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1. Introduction

1.1. Joint Spatial Plan and Joint Transport Study

The West of England authorities (Bath & North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council), supported by the West of England office, are in the process of preparing a Joint Spatial Plan (JSP) and Joint Transport Study (JTS). The JSP and JTS cover the whole of the West of England, including Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire.

The purpose of the JSP is to consider the long-term development needs in the West of England to 2036 and identify strategic locations for growth. This includes identifying overall requirements for housing and employment land, along with the most appropriate locations for the new housing and employment, and transport and other infrastructure requirements in the Plan area. This growth is addressed partially in the Local Plans of the four authorities but these only address housing and employment needs as far as the late-2020s. The proposed strategy for development to 2036 is set out in Towards the Emerging Spatial Strategy, which has been published at the same time as this Emerging Transport Vision. Further information can be found on the website at https://www.jointplanningwofe.org.uk/consult.ti.

The purpose of the JTS is to provide a clear direction for the long-term development of the transport system in the West of England to 2036 and beyond. This will follow on from the current Joint Local Transport Plan (JLTP) which sets investment priorities to 2026. The JTS will also inform, and be informed by, the JSP. It has therefore considered different spatial options and supported the development of the Emerging Spatial Strategy. The JTS identifies an overall approach for transport to deliver growth in the region: this approach is the Transport Vision. The Transport Vision addresses the combined impact of current challenges on the network, growth from committed development in Local Plans and longer term growth up to 2036. Further information on the Vision can be found on the website at https://www.jointplanningwofe.org.uk/consult.ti.

The Transport Vision outlines the transport measures required to tackle not only current challenges on the network but also to deliver future growth in the region. The Transport Vision includes some schemes that will help specifically to address the impact of new journeys generated by development at locations in the Emerging Spatial Strategy. Subject to the results of the consultation, the councils will plan how to ensure that investment programmes are prioritised so that new development locations come forward at the same time as the transport schemes which help to address their impacts on the network.

1.2. Purpose of this Report

This report presents the Transport Vision for the West of England. It draws on extensive analysis of the current and future problems on the transport network and the potential implications for the West of England’s economic, environmental and social future. These issues were set out in the Key Principles Report, which formed part of the consultation on transport issues and options that took place in late 2015 and early 2016. The feedback from the consultation has been a key factor, alongside technical work on potential options, in developing the overall Transport Vision.


Following the completion of consultation on the Emerging Transport Vision (as well as the Emerging Spatial Strategy), feedback from the public and stakeholders will be considered in reviewing the key components of the Transport Vision. A final report from the Joint Transport Study will be prepared in spring 2017. This will be used to inform the development of the next JLTP and investment programmes for the West of England.

1.3. Structure of this Report

The remainder of this report is structured as follows:
• Chapter 2 presents the transport challenges for the area, both now and in the future, and the transport objectives that have been used to shape the Transport Vision;
• Chapter 3 describes the key components of the Transport Vision, with a focus on key corridors in the West of England; and
• Chapter 4 sets out the potential benefits, costs and issues in delivering the Transport Vision.
2. Shaping the Transport Vision

2.1. Introduction

The West of England is a successful city region with strong potential for further growth. This economic success has created strong demand for travel, which will increase rapidly with the future growth of the area. However, the transport network has failed to evolve to these changing needs; the problems of limited travel choices, heavy congestion and unreliable journeys in many areas are holding back our potential. Investment in the transport network will be a critical component for the future success of the city region.

Significant progress is already being made in encouraging sustainable transport choices. Major improvements have already been delivered in recent years, including the Greater Bristol Bus Network, Bath Package, Weston Package and Local Sustainable Transport Fund (LSTF) programmes. The numbers of people travelling by bus, train and cycling have all grown substantially since 2008 and a significantly higher proportion of people walk and cycle than in equivalent city regions such as Birmingham, Leeds and Manchester. However, much deeper behaviour change, much higher levels of walking, cycling and public transport use and more effective use of the road network will be needed for the area to function effectively in the future.

This chapter outlines the transport challenges facing the region, the objectives for the future transport network and the potential transport concepts that were considered as options to help shape the Emerging Transport Vision.

2.2. Transport Challenges

The West of England faces significant transport challenges, at present, with current planned growth, and with the longer-term growth of the area.

- Current challenges – the area currently faces a number of problems with limited travel choices for many people, high levels of car dependence and congestion on the road network. These will be partly addressed by the current transport investment programme, but a number of challenges will remain. These can be viewed as ‘legacy’ problems of connectivity, capacity, congestion and impacts of transport on quality of life and the environment.

- Growth in current Local Plans – a significant amount of growth in housing and jobs is identified in the current Local Plans covering the period to 2026: this will generate additional travel demand. The Local Plans have identified transport schemes to mitigate the effects of new development, but not all of these are funded by new developments. It is likely that the challenges will increase as the transport system fails to keep pace with growth in travel caused by economic growth and increased levels of activity.

- Longer term growth to 2036 and beyond – the evidence demonstrates that there will continue to be strong growth in the numbers of people living and working in the area, causing increased travel demand and placing further pressures on the transport system. However, there are also opportunities to shape future travel demand through the Emerging Spatial Strategy, new transformational infrastructure and new ways of travelling.

The transport challenges for the West of England are discussed in more detail in Appendix A and can be summarised as follows:

- There are limited travel options – many areas have limited travel choices caused by poor conditions for walking and cycling, slow and infrequent bus services, the limited number of railway stations and infrequent train services, which result in high levels of car dependence for many journeys.

- Congestion on the road network – high levels of car use are causing overloaded road networks, long traffic delays, rat-running along inappropriate roads and poor reliability of journey times. Future growth in traffic demand will exacerbate these problems.

- Transport problems are a barrier to economic growth – the West of England is one of the UK’s best-performing city regions, with high numbers of well-qualified workers and innovative businesses
and very strong growth potential. However, limited travel options and high levels of congestion will be a serious barrier to the future competitiveness and growth of the city region.

- **Demand for housing will create new pressures** – the West of England is an attractive place to live and there will be growth in the number of people wishing to live and work in the area. This will necessitate new housing, which will generate more travel and exacerbate pressures on the transport network.

- **There are a number of social challenges** – there are high levels of social inequality, with people in some communities suffering from poor life chances. Problems caused by the transport network include poor accessibility, severance caused by high volumes of traffic, safety issues and poor air quality.

- **The transport network impacts on the environment** – the West of England has many environmental assets, including Areas of Outstanding Natural Beauty (AONBs) and a rich built environment, but the transport system has a number of negative impacts, including carbon emissions, noise on busy corridors, poor air quality in urban areas and visual intrusion.

Failure to address these problems will have serious consequences for the West of England. The growth in the numbers of people living and working in the area will result in a significant increase in travel demand. This will include large increases in the numbers of trips that will be made on foot, by bike and public transport. These include the forecast effects of the MetroBus and MetroWest projects (see Chapter 3 for more detail). However, there will also be large increases in the volume of travel by car, which will cause rising congestion, particularly within the main urban areas and along key traffic routes.

These problems will damage the competitiveness of the West of England for inward investment, which will in turn stifle economic growth. They will also constrain the delivery of new housing that is needed to accommodate the growing population of the area. These problems will also mean worsening quality of life, increased health problems (and deaths) caused by poor air quality and continued high levels of carbon emissions.

**People’s views on the transport challenges**

The Issues and Options consultation, which took place in late 2015 and early 2016, gave people the opportunity to comment on the transport challenges. There was generally strong agreement with the challenges that had been identified. At least two thirds of survey respondents agreed with the challenges, with particularly high levels of agreement with challenges relating to limited travel options and congestion, reliability, resilience and connectivity. Many people commented in their responses on the quality of travel choices in the sub-region, including buses, rail and cycling.

The responses revealed a consistent view amongst respondents on the importance of the challenges in both level of agreement and ranking. Travel choices and congestion, reliability, resilience and connectivity were identified as the most important challenges, followed by environmental challenges, then housing and employment growth, and finally the social challenges.

The evidence and the high level of agreement from consultees provides a compelling case for action to address the significant challenges that are faced – both now and looking into the future.

### 2.3. Transport Goals and Objectives

The West of England transport goals and objectives provide the framework for developing the Transport Vision. They are consistent with wider policy objectives for the West of England and they have been designed to respond to the challenges described in the preceding section. The goals and objectives also help in identifying and assessing potential options to tackle the problems.

Figure 2-1 shows the goals and objectives, together with the challenges that were described above.
Figure 2-1 Framework for shaping the Transport Vision

Vision

- An affordable, low carbon, accessible, integrated, efficient and reliable transport network to achieve a more competitive economy and better connected, more active and healthy communities.

Goals

- Support economic growth
- Reduce carbon emissions
- Promote accessibility
- Contribute to better safety, health & security
- Improve quality of life and a healthy natural environment

Challenges

- Impacts of congestion
- Limited transport options
- Social challenges
- Environmental impacts

Objectives

- **EC1**: Tackle congestion and improve journey times and journey time reliability
- **EC2**: Improve the resilience of road and rail networks to incidents and the impacts of climate change
- **EC3**: Deliver the transport infrastructure capacity needed to enable job creation and business growth
- **EC4**: Deliver the transport infrastructure needed to unlock sustainable growth in housing
- **EC5**: Improve connections with strategic road and rail links, Bristol Port, Bristol Airport and other Gateways

- **CA1**: Provide a transport network which is low carbon and resource efficient in operation
- **CA2**: Encourage low carbon travel choices

- **AC1**: Improve access for all to employment, education and training
- **AC2**: Improve access to local services

- **SH1**: Encourage healthy travel choices and behaviours
- **SH2**: Address issues of poor air quality generated by transport
- **SH3**: Improve the safety of all users of the transport network, particularly the most vulnerable

- **EV1**: Reduce the impacts of travel on the quality of places and enhance the built environment
- **EV2**: Minimise the impacts of transport and travel on the rural environment

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People’s views on the goals and objectives

The Issues and Options consultation gave people the opportunity to comment on the goals and objectives. Respondents considered that the most important goals are improving quality of life and a healthy natural environment, reducing carbon emissions and promoting accessibility. These three goals were strongly related by respondents to the priority challenges of tackling congestion, improving travel options and reducing impacts on the environment. In particular, people made strong links between problems caused by poor travel choices and congestion impacting on their own quality of life.

Whilst the goal to support economic growth was not identified as the highest priority, three quarters of respondents strongly agreed or tended to agree with the goal. Some respondents suggested that the focus should be on sustainable economic growth, which benefits all members of society and avoids adverse environmental impacts. In the case of ‘contribute to better safety, health and security’, some people questioned if these should be grouped. They highlighted that delivering better health outcomes through the transport system requires different forms of intervention to improving road safety. These different issues are addressed in the specific objectives developed for this goal.

The responses to the consultation demonstrate the importance of all five goals. People have a strong understanding of the importance of improving travel choices and reducing congestion in meeting all five goals, with a particularly strong focus on improving quality of life, tackling carbon emissions, reducing the impacts of transport on the environment and in supporting sustainable economic growth.

2.4. Future Transport Concepts

A series of future transport concepts were identified as potential options for meeting the transport goals and objectives. They were identified during the Issues and Options stage to help ensure that a full range of options was considered, and to help stimulate debate during the Issues and Options consultation. Figure 2-2 shows the future transport concepts.

Figure 2-2 Future Transport Concepts

- Strengthen and enhance public transport corridors - further bus priority, improved frequencies
- Extend MetroBus network - new routes and further enhancement to existing corridors
- Extend MetroWest - new services, new stations, further improvements to existing services
- ‘MetroWest ++’ - major investment in new light or heavy rail options
- Walking and cycling superhighways - major improvements on the most popular corridors
- Better connectivity - focusing on connections to strategic destinations
- Sub-regional pinch points and bottlenecks - improving the road network to tackle bottlenecks
- Strategic corridor packages - multi-modal packages to encourage cycling and bus use
- Working better together - to improve planning and delivery of transport projects
- Local Sustainable Transport Fund - specific funding for projects to support smarter travel choices
- Regional connectivity - better connectivity by road and rail to the rest of the UK
- Freight - better meeting the needs of the freight industry and managing the impacts of HGVs
- Travel demand management - using a range of tools, including charging, to better manage demand

These future transport concepts have played an important role in shaping the Transport Vision. They have helped to ensure that a range of possible options is considered, and they have also helped to identify where trade-offs need to be considered, for example in places where roadspace is limited and choices have to be made between different modes of travel.
People’s views on the Future Transport Concepts

The Issues and Options consultation also gave people the opportunity to consider how the concepts could tackle the challenges and support the goals and objectives. The most important priorities were improving public transport corridors, creating walking and cycling superhighways, adding new and improved rail services (both light rail and heavy rail) and tackling bottlenecks. People also identified the importance of transport authorities and operators working better together, which will be critical in delivering a better transport system for the West of England. People identified freight as being least important, although written responses highlighted the importance of reducing the impacts of freight on the road network.

In addition, respondents to the consultation specifically identified the importance of improving orbital connectivity around Bristol, including completion of the Bristol Ring Road, as well as improving connections to the M4 and M5. People also identified the importance of improving the public realm and considered that more clarification is needed on the walking and cycling superhighways concept. People highlighted that Park & Ride should be considered as part of improving public transport corridors, and the role of MetroBus should be considered alongside other forms of rapid transit, for example light rail. This feedback has been particularly important in helping to shape the Transport Vision.

The responses to the consultation demonstrate the importance of transforming the way that people travel in the West of England, with strong support for encouraging active travel and transforming public transport. This reflects the strength of support for improving travel choices and promoting alternatives to the car to reduce traffic congestion, and strongly supports the goals to improve quality of life, reduce carbon emissions and support sustainable economic growth. These principles have strongly shaped the Transport Vision.

2.5. Framework for shaping the Transport Vision

The Transport Vision has been shaped through the framework of the transport challenges, goals and objectives, shown in Figure 2-1, together with people’s feedback from the Issues and Options consultation.

The Transport Vision has been designed to:

- Address the transport challenges facing the West of England;
- Achieve the goals and meet the transport objectives for the region; and
- Support the aim for an affordable, low carbon, accessible, integrated, efficient and reliable transport network to achieve a more competitive economy and better connected, more active and healthy communities.

The following chapter describes the Transport Vision.
3. Proposed Transport Vision

3.1. Introduction
The preceding chapter demonstrated that there is a strong case for action, with a need to improve travel choices and tackle congestion, particularly given the high levels of growth forecast in the numbers of people living and working in the West of England. This will be critical in enabling the area to meet its full potential, whilst improving quality of life, protecting the environment and improving people’s life chances.

The Transport Vision is designed to tackle these challenges and is deliberately ambitious. The aim is:

An affordable, low carbon, accessible, integrated, efficient and reliable transport network to achieve a more competitive economy and better connected, more active and healthy communities.

This chapter describes the Transport Vision. It first explains how it will build on existing committed investment, and then provides an overview of the key components of the Vision, with more detail for different geographic areas of the West of England.

3.2. Building on existing commitments
The Transport Vision builds on the recent and current transport investment programme in the West of England:

- Programmes to facilitate and promote travel behaviour change and increase cycle and bus use: Local Sustainable Transport Fund, Better Bus Area Fund and Cycling Ambition Grant;

- The Weston-super-Mare Transport Package, completed in 2015, is already delivering benefits: this has included improvements to the local transport network and M5 Junction 21, but much more will be needed to meet the needs of a rapidly growing population in the town;

- The Bath Transport Package has expanded the capacity of Park & Ride and reconfigured parts of the city’s road network. This has substantially improved travel conditions and created more capacity to support the city’s dynamic economy;

- Construction of the MetroBus network is well advanced and on opening is expected to substantially improve connectivity between the North Fringe and South Bristol;

- The Great Western Electrification Programme is well underway. On completion, this will provide a new fleet of electric trains connecting to Cardiff, the Thames Valley and London, with faster journeys and more frequent trains;

- Preparations for MetroWest Phases 1 and 2 continue to progress, which will significantly improve future rail travel across the area;

- Significant works are taking place to improve access to Temple Quarter Enterprise Zone, including a new bridge to provide access to Arena Island, and planning is well advanced for further major investment to unlock the full potential of the area, including Temple Meads station and improving the road network around Temple Gate;

- Highways England is planning the delivery of a new M49 junction to improve access to Severnside and Avonmouth; and

- Projects funded by the West of England Growth Deal are improving access to key growth sites, for example new infrastructure to support growth in the Filton area.

Key projects, including the Weston and Bath Packages, MetroBus and MetroWest, are shown in Figure 3-1.
Figure 3-1 Existing Investment Programme

Key:
- Existing Network:
- Local Authority Boundary
- Transport Major Schemes:
  - Rapid Transit
  - Rapid Transit Feeder Service
  - Transport Links
  - Transport Package
- New Park & Ride Site
- New Homes and Jobs, 2006 - 2030:
  - Current Enterprise Zones
  - Enterprise Areas
  - Other Major Employment Site
  - Priority Growth locations
- Greater Bristol Metro Phases 1 & 2
  - Existing rail services (local and inter-regional)
  - Portishead to Severn Beach
  - Portishead to Bristol
  - Bath to Bristol Temple Meads (and extension to Severn Beach)
  - Weston-super-Mare to Yate
  - Henbury to Bristol Temple Meads

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These projects are expected to result in a substantial improvement to travel conditions in the West of England. Transport modelling for the West of England authorities has shown that public transport patronage is forecast to rise substantially in the future, with further increases in rail and bus use expected following the completion of the MetroBus and MetroWest projects.

Travel by bus is forecast to rise by around 40% and travel by rail is forecast to rise by more than 50% between 2013 and 2036 with these schemes in place. In contrast, car traffic is forecast to grow by just under 20%, but goods traffic will grow much faster, by 40%. The proportion of travel by car will therefore reduce slightly, but not significantly. Furthermore, the forecast increase in cars and goods traffic will result in a significant deterioration in conditions on the road network. This confirms that further action will be required, through the Transport Vision, to continue to extend travel choices and improve the performance of the transport system.

3.3. Overview of the Transport Vision

The Transport Vision is a package of mutually supporting transport schemes that will dramatically expand travel choices and improve the performance of the transport network, which will support the five goals described in the previous chapter.

The Vision has been developed to address current problems, resolve issues related to the delivery of the current Local Plans and mitigate the issues associated with the Emerging Spatial Strategy. It therefore provides a comprehensive response to the challenges looking ahead to 2036. It has been developed on the basis of the following principles:

- New forms of mobility, such as shared mobility and connected and autonomous vehicles, could have significant impacts on the ways that people travel in future. This raises greater uncertainties but must be taken into account in the planning of the future transport system.

- It will be critical to continue to drive behaviour change – through smarter choices programmes – so that people more frequently consider sustainable forms of travel: walking, cycling, public transport and car-sharing. New technologies, including improved information channels and smart ticketing, will also support a shift to more sustainable travel choices.

- Walking and cycling are popular choices for many local journeys, particularly for shorter-distance travel within the towns and cities. These modes will become even more important with the increased numbers of people living in the urban areas in the Emerging Spatial Strategy.

- Buses will continue to be the foundation of the public transport network, catering for most public transport journeys. MetroBus will cater for longer-distance journeys between the North Fringe, south Bristol and central Bristol, as well as longer-distance journeys from Nailsea, Yate and Thornbury.

- Significant expansion of Park & Ride will enable much greater opportunities to intercept traffic on the main corridors into the urban areas, integrating with other forms of public transport and significantly reducing traffic on key radial routes.

- Building on the committed MetroWest programme, the rail network will continue to be improved, with an ambition for investment in local services and stations and longer-distance connectivity to other parts of the South West, South Wales, the Midlands, the Thames Valley and Oxford.

- New local rail corridors (light or heavy rail) will complement the existing heavy rail network to transform public transport across the West of England, with new connections to Bristol Airport, A4 corridor to Keynsham (and potentially Bath), Bristol East Fringe, Bristol North Fringe and Avonmouth.

- There will be a more effective approach to management of freight traffic, with stricter controls on lorries in the centres of the two cities, consolidation facilities to reduce the need for freight to travel into the cities, improved traffic management for longer-distance movements and improved access to Bristol Port.

- Better management of traffic in the urban areas will enable a reduction of through traffic on some congested routes and reallocation of roadspace to walking, cycling and public transport. This will
include investment in improved orbital connectivity to enable progressive reduction in traffic on radial routes in Bristol.

- Investment in the road network is needed to enable the removal of traffic from urban areas and will be required to improve connectivity between key parts of the sub-region, including Bath, Bristol East Fringe, south Bristol and North Somerset.

- Consideration must be given to new ways of funding the transport system. Current funding sources are unlikely to be able to deliver the ambition of the Vision, and new fiscal tools could be considered both to manage demand and to raise funding to support the delivery of the investment programme.

The Transport Vision is presented in Figure 3-2. This incorporates current commitments: both the MetroBus routes that are currently under construction and Phases 1 and 2 of the MetroWest programme. The schemes shown in Figure 3-2 have been identified as an important part of the Transport Vision, before taking into account housing and employment development in the Emerging Spatial Strategy.

Figure 3-3 shows the Transport Vision including additional schemes needed to mitigate the impacts of the strategic locations included in the Emerging Spatial Strategy. A number of the schemes shown in Figure 3-2 that address the current challenges would also help to mitigate the impacts of the strategic locations in the Emerging Spatial Strategy. Figure 3-3 shows a number of additional schemes to serve the strategic locations, including walking and cycling connections, further extension of MetroBus routes, new and improved railway stations and additional highway infrastructure to mitigate the impact of the additional development.
Figure 3-2  West of England Transport Vision

Key:
- Area package
- Strategic cycle route
- Expanded Park & Ride
- New Park & Ride
- MetroBus
- LRT
- LRT (route to be determined)
- Rail Improvements
- New rail station
- New road
- Improved road
- Smart motorway
- New junction
- Improved junction
- Freight consolidation centre
- Also included in Vision but not shown on map:
  - Local bus network improvement package
  - A350 package to be discussed with Wiltshire Council
- Urban area
- Council area

Alignments in this plan are shown for illustrative purposes only and are not intended to indicate specific alignments.
Figure 3-3   West of England Transport Vision including Mitigation for Emerging Spatial Strategy

Key:
- Area package
- Strategic cycle route
- Expanded Park & Ride
- New Park & Ride
- MetroBus
- LRT
- LRT (route to be determined)
- Rail improvements
- New rail station
- Improved rail station
- New road
- Improved road
- Smart motorway
- New junction
- Improved junction
- Freight consolidation centre
- Also included in Vision but not shown on map:
  - Local bus network improvement package
  - A350 package to be discussed with Wiltshire Council
- Urban area
- Council boundary

Alignments in this plan are shown for illustrative purposes only and are not intended to indicate specific alignments.
3.3.1. New Technology

The Joint Transport Study is taking into account the potential impacts of evolving transport technology on travel behaviour. This includes recent and new developments such as smarter choices, electric vehicles and alternative fuel sources, connected and autonomous (driverless) vehicles, on-demand public transport and ‘Mobility as a Service’.

The availability of the internet and faster broadband services have had an impact on the need to travel for journey purposes such as commuting and shopping. The 2011 Census showed that 5.5% of workers in the West of England work from home and the internet has had major impacts on shopping patterns. However, these impacts are complex: internet shopping has resulted in large increases in home deliveries and van traffic is forecast to increase rapidly in the future.

New technologies are resulting in increased uncertainties about future patterns of travel behaviour. Whilst some technologies could reduce the need to travel for some journey purposes, other technologies could result in more vehicle traffic, for example new groups of people having access to autonomous vehicles. This will mean increasing uncertainty about the implications for travel demand; however, the forecasting used for the Transport Vision indicates that there will continue to be significant growth in car travel.

The advent of connected and autonomous vehicles (CAVs) could mean major changes in the management of the road network. It could mean a progressive reduction in the need for parking at people’s destinations, as shared vehicles then drive away and are used by other people or can be parked at the edge of cities. City centre car parks could instead be redeveloped for commercial or residential uses. On-street parking could be removed or reduced significantly and reallocated for public realm, cycling routes or public transport priority lanes. CAVs would be expected to communicate with each other to enable greater efficiency in how the road network is used. However, the systems would need to take account of the needs of pedestrians and cyclists, and there would be a continued presumption in favour of prioritising public transport.

These questions are already starting to be considered with the ground-breaking VENTURER® and FLOURISH projects, with the ambition for the West of England to become a European leader in the progressive roll-out of new technologies and new forms of mobility. The Transport Vision takes into account these major changes in mobility, including changes in future trip rates reflecting the impacts of technology on demand for travel. It also takes into account opportunities to reduce the amount of roadspace taken by cars, enabling a shift in roadspace to walking, cycling and public transport.

3.3.2. Smarter Choices

New technologies also offer the opportunity to significantly shift travel behaviour, from single-occupancy car use to car-sharing, public transport and walking and cycling. This will include new media for providing information on travel choices, with continued development of app-based platforms, helping people to make informed choices based on real-time travel conditions. It will also include new payment and ticketing technologies, with a particular focus on smartcards and mobile ticketing.

More generally, there is clear evidence that programmes to influence travel behaviour have the potential to deliver large benefits – in terms of congestion impacts, improved air quality and health benefits from increased active travel. These campaigns are particularly effective when people are making significant transitions in life – moving from primary to secondary school, starting university, starting new jobs and moving home – when they are open to considering new travel choices. Workplace Travel Plans will also continue to be important in influencing travel behaviour for commuting during peak periods. This will need to move beyond major employers, to improve engagement with smaller businesses, to help influence behaviour of larger numbers of commuters during the peak periods.

3.3.3. Walking and Cycling

Walking is the most sustainable form of travel, requiring no vehicle, with physical activity being the main feature of the journey. It is arguably the most viable form of travel for short journeys within communities and can be an attractive option for most journeys of up to one mile. Within the main urban areas, particularly Bath and inner Bristol, it is already a highly popular choice for commuting and other day-to-day travel needs. Walking will become an even more important travel choice with the emphasis on Urban Living in the

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1 ‘Mobility as a Service’ can be described as a shift away from ownership of personal forms of transport (e.g. cars) towards mobility solutions that are consumed as a service.
2 For further information refer to http://www.venturer-cars.com/
Emerging Spatial Strategy. This focus on intensification of development in the Bristol urban area, Weston-super-Mare and Bath will result in shorter journeys for which walking should be a highly attractive option. However, this will require continued investment to improve the attractiveness of walking, including local traffic management schemes, pedestrian crossings and effective maintenance of footways.

The popularity of cycling has increased dramatically in recent years, particularly within Bristol, due to people’s underlying desire to incorporate cycling into their daily lives and in response to significant investment in cycling facilities. It can be an attractive option for journeys up to five miles, but encouraging more cycling is dependent on a number of factors. Significant progress has been made in providing more cycle parking at destinations, together with changing facilities at a number of major employers. However, much more is needed to create safer, more attractive facilities on the road network, including providing segregated lanes and adequate facilities at junctions. There is a strong case for both improving facilities where there are already large numbers of cyclists (e.g. Gloucester Road in Bristol) and in significantly improving the attractiveness of cycling where it is currently less popular.

There was strong support in the Issues and Options consultation for walking and cycling investment. The Vision has a strong focus on active travel – both walking and cycling – particularly within the urban areas. This will build on recent success, through Cycling City and other programmes, in increasing active travel. The Vision includes ongoing investment in walking and cycling networks to support continued growth in active travel, particularly in the urban areas. It also makes provision of strategic cycling routes connecting to key towns, together with key radial and orbital routes in the urban areas. The delivery of improved cycling routes on some corridors will require traffic restrictions on through traffic movements, which will require some difficult decisions about the management of roadspace.

3.3.4. Public Transport

At present, public transport has a relatively limited role in catering for the travel needs of much of the West of England. The public transport mode share for travelling to work is lower than most other comparable city regions – with relatively low levels of use of both buses and trains. This reflects an historic lack of investment in bus services and infrastructure and a relatively limited local rail network in comparison with other city regions. There have been major improvements in bus services in the last decade, including the Greater Bristol Bus Network, and further recent investments by operators, and demand has increased, but it is still a long way behind many other areas. Rail demand has also increased, but this reflects wider national trends in growing rail demand.

There was strong support in the Issues and Options consultation for improved public transport – both bus and rail. The Vision will build on the current MetroBus and MetroWest programmes and develop an integrated public transport system, which will enable people to much more easily move around the West of England – and beyond – using a combination of public transport modes. This will incorporate a combination of bus, MetroBus, light rail and heavy rail together with improved integration between the different modes.

Bus and MetroBus

There will be continued investment in the bus network, with faster, more frequent, more convenient journeys, modern bus fleets and high quality waiting facilities. On-demand information will enable users to make informed choices and improved interchange will enable more journeys to be made by bus. The focus on Urban Living in the Emerging Spatial Strategy is likely to significantly increase demand for travel on the bus networks in Bath, Weston-super-Mare and Bristol. The extension of Bristol city centre into the Temple Quarter Enterprise Zone will require significant changes to the bus network in the city centre, which will be addressed through a Bristol city centre package.

A local bus network package is proposed, to build on the success of the Greater Bristol Bus Network (GBBN) by raising the quality of the local bus network to a par with MetroBus, in terms of improvements to vehicle specification, stops, ticketing and bus priority. This will include a focus on the designation and improvement of interchanges between radial and orbital local bus services, at off-street locations as well as on the road network.

Building on this will be continued investment in the MetroBus system. A consolidation package to ‘lock in’ the benefits of the first MetroBus routes currently under construction will upgrade bus priorities and renew signalised junctions, particularly in the city centre. Extensions to serve the growing communities of Nailsea, Yate and Thornbury are proposed, which would have a high level of segregation, including bus lanes and
bus-only routes, high quality stops, real time information, a range of ticketing options and high quality vehicles.

**Light Rail**

Whilst rapid transit can be delivered in the form of a bus-based mode, the ambition is for new light rail solutions where the potential is greatest for high passenger demand. Furthermore, on some corridors in the Bristol urban area there will be a limit to which the current bus system is able to accommodate more traffic, and new rapid transit options will be needed to meet growing travel demand. These corridors would connect the East Fringe, North West Bristol, Avonmouth, Airport and Bath with Central Bristol.

This requires careful consideration of the configuration of the network, including interchange with MetroBus (which serves complementary corridors) and integration with the existing passenger rail network. New light rail services could be introduced on some corridors by diverting through traffic with complementary highway investment to accommodate diverted traffic. In some locations it may not be feasible to achieve on-street running, and some underground sections may be required, subject to consideration of costs and business case.

‘Tram-train’ options may be an alternative on some of the core corridors. ‘Tram-trains’ are hybrid vehicles with the ability to operate on both tram and heavy rail routes. They have operated for a number of years in cities in continental Europe and a pilot trial is planned between Sheffield and Rotherham. However, capacity on the rail network will be very constrained following the delivery of MetroWest and adding the necessary further capacity to enable high frequency tram-train services is likely to be expensive on most corridors. The authorities will, however, continue to explore, with Network Rail, a range of options to provide high quality rail-based connections on the core corridors.

**Interchange and Park & Ride**

The public transport strategy will include major improvements to public transport interchange within the urban areas, enabling seamless transfer between the different parts of the public transport system: bus, MetroBus, light rail and heavy rail. Interchanges should include, as a minimum, clear wayfinding between stops and platforms, sheltered waiting facilities and real time information. More comprehensive interchange facilities will be required at key stations and rapid transit stops. Effective interchange will therefore play a key role in developing an integrated public transport system for the West of England.

On the edges of the urban areas, a network of Park & Ride sites will also play a critical role, by enabling interchange between radial and orbital services, allowing easy transfer between different services and public transport journeys to be made in different directions. These sites will also intercept traffic on the edges of the urban areas and enable people to transfer to public transport for their onward journeys. This will deliver significant benefits in providing high quality travel choices for people living outside the urban areas and who otherwise do not have access to public transport. It will also significantly reduce congestion in the urban areas, freeing road capacity for walking, cycling and public transport. This will be important in supporting the urban living component of the Emerging Spatial Strategy by freeing roadspace for sustainable travel modes in the urban areas.

A new Park & Ride site to the east of Bath will complement the three existing sites serving the city, whilst a new site to the east of Weston-super-Mare will intercept trips entering the town from the east near M5 Junction 21. A series of new sites around the Greater Bristol conurbation will complement the existing sites: a site near M32 Junction 1 will help intercept traffic on the strategic road network and a series of smaller sites will intercept more local trips.

**3.3.5. Rail**

Around 2% of commuting trips in the West of England are currently made by train. Over the last eight years rail passenger numbers in the West of England have risen by around 60%, which is broadly in line with national trends. The councils are currently progressing an ambitious existing package of improvements to the rail network through MetroWest Phases 1 and 2, totalling approximately £100 million investment.

The Transport Vision includes a next stage of improvements to local rail services and a number of new stations on the network. However, it is challenging to construct a robust business case for further improvements such as new rail lines, which would satisfy DfT funding requirements, due to the cost of rail infrastructure, existing capacity constraints on the network and the relatively low base (2% mode share for commuting) for growth.
It is also important to recognise the constraints in the capacity of the rail network and the needs of both local and longer-distance train services in the area. The Great Western Electrification Programme will significantly improve journey times to London, Thames Valley and South Wales, but it is also important to recognise the importance of effective rail connectivity to the Midlands, the South West Peninsula and the South Coast. The focus for the rail network is therefore based on integration with the ambitious rapid transit proposals in the Transport Vision, which includes a number of potential new light rail corridors.

The redevelopment of Temple Meads station, whilst primarily promoting sustainable transport choices for trips to and from the station and surrounding area, will include the return of rail services into the ‘Passenger Shed’ to increase platform capacity, which will also facilitate some improvements in local frequencies further afield. The Vision also has a strong focus on Temple Meads as a critical transport hub for central Bristol, West of England and wider region.

3.3.6. Management of traffic

Traffic capacity on radial routes into the centres of Bristol, Bath and Weston-super-Mare is constrained and ‘quick wins’ for reallocating local road space to sustainable modes have already been delivered through schemes such as the Greater Bristol Bus Network (GBBN). Further substantial improvements to public transport and cycling corridors will be increasingly dependent on complementary restrictions on through traffic movement on those corridors.

Improved orbital highway links, enabling traffic to divert around the Bristol urban area, will provide the opportunity to successfully deliver improvements to cycling and public transport by re-routing through traffic. In particular, the A4 Bath Road corridor has the potential to be a testbed for this approach. Some other corridors are more challenging – such as A420 Church Road and A38 Gloucester Road – and have a high proportion of local car trips with less potential to reduce through traffic movements. Other options (such as congestion charging and/or workplace parking levies) may be necessary as complementary tools in managing traffic demand.

The Transport Vision has the ambition to support a substantial mode shift to active travel and public transport, but it is likely that a large proportion of journeys will, in future, continue to be made by car. The Vision seeks to reduce the dominance of cars in the main urban areas, to build a ‘virtuous circle’ in which walking, cycling and public transport are increasingly attractive. It will be important to proactively manage traffic in the urban areas, but it will also be necessary to better manage traffic across the sub-region, to enable the delivery of the ambitious proposals for walking, cycling and public transport. This will include targeted investment in the road network to better manage traffic in some of the most sensitive communities and provide greater resilience in the network.

3.3.7. Freight and Strategic Corridors

The West of England is at the gateway to the South West and South Wales, on both the rail and motorway networks, which play critical roles in meeting the needs of both local and long distance trips. Bristol Airport is the main gateway for air travel in the South West and South Wales, but suffers from poor connectivity to both the road and rail networks. The Transport Vision therefore proposes major improvements to road and rail access to the Airport. Bristol Port, meanwhile, is one of the UK’s most important ports. It benefits from direct access to the M5 at Junctions 18 (Avonmouth) and 19 (Portbury), as well as direct rail freight access, which provides high quality connections to/from the rest of the UK for transport of imports and exports.

The area is a major hub for Great Western and Cross Country rail services but limitations of track capacity will pose constraints to future enhancements to the rail network beyond the current MetroWest programme, so careful consideration of future priorities will be required. The West of England authorities will consider the case for better rail services to a number of locations including Oxford, Birmingham and the South West, with a focus on improved connectivity to better meet the needs of business users to more easily connect with other growing cities.

The M4 and Severn Crossings are critical to the economy of South Wales and the M5 is the only motorway serving the South West peninsula, with particularly heavy traffic heading towards Devon and Cornwall during holiday periods. There is severe recurrent congestion on the M4 between Junctions 19 and 20 and the M5 from Junctions 14 to 17, which impacts on both local and long distance journeys, and is forecast to worsen in future. Traffic from South Wales is forecast to grow rapidly due to reductions in tolls on the Severn Crossings and traffic being ‘released’ by the new M4 south of Newport. The M4 / M5 interchange is a critical point in the network of the whole region, with limited options for further improvement. It will be critical to encourage a
significant shift onto alternative modes: rail for longer distance trips from South Wales, Gloucestershire and Somerset and rapid transit for more local travel.

There are also shortcomings in road connections to a number of other destinations, in particular north-south connections through the area. The West of England is working with neighbouring authorities to develop the case for improved connections to the south coast, including the A36 and A350 corridors passing through or near the area. In addition, the Vision will support improved connectivity to Hinckley Point. As one of the UK’s largest infrastructure projects, this will require a large labour force: the West of England will play a key role in meeting these needs.

The West of England is a major freight destination. Bristol Port is a major international gateway and Avonmouth / Severnside is an important logistics hub, which benefits from proximity to the Port and direct access to the motorway network. This area is forecast to grow significantly, which will be assisted by the planned opening of a new junction on the M49, resulting in increased goods traffic in this area. There are also high volumes of through traffic on other major roads, many of which pass through the Bristol and Bath urban areas. Significant increases in light goods traffic are also forecast, servicing the needs of both households and businesses.

The Transport Vision includes a number of schemes to tackle road congestion, which will also benefit freight movements, particularly to and from Bristol Port. It also supports the provision of capacity improvements to help facilitate rail freight movements on the strategic network, including those enabled through electrification.

The Vision makes provision for improved routing of freight traffic and strengthens the approach to managing freight into the urban areas, particularly given the importance of tackling air quality problems through future implementation of Clean Air Zones. This would need to give renewed focus to consolidation of freight, with support for the existing centre at Avonmouth and exploring the potential for a new centre near Bath.

3.4. Further Defining the Transport Vision

Having provided an overview of the Transport Vision, it is then necessary to provide further detail on how the components fit together and how they will meet the needs of different parts of the West of England. The evidence demonstrates that there are distinct challenges in different areas, and the Transport Vision is further defined as follows:

- South West: Weston-super-Mare to Bristol, including Bristol Airport and Royal Portbury Dock;
- South East: Bath to Bristol;
- North East: Yate and East Fringe to Bristol;
- North West: Thornbury, North Fringe and Avonmouth / Severnside to Bristol; and
- Bristol.

3.5. South West: Weston-super-Mare to Bristol

This corridor includes Weston-super-Mare, other parts of North Somerset, Bristol Airport, Portbury Dock and routes into Bristol from the south west. The evidence indicates that the priorities on this corridor are to:

- Improve connectivity to Weston-super-Mare and key settlements in North Somerset.
- Improve strategic connectivity to Bristol Port and Bristol Airport.
- Improve regional connectivity to London, the Midlands and the South West.

The proposals in this area focus on improved connectivity to/from North Somerset, including a package for Weston-super-Mare to support existing growth commitments, a new strategic corridor from the M5 to the
Airport and Bristol, rapid transit from Nailsea/Clevedon and the Airport, and improved orbital connectivity around south Bristol, as shown in Figure 3-4.

Extension of the Smart Motorway on the M5 from Cribbs Causeway to Weston-super-Mare will improve regional connectivity. New and expanded Park & Ride sites are proposed as an integral part of the rapid transit network, including a new Park & Ride site for Weston-super-Mare.

The international gateways – Bristol Airport and Bristol Port – also create wider travel demands. Bristol Airport has a catchment that extends across the South West and into South Wales, whilst Bristol Port generates freight traffic to/from other parts of the UK. A comprehensive package is proposed to improve access to the airport by public transport and car. Access to Royal Portbury Dock will be improved through extension of the Smart Motorway and significant improvements to M5 Junction 19.

**Figure 3-4 South West Area**

3.5.1. Access to Bristol Airport and A38 Corridor

**Overview**

The A38 is the primary route connecting Central Bristol to the Airport and Somerset, with the A370 running parallel from M5 Junction 21. The lack of a motorway junction where the A38 crosses the M5 results in traffic using the A370/A371 to access the M5, or traffic using country lanes to access the motorway further north, impacting on the communities on these routes. A package is proposed for the A38, which in turn will alleviate a number of traffic issues on the A370 corridor.

There are also high traffic flows on the A370 through villages in North Somerset, creating both congestion and environmental problems in these communities. The village of Barrow Gurney also suffers high traffic flows between the A370 and A38. The impending completion of the South Bristol Link will significantly improve connectivity between these routes and will help to relieve Barrow Gurney. The additional capacity provided by the South Bristol Link will also help to accommodate some of the traffic growth associated with the expanding Bristol Airport.

Substantial future growth is forecast in the numbers of passengers using the Airport, which will generate additional travel on the corridors serving the Airport. At present, the Airport is served by the single carriageway A38 and a range of bus services, including the Bristol Flyer to Bristol city centre. Forecasts
indicate that the growth in use of Bristol Airport will result in increased congestion and delays on the A38. In order to effectively meet the future needs of the Airport, it will be necessary to both improve road capacity on the A38 and transform the quality of public transport connections to the Airport.

**Junction 21A and A38 Corridor**
Forecasts indicate that that congestion will increase on the A38 between the South Bristol Link and the Airport, and on the A371 through Banwell. There is a strong case for investment on both the A38 and A371 to tackle congestion along this route and to improve strategic connectivity from the M5 to south Bristol. This package of highway schemes comprises a new strategic road connection between the M5 at a new Junction 21A and Churchill, improvements on the route between Churchill and Bristol Airport, and a major upgrade to the route between the Airport and south Bristol. The significant improvement to road connectivity between Junction 21A and Churchill will also create significant capacity for new development along this corridor as part of the Emerging Spatial Strategy.

The provision of a new strategic route between the M5 and south Bristol would also help to reduce through traffic on the A370 and unlock capacity for growth in Nailsea and Backwell. There will be significant benefits in reducing traffic on inappropriate routes and improving road connectivity to the south.

This route also has potential to form part of an improved road corridor, running around the south and east of Bristol, which would help to improve the resilience of the transport network in the event of major incidents. At present, in the event of incidents on the M5, drivers tend to take a number of different routes through Bristol, which results in major problems across the city. The new route will provide the opportunity to take a much more proactive approach to future traffic management, by diverting traffic onto a more clearly defined corridor, with clearer guidance for drivers and less rat-running on unsuitable roads.

**Public Transport to Bristol Airport**
High quality transport infrastructure is needed to connect this key gateway to Bristol and the wider South West. The existing 'Bristol Flyer' bus service is currently delayed by high traffic volumes and low speeds on the A38 corridor resulting in unreliable journey times. Increasing traffic in the future will result in a further deterioration in journey times and reliability.

The Transport Vision proposes transport improvements to Bristol Airport, based on permitted growth within existing planning consents, including highway improvements on the A38 and a MetroBus route to Bristol. This could be incorporated into an improved highway corridor between Bristol and the Airport. Further transport improvements to the Airport are likely to be dependent on significant growth in passenger numbers above existing consents at the Airport in order to deliver a robust business case. There are significant topographic constraints in delivering a rail connection to the Airport: a light rail option is likely to be most feasible. One option would be for the light rail connection to follow the A38 corridor outside the city and then follow the heavy rail corridor within the city to Temple Meads.

**3.5.2. Weston-super-Mare**
There are existing congestion problems within Weston-super-Mare, with queuing along the A370, A371 and at M5 Junction 21. The current levels of planned growth in the town will mean that these problems will continue to worsