national targets'
- SEAO 4: 'Adapt transport network to effects of climate change and minimise the vulnerability of transport network to flood risk'
- SEAO 5: 'Protect and enhance biodiversity and ecological networks'
- SEAO6: 'Promote human health'
- SEAO7: Improve road safety, particularly for vulnerable users, and to reduce road casualties'
- SEAO8: Minimise adverse effects on soils such as loss, compaction, erosion and pollution from transport-related activities'
- SEAO9: 'Protect, and where possible improve, water quality'
- SEAO10: 'Minimise waste produced and resources consumed by transport infrastructure and operation of transport services'
- SEAO11: Protect and enhance the rich diversity of the historical and cultural environment, its heritage assets and their setting'
- SEAO12: Maintain and enhance the quality and character of the built environment and landscape'

As outlined above, the potential significant effects and proposed mitigations against these are outlined in Table 1 of Appendix 1: Summary of Environmental Report.

Generally, the certainty of the assessment has been assessed as being low to medium. The main reasons for this are listed below:

- Despite the strong commitment to shift journeys into cleaner and more sustainable transport modes, there are various degrees of uncertainty with regards to planned actions, programme and funding of some of the interventions;
- There is uncertainty regarding whether improvements to the public transport system from the major schemes would be sufficient to counteract traffic growth and associated adverse environmental effects. The implications of removal of the Severn Crossing Toll could be significant are still being assessed;
- Advanced technologies are currently in early development stages;
- Uncertainty regarding the rate of climate change and the degree to which it will alter weather patterns in the medium and longer term;
- Information from the Habitats Regulations Assessment is required to better understand potential adverse effects on European designated sites;
- Effects are likely to be both variable across the region and dependent upon proximity of the sensitive receptors to the road network;
- There are also uncertainties about route alignments as well as specific design details such as use of material and sitting; and
- The combined effect of the predicted growth in the region with the various transport infrastructure schemes that may go ahead are likely to adversely affect biodiversity, soils and potentially water quality. This is also the case for potential effects on cultural and built environment. Mitigation / enhancement measures included as part of the design and implementation of the specific schemes may offset some of the adverse effects.

Cumulative effects

The SEA Regulations require that cumulative effects are considered when identifying likely significant effects. The type of development involved in both JLTP4 and regional and local growth ambitions will result in similar types of effects and in some locations they will affect the same environmental and other assets. Cumulative effects are therefore expected from the implementation of these two plans. A coordinated and supportive approach to mitigation and enhancement between the plans will assist with minimising the likelihood and scale of adverse effects and maximising potential benefits. The development and implementation of the West of England's Green Infrastructure Strategy has been identified as the environmental strategic framework to facilitate this.

The cumulative effect between the JLTP4 and the Local Air Quality Strategies of the West of England's and those of the neighbouring authorities have been assessed as being beneficial. A combination of both adverse and beneficial effects is expected as a result of the JLTP4 in combination with the West of England's Adopted Joint Waste Core Strategy 2011 and the local transport plans of the neighbouring authorities. Scheme design and the relevant consenting processes will provide opportunities to mitigate adverse effects and promote enhancements.

Alternatives to JLTP4

The SEA also considers the impact of adopting and implementing JLTP4 compared to the likely impact of any reasonable alternative scenarios. The likely impacts of the plan and the reasonable alternatives are identified, described and evaluated. The reasonable alternative scenarios considered as part of this JLTP4 assessment, are:

- JLTP4 Scenario: this situation considers the development and eventual adoption of the policies contained in the JLTP4;
- Retention of JLTP3 - This scenario represents a continuation of existing policies planning principles and policies outlined in the JLTP3 document, with the accompanying Major Schemes programme and priorities packages with the plan period being extended to cover the period up until 2036;
- The "Without Plan" scenario - This scenario assumes that the JLTP3 is completed with no replacement LTP in place, so no transport planning principles, policies or interventions would be in place.

Generally, the Retention of JLTP3 and JLTP4 perform equally in SEA Objectives 1, 2, 4, 7, 8, 9 and 12. JLTP4 performs better against SEA Objectives 3 and 6, whilst Continuation of JLTP3 performs better against SEA Objectives 5, 10 and 11. The "Without Plan" performs worst against all the SEA objectives.

Section 13:
Environmental, equalities and health impact assessments of JLTP4 continued

Habitats Regulations Assessment (HRA) summary

As outlined above, a Habitats Regulations Assessment (HRA) was required to be undertaken on the JLTP4 major transport schemes that were assessed to have a Likely Significant Effect (LSE) on one of the identified Natura 2000 network (or 'European Sites'). 'European Sites' are: candidate Special Areas of Conservation (cSACs), Special Areas of Conservation (SACs) and Sites of Community Importance (SCIs); and Special Protection Areas (SPAs). The National Planning Policy Framework also requires proposed SPAs, possible SACs, listed or proposed Ramsar sites, and sites required to provide compensatory measures to be treated as European sites in England.

Summaries of the HRA Screening Stage and the following HRA Appropriate Assessment are provided below. More information is included in the full assessments, which are published on the JLTP4 section of the travelwest website.

HRA screening stage summary

Habitats Regulations Assessment (HRA) is required of JLTP4 in accordance with Article 6 (3) of the EU Habitats Directive1 as transposed into the UK law by the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations'). Habitats Regulations requires an assessment (referred to as a HRA) to be undertaken in respect of any plan or project which either alone or in combination with other plans or projects would be likely to have a significant effect on a site designated within the Natura 2000 network (or European sites) and is not directly connected with, or necessary to, the management of the site. In 2009, the Department of Transport also issued guidance that local transport authorities need to consider if their Local Transport Plan is likely to have a significant effect on a European site.

An HRA should determine whether a plan would adversely affect the integrity of a European site in terms of its nature conservation objectives. Where negative effects are identified, other options should be examined to avoid any potential for damaging effects.

'Screening' is the first stage in HRA. If Likely Significant Effects (LSEs) on European sites are identified in screening, measures must be put in place to avoid them. Further investigation may be necessary to understand how a plan might affect the integrity of European sites i.e. Appropriate Assessment and to develop effective avoidance and mitigation measures (or consider mitigation measures already proposed in relation to schemes and projects).

The following European sites have been considered in the HRA of the WoE JLTP4:

- Avon Gorge Woodlands SAC;
- Bath and Bradford-on-Avon Bats SAC;
- Chew Valley Lake SPA;
- Mells Valley SAC;
- Mendip Limestone Grasslands SAC;
- Mendip Woodlands SAC;
- North Somerset & Mendip Bats SAC;
- River Usk / Afon Wysg SAC;
- River Wye SAC;
- Rodborough Common SAC;
- Salisbury Plain SAC and SPA;
- Severn Estuary SAC, SPA and Ramsar;
- Somerset Levels and Moor SPA and Ramsar;
- Wye Valley and Forest of Dean Bats SAC; and
- Wye Valley Woodlands SAC.

Apart from 'softer' actions which will occur as a result of the JLTP4, such as improving information provision and road safety training, it is the major schemes set out within the plan which will physically deliver the JLTP4 with regards to, for example, infrastructure development and changes to traffic. HRA screening has therefore focussed on the major schemes in order to identify the potential LSEs on European sites resulting from the JLTP4.

A Geographical Information System (GIS) has been used along with expert judgement to screen the major schemes for potential LSEs.

Screening has identified whether:

a) The scheme is not likely to have a significant effect on a European site - no LSE identified;

b) The scheme is likely to have a significant effect on a European site either alone or in-combination with other plans and projects - LSE identified; or

c) It is not possible to rule out the risk of significant effects on a European site, either alone or in-combination with other plans and projects – LSE identified.

The findings of the screening stage have identified LSEs in relation to the following sites:

- Avon Gorge Woodlands SAC;
- Bath and Bradford-on- Avon Bats SAC;
- Chew Valley Lake SPA;
- Mendip Limestone Grasslands SAC;
- Mendip Woodlands SAC;
- North Somerset and Mendip Bats SAC;
- Severn Estuary SAC, SPA and Ramsar; and
- River Wye / Afon Gwy SAC.

Some uncertainty has also been identified in relation to some schemes for which insufficient details are available at this stage to allow screening.

As LSEs and uncertainty have been identified in the screening stage, the HRA had to progress to the second stage (appropriate assessment) in which the potential effects and uncertainty identified in screening was to be considered in more detail, including any mitigation already proposed and identifying additional mitigation if necessary.

It was envisaged that the appropriate assessment would need to consider the following potential effects:

- Loss of foraging areas or severance of flyways used by bats;
- Increase in recreational pressures;
- Spread of diseases;
- Spread of invasive species;
- Water pollution;
- Marine litter;
- Loss of habitats for birds;
- Physical modification of watercourses; and
- Coastal squeeze effects.

The appropriate assessment would need to reflect the strategic nature of the JLTP4 and would make reference to the appropriate assessment of the previous regional growth plan – the Joint Spatial Plan. The JLTP4 appropriate assessment work will commence as soon as possible after consultation on the screening findings with Natural England.

Section 13:
Environmental, equalities and health impact assessments of JLTP4 continued

HRA Appropriate Assessment: summary

The Appropriate Assessment of the WoE JLTP4 has considered whether adverse effects or uncertain effects on European sites could result, both from the JLTP4 alone and in combination with the WoE's previous regional growth plan, the Joint Spatial Plan, as well as other plans and projects in or near to the plan area. The assessment has taken into consideration mitigation measures put forward within the Appropriate Assessment of the then WoE Joint Spatial Plan. An Appropriate Assessment of the new regional growth plan will be worked on alongside this (JLTP4) Appropriate Assessment in due course.

Several European sites could be affected by a number of different transport schemes as follows:

- The Avon Gorge Woodlands SAC could be affected by the direct loss of habitat as a result of the MetroWest Phase 1 scheme;
- The North Somerset and Mendip Bats SAC could potentially be affected by a number of different schemes and the adverse effects could relate to fragmentation of bat commuting corridors and loss of bat foraging areas and recreational pressure;
- The Bath and Bradford Bats SAC could similarly be affected by a number of schemes in relation to fragmentation of bat commuting corridors and loss of bat foraging areas;
- The Mendip Limestone Grasslands SAC could be affected by a number of cycle route schemes and adverse effects could result from recreational pressure; and
- The Severn Estuary SAC, SPA and Ramsar site could potentially be affected by a number of schemes and adverse effects could result from loss of habitats used by birds, recreational pressure, water pollution and physical medication of watercourses impeding migration of fish.

Suggested mechanisms for potential effects to be mitigated and environmental benefits to be incorporated into scheme delivery have been put forward in order to avoid the risk of adverse effects occurring on all European sites. The HRA is strategic in nature, acknowledging that there is a need for further detailed, specific assessments of impacts and mitigation requirements at the local level (through the preparation of new Local Plans and their HRAs and the development consent process).

However, the MetroWest Phase 1 scheme would result in the direct loss of up to 0.71ha of woodland within the Avon Gorge Woodland SAC and therefore an adverse effect on this SAC remains following mitigation. No feasible alternatives to this scheme have been identified. It is therefore necessary for this scheme to proceed to the 'IROPI test' (Imperative Reason of Overriding Public Interest). If the UK is still subject to the Habitats Directive at the time the application for the MetroWest Phase 1 is determined (expected to be 2021) then consent may be granted following consultation between the Government and the European Commission. If the UK is no longer subject to the Habitats Directive then it is expected that the decision would be made by the Secretary of State. Compensation measures, included planting of additional woodland, would be provided if the IROPI test is passed. At this stage, it is therefore not possible to conclude no adverse effect on the integrity of the Avon Gorge Woodland SAC as a result of

MetroWest Phase 1

With the exception of the MetroWest Phase 1 scheme, provided that the mitigation measures identified within Chapters 5 to 12 of the full HRA Appropriate Assessment report are incorporated within the JLTP4, it should otherwise be possible to conclude that the JLTP4 will not have an adverse effect on the integrity of all other European sites, either alone or in combination with other plans and projects. The assessment can be found in full on the JLTP4 section of the travelwest website.

The next step is for the recommended mitigation within the report to be responded to and changes made to the JLTP4 by the West of England JLTP4 working group. Once mitigation has been incorporated within the JLTP4 it will then be possible to conclude the Appropriate Assessment of the JLTP4 except the MetroWest Phase 1 scheme. The final conclusion of the JLTP4 Appropriate Assessment would be reached in 2021 once a decision has been made on MetroWest Phase 1.

Mitigation Requirements

A series of mitigations requirements have been identified by the JLTP4 HRA Appropriate Assessment and as a result have been added to the plan to strengthen it. A summary of all mitigations can be found at Table 14.1 in the final HRA Appropriate Assessment Report on the JLTP4 section of the travelwest website. The resulting updates to the plan, including all comments from the consultation period regarding the environmental effects of the plan, will also be published on the JLTP4 section of the travelwest website in Spring 2020 as part of the SEA Statement.

Equalities Impact Assessment (EqIA) summary

Equality Impact Assessment considers the impact of a project or policy on persons or groups of persons who share characteristics which are protected under section 4 of the Equality Act 2010 ("protected characteristics") and might also include others considered to be vulnerable within society such as low-income groups. It is an information gathering tool which enables decision makers within public bodies to implement their equality duty under the Equality Act 2010. The Equality Impact Assessment concluded that the JLTP4 should have a positive impact on the general public that are living, working or visiting the West of England by providing a safer, resilient, sustainable and convenient transport opportunities for the region. Some of the most vulnerable groups will particularly benefit, specifically:

- People with limited or no access to cars;
- People with respiratory illnesses, and those more susceptible to poor air quality (children and young people and older people); and
- People that require access to employment, education, health and/ or other services.

Although positive, the Equality Impact Assessment concluded that there still possible adverse impacts that would be felt by people who are reliant on the use of a car (such as people with a disability), particularly if charging is introduced, or those with limited mobility who are unable to participate in active travel (such as older people of people with a disability).

The full Equalities Impact Assessment can be found at Appendix C of the JLTP4 Environmental report on the travelwest website (https://travelwest.info/projects/joint-local-transport-plan).

Health Impact Assessment (HIA) summary

Health Impact Assessment is a systematic approach to identifying the differential health and wellbeing impacts, both positive and negative, of projects and plans.

The single greatest potential health outcome of the draft Joint Local Transport Plan has been assessed as the indirect health benefits from improved access to, and accessibility of, transport options. These benefits have been assessed as being of long-term, permanent, major benefit for all groups. In addition, the proposed development has been assessed as providing indirect health benefits as a consequence of improving air quality in urban areas, encouraging greater physical activity through active travel, and providing economic and employment benefits in the region.

Section 13:
Environmental, equalities and health impact assessments of JLTP4 continued

In contrast to the beneficial impacts above, the draft Joint Local Plan has been assessed as potentially contributing to adverse health outcomes as a consequence of potential noise impacts. Potential moderate adverse health outcomes were predicted as a result of an unlikely reduction in traffic on transport networks despite improvements to the road networks and public transport provisions in the region. These potential adverse effects would be scheme and location specific and the implementation of mitigation measures associated with Policy N1 and / or the Environmental Impact Assessment process (where relevant) are likely to reduce their impact. These adverse health effects associated with noise are considered temporary, as improvements might be made through technological development.

The full Health Impact Assessment can be found at Appendix D of the JLTP4 Environmental report on the travelwest website (https://travelwest.info/projects/joint-local-transport-plan).

SEA consultation

The SEA Environmental Report was made available for consultation and public comment at the same time as the draft plan or programme back in February & March 2019, as an integral part of the consultation process. The SEA Environmental Report and a separate Non-Technical Summary is still available on the travelwest website https://travelwest.info.

Monitoring and next steps

The SEA Regulations require that monitoring is undertaken on a plan so that the significant effects of implementation can be identified and remedial action imposed. A monitoring framework for the SEA has been developed following consultation on this SEA. A number of indicators have been identified as relevant to the potential impacts of the JLTP4 on the SEA objectives and are included within the JLTP4 monitoring framework. Details of this monitoring framework will be included in the SEA Statement, which will be available on the JLTP4 section of the travelwest website in Spring 2020.

Given the links between JLTP4 and residential & employment growth planning in the West of England, a coordinated approach to monitoring both plans will be explored.

Glossary

Active travel
Using your own power to travel, such as cycling and walking. It also includes walking or cycling as part of a longer journey. Active travel helps to increase physical activity levels which has a range of health benefits and can play a role in reducing congestion and air pollution.

Air Quality Management Area (AQMA)
Areas designated by local authorities where air quality improvements are required to meet national air quality objectives. Local authorities are required to produce an air quality action plan describing the measures it will put in place to reduce pollution in the AQMA.

Benchmarking
The use of performance indicators and other metrics to compare performance results against a reference point, especially between organisations (and local authorities) with similar characteristics.

Business rates
A supplement levied by local government on non-domestic rate payers which is used to fund additional investment to promote economic development.

Capital delivery
Capital spending refers to major purchases spent on a physical asset or major physical infrastructure or services, usually being built or bought from new. The life of this spending is beyond the current accounting period. Examples of capital spending could be on a new bus infrastructure, such as bus lanes, as well as purchasing the buses, seen in metrobus.

Carbon dioxide (CO_2)
A gas produced and released into the atmosphere when fossil fuels such as petrol and diesel are burned. See also: Carbon Footprint, Climate change

Carbon footprint
The total greenhouse gas emissions caused directly and indirectly by an individual, organisation, event or product, expressed as a carbon dioxide equivalent. See also: Carbon dioxide, Greenhouse gas

City region
The functional area around a city or large town.

Clean Air Zone (CAZ)
A defined area where measures are taken to improve air quality, deliver improved health benefits, whilst supporting economic growth.

Climate change
The change in global climate patterns largely attributed to increased levels of carbon dioxide produced by the burning of fossil fuels. See also: Carbon dioxide

Climate Emergency
The recognition of scientific consensus that climate change is a significant threat to humanity and represent a commitment to reduce or halt climate change to avoid potentially irreversible environmental damage resulting from it. The West of England Combined Authority and all of the West of England authorities declared climate emergencies in 2019.

Combined authority
A combined authority is a legal structure that enables two or more local authorities to collaborate and make collective decisions across council boundaries.

Community Infrastructure Levy (CIL)
A tariff-based charge paid by developers to local authorities to fund strategic infrastructure. CIL money does not need to be used to provide infrastructure on the same site it is collected from. See also: Section 106

Glossary continued

Connected and Autonomous Vehicles (CAVs)

Vehicles, also referred to as driverless cars, which incorporate a range of technologies allowing them to communicate with and draw information from their environment to enable the safe, efficient movement of people and goods.

Core cities

A network of eight major regional cities, including Bristol, forming a strategic partnership to enhance their economic performance and international competitiveness, with a particular focus on transport and connectivity, climate change, and sustainability.

Core Strategy

A compulsory and key strategic document in a Local Plan which includes: the evidence base for an area's main social, physical and economic characteristics; its key strategic issues; and policies to shape the development and use of land in that area. See also: Local Plan

Enterprise Zone/Enterprise Area

Areas across England that provide tax breaks and receive government support as part of a wider government strategy to support business and enable local economic growth.

Greenhouse gas

A gas which absorbs solar radiation contributing to the greenhouse effect which leads to global warming and climate change.

Gross Domestic Product (GDP)

An economic measure of the total value of all final goods made and services provided within a country during a specific time period.

Gross Value Added (GVA)

An economic measure of the value of goods and services produced in an area, industry or sector.

Heavy rail

A term for the conventional railway system to distinguish it from light rail or tram systems.

Intelligent Transport Systems (ITS)

The use of information and communication technologies applied to road transport, infrastructure, vehicles and users to improve the efficiency of transport across a range of situations.

Joint Spatial Plan (JSP)

A statutory document which provides the strategic overarching framework to guide housing, employment and infrastructure over a defined period within the combined authority area. See also: Combined authority

Joint Transport Study (JTS)

A report assessing current transport issues which is used to inform high level strategy for the long-term development of a transport system over a defined period in a combined authority area. See also: Combined authority

Key Route Network (KRN)

A defined network of highway routes that contributes to economic growth by serving the main flows of people, goods and services, and provides connections to the national Strategic Road Network. See also: Strategic Road Network and Major Road Network

Light rail

A form of urban rail transport which operates at a higher capacity to a tramway, often on an exclusive right of way, and serving parts of a large metropolitan area. See also: mass transit

Loading gauge

Refers to the size of freight wagons and containers that can travel on a section of railway track. Network Rail uses a W loading gauge classification system for freight ranging from W6A (smallest wagons) through W7, W8, W9, W9Plus, W10, W11 to W12 (largest containers). The movement of freight by rail relies on there being a loading gauge large enough to accommodate the wagons/containers.

Local authority

A local government organisation. In England there may be either one or two tiers of local government.

A two-tier structure includes a County Council as the upper tier and a District Council as the

lower tier. Local authority responsibilities include strategic land use planning, and highways and transport.

Local Plan

A statutory planning document which sets out the vision and framework for future development

within a local planning authority area. It addresses housing, economy, community and infrastructure and is used as a tool to guide decisions about development proposals. See also: Core Strategy

MaaS (Mobility as a Service)

A shift away from privately owned vehicles towards a model where different transport modes are consumed as an on-demand service through a single (online) platform. For example, the concept of paying for a weekly travel pass that includes bike hire, car hire, bus and train travel.

Major Road Network (MRN)

The most strategic local routes in England, commonly A roads, for which local (unitary) authorities are responsible. See also: Key Route Network and Strategic Road Network

Mass transit

A form of public transport to satisfy higher potential trip demand, featuring limited stops, high capacity and attractive, reliable journey times. It is usually rail based, such as trams or light rail above ground, or underground trains.

Masterplan

An overarching planning document which includes analysis and recommendations for a site or area's population, economic development, housing, transportation and other land uses.

Mode shift

A percentage change in the use of different transport modes. When one transport mode becomes more advantageous than another over the same route or market, a modal shift is likely to take place. The advantages of modal shift can be cost, convenience, speed or reliability.

Multimodal

Combining different transport options, such as cycling and rail, to form one single trip.

Nitrogen dioxide (NO_2)

A gaseous pollutant caused by motor vehicles. See also: NOx

NOx

A generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide (NO) and nitrogen dioxide (NO_2). NOx gases are produced during the combustion of hydrocarbon fuels in diesel and petrol-powered vehicles. In areas of high motor vehicle traffic, NOx can be a significant source of air pollution.

Open data

Data which anyone can access, use and share. For example, data obtained from journey planning tools and ticket sales can provide an understanding of travel behaviour and support the identification and development of measures that influence future travel demand and mobility networks.

Private Hire Vehicle

A vehicle with fewer than eight seats that is only allowed to carry passengers with pre-arranged bookings and is therefore different to taxis (hackney carriages).

Glossary continued

Rapid transit
Public transport on a high-quality bus-based vehicle, with twin doors and ultra-low emissions, which is often segregated from general traffic through bus lanes or bus-only alignments. Offers a significant increase in the quality and speed of public transport, including off-board ticketing. E.g. metrobus

Real Time Information
The use of vehicle location systems to automatically update service information about whether services are running to time. Passengers can access this information through web applications and at public transport stops.

Section 106 (S106)
A financial contribution made by developers to pay for the infrastructure necessary to make their development acceptable in planning terms. See also: Community Infrastructure Levy

Smart city
An urban area which uses different types of electronic data collection sensors to supply information which can then be used to efficiently manage assets and resources. This includes data collected from citizens, devices and assets and can be applied to traffic, transport, and other systems.

Smart ticketing/Smartcard/travelwest card
An electronic form of pre-payment ticket for use on buses and other forms of public transport with the possibility of also being used to pay for other transport services. It is sometimes referred to as an 'electronic purse'.

Strategic Road Network (SRN)
The network of 4,300 miles of motorways and major A-roads in England, which carries 30% of all traffic and 60% of freight and business traffic. It is managed by Highways England. See also: Key Route Network and Major Road Network

Supplementary Planning Documents (SPDs)
Documents which expand upon and support Local Plan policies with more detailed guidance. See also: Local Plan

Sustainable transport
Forms of transport which have lower environmental impact than single occupancy car use. It includes walking, cycling, public transport, Park & Ride, and car-sharing.

Unitary authority (UA)
A type of local authority with a single tier responsible for local government functions within its area.

Urban Living
The principle of significantly increasing densities in urban areas to create compact urban areas where people can live, work, socialise and easily access amenities, with good access to public transport.

West of England
The four local authority areas of Bath & North East Somerset Council, Bristol City Council, North Somerset Council, and South Gloucestershire Council.

Ultra Low Emission Vehicle (ULEV)
Vehicles that use low carbon technologies, fuelled by electricity or hydrogen, to reduce the amount of pollutants emitted. They commonly have rechargeable batteries which are used to store energy

Appendix 1: Summary of Environmental Report

West of England Joint Local Transport Plan (JLTP4) Strategic Environmental Assessment (SEA) – Key Findings (November 2018)

The councils making up the West of England are currently updating their Joint Local Transport Plan 3 (JLTP3) into what is known as the "JLTP4". The objectives of JLTP4 are to:

- Support sustainable economic growth
- Enable equality and improve accessibility
- Address poor air quality and take action against climate change
- Contribute to better health, wellbeing, safety and security
- Create better places

The overall aim is to provide a well-connected sustainable transport network that offers greater realistic travel choices and makes walking, cycling and public transport the natural way to travel. Policies and interventions under the new JLTP4 are structured around improving connectivity at four levels:

- Beyond the West of England – strategic road and rail, port and airport
- Within the West of England – between the urban areas, longer than 10km
- Local – up to 10km
- Neighbourhood – journeys within local communities

Central to this is the major schemes programme based around the West of England's Joint Transport Study (JTS). The JTS was developed as part of the supporting technical work to the previous regional growth plan, West of England Joint Spatial Plan (JSP).

Core to the delivery of the JLTP4 will be the Major Schemes programme. The Major Schemes were grouped as follows:

- Transformational – including a mass transit network
- Mitigate Joint Spatial Plan growth – including corridor scheme packages
- Early investment schemes – including MetroWest
- Schemes under development – studies funded by the West of England
- Other long-term opportunities

A Strategic Environmental Assessment (SEA) is being prepared alongside the JLTP4. SEA is a process required by law for certain types of plan or programme, such as a local transport plan. The overall aim of the SEA process is to ensure better protection for the environment, population and human health by making decision-makers aware at an early stage of the likely significant effects of the plan on the environment and by seeking to introduce measures that can be undertaken either to avoid adverse effects or to help improve the environment.

In compliance with the Conservation of Habitats and Species Regulations 2017, an Appropriate Assessment (AA) of JLTP4 is also being carried out. The first stage (screening) of the assessment has identified a number of likely significant effects on European sites and therefore it is necessary to advance to the full AA stage. Please refer to the Habitats Regulations Screening Stage Summary prepared by ClearLead for further information.

An Equalities Impact Assessment and a Health Impact Assessment of the JLTP4 have also been undertaken and have informed the SEA process.

Appendix 1:
Summary of Environmental Report continued

The SEA process is undertaken in five key stages which are:

- Stage A – Scoping: Setting the context and objectives, establishing the baseline and deciding on the
- Stage B – Environmental Assessment: Developing and refining alternatives and assessing effects
- Stage C – Reporting: Preparing the SEA Environmental Report
- Stage D – Consultation: Consulting on the draft programme and the SEA Environmental Report
- Stage E – Monitoring: Monitor the significant effects of implementing the plan or programme on the environment

The SEA Directive and associated UK Regulations state that the SEA must consider the following topic areas: Biodiversity; Population; Human health; Flora and Fauna; Soil; Water; Air; Climatic factors; Material assets; Cultural heritage, including archaeological and architectural heritage; Landscape; and the interrelationship between these factors.

The Scoping Stage, which included statutory consultation with Natural England, Historic England and the Environment Agency[1], provided the baseline information on the topics listed above and identified the SEA Objectives listed in Table 1. The policies and interventions within JLTP4 were assessed against the SEA Objectives. The key findings of this assessment in terms of potential significant effects and mitigation are summarised in Table 1:

Table 1 JLTP4 SEA Objectives, potential significant effects and mitigation

SEA OBJECTIVE (SEAO)	POTENTIAL SIGNIFICANT EFFECTS	MITIGATION
SEAO 1: 'Improve accessibility for a growing and aging population	Most of the policies and interventions included in the JLTP4 aim at improving accessibility which aligns with this SEA Objective resulting in likely long term major beneficial effects.	There is a need to ensure that services and employment or education opportunities are accessible by those with limited mobility. Charging should not result in creating a barrier to employment or education opportunities, particularly for those who are unemployed or on low income. Strategic and major schemes will be delivered through the appropriate consenting process and will need to be subject to assessments including health and equalities assessments. Detailed mitigation and enhancement opportunities will be developed as part of the design and consenting process.
SEAO 2: Reduce transport related air pollution'	Many of the policies and interventions within JLTP4 have the potential to reduce traffic congestion and associated air pollution. Major long-term beneficial health effects on urban population are therefore expected from policies and interventions which encourage modal shift away from private car use and those that promote active travel. Minor adverse health effects for population near strategic road network, and those close to new proposed road links are expected from policies promoting additional road links or upgrading local and strategic road network. Future cleaner technologies may play a key role in reducing the amount of air pollution from transport in the longer term.	Public transport vehicles should be of high modern standards to utilise alternative fuels where possible and minimise emissions. Where schemes/initiatives are time limited, new replacement measures need to be implemented to maximise the opportunity for benefits over time. Promoting exposure reduction and ensure that any new road links are isolated from vulnerable receptors, would reduce the harmful effects of the policies promoting additional road links or upgrading local and strategic road network. Strategic and major schemes will be delivered through the appropriate consenting process and will need to be subject to Environmental Impact Assessment (EIA) and other relevant environmental legislation. Detailed mitigation and enhancement opportunities will be developed as part of the design and consenting process at the scheme level.

1 Consultation response from Environment Agency was still outstanding at the time of writing.

Appendix 1:
Summary of Environmental Report continued

SEA OBJECTIVE (SEAO)	POTENTIAL SIGNIFICANT EFFECTS	MITIGATION
SEAO 3: 'Reduce transport related carbon emissions in line with national targets'	Numerous policies within the LTP4 will have a minor or potential major positive effect on this SEA objective. However, there is significant uncertainty in the assessment. Most of the polices require a modal shift away from private car use, to more sustainable mode of transports (e.g. bus, rail, tram, cycling). Success of the policies in the long term will depend upon whether traffic growth can be curbed and whether the required behavioural change associated with a shift towards sustainable travel modes takes place.	Public transport vehicles should be of high modern standards. Where schemes / initiatives are time limited, new replacement measures need to be implemented to maximise the opportunity for benefits over time. Strategic and major schemes will be delivered through the appropriate consenting process and will need to be subject to EIA and other relevant environmental legislation. Detailed mitigation and enhancement opportunities will be developed as part of the design and consenting process at the scheme level.
SEAO 4: 'Adapt transport network to effects of climate change and minimise the vulnerability of transport network to flood risk'	It is expected that new transport infrastructure will be designed to be more resilient to climate change than existing transport infrastructure. However, the low-lying nature of much of the sub-region, and its coastal and tidal location, mean flood risk is likely to be an increasing concern. The potential effects of climate change and sea level rise are of particular relevance in the areas of the sub-region most affected by flooding. The potential effect of policies and interventions involving new major infrastructure has been identified as uncertain at this SEA level. Policies and interventions aimed at improving connectivity at local level and neighbourhood levels have been assessed as having mainly neutral effects on this SEA objective.	Strategic and major transport infrastructure schemes will have to be designed to take into the effects of climate change in line with national policy and best practice design such as CIRIA Report C753 The SuDS Manual. Additionally, all strategic and major schemes will be delivered through the appropriate consenting process and will be subject to Flood Risk Assessment (FRA) and EIA. Detailed mitigation and enhancement opportunities will be developed as part of the design and consenting process at the scheme level. Use of information regarding weather conditions and impact on travel can benefit transport users.
SEAO 5: 'Protect and enhance biodiversity and ecological networks''	Policies and interventions involving strategic and major transport infrastructure schemes have been identified as having adverse effects on this SEA Objective, some of them potentially major adverse. European designated sites are particularly sensitive receptors. The Habitats Regulations Screening exercise has identified some likely significant effects of major schemes on European sites and therefore it is going to be necessary to advance to the appropriate assessment (AA) stage of HRA. The assessment of the effects on this SEA objective are preliminary and will need to be informed by the findings of the HRA AA. Please refer to the Habitats Regulations Screening Stage Summary prepared by ClearLead for further information.	The WoE JSP committed the authorities to develop a WoE Green Infrastructure (GI) Plan and to delivering a 'net gain' for the environment. The Green Infrastructure Strategy, currently under preparation, will identify the strategic measures and mechanisms to support, guide and implement the delivery of environmental commitments set within future strategic planning and Local Plans, including mitigation for protected sites. Further development of GI Plans at an authority level should also reflect schemes within this JLTP4. All strategic and major schemes will be delivered through the appropriate consenting process and will be subject to EIA and relevant environmental mitigation. Detailed mitigation and monitoring measures will be developed as part of the EIA process. it is recommended that major schemes have a Construction Environmental Management Plan (CEMP). The Habitats Regulation AA will provide the information with regards to mitigation associated with potential significant effects on European sites.
SEAO6: 'Promote human health'	Most of the policies and interventions included in the Draft JLTP4 have as key objective promoting more sustainable and active modes of travel which would result in likely long-term benefits on human health. Encouraging more journeys to be made by active travel modes improves physical and mental health, quality of life and the environment. Direct beneficial effects on human health would result from increased physical activity whilst indirect effects may derive from less congested roads as well as improved access to services and opportunities which may tackle some of the inequality issues which may also underlain health issues. Beneficial effects might be offset by increased noise, air pollution and / or severance resulting from some of the proposed strategic road and rail improvements.	All strategic and major schemes will be delivered through the appropriate consenting process and will be subject to EIA which includes assessment of health. Detailed mitigation and monitoring measures to minimise potential adverse effects will be developed as part of the EIA process. Enhancement opportunities should also be considered as part of the development and consenting process of the larger schemes. Any charging scheme should consider exemptions for drivers with specific need, those on low income or unemployed seeking access to employment or education opportunities.

Appendix 1:
Summary of Environmental Report continued

SEA OBJECTIVE (SEA0)	POTENTIAL SIGNIFICANT EFFECTS	MITIGATION
SEA07: Improve road safety, particularly for vulnerable users, and to reduce road casualties'	The majority of polices will have a positive impact on improving road safety. Particularly, Policy W2 (which improves the road safety for motorcyclists), Policy L1 (through providing education for cyclists) and Policy L2 (using education and implementation of cycle lanes etc.) will all have a long-term major positive impact on the SEA objective.	Where schemes / initiatives are time limited, new replacement measures need to be implemented to maximise the opportunity for benefits over time. Road safety camera enforcement provides opportunity for driver education. Targeting road safety campaigns at motorcyclist safety. Motorcyclists are disproportionally represented in road accident statistics. New projects should be subject to safety audit checks and aim to improve road safety through design.
SEA08: Minimise adverse effects on soils such as loss, compaction, erosion and pollution from transport-related activities'	Policies and interventions involving major transport infrastructure schemes have been identified as having adverse effects on this SEA Objective. Strategic and major road and rail infrastructure schemes would result in direct adverse effects on soils in terms of loss and compaction where these are to be delivered on undeveloped land. Operational effects may result in pollution, erosion and increased run-off. Due to the relative permanence and irreversibility of soil loss, the potential effect should be regarded as significant. Transport schemes to be delivered on previously developed land would result in beneficial effects through the remediation of contaminated soils.	As noted under SEA0 5 above, further development of GI Plans at an authority level should also reflect schemes within this JLTP4. All strategic and major schemes will be delivered through the appropriate consenting process and it is recommended that major schemes have a CEMP. This would include mitigation and monitoring measures to avoid and minimise the degradation of soil resources.
SEA09: 'Protect, and where possible improve, water quality'	Policies and interventions involving major transport infrastructure schemes have been identified as having potential to result in adverse effects on this SEA Objective. The quality of water in rivers, streams, rhynes and ditches can be affected by the construction of transport infrastructure as well because of its operation through pollution and accidental spillages. It is expected, however, that new transport infrastructure will be designed following current best practice guidance and hence should include mitigation measures inherent to the scheme design. Overall, the potential effect on this SEA objective has been assessed as being uncertain for those policies involving major infrastructure works. There is the potential for adverse effects but also opportunities for beneficial effects through improved drainage design.	Detailed design should follow best practice guidance such as that provided within CIRIA Report C753 The SuDS Manual. The guidance covers the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with their effective implementation within both new and existing developments. It looks at how to maximise amenity and biodiversity benefits and deliver the key objectives of managing flood risk and water quality. As noted under SEA0 5 above, further development of GI Plans at an authority level should also reflect schemes within this JLTP4. All strategic and major schemes will be delivered through the appropriate consenting process and will be subject to EIA and relevant environmental mitigation. Detailed mitigation and monitoring measures will be developed as part of the EIA process. it is recommended that major schemes have a CEMP.
SEA010: 'Minimise waste produced and resources consumed by transport infrastructure and operation of transport services'	Generally, policies and interventions under consideration seek to make good use of existing infrastructure whilst new schemes would be designed in line with relevant policy and legislation aimed at minimising the production of waste and making sustainable use of resources. However, JLTP4 comprises major new transport infrastructure which will result in significant use of materials such as aggregates and generation of waste. Interventions aimed at promoting alternative modes to private car would reduce reliance on fossil fuels. The overall effect on this SEA objective is likely to be adverse.	Seek to make best use of existing infrastructure to minimise resource consumption and waste generation before constructing new facilities. Ensure scheme design incorporates sustainable use of materials as well as measures to minimise future maintenance requirements. For construction projects, a Site Waste Management Plan (SWMP) should be implemented. New development can be designed to increase the potential for recycling waste. New transport modes should use sustainable fuels (electric). There should also be modal shift to public transport and active travel from car use.

Appendix 1:
Summary of Environmental Report continued

SEA OBJECTIVE (SEA0)	POTENTIAL SIGNIFICANT EFFECTS	MITIGATION
SEA011: Protect and enhance the rich diversity of the historical and cultural environment, its heritage assets and their setting'	In the short and medium term, the construction of strategic and major schemes is likely to adversely affect heritage. However, some policies (W5 and W1) are likely to reduce pressure from traffic in the cities of Bath and Bristol and therefore reduce impacts on their cultural heritage assets. Due to the relative permanence and irreversibility of damage to heritage assets, the potential effects (both adverse and beneficial) should be regarded as significant.	The JLTP4 provides an opportunity to improve the setting and integrity of the WoE's historic places, and ensure future development is appropriately considered and designed to respond to local context. Good design (following best practice guidance such as *Highways England – the road to good design* (2018)), and cultural heritage assessments (as part of EIA where appropriate) should be required for all strategic and major schemes to minimise potential adverse impacts and maximise opportunities for benefits.
SEA012: Maintain and enhance the quality and character of the built environment and landscape'	Noise and congestion from traffic can seriously degrade the quality of the urban environment. The policies which are likely to have the most positive on this SEA objective are those which limit opportunity for private car use within urban centres and free up space for other activities and improvements to the urban realm. Impacts from major schemes are likely to be on green belt land around the urban fringes. Introduction of new infrastructure would result in negative impacts on the landscape in terms of visual impacts and increased noise during construction and operation. Major development schemes also have the potential to have impacts on landscape setting.	Good design (following best practice guidance such as *Highways England – the road to good design* (2018)), and landscape/townscape and visual assessments (as part of EIA where appropriate) should be required in all strategic and major schemes to minimise potential adverse impacts and maximise opportunities for benefits. Design the proposed infrastructure sensitively to reduced visual impact and to include effective landscaping schemes to soften any major structures. It is recommended that signage and infrastructure for pedestrians and cyclists is designed to be sympathetic to the local distinctiveness whilst remaining clear, visible and informative. Further development of The West of England's GI Plans at an authority level should also reflect schemes within this JLTP4. A modal shift away from car use is needed to maximise the potential beneficial impacts of JLTP4 on this SEA objective. Measures to discourage car use within urban centres should be pursued to maximise use of alternative modes provided and to reduce traffic congestion and noise.

The SEA Statement shows how the JLTP4 was updated to reflect the mitigations requirements identified by the SEA and shown in the table above. This will be completed post adoption of JLTP4 and published on the JLTP section of the travelwest website.

Generally, the certainty of the assessment has been assessed as being low to medium. The main reasons for this are listed below:

- Despite the strong commitment to shift journeys into cleaner and more sustainable transport modes, there are various degrees of uncertainty with regards to planned actions, programme and funding of some of the interventions
- There is uncertainty regarding whether improvements to the public transport system from the major schemes would be sufficient to counteract traffic growth and associated adverse environmental effects. The implications of removal of the Severn Crossing Toll are a key unknown
- Advanced technologies are currently in early development stages
- Uncertainty regarding the rate of climate change and the degree to which it will alter weather patterns in the medium and longer term
- Information from the Habitats Regulations Assessment is required to better understand potential adverse effects on European designated sites
- Effects are likely to be both variable across the region and dependent upon proximity of the sensitive receptors to the road network
- There are also uncertainties about route alignments as well as specific design details such as use of material and sitting
- The combined effect of the predicted growth in the region with the various transport infrastructure schemes that may go ahead are likely to adversely affect biodiversity, soils and potentially water quality. This is also the case for potential effects on cultural and built environment. Mitigation / enhancement measures included as part of the design and implementation of the specific schemes may offset some of the adverse effects.

The following alternative scenarios were also assessed against the SEA Objectives:

- Continuation of JLTP3 (with period plan extended to cover the period up to 2036)
- The "Without Plan" Scenario

Continuation of JLTP3 and JLTP4 perform equally in SEA Objectives 1, 4, 7, 8, 9, 10 and 12. JLTP4 performs better against SEA Objectives 3 and 6, whilst Continuation of JLTP3 performs better against SEA Objectives 2, 5 and 11. The "Without Plan" performs worst against all the SEA objectives.

Cumulative effects:

The JLTP4 is intrinsically linked to future strategic planning. The type of development involved in both plans will result in similar type of effects and in some locations they will affect the same environmental and other assets. Cumulative effects are therefore expected from the implementation of these two plans. A coordinated and supportive approach to mitigation and enhancement between the plans will assist with minimising the likelihood and scale of adverse effects and maximising potential benefits. The development and implementation of the WoE GI Plan has been identified as the environmental strategic framework to facilitate this. The cumulative effect between the JLTP4 and the Local Air Quality Strategies of the WoE authorities have been assessed as being beneficial. A combination of both adverse and beneficial effects is expected as a result of the JLTP4 in combination with the WoE Adopted Joint Waste Core Strategy 2011 and the local transport plans of the neighbouring authorities.

Appendix 1:
Summary of Environmental Report continued

Monitoring:

The SEA Regulations require that monitoring is undertaken on a plan so that the significant effects of implementation can be identified and remedial action imposed. A monitoring framework for the SEA will be developed following consultation on this SEA. Given the links between JLTP4 and future strategic planning, a coordinated approach to monitoring will be considered.

Next Steps:

The SEA Environmental Report will be made available at the same time as the draft plan or programme, as an integral part of the consultation process

Appendix 2:
Scheme Summary Table – categories

Connectivity

- Beyond the West of England – schemes that improve journeys into and out of the West of England, including to other areas in the South West, South Wales, national and international
- Within West of England – a scheme that improves other journeys wholly within the West of England, but longer than approximately 10km, including those between main urban areas
- Local – a scheme that improves journeys of up to approximately 10km, including all journeys wholly within one urban area and those between neighbouring rural areas, and rural and urban areas. Many of these schemes will also benefit neighbourhood connectivity

Principal Mode

- Active Travel – cycling and walking
- Freight – by rail, road or water
- Highway – schemes that benefit all motor vehicles
- Multimodal – schemes that benefit a number of principal modes
- Public Transport – local bus, metrobus, mass transit, Park & Ride, rail
- Other – other modes or supporting measures

Cost Level

The indicative cost level (current prices, including risk allowance) is provided as follows:

- Low – up to £50m
- Medium – £50m to £200m
- High – more than £200m

Timescale

The indicative timescale for implementation of the scheme is shown as follows:

- Short – by 2021
- Medium – by 2026
- Long – by 2036

Type of scheme

- T – Transformational
- C – Committed early investment scheme
- E – Early investment scheme under development
- LP – Local Plan
- L – Other longer-term opportunities

Scheme type and priority are subject to change based on the timing and purpose of emerging funding opportunities, such as Central Government bidding windows and developer contributions.

Appendix 2:
Scheme summary table categories continued

Appendix 3:
Major scheme details

Transformational Major Schemes

Ref	Mass Transit Scheme	Details
T1	Bristol City Centre to Airport	Segregated mass transit route connecting Bristol Airport and South Bristol with city centre. Through the current mass transit studies and the Bristol South West Economic Link project (BSWEL) (see Scheme Ref. E1), various options are being considered for assessment. Those options which perform well against an initial set of criteria will then be developed into more detailed option variants for further assessment. Options are being considered for bus, metrobus, tram, tram-train, mass transit (fully segregated underground running) and heavy rail. Route to be determined balancing maximising patronage against engineering costs. The heavy rail option assessment includes a potential heavy rail link from Bristol Temple Meads.
T2	Bristol City Centre to Bath	A mass transit route providing high frequency, high capacity and fast public transport services between Bristol and Bath. The route from Hicks Gate to Bristol will be facilitated by diversion of traffic onto the Callington Road Link to enable reallocation of roadspace from car to public transport within Bristol. Careful consideration of routing options and future management of roadspace between Bristol and Bath, will be required. In the short term metrobus would provide mass transit along the corridor from Bristol to Bath, and in the longer term there is an ambition for light rail.
T3	Bristol City Centre to East Fringe	A dedicated, segregated mass transit route providing high frequency, higher capacity and faster public transport services connecting central Bristol and the East Fringe and associated infrastructure to provide a high-quality passenger experience. Sections of the dedicated route would probably need to be delivered below surface due to highway capacity constraints on the A420 and A432 corridors and environmental constraints on the Bristol-Bath Railway Path. It includes the A420/Ring road Park & Ride site(s).
T4	Bristol City Centre to North Fringe	A dedicated, segregated mass transit route providing high frequency, higher capacity and faster public transport services between central Bristol, North Bristol and the North Fringe with associated infrastructure to provide a high quality passenger experience. Constraints on the A38 Gloucester Road and other corridors mean that an underground alignment should be considered as one of the options to fully achieve the scheme objectives. This scheme would be complementary to the North Fringe – Hengrove metrobus scheme currently being delivered and the planned MetroWest programme.
T5	Bath city centre and corridors	Introducing light rail in Bath city and environs. Given the environmental and physical constraints trams should be one of the options considered. All key routes will be considered including: – A367 Odd Down – Newbridge – either along the A4 or A36 integrating with the new rapid transit corridor between bath and Bristol – Lansdown from the north of Bath – A4 from the east of Bath

Appendix 3:
Major scheme details continued

Early investment schemes in progress (committed projects)

Ref	Scheme	Details
C1	M49 Avonmouth junction	New M49 Avonmouth junction to improve access to the port of Avonmouth and the Avonmouth Severnside Enterprise Area; works are expected to be completed by the end of 2019.
C2	Temple Quarter masterplan	Masterplan to cover the 70-hectare development zone, to feature a mixed-use quarter comprising up to 11,000 homes and a revitalised transport interchange, including improvements to Temple Meads railway station. The masterplan will include station capacity improvements, better access to Temple Meads and the area, with new public space and improvements to the public realm. The project will also involve a sensitive adaptation, development and protection of the grade 1 listed station, which was designed by Brunel.
C3	MetroWest Phase 1	Upgraded train services to half-hourly connections for Severn Beach Line and the Bath Spa to Bristol line. Reopening the Portishead Line to passenger services with an hourly service is a priority for WoE authorities. New station at Portishead and the reopening of former Pill Station. **HRA Mitigation** The MetroWest Phase 1 project level HRA proposes a series of mitigation measures, including implementing protective measures during scheme construction which would reduce the adverse effects on the Avon Gorge Woodlands SAC. However, it is not possible to avoid the loss of up to 0.71ha of woodland within the SAC and therefore an adverse effect on this SAC remains following mitigation. The project level HRA has therefore proceeded to evaluate the alternatives to the MetroWest Phase 1 scheme, however, it has not been possible to identify any feasible alternatives to this scheme. It is therefore necessary for this scheme to advance to the 'IROPI test' (imperative reasons of overriding public interest). The IROPI that have been considered within the project level HRA relates to human health, public safety and important environmental benefits. Compensatory measures are also provided within the project level HRA, including habitat management and planting of additional woodland with whitebeams. However, as a result of the European Court of Justice interpretation of the Habitats Directive, these measures cannot be taken into account in the assessment of the implications of the project.
C4	MetroWest Phase 2	Reopening of Henbury line to an hourly spur and increase train services to Yate. New stations at Henbury, North Filton and Ashley Down.
C5	Hengrove Transport Package	Internal roads and creating access for metrobus through urban living site of around 1500 homes.
C6	Lockleaze Transport Package	Including bus lane on Muller road and accessible pathway through Stoke Park to cater for urban living sites in Lockleaze (800 homes).
C7	Metrobus Cribbs Patchway extension	An extension to the existing North Fringe to Hengrove metrobus route. Metrobus from Bristol Parkway to The Mall via Hatchet Road, Gipsy Patch Lane, North Way and CPNN. Includes bus lanes and bus links to enable rapid, reliable metrobus services to connect existing and planned residential, employment and leisure areas in the North Fringe. Bus priority includes bus links at San Andreas roundabout and North Way, and bus lanes on Gipsy Patch Lane. The replacement of the existing railway bridge at Gipsy Patch Lane with a wider bridge to remove the pinch-point for motorised and nonmotorised users is a key element of the scheme.

Early investment schemes under development

Ref	Scheme	Details
E1	Bristol South West Economic Link (BSWEL)	New multimodal corridor between the M5 and the A38, Bristol Airport, South Bristol and Bristol City Centre to improve connectivity and overall network resilience. The BSWEL Options Assessment Report grouped together the various options to form packages, based on their broad geographical location and their likely ability to meet the project objectives in a coherent way. The packages are labelled from 1-8, indicating the potential order of implementation, although this will depend on funding sources and engagement with external partners: • Package 1: Weston-super-Mare bus network improvements; Weston-super-Mare to Bristol bus services with metrobus compatibility (complementary services); • Package 2: A38 online improvements between A368 to Bristol Airport, along with Downside Road junction improvements. A38 widening at Bristol Airport; • Package 3: Banwell Bypass; Rail options: Weston Parkway station; Weston-super-Mare (WsM) – Weston Parkway – Bristol Airport bus service; • Package 4: A38 offline improvements between Bristol Airport and South Bristol Link (SBL); A38/SBL Park & Ride; Highway improvements for Churchill and Sandford; • Package 5: M5 new junction J21A • Package 6: Rail options: Bristol Airport Rail Link Phase One: Bristol Airport to Bristol Temple Meads • Package 7: Rail options: Bristol Airport Rail Link Phase Two: Bristol Airport to Bristol Temple Meads, Severn Beach/Bath Spa, Bristol Airport to Weston-super-Mare/ Taunton • Package 8: A370-A38 Link **HRA Mitigation** For BSWEL Packages 6, 7 & 8, the JLTP4 HRA recommends that this scheme is subject to a project-level HRA when sufficient scheme information is available. If a Likely Significant Effect (LSE) is screened-in during the project level HRA then an Appropriate Assessment should be undertaken. The Appropriate Assessment should input into the design and location of this scheme to ensure no adverse effect on European sites occur. Permission should only be granted and this scheme allowed to go ahead if the Appropriate Assessment are able to conclude that no adverse effects will occur on European sites.
E2	East of Bath access improvements	Provision of a high quality north-south route connecting the south coast to the M4. This route will enable north-south traffic to avoid passing through Bath.

Appendix 3:
Major scheme details continued

Early investment schemes under development

Ref	Scheme	Details
E3	M5 Junction 19	Improvements to M5 Junction 19 to improve access between the M5 and the Royal Portbury Dock, Portishead, Portbury and Pill. The scheme will provide enhanced capacity to improve the efficiency of movements for freight using the Royal Portbury Dock, enhancing connectivity to national road networks. The scheme will also assist in accommodating future traffic growth generated by planned housing and employment growth in the area.
E4	Passenger Rail Service and Capacity Improvements, Station Upgrades and New Stations Package	Package of rail improvement measures: Rail service improvements, bringing the frequency of local rail services up to a minimum of 2 tph, plus hourly rail services from Weston-super-Mare to London. • Infrastructure to support service improvements including double tracks on the loop line between Weston Railway Station, reinstating the southern chord at Weston-super-Mare, and the Herluin Way to Locking Road Link (bridge replacement to enable width for double tracking). • Longer rolling stock to cater for increased demand, in conjunction with longer platforms where required (including Worle, Nailsea & Backwell and Yatton), with higher quality rolling stock from all stations. • Station upgrades for existing rail stations with a focus on developing transport interchanges (interchange with metrobus, Mass Transit, bus services and cycle and car parking provision), in conjunction with schemes to improve access to existing rail stations by sustainable modes on key routes to stations across the West of England. • New railway stations at the following locations: Constable Road, Bristol; Ashton Gate, Bristol; St Annes, Brislington, Bristol; Saltford, Bath & North East Somerset. Stations to be delivered with associated infrastructure: passenger waiting facilities, bus stops, cycle stands, car parking, real-time information and be fully Equality Act compliant. Westerleigh junction upgrade.
E5	Smart Motorways: M4 J18-19	Smart Motorway scheme on the M4 from J18 (A46, Tormarton) to J19 (M32).* This will complement the recently delivered M4 J19-20 and M5 J15-17 Smart Motorway to provide an extensive system of motorway management on the most congested parts of the network. The M4 J18-19 scheme will deliver increased capacity and enhanced reliability to complement the delivery of the new M4 J18A (to provide direct access to the Bristol East Fringe). ** schemes to be progressed in light of the outcome of the safety review by Highways England and the DfT*

Early investment schemes under development

Ref	Scheme	Details
E6	M5 new junction J21A	A new Junction 21A on the M5 motorway south of the existing J21. This will be supported by a new multimodal corridor connecting the new junction with the A38, with a bypass for Banwell in the short to medium term, and potential highway improvements at Sandford and Churchill in the medium to long term. Major improvements to the A38 between Langford and South Bristol will further improve connectivity. The scheme will improve links to the airport and improve resilience of the Strategic Road Network and locally will improve access to potential housing and residential growth.
E7	A4174 Ring Road junction improvements including Wraxall Road (Longwell Green)	Junction improvements supported by JTS linked to orbital bus route and J18a link. Wraxall Rd junction will be improved to improve access onto the Ring Road and safety at the roundabout.
E8	Freezing Hill junction upgrade and whole route improvements	This includes improvements at three junctions along the route between the A420 and Lansdown P&R, known as Freezing Hill Lane. Currently there are excessive delays and the route isn't suitable for the number of vehicles using it to access Lansdown P&R. The scheme also includes localised widening of the Freezing Hill Lane route.

Appendix 3:
Major scheme details continued

Early investment schemes under development

Ref	Scheme	Details
E9	Interurban cycle routes	Strategic cycle routes across the region to supplement those detailed in the Corridor Scheme Packages to mitigate growth. Many of these will be delivered along the metrobus corridors and some will be identified through the West of England Local Cycling and Walking Infrastructure Plan. **HRA Mitigation: Protecting & enhancing the natural environment with Interurban Cycle Routes** The proposed cycleways within the JLTP4 are indicative at this stage and yet to be finalised. It is therefore not possible to fully assess the potential environmental effects of each route. Some cycle routes will be included within the Cycling and Walking Infrastructure Plan. It is therefore recommended that an HRA of the Local Cycling and Walking Infrastructure Plans would ascertain the predicted level of use of new cycle routes in the WoE and therefore more accurately predict the potential for an adverse effect on the European sites identified and be able to put forward suitable mitigation. The Interurban cycle routes which form part of scheme E9 will not be included within the Cycling and Walking Infrastructure Plan. It is therefore proposed that the potential effects of recreational pressures resulting from the following cycle routes are assessed through project-level HRA of the individual schemes, as well as a separate HRA of the WoE Local Cycling and Walking Infrastructure Plan: • Strawberry Line Cycle Route (Interurban Cycle Routes - E9); • Weston Town Centre to J21 Cycle Route (Weston-super-Mare: Local walking & cycling infrastructure improvements – LP5); • Banwell - Churchill Cycle Route (Banwell and Churchill: Sustainable travel package – LP6); and • North Somerset Coastal Towns Cycle Route, particularly the WSM to Sand Bay and Sand Bay to Clevedon sections (Interurban Cycle Routes - E9). It is recommended that the requirement for HRA of individual cycle route schemes is included within the JLTP4. If an LSE is identified in screening during the project level HRA then an Appropriate Assessment should be undertaken and schemes should only be granted permission and allowed to go ahead if the Appropriate Assessment is able to demonstrate that there would be no adverse effects on these European sites, either alone or in combination with other plans and projects. The Appropriate Assessment should input into the design and location of the cycleways as appropriate. There is also an opportunity for the cycleways to provide linkages as a part of the local green infrastructure networks and it is recommended that this opportunity if referred to within the JLTP4. It is also assumed that all cycleways will eventually be incorporated into Local Plans as part of infrastructure delivery. Local Plans will be subject to their own HRAs and new cycleways will be considered within the HRAs along with other developments. Through their HRAs, the Local Plans of the WoE authorities would need to demonstrate that there would be no adverse effect on the North Somerset Bats SAC and the Severn Estuary SPA, SAC and Ramsar as a result of the transport schemes before the plans are adopted.

Early investment schemes under development

Ref	Scheme	Details
E10	M4 Junction 18A to A4174 Ring Road	New motorway junction on the M4 (Junction 18A) between Junction 19 for Bristol and Junction 18 for Bath, providing a new highway link between the M4 and the A4174 Ring Road near the Emersons Green Enterprise Area. It would necessitate improvements to the M4 between Junction 19 and the new Junction 18A, plus improvements to junctions on the A4174. The scheme was considered in a feasibility study undertaken by South Gloucestershire Council and in partnership with Highways England which examined potential location options for the junction and link road. South Gloucestershire Council's Cabinet considered the outcome of the feasibility study in March 2018 and Option 1 (the Western Option at Emersons Green) was agreed as the Council's preferred location. The study has been provided to Highways England for their consideration.
E11	Metrobus – Bristol City Centre to Clevedon and Nailsea	Metrobus route from Clevedon and Nailsea to Bristol City Centre, a rapid transit limited stop service with an emphasis on segregation from general traffic with bus lanes. The section within Bristol would use the infrastructure for the Ashton Vale to Temple Meads route, which was completed in September 2018. This will help to support growth at Nailsea and Backwell and improve connectivity and travel choices.
E12	Metrobus consolidation package	A package of measures to make further enhancements to the existing metrobus network, with potential measures including fleet upgrade, addition of descoped infrastructure, signals replacement, and Great Stoke ('Rabbit') roundabout.
E13	Sustainable travel package for Bath	Increasing high-quality, sustainable travel options for the city of Bath to expand, complement and/or offer alternatives to existing Park & Ride/transport interchanges at Lansdown, Odd Down and Newbridge.
E14	Regional Electric Vehicle Charging Network	Increasing public charging infrastructure, including through 'Go Ultra Low West' (Source West) EV charging infrastructure programme.
E15	Metrobus – Bristol City Centre to Severnside	Metrobus route from Severnside to Bristol City Centre via the A403 and A4 Portway, connecting into existing metrobus infrastructure in Central Bristol. The route would connect the logistics cluster at Severnside and Avonmouth with Bristol City Centre via the Portway Park & Ride site. This would improve travel options and connectivity for employees and businesses in accessing Severnside and Avonmouth. The scheme builds on the extensive existing bus priority on the A4 Portway, with extended bus priority, enhanced stops and upgraded metrobus services. In particular, further bus priorities including potential bus-only links would be needed into Severnside.
E16	Bath Cycle Network and City Centre Package	Completion of a continuous and integrated network of strategic cycle routes and their associated infrastructure, comprising key corridors and cross city and/or river routes, complemented by improved permeability and investment in public realm in the city centre. This network will connect key destinations across the Bath urban area. Local routes will be improved and integrated into the strategic network as part of ongoing programmes.

Appendix 3:
Major scheme details continued

Early investment schemes under development

Ref	Scheme	Details
E17	Keynsham / Midsomer Norton and Somer Valley Public Realm Improvements Packages	Keynsham town centre public realm/ regeneration improvements to encourage sustainable modes of travel, such as walking, cycling and public transport. Including strategic cycling routes to/from Bath, Bristol, east/ north Bristol and within Keynsham including completion of the link from the Somerdale cycle bridge via the River Avon towpath to the Keynsham Peninsular and the Bristol/Bath strategic cycle network. Midsomer Norton town centre public realm/ regeneration improvements to encourage sustainable modes of travel, such as walking, cycling and public transport. Highway, cyclist and pedestrian improvements linking the Somer Valley Enterprise Zone with the A37 to the west and the wider Somer Valley to the east.
E18	Weston-super-Mare Package 2	Package of multimodal highway/junction improvements to complement and support the other Weston-super-Mare schemes. These could include, but not be limited to, the M5 Junction 21 Bypass, A370/A371 Airport Roundabout, Cross Airfield Link/A371 Roundabout, West Wick Roundabout, Airfield Bridge Link (which is likely to be bus/ cycle/ped only) and Herluin Way to Locking Road Link.
E19	Weston-super-Mare Cycling and Walking Network	Completion of a network of legible, attractive and safe strategic cycle routes in the Weston-super-Mare area, with a focus on east-west routes from Worle and Weston Villages into the town centre. Within the Weston-super-Mare Town Centre Masterplan and SPD. This includes better pedestrian and cycling facilities to serve Weston-super-Mare as part of future strategic planning and Core Strategy growth.
E20	Banwell Bypass	Bypass to the north of Banwell, linking the A371 with A368. The bypass will enable potential development opportunities north of Banwell and support the delivery of Weston Villages; provide a more suitable strategic route for HGVs, and most importantly provide significant improvements to air quality and public realm in the centre of the village. This new infrastructure is a key element of the Bristol South West Economic Link (BSWEL).

Early investment schemes under development

Ref	Scheme	Details
E21	South East Bristol and Whitchurch	**A4 metrobus + Callington Road Link** metrobus service along the A4 corridor between Keynsham and Bristol, incorporating Callington Road Link to reduce congestion on the A4. **A37 Sustainable Transport** Package of bus priority and enhanced bus services to Whitchurch, possibly including extension of metrobus from Hengrove, and Park & Ride option at Whitchurch. **Hicks Gate interchange** New Park & Ride/transport interchange at Hicks Gate junction – this would replace the existing Brislington Park & Ride site. **Hicks Gate Junction** Changes to existing roundabout layout including a new link between the A4174 and A4 Keynsham Bypass. **South East Bristol Orbital Low Carbon Corridor** Transport infrastructure improvements creating a multimodal orbital corridor to facilitate north/south connectivity incorporating metrobus. Measures to improve public transport movements and reduce single occupancy private car movements through the area. **Local highway improvements** Local traffic management schemes, including improvements to Whitchurch Lane towards Hengrove, and traffic management on A37 towards Pensford.
E22	Keynsham	**Keynsham railway station** Review of access arrangements and passenger waiting facilities to enhance the attractiveness of rail for commuting and other travel needs from wider Keynsham area. **A4-A4175 corridor** Corridor between the A4 and A4175 including new bridges over the railway line. **Avon Mill Lane improvements** Improvements to convert Avon Mill Lane and A4175 junction to a roundabout with enhanced pedestrian and cycle facilities. **New sustainable travel measures** Package of strategic cycle corridor, bus priority, and enhanced bus services to Bristol and Bath. Including a direct link to the Bristol Bath Railway Path. **Hicks Gate Junction** Changes to existing roundabout layout including a new link between the A4174 and A4 Keynsham Bypass. **Local highway improvements** Improvements to other junctions affected by traffic, including A4 / B3116 Roundabout (between Keynsham and Saltford) and A420 / A4175 junction at Bridgeyate (in South Gloucs).

Appendix 3:
Major scheme details continued

Joint Transport Study schemes

Ref	Scheme	Details
LP1	Yate and Coalpit Heath	**A432 metrobus, walking and cycling** Package of strategic cycling corridor, bus priority, and enhanced bus services (including metrobus) to Coalpit Heath and Yate and potential Park & Ride option west of Yate. **Yate railway station** Package of measures to improve access and enhance waiting facilities, including improved bus interchange on A432. **Winterbourne and Frampton Cotterell Bypass** Single carriageway link between Stoke Gifford and Iron Acton, bypassing Winterbourne and Frampton Cotterell. **Local highway improvements** Improvements to other parts of the network impacted by traffic, to include B4057 between Winterbourne and Stoke Gifford, B4058 / B4059 junctions at Iron Acton, and route between Yate and East Fringe via Westerleigh. **Coalpit Heath and Westerleigh Bypass** A new multimodal corridor (road and cycle route) from Yate to Emersons Green and the east of Bristol, connecting with the Ring Road and possibly a new M4 Junction 18A. The new link would connect the A432 Badminton Road to Westerleigh Road providing access to new employment and housing in Yate. This may be required instead of, or together with, a Winterbourne and Frampton Cotterell Bypass. This link would provide additional capacity, freeing up road space on the A432 for metrobus.
LP2	Nailsea and Backwell	**Nailsea sustainable travel, rail station and local network improvements** Enhanced bus services, including options for improved connections to Bristol via the Long Ashton Park & Ride and metrobus M2 service, explore improved interchange at Nailsea & Backwell rail station. **Nailsea – Backwell A370** New link from Nailsea to A370 including crossing of the rail line, providing improved access to potential development locations. **Clevedon-Nailsea-Bristol transport corridor improvements** Investigate improved multimodal connections between M5 Junction 19 and Nailsea & Backwell, and along the Clevedon-Nailsea-Bristol corridor including bus priority and other public transport improvements.

Joint Transport Study schemes

Ref	Scheme	Details
LP3	Thornbury, Buckover and Charfield	**A38 metrobus, walking and cycling** Package of strategic cycling corridor, bus priority, and enhanced bus services (including metrobus) to Thornbury and Buckover, including potential Park & Ride option. **Charfield Station** New railway station at Charfield (services to Bristol and Gloucester). **M5 J14** Upgraded motorway junction to a full roundabout layout, improved approaches from east and west. **Local highway improvements** Improvements to local road network in the Thornbury, Buckover and Charfield area, including capacity improvements at B4509 / B4058 junction at Charfield Hill.
LP4	Bristol Urban Area	**Bristol City Centre Framework** Multimodal package to improve connectivity and growth in Bristol city centre. Includes enhanced cycling provision, enhanced bus priority and reorganisation of road network in city centre core. **Local bus package (GBBN2)** Expansion of bus priority measures across the Bristol urban area and further improvements to bus facilities to support sustained growth in bus patronage across the city. **Bristol walking and cycling package** Improvements to walking and cycling infrastructure **HRA Mitigation** The JLTP4 HRA recommends that this scheme element is subject to a project-level HRA when sufficient scheme information is available. If a Likely Significant Effect (LSE) is screened-in during the project level HRA then an Appropriate Assessment should be undertaken. The Appropriate Assessment should input into the design and location of this scheme to ensure no adverse effect on European sites occur. Permission should only be granted and this scheme allowed to go ahead if the Appropriate Assessment is able to conclude that no adverse effects will occur on European sites. **M32 Park & Ride** New Park & Ride site south of M32 J1 to intercept trips into Bristol. **A38(S)/A4174 Park & Ride** New Park & Ride site at the A38/South Bristol Link roundabout, served by metrobus and Airport Flyer services to Bristol. **A4018 Park & Ride** New Park & Ride site, possibly served by rail services to Bristol from proposed Henbury station. **A4 Portway and A370 Long Ashton Park & Ride expansion** Expansion of existing Park & Ride sites.

Appendix 3:
Major scheme details continued

Joint Transport Study schemes

Ref	Scheme	Details
LP5	Weston-super-Mare	**Weston-super-Mare metrobus** Metrobus serving Weston town centre, Weston villages, and possibly Park & Ride. **Weston-super-Mare Park & Ride** New Park & Ride site at either A370/A371 junction, M5 J21 or new junction J21A. **Local bus improvements** Additional bus priority measures and bus stop infrastructure to improve journey reliability. **Local highway junction improvements** Upgrades and improvements to a number of junctions related to the primary distributor route and other key junctions around the Weston-super-Mare area. **Local walking & cycling infrastructure improvements** Package of walking and cycling infrastructure improvements, to promote sustainable transport modes
LP6	Churchill	**Local highway improvements** Improvements to other junctions affected by additional traffic, including A368/A38 Churchill signals. **Local sustainable travel package** Improvements to strategic and local walking and cycle networks, to improve sustainable travel connectivity along the corridor between the A38, Churchill, Sandford and Banwell.

Other longer-term opportunities

Ref	Scheme	Details
L1	Strategic Rail and Road Freight Package	Freight consolidation centre (rail) at Avonmouth, network loading gauge enhancements on railway network, sustainable distribution projects at key stations (initially Bristol Temple Meads), and restrictions on HGV movements. **HRA Mitigation** The JLTP4 HRA recommends that this scheme is subject to a project-level HRA when sufficient scheme information is available. If a Likely Significant Effect (LSE) is screened-in during the project level HRA then an Appropriate Assessment should be undertaken. The Appropriate Assessment should input into the design and location of this scheme to ensure no adverse effect on European sites occur. Permission should only be granted and this scheme allowed to go ahead if the Appropriate Assessment are able to conclude that no adverse effects will occur on European sites.
L2	A46 to M4 route improvements, Cold Ashton	Capacity improvements especially at the Cold Ashton roundabout to remove existing delays between Bath and junction 18 of the M4.
L3	Bath Area Bus Network Improvement Scheme (BABNIS)	New vehicles to implement fleet improvements at a faster pace. Real time information (RTI) screens at all stops and upgrade to thin-film-transistor (TFT) displays. New bus priority measures, including on A367 Wellsway, A36 Lower Bristol Road and A4 London Road. New access to Bath Bus Station from Churchill Bridge.
L4	Henbury Loop rail services	Orbital rail service around north Bristol, introduction of passenger services along freight line.
L5	Rail services to Thornbury	This includes the reopening of the line to passenger services to Thornbury. Assumes the completion of the Westerleigh junction upgrade.
L6	M5 Junction 20 Local Highway Improvements	Improvements to the local highway network in the vicinity of M5 Junction 20 (Clevedon) to improve transport connectivity. The scheme should look to include bus infrastructure and priority improvements and the reallocation of roadspace to more sustainable modes wherever possible.

Appendix 3:
Major scheme details continued

Important environmental, equalities and health impact considerations for all JLTP4 Major Schemes

As part of the Strategic Environmental Assessment (SEA), a Habitats Regulations Assessment (HRA) an Equalities Impact Assessment (EqIA) and a Health Impact Assessment (HIA) were also undertaken. As part of these assessments, mitigations were identified and updates containing these mitigations were made to the plan. Some of these mitigations have been added to the relevant parts of the JLTP4, others were already covered in the document and some of the more generic, high-level mitigations regarding the major schemes have been added to this section. For the major scheme mitigation requirements, the scheme-specific ones have been added either against references to the scheme within the main body of the JLTP4 or within this Appendix. It should be noted that all strategic and major schemes will be delivered through the appropriate consenting process and will need to be subject to the following assessments and considerations:

- Environmental Impact Assessment and other relevant environmental legislation;
- Flood Risk Assessment. Detailed design should follow best practice guidance such as that provided within CIRIA Report C753 The SuDS Manual. The guidance covers the planning, design, construction and maintenance of Sustainable Drainage Systems to assist with their effective implementation within both new and existing developments and can be applied to major schemes. It looks at how to maximise amenity and biodiversity benefits, and deliver the key objectives of managing flood risk and water quality.
- Construction Environmental Management Plan (this would include mitigation and monitoring measures to avoid and minimise the degradation of soil resources);
- Health Impact Assessment;
- Equalities Impact Assessment. Detailed mitigation and monitoring measures will be developed as part of the assessment process, with one of the outcomes including ensuring that water quality is protected and improved where possible;
- Good design (following best practice guidance such as Highways England – the road to good design (2018)), cultural heritage assessments, and landscape/townscape & visual assessments (as part of Environmental Impact Assessment where appropriate) should be required for all strategic and major schemes to minimise potential adverse impacts and maximise opportunities for benefits.
- For construction projects, a Site Waste Management Plan should be implemented. New development can be designed to increase the potential for recycling waste. Scheme promoters should seek to make best use of existing infrastructure to minimise resource consumption and waste generation before constructing new facilities. Additonally, scheme design should incorporate sustainable use of materials as well as measures to minimise future maintenance requirements.
- To actively contribute to reducing carbon emissions and combatting climate change in line with local and national policy and best practice design such as CIRIA Report C753 The SuDS Manual.

Emerging from these assessments, further detailed mitigation and enhancement opportunities will be developed, as part of the design and consenting process.

The Appropriate Assessment stage of the JLTP4 Habitats Regulation Assessment (HRA – part of the Strategic Environmental Assessment) has identified a number of mitigations and considerations required to be made in major scheme development.

This is so that the JLTP4 can be concluded that no adverse environmental effects are likely from the full major schemes programme (except for MetroWest Phase 1, see Section 13 for details). In summary, it is recommended that the JLTP4 includes the following mitigation principles:

Bats

All schemes within the JLTP4 need to avoid the Juvenile Sustenance Zones around the horseshoe maternity roosts within the Special Areas of Conservation (SACs).

HRA of the West of England Local Plans to use the strategic bat survey results to produce horseshoe bat mitigation strategies which would show the key bat foraging/commuting habitats in their areas. These bat habitats would inform the location and design of the schemes thereby ensuring a coordinated approach to the planning of the schemes within the JLTP4 and SDLs proposed within the former regional growth plan, the JSP.

A project level HRA would be required for the schemes listed in Tables 5.2 and 5.3 of the final HRA [see below list of schemes]. These HRAs should include a Horseshoe Bat Mitigation Plan, which would be informed by the results of the detailed bat survey of each scheme undertaken in accordance with the Supplementary Planning Document (SPD) survey methodology. The Horseshoe Bat Mitigation Plan would include suitable horseshoe bat crossing points to enable bats to cross the roads and commute through the landscape. The crossing points must have the following features designed in accordance with best practice:

a) Underpasses to be of sufficient height to allow horseshoe passage;

b) Crossing structures to maintain connectivity with existing bat commuting routes;

c) Crossing structures to be unlit.

These schemes are:

Mass Transit - Bristol City Centre to Airport (T1);

Local network improvements in Nailsea area (LP2);

Nailsea–Backwell A370 (LP2);

Clevedon–Nailsea–Bristol transport corridor improvements (LP2);

A371 / A368 Banwell Bypass (E20);

BSWEL Package 4: A38 (south) offline improvements (E1);

M5 Junction 19 (E3);

MetroWest Phase 1 (C3);

M5 new junction J21A (E6);

Bristol City Centre to Bath (T2);

Bath city centre and corridors (T5);

A4-A4175 corridor (E22);

East of Bath access improvements (E2);

Sustainable travel package for Bath (E13);

Keynsham / Midsomer Norton and Somer Valley Public Realm Improvements Packages (E17).

- The project level HRA of the schemes listed in Tables 5.2 and 5.3 [see schemes above] should also use the metric for calculating replacement horseshoe bat foraging habitat as detailed in the North Somerset Bats SAC SPD (or any subsequent updated editions). This metric would be used to demonstrate that the schemes would result in a net gain in horseshoe bat habitat by retaining/enhancing habitat within the proposed scheme and provided off-site if lost; and
- The JLTP4 schemes would only be granted permission and allowed to go ahead if the HRAs of the Local Plans and proposed schemes are able to demonstrate that there would be no adverse effect on the integrity of the North Somerset and Mendip Bats SAC and the Bath and Bradford-on-Avon Bats SAC either alone or in combination.

Appendix 3:
Major scheme details continued

Water pollution & marine litter

A risk of an adverse effect on the integrity of the Severn Estuary has been identified due to water pollution and litter during scheme construction. It is therefore recommended that the JLTP4 states that any scheme which has the potential to have an adverse impact on the water quality of the Severn Estuary during construction should ensure that best practice pollution prevention guidelines are followed, including adherence with the following CIRIA guidance documents to manage construction run-off:

- CIRIA C532 (2001). Control of water pollution from construction sites. Guidance for consultants and contractors;
- CIRIA C648 (2006) – Control of Water Pollution from Linear Construction Projects; and
- CIRIA C692 (2010) – Environmental Good Practice on site. 3rd Edition.

Where a risk of an adverse effect on the integrity of the Severn Estuary has been identified due to water pollution and litter during scheme, this could be mitigated by incorporating interceptors into the scheme design to trap the silt, oil and other possible contaminants in run-off to prevent pollution and degradation of the downstream habitats. This should be designed in accordance with current best practice, including adherence to the DMRB Volume 11 Section 3 Part 10 HD 45/09 Road Drainage and the Water Environment. The schemes that this applies to are:

Bristol City Centre to North Fringe (T4)

Local improvements to road network in Nailsea area (LP2)

M5 J19 & J20 improved multimodal connections (LP2)

A371 / A368 Banwell Bypass (E20)

A4 Portway Park & Ride expansion (LP4)

M49 Avonmouth Junction Upgrade (C1)

M5 Junction 19 (E3)

Pill Station (C3)

M5 new junction J21A (E6)

Physical modification of watercourses

A risk of an adverse effect on the integrity of the Severn Estuary has been identified due to physical modification of watercourses potentially used by fish species associated with the Severn Estuary SAC and Ramsar. It is therefore recommended that the JLTP4 states that any scheme which crosses a watercourse linked to the Severn Estuary should ensure it does not result in a barrier to fish passage by ensuring crossing points are designed and constructed in accordance with best practice guidance, including adherence to the Environment Agency Fish Pass Manual (2010).

These schemes are:

Bristol City Centre to North Fringe (T4)

Local improvements to road network in Nailsea area (LP2)

M5 J19 & J20 improved multimodal connections (LP2)

A371 / A368 Banwell Bypass (E20)

M5 new junction J21A (E6)

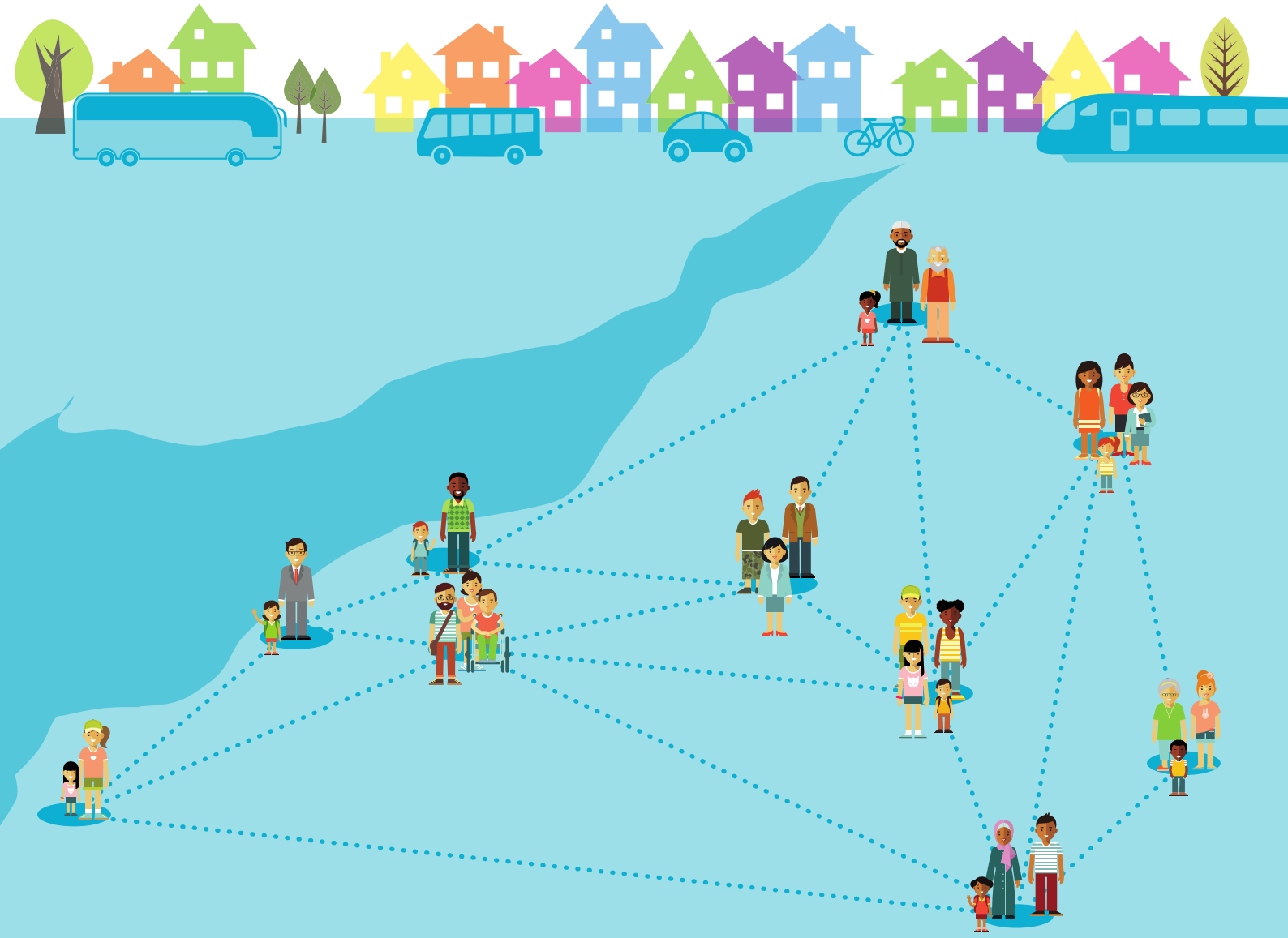
A summary of all mitigations can be found at Table 14.1 in the final HRA Appropriate Assessment Report on the JLTP4 section of the travelwest website. The resulting updates to the plan, including all comments from the consultation period regarding the environmental effects of the plan, will also be published on the JLTP4 section of the travelwest website in Spring 2020 as part of the SEA Statement.

Appendix 4:
JLTP4 Consultation Report

travelwest

Draft Joint Local Transport Plan 4 Consultation Report

January 2020



Contents

Introduction to JLTP4

Welcome to the consultation report on the West of England's draft Joint Local Transport Plan 4.

We took the draft JLTP4 out to public consultation between 6 February and 20 March 2019 and received around 4,200 responses.

This document looks at the feedback we received; sets out what people in the region think and looks at next steps.

Thank you to everyone who responded. We appreciate the time people took to respond, and the wide range of views expressed. Your views will help ensure that a stronger and more collaborative JLTP4 emerges as a result.

What is JLTP4?

The Joint Local Transport Plan sets out the approach to the way transport will develop up to 2036 in the West of England, addressing existing and future transport challenges.

It's our fourth transport plan and it sets out our aims to support clean and sustainable economic growth, address poor air quality and take action against climate change, enable quality public services and improve accessibility, create better places, and contribute to better health and wellbeing.

The plan is led by the West of England Combined Authority, working with Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire councils. It builds on previous work done in the West of England and involved collaboration with the Department of Transport, Highways England, Network Rail, public transport operators and other organisations.

It considers a wide range of options which could support sustainable and greener travel including cycling, walking, bus, rail, mass and rapid transit, and electric/autonomous vehicles. To do this the JLTP4 sets out to provide a well-connected sustainable transport network that offers greater, realistic travel choices and makes walking, cycling and public transport the natural way to travel. Trips into and within the West of England will be seamless, faster, cheaper, cleaner and safer. That's our goal.

An advisory group, comprising representatives from around 20 transport operators and user groups, was set up to provide technical and professional advice.

The alignment and locations of schemes shown on this plan are purely indicative. Any schemes identified in JLTP4 would be subject to further detailed feasibility work and consultation, as well as requiring planning permission.

What you said

- 79% of respondents agreed with the challenges identified by JLTP4
- 65% of respondents agreed with JLTP4's vision and objectives
- You told us you want to see new and improved railways stations and services

- You told us you want more priority for active and sustainable travel, creating a comprehensive and safe network to support active travel for shorter trips
- To help tackle congestion and air quality, you told us that you were supportive of reallocating road space for public transport, walking and cycling
- You told us you want to see a mass transit option developed for our region

We also asked you how you think transport improvements should be funded in future. Road User Charging or a Workplace Parking Levy were roughly two times more likely to be favoured than Council Tax or Business Rate increases.

You told us that you want to see bus services improved across our region.

Whilst the Transport Focus survey tells us that 85% of bus passengers services are satisfied with bus services, in this consultation it became clear that you don't find services easy to plan, value for money and are concerned about their reliability. This is why we are doing more work on this through our Bus Strategy.

In the free text comments a number of people used the opportunity to highlight concerns about specific schemes – in particular the need identified in our draft plan for an orbital corridor to the south east of Bristol. The alignment and locations of schemes shown on this plan are purely indicative. Any schemes identified in JLTP4 would be subject to further feasibility work and consultation, as well as requiring planning permission.

Many of the free text comments reiterated support for the challenges and objectives identified by JLTP4.

This feedback will be used to help shape the final JLTP4, which will be considered by our West of England Joint Committee later in the year.

Next consultation steps

Following on from what you told us, we are also now running another two consultations which look in more detail at bus services, walking and cycling.

Bus services

We asked some questions about bus services as part of this consultation; following on from this we want your views on our Bus Strategy in later in the year. This will consider options to improve the performance of the bus network across the region and set out how further growth in bus usage can be encouraged, including proposals to create better, faster, more reliable and more accessible services.

Walking and cycling

We will also be running a consultation on our Cycling and Walking Plan – this is a more detailed plan which proposes investment in cycling and walking routes of £411 million over the next 16 years. It aims to provide high quality infrastructure to support our transition to a region where cycling and walking are the preferred choice for shorter trips.

Consultation approach

Given this is the most ambitious JLTP that has been produced by the West of England we wanted to ensure that as many people as possible had a chance to respond to the consultation on the document. As such, we were keen to explore new ways of engaging with the public to try to encourage those who do not usually take part in public consultations.

Priority simulator tool

We were aware of previous consultations that had been carried out in the region that had used a simulator tool to allow people to respond by allocating points to a set of policies and measures. This approach allowed those policies and measures to be prioritised in a meaningful way whilst at the same time helping to inform those people of the consequences of their selections.

This method was adapted for the JLTP4 consultation with the creation of a simulator tool that allowed people to have a 'budget' of 20 points and a maximum allocation of up to five points for each transport measure featured in the JLTP4 to identify what transport measures they would like to see prioritised. More points could be 'earned' by selecting any of the proposed funding measures that feature in the JLTP4, which in turn could be allocated to more transport measures. Through this simulator approach, people were given an insight into the challenge of prioritising transport improvements in the region with a limited budget and highlighted that in order to achieve more we would have to identify new ways to fund them. The simulator was used to gather responses on the types of measures that our people want to see prioritised as well as the level of support for measures to fund them.

Questionnaire

Accompanying the simulator, we were interested in capturing views on the proposed objectives and approaches as set out in the draft JLTP4. As such, a questionnaire was created, asking how strongly people agreed with the vision, objectives and approaches set out in the draft JLTP4. The questionnaire was available both online and in paper format (available at libraries) and allowed respondents to provide any additional comments in a free text section.

Webpage and video

We created a short video that summarised the JLTP4 and explained what it seeks to do, how the consultation works and what the next steps will be following the consultation. A dedicated consultation webpage was included on the Travelwest website. The webpage included links to the draft of the full JLTP4, a summary of the JLTP4, and an easy read version for accessibility purposes, as well as other key documents such as environmental and habitat reports and the previous JLTP4.

Digital campaign

Use of social media has the potential to engage with a considerably wider audience than traditional methods alone. At the time of the consultation, West of England authorities' Twitter accounts had over 140,000 followers. Given the potential reach of our social media, the West of England

Combined Authority's communications team led the social media activity/advertising via the Travelwest Twitter and Facebook accounts and drafted a social media toolkit for the West of England councils to coordinate their accounts. Over the course of the consultation, the social media activity exceeded over half a million views.

Materials

Posters, postcards and hard copies of the JLTP4 summary and the questionnaire were sent to the larger libraries and customer service points around the region. The posters and postcards contained the web address, encouraging people to complete the consultation online. The paper copies of the questionnaire were made available for anyone for whom accessing online information is difficult.

Summary

A summary of the draft JLTP4 was also created to make it easier for people to engage with the content. The document made available on the Travelwest website and hard copy by request.

Easy-Read version

Throughout the consultation process we engaged very closely with equalities groups and subsequently an easy read version of the draft JLTP4 document was created for people with a learning disability who like clearly written words with pictures to help them understand. These were made available on the Travelwest website, with hard copies available on request.

Advisory Group

To build upon the success of the JLTP3 an Advisory Group was established to provide technical and professional advice and guide the development of JLTP4. Comprising of key transport operators and providers, transport user groups, delivery partners and discipline experts two workshops took place. These provided the West of England authorities with advice on issues, challenges, types of interventions, areas of focus, and innovation and helped build on existing partnerships to continue improving the region.

Stakeholder workshop

The draft JLTP4 was launched to stakeholders in February 2019 at the Somerdale Pavilion in Keynsham. The event was attended by approximately 100 stakeholders from a range of organisations including transport operators, user groups, statutory bodies, campaign groups, health professionals, environmental organisations and academia. The purpose of the event was to:

- Provide an overview of the draft JLTP4 document, strategy and transport measures
- Explain the consultation and how feedback will guide the development of the final plan
- Stimulate discussion about the plan and gain some initial feedback
- Encourage people to spread the word about the consultation, including the priority simulator tool and questionnaire

Consultation results

Summary statistics

- 539, 536 views on social media
- 67,443 views of our engagement video
- 11,200 website views
- 4,090 document downloads
- 4,192 responses, including:
  - Letters/emails: 1,979
  - Online questionnaire responses: 1,317
  - Paper questionnaire responses: 28
  - Priority simulator tool responses: 868

Questionnaire and priority simulator tool: overview

Respondents could complete the questionnaire (online or offline), the priority simulator tool (online only), or both. The simulator asked respondents to identify their priorities for specific measures, whereas the questionnaire asked respondents their views on the content of the Joint Local Transport Plan. The questionnaire included sections of the strategy and asked respondents how far they agree with each section

Demographic information

The priority simulator tool attracted a significantly younger demographic and was slightly more popular with female participants as illustrated in the figures below.

Figure 1: Age of participants completing Questionnaire and Priority Simulator Tool

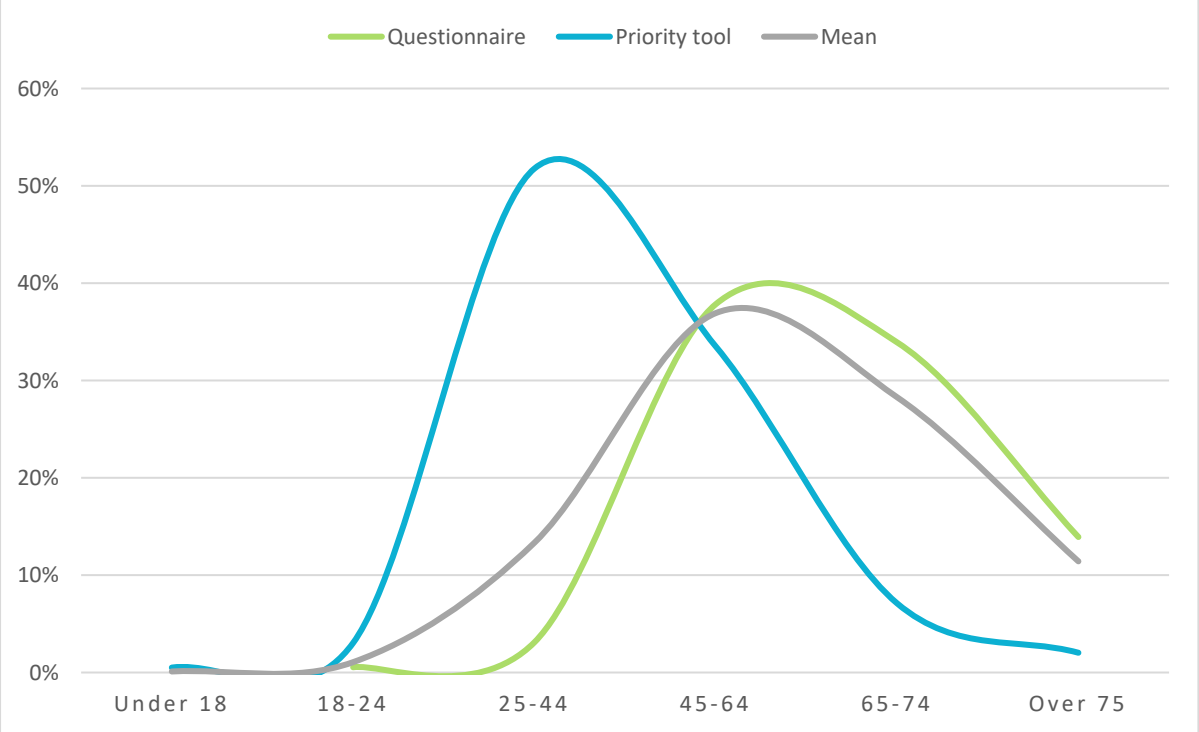
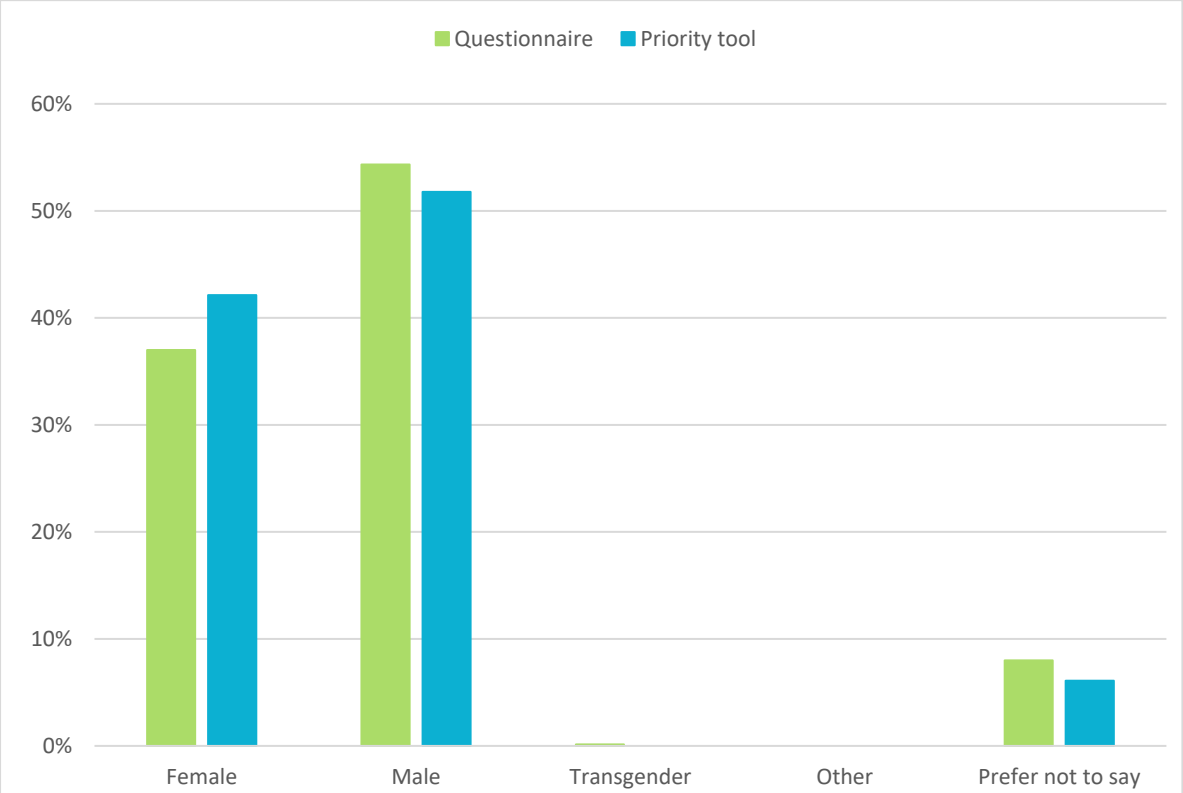
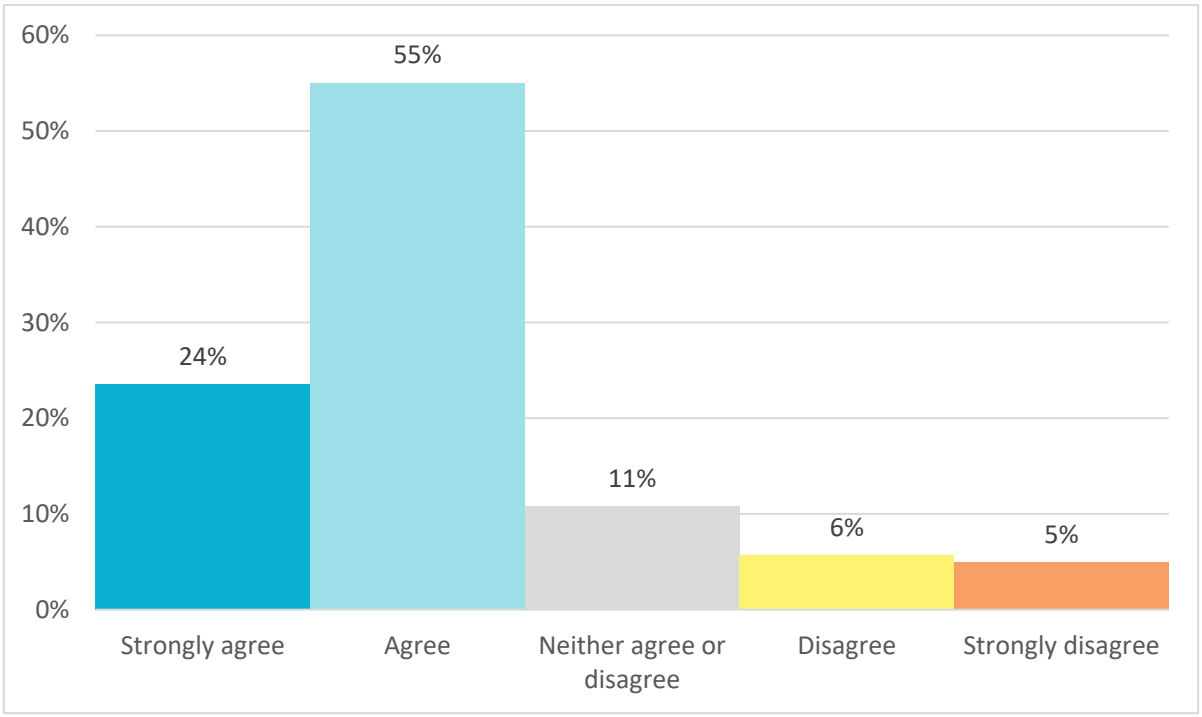


Figure 2: Gender of participants completing Questionnaire and Priority Simulator Tool

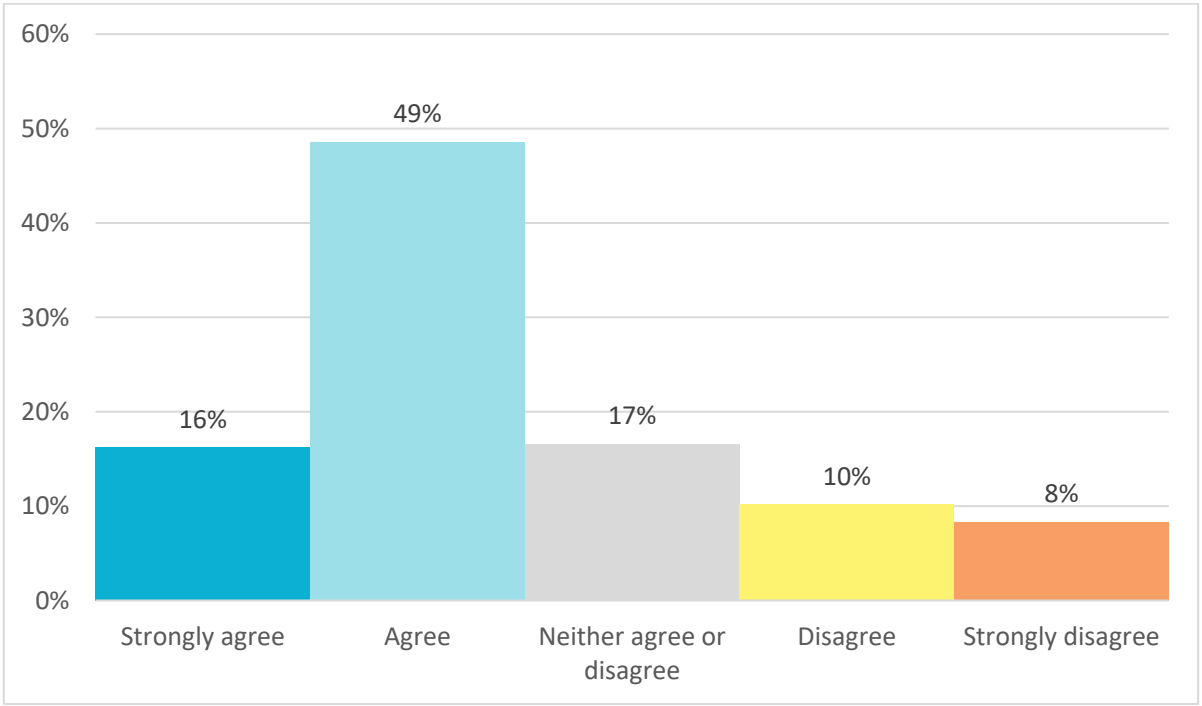


Questionnaire: multiple choice

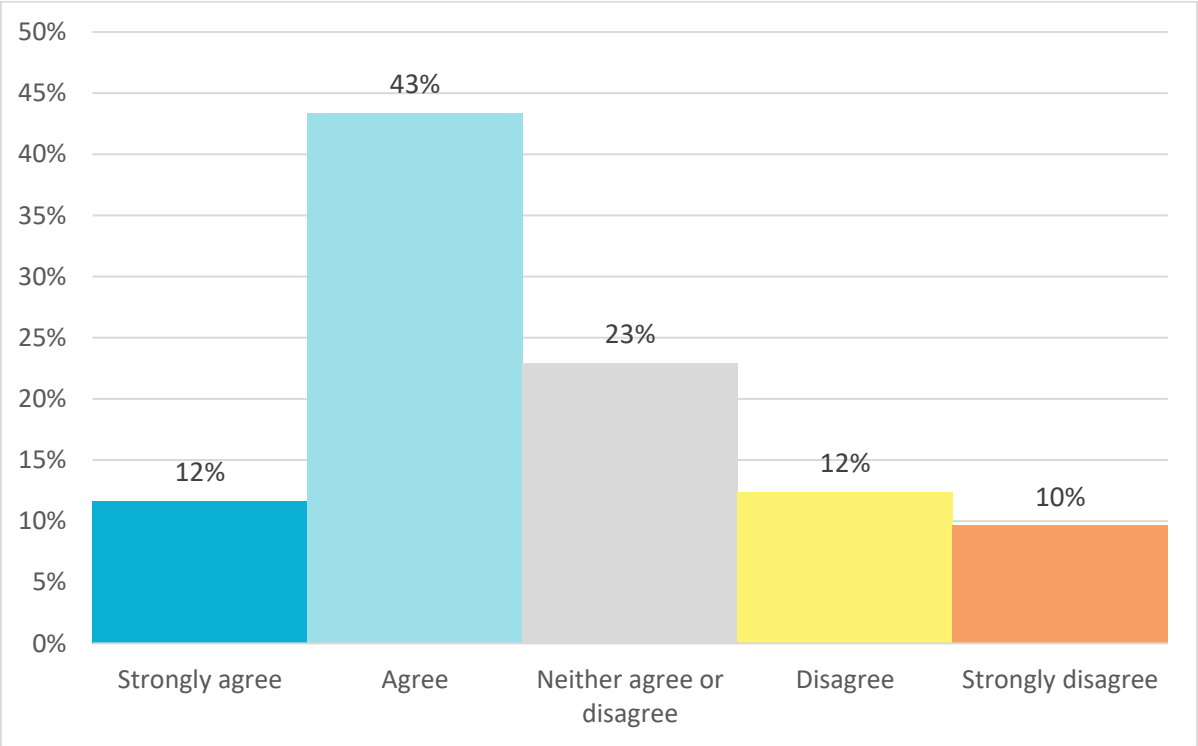
How far do you agree with the **challenges** identified in the West of England JLTP4?



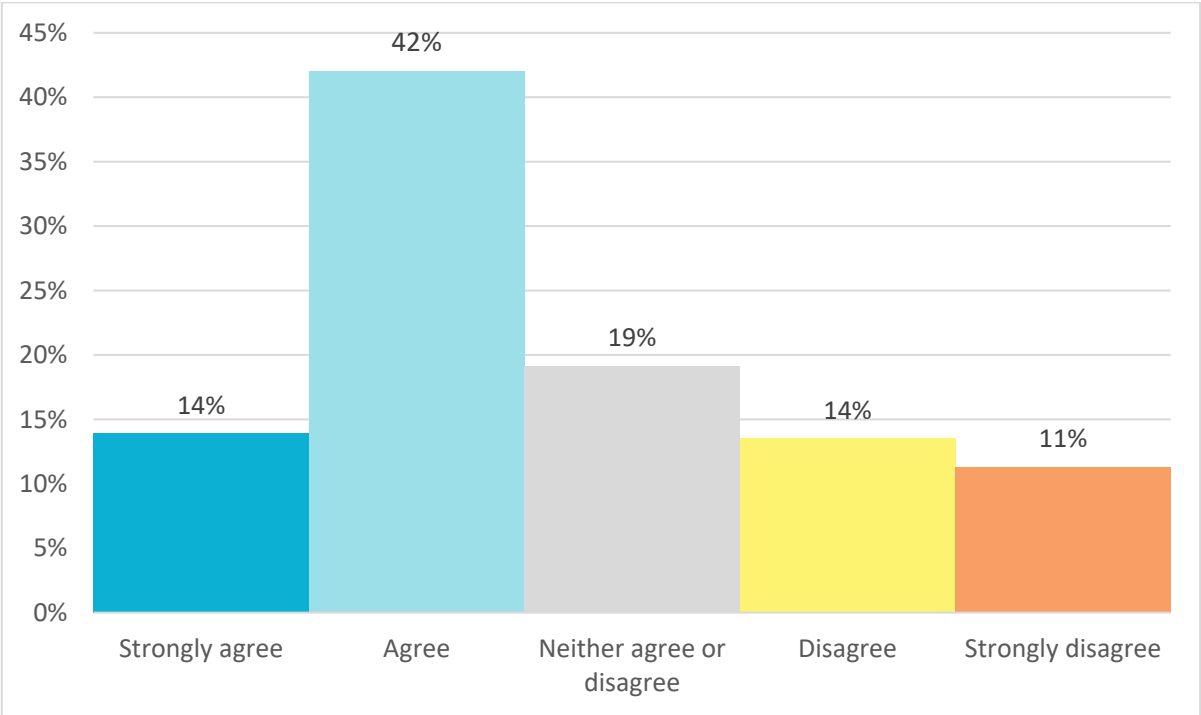
How far do you agree with the **vision and objectives** identified in the West of England JLTP4?



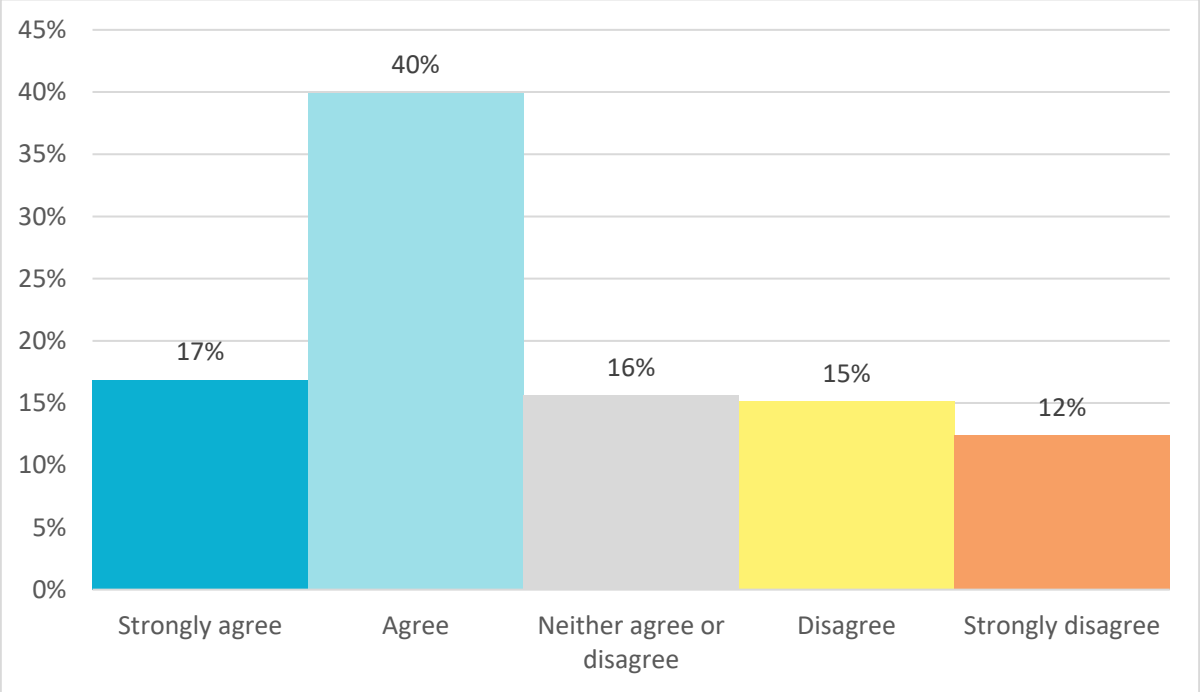
How far do you agree with our approach for improving connectivity for trips **beyond** the West of England?



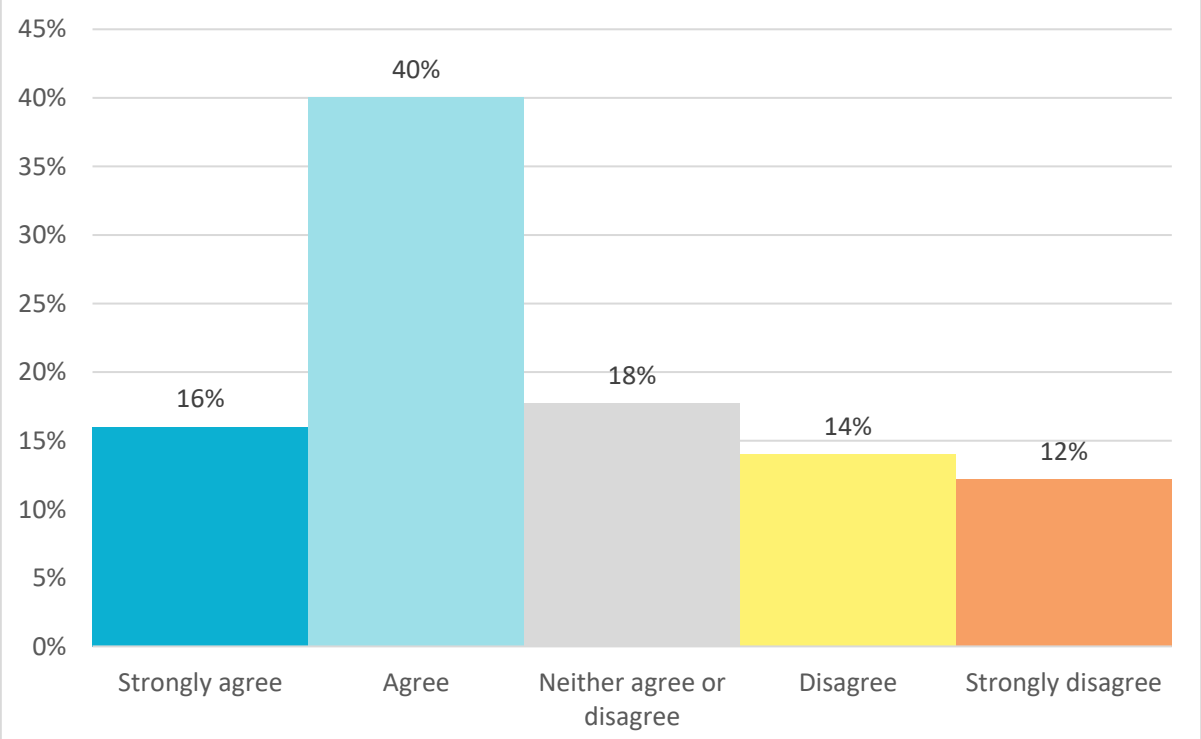
How far do you agree with our approach for improving connectivity for trips **within** in the West of England?



How far do you agree with our approach for improving connectivity for **local trips** in the West of England?

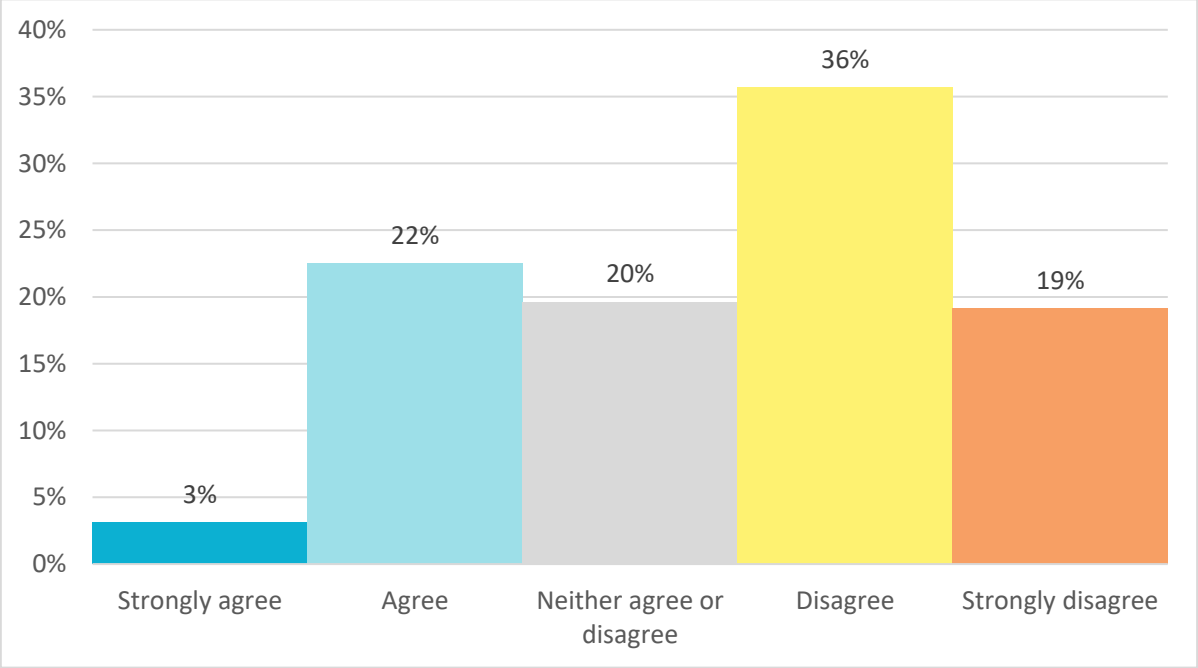


How far do you agree with our approach for improving connectivity for **neighbourhood trips** in the West of England?

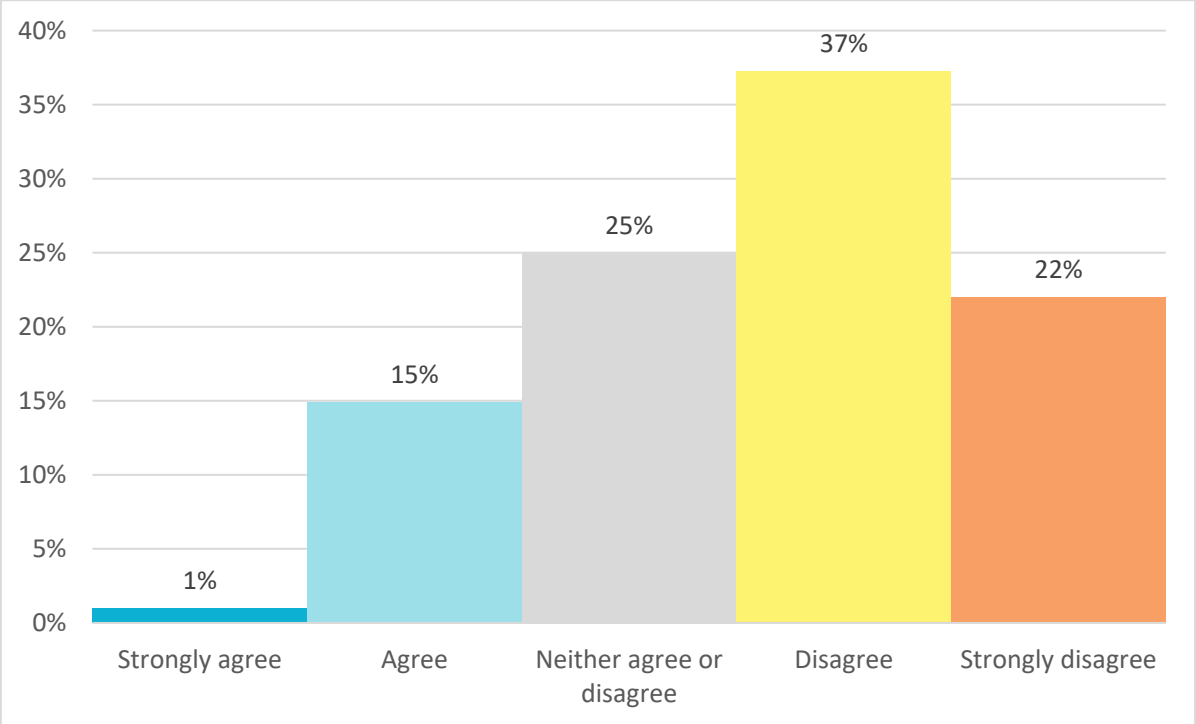


To support the development of the Bus Strategy, we asked three questions about buses in the West of England:

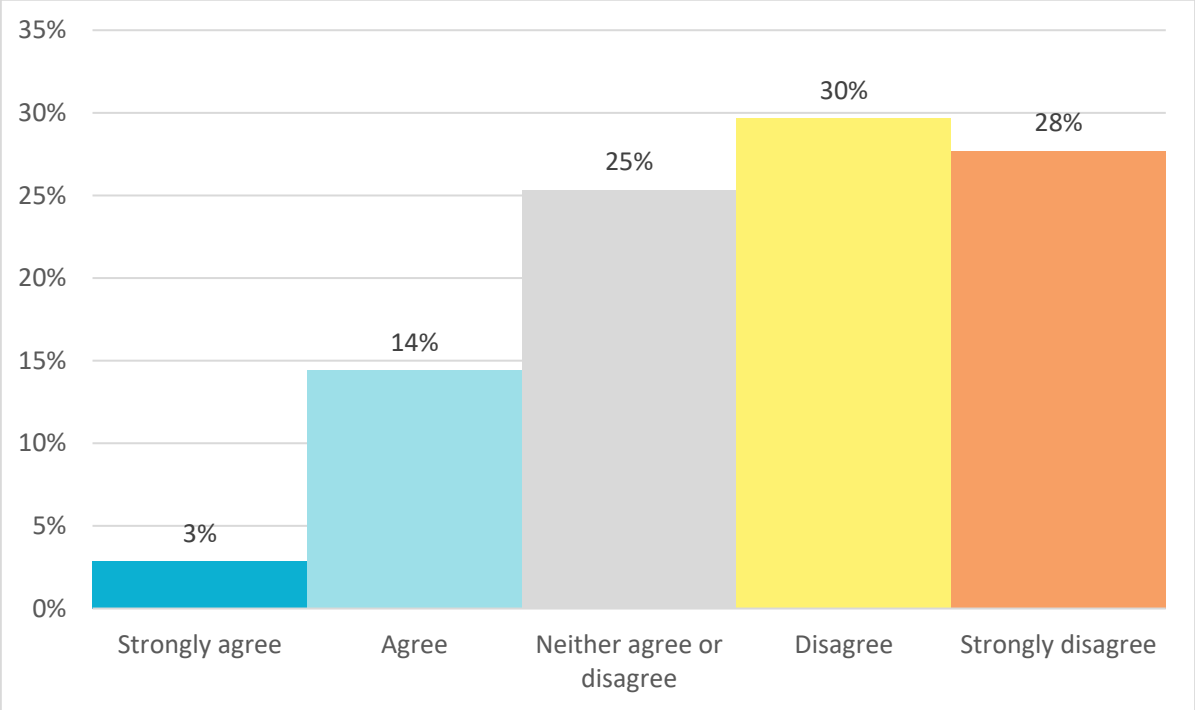
How far do you agree that it is **easy to plan** and make a journey by bus in the West of England?



How far do you agree that bus services in the West of England are **reliable**?

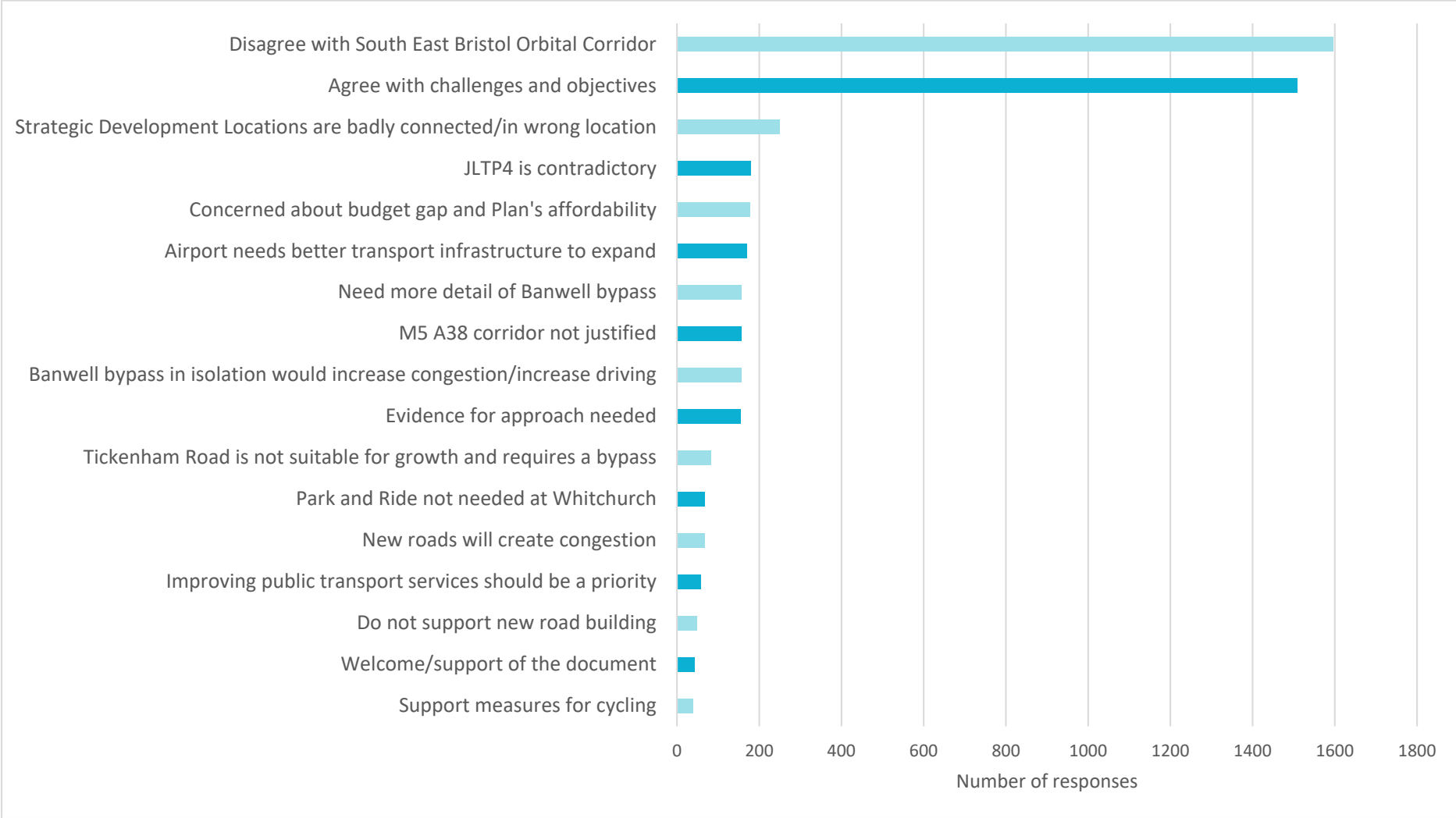


How far do you agree that travelling by bus in the West of England is **good value for money**?



Questionnaire: free text box, email and letter

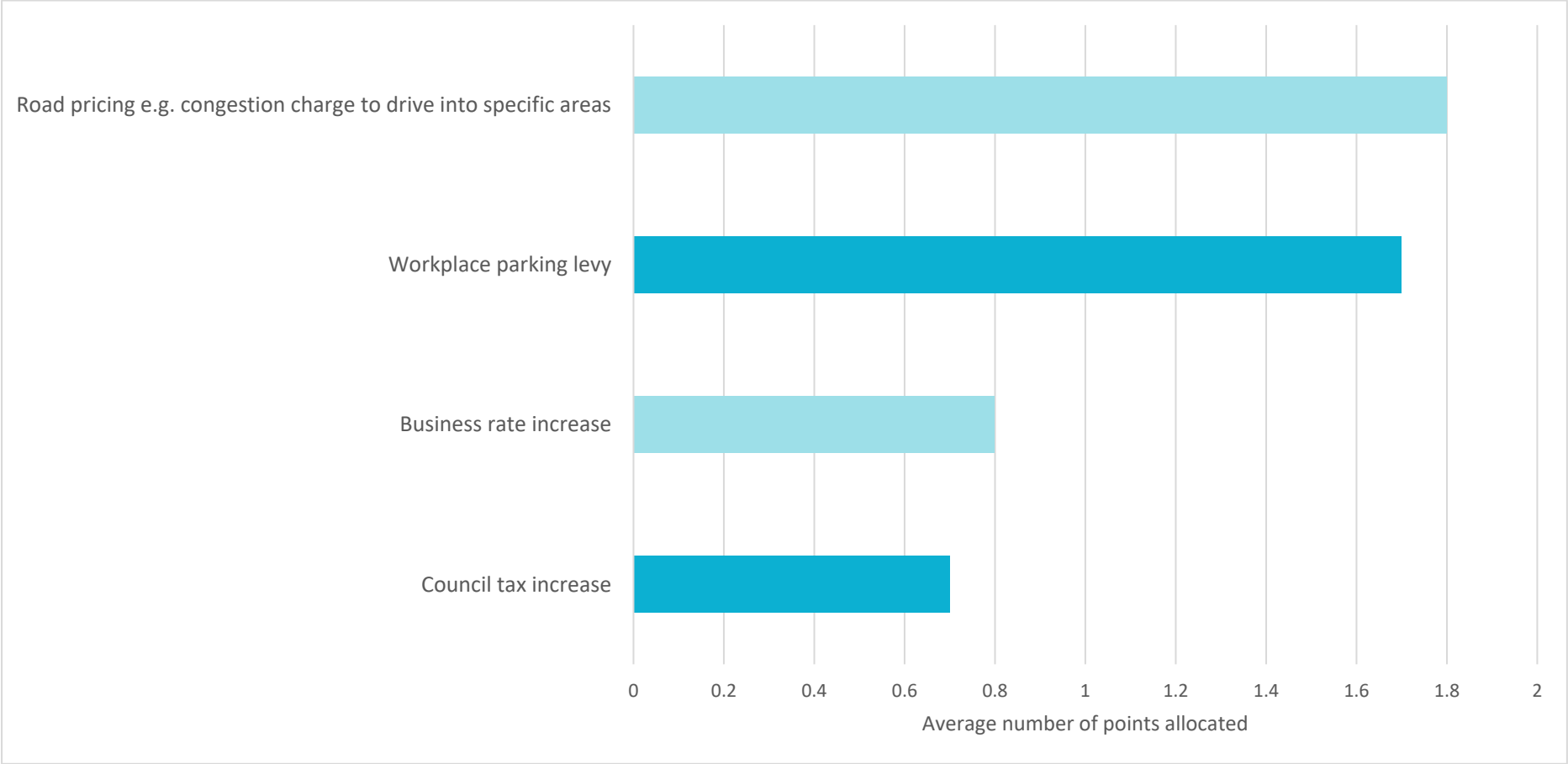
The graph below shows the most responded to issues in the JLTP4, by theme, received via email, letter, and the free-text section of the questionnaire.



Priority simulator tool: prioritising transport measures

Respondents to the simulator allocated up to five points to the transport measures they would like to prioritise in the West of England. The charts below show the average points allocated to each funding measure and each transport measure from most popular to least.

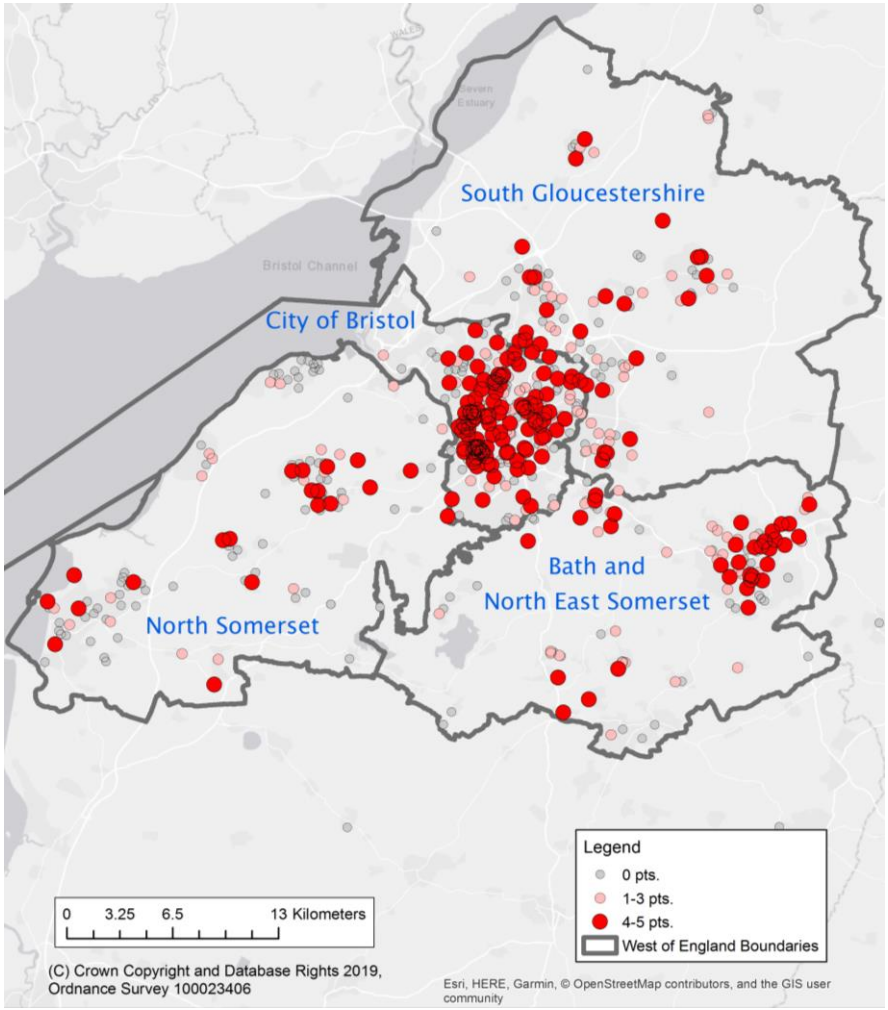
How people would increase transport funding



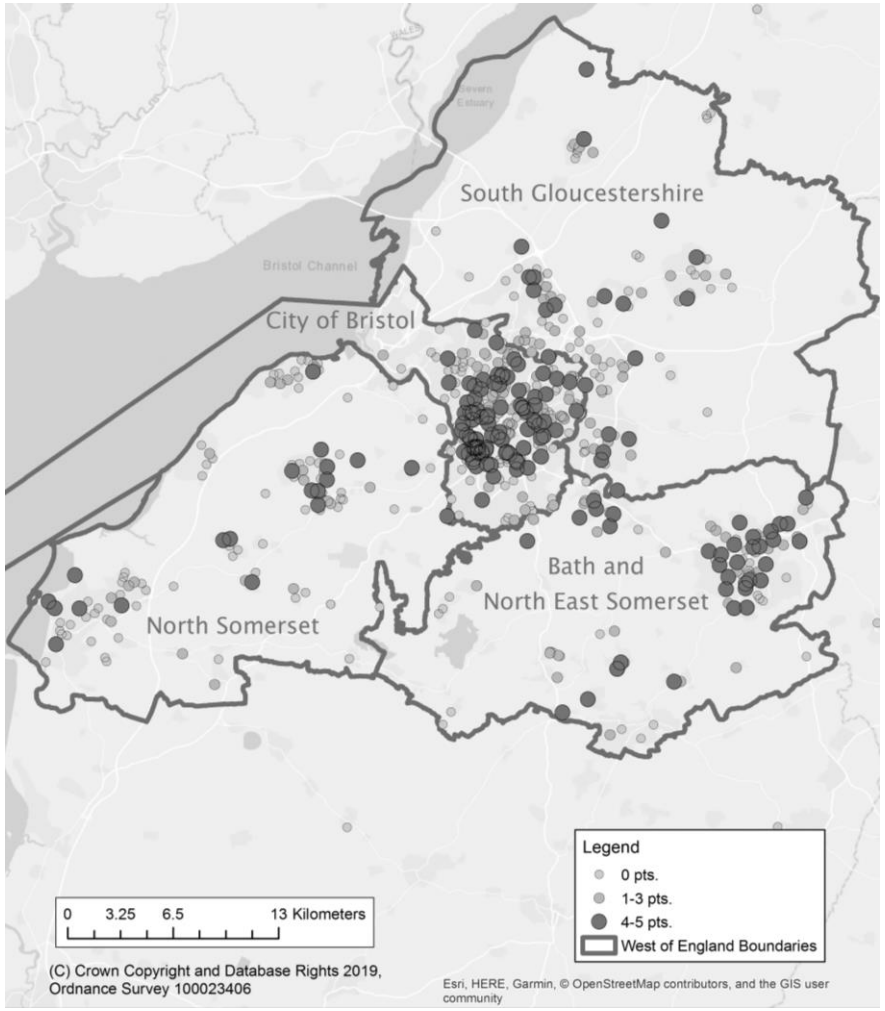
Where people responded from

We were keen to explore where people who responded to the consultation live to get a better understanding of the issues or priorities people face in different parts of the region. The maps below show how people would increase transport funding and where people responded from in the region.

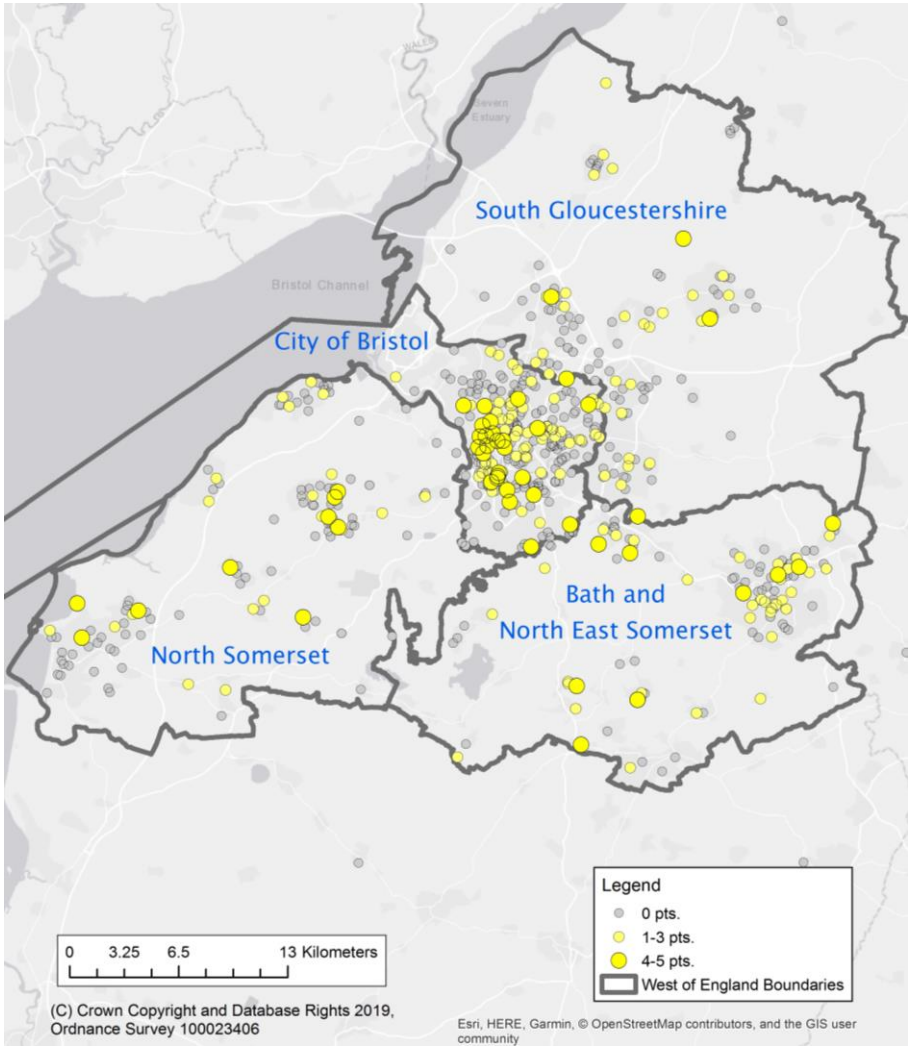
Road pricing eg. congestion charge to drive into specific areas



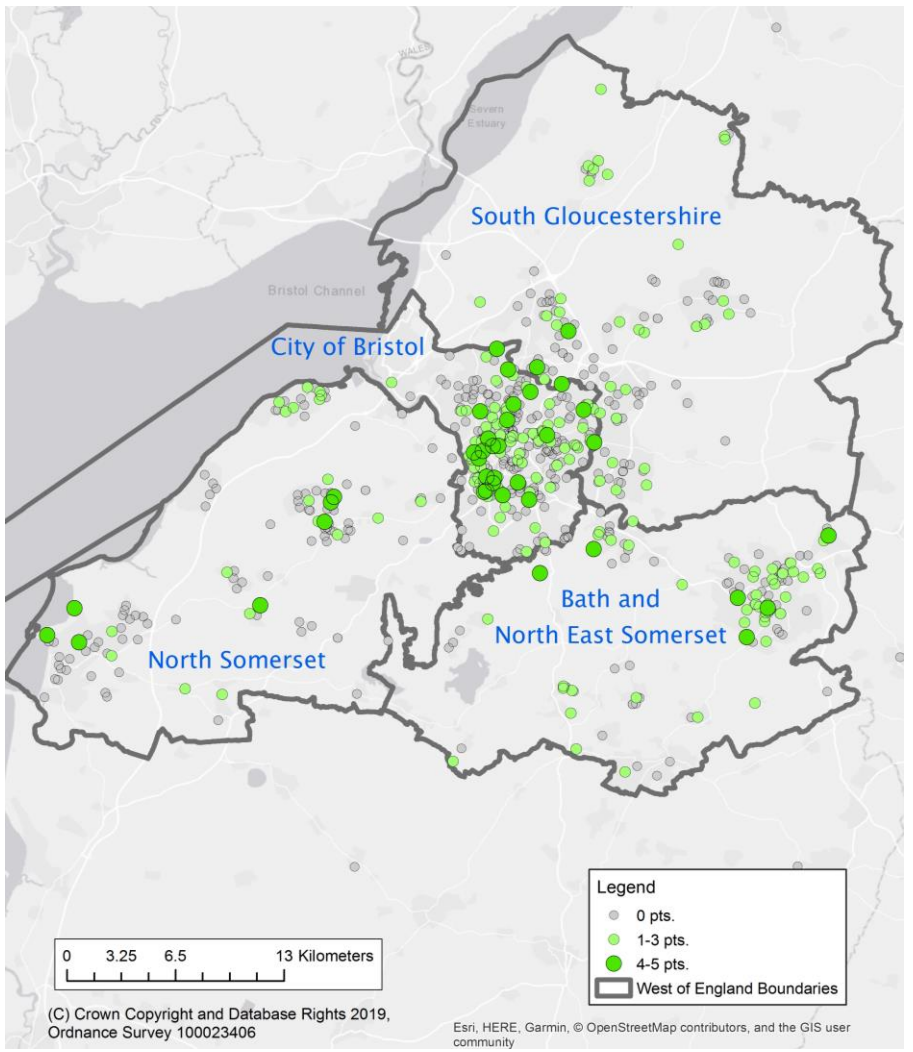
Workplace parking levy



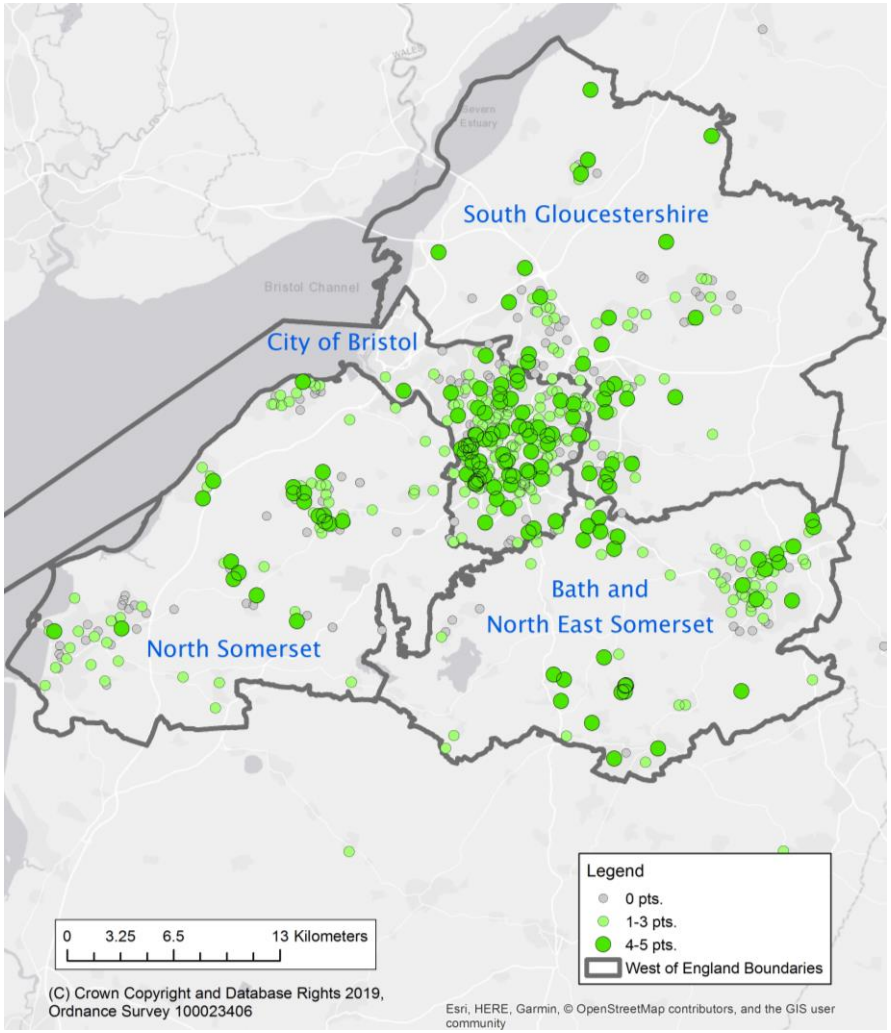
Business rate increase



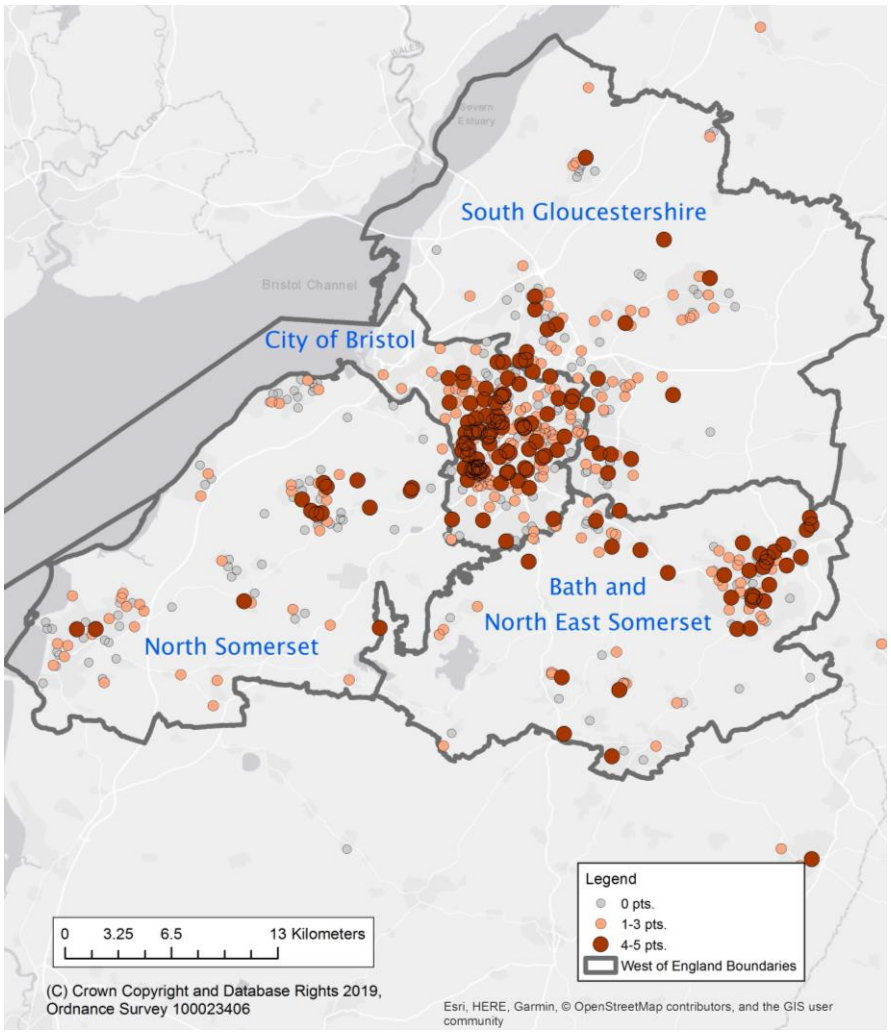
Council tax increase



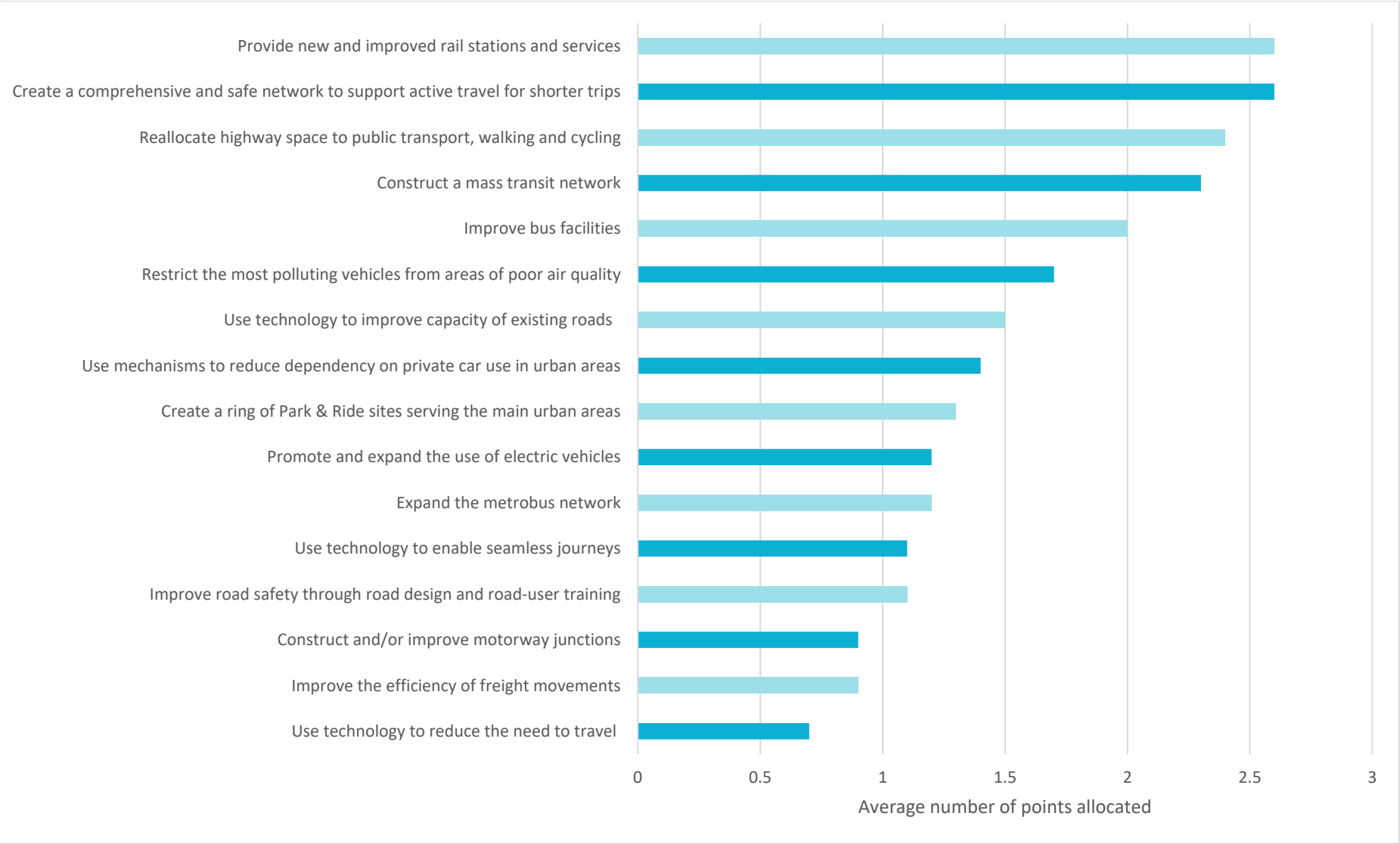
Improve bus facilities



Restrict polluting vehicles



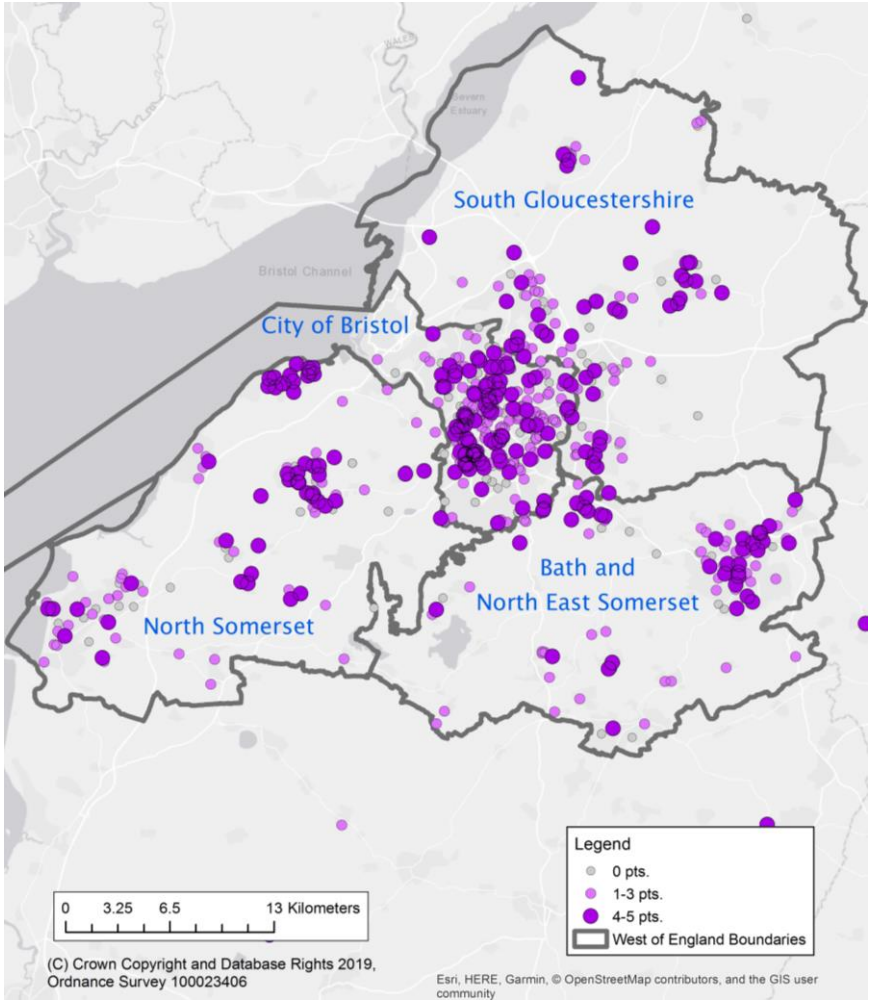
How people would prioritise transport spending



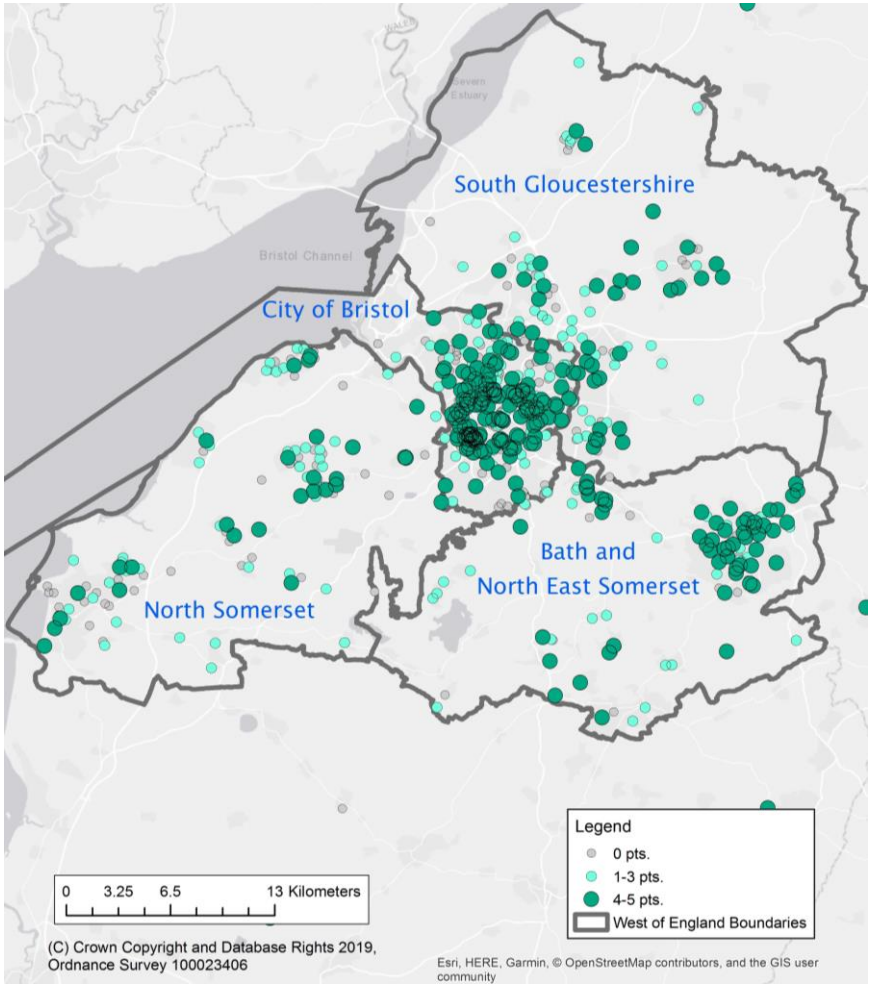
Where people responded from

We were keen to explore where people who responded to the consultation live to get a better understanding of the issues or priorities people face in different parts of the region. The maps below show how people would prioritise transport spending and where people responded from in the region.

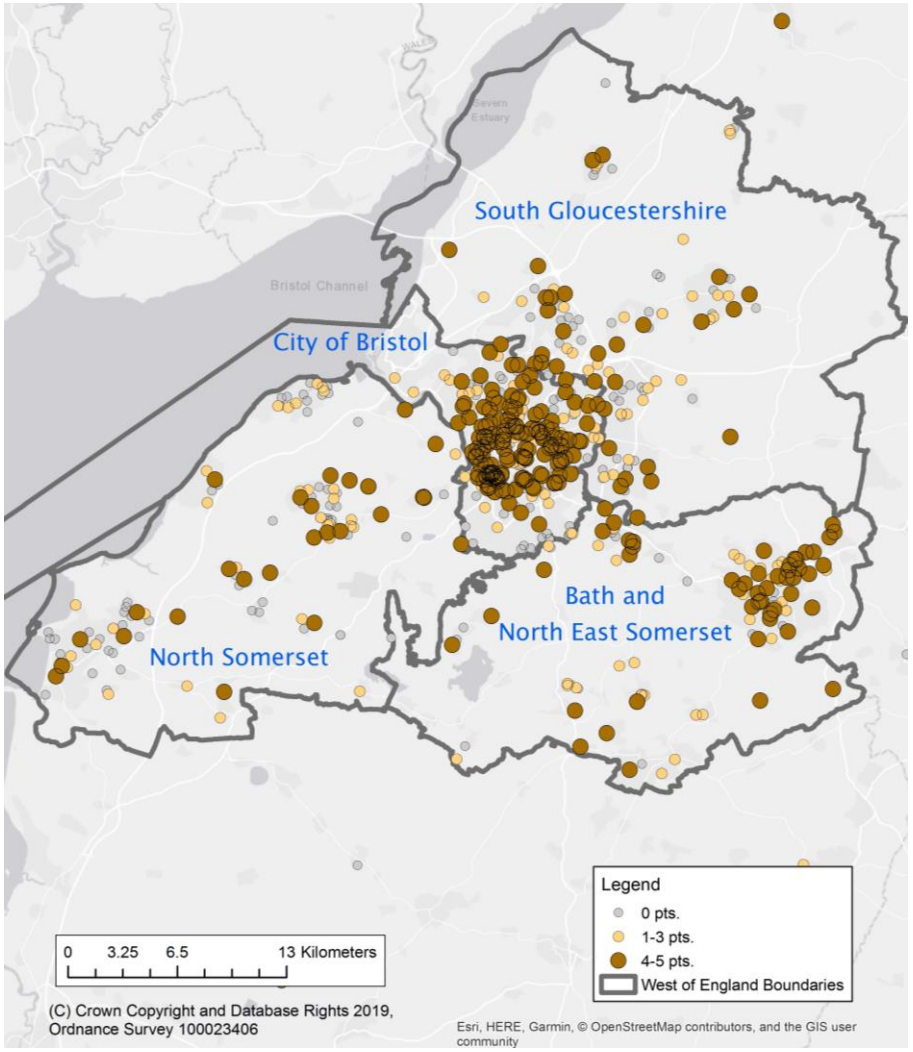
Provide new and improved rail services



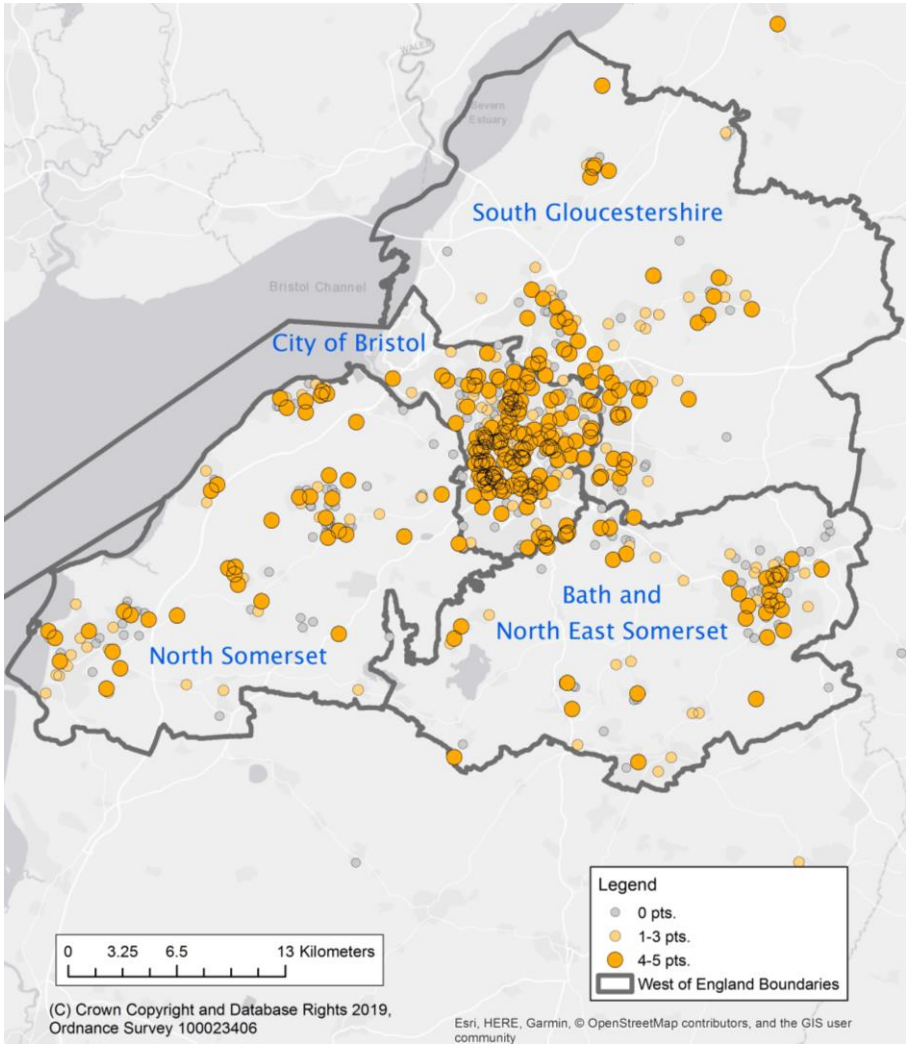
Create a comprehensive and safe network to support active travel for shorter trips



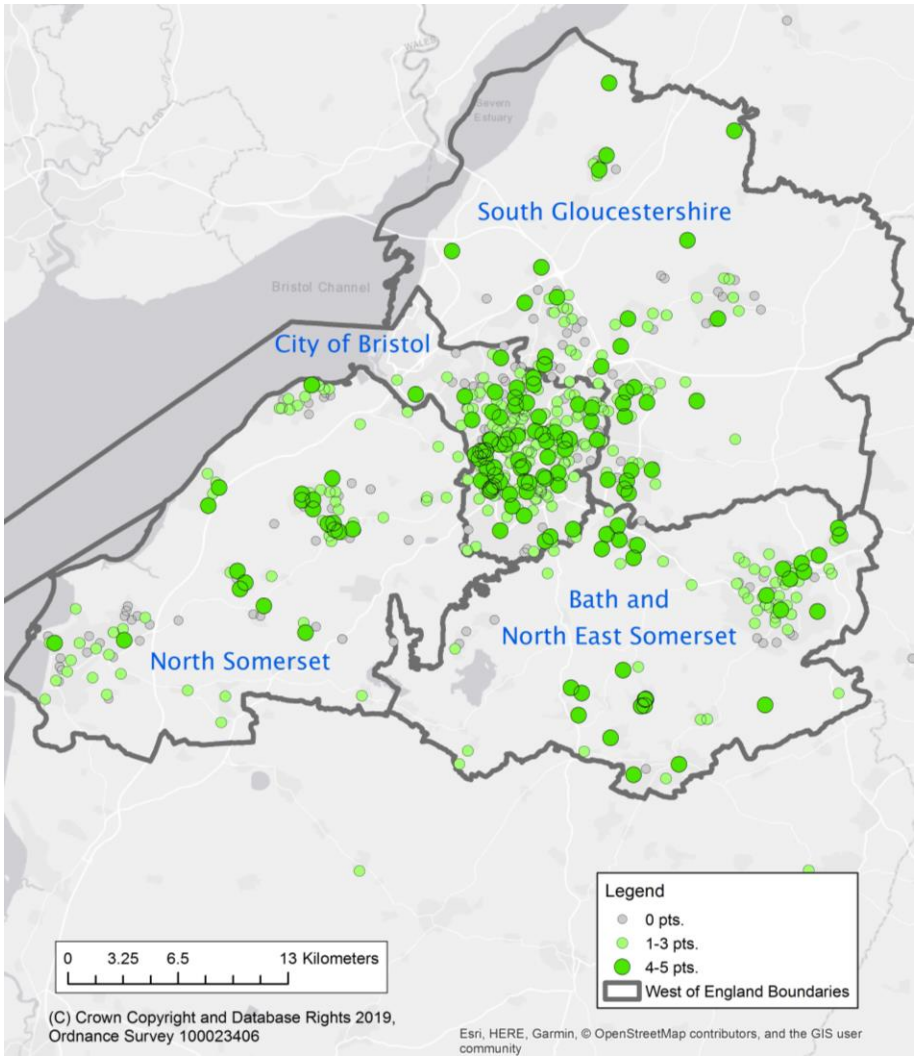
Reallocate highway space to public transport, walking and cycling



Construct a mass transit network

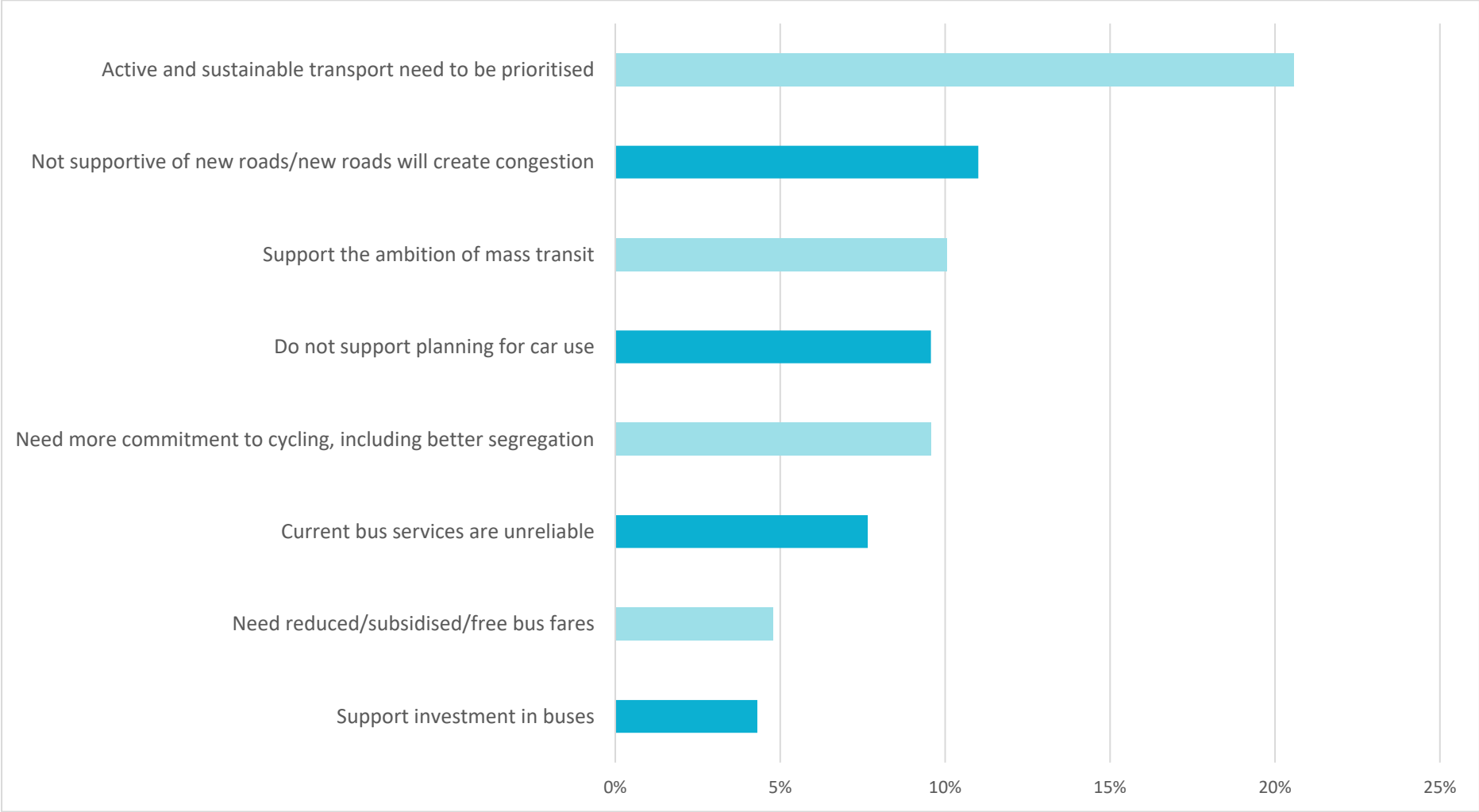


Improve bus facilities



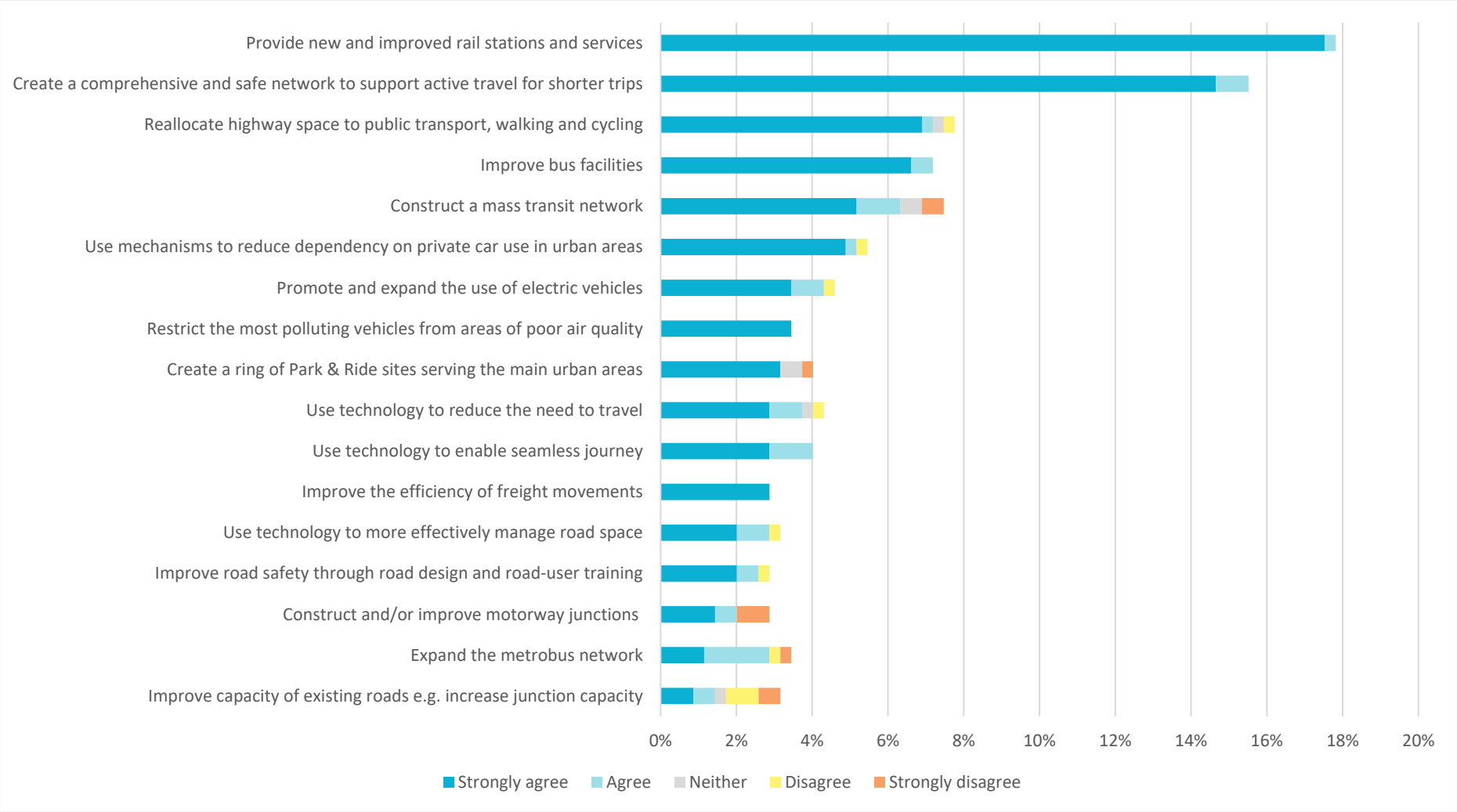
Priority simulator tool: free text box

The graph below shows the issues most frequently raised by people in the free-text section of the priority simulator tool.



Stakeholder event: prioritising transport measures

We ran an adapted offline version of the priority simulator tool at the stakeholder event. Attendees were each given stickers and asked to allocate them against which transport measures they supported or opposed on a chart. 348 stickers were allocated, and their distribution is shown below.



Stakeholder event: facilitated discussions

Stakeholders were invited to provide feedback on the various aspects of the plan including the vision, objectives and challenges as well as the concept of the four connectivity levels and the policies, interventions and actions that were being proposed as part of these.

The facilitated discussions covered a wide range of issues which were grouped into three main themes:

Interchange and connectivity

- Most modes of transport (walking, bus, rail, e-bikes) cover multiple levels of connectivity to some degree, and all play a role in contributing to multi stage journeys.
- Facilitation of multimodal journeys requires the development of high-quality and attractive infrastructure including new rail stations and rail services, safe cycle routes, prioritised bus lanes and user-friendly and inter-modal transport hubs which also recognise the role of the taxi.
- Rural locations require some form of non-car transport provision
- Demand for orbital bus routes
- Public transport needs to be attractively priced with an easy to understand fare structure

Environment

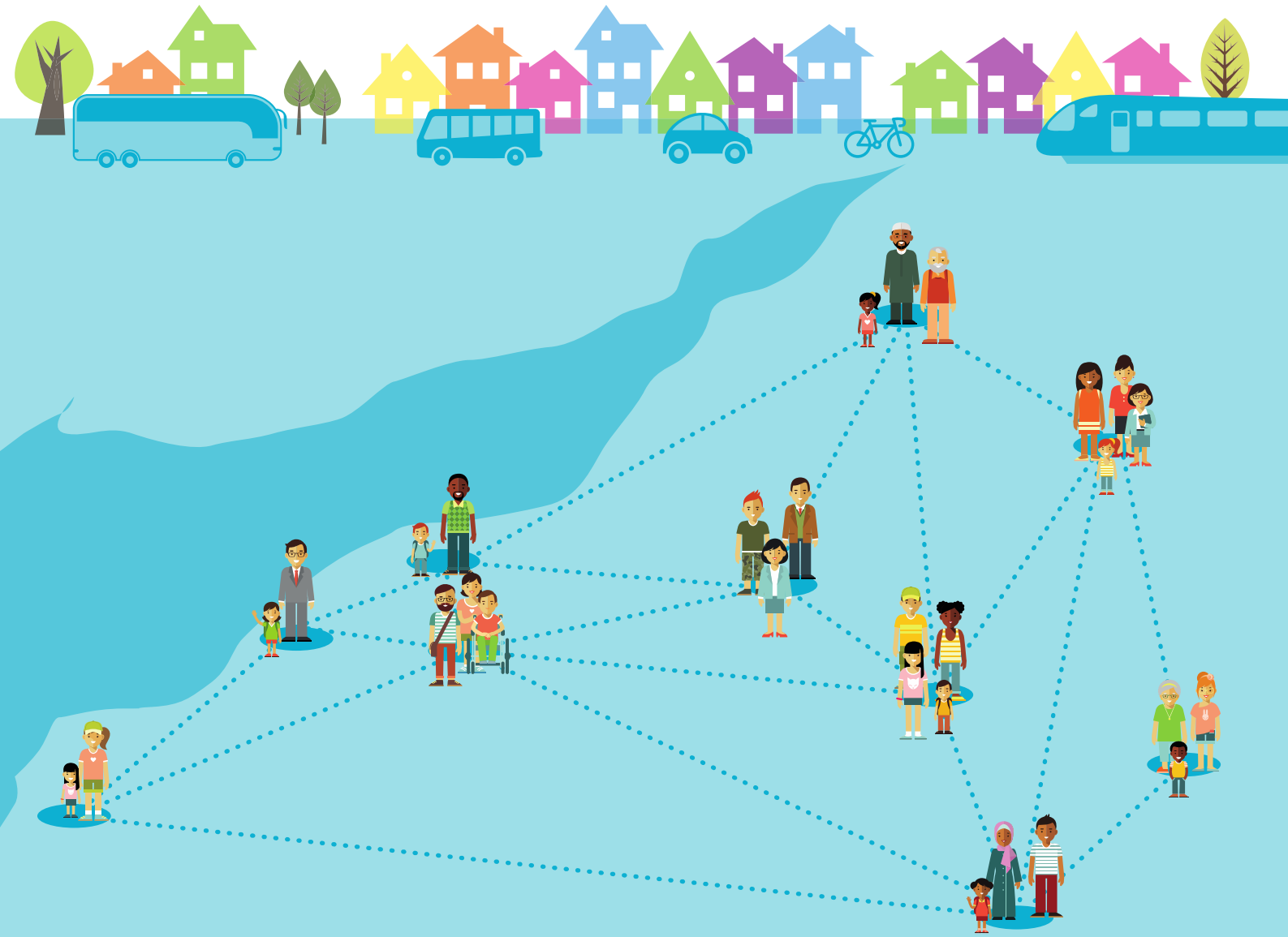
- Building new roads will worsen carbon emissions
- Low carbon transport to the Airport is negated if airport expansion permitted
- Freight (HGVs) should be restricted within city centres
- Decision makers need to be bold about introducing potentially unpopular measures to restrict car use, e.g. Workplace Parking Levy for city centre employers to achieve the required mode shift.

Delivery

- Need to consider those with limited access to technology
- Behaviour change initiatives are low cost, and can be delivered quickly compared to infrastructure
- Tourism should be considered

Methodology

A wide range of people participated in the consultation. Different ways of consulting (e.g. priority simulator tool, questionnaire) resulted in slightly different demographics: the priority simulator tool was more popular with the 25-44 age range, and women, although overall slightly more men responded to the consultation than women. By making use of digital methods of consultation and targeting younger demographics when promoting the consultation on social media, we received greater representation in those age groups than other comparable consultations.



Bath & North East Somerset Council

BRISTOL CITY COUNCIL

North Somerset COUNCIL

South Gloucestershire Council

WEST OF ENGLAND Combined Authority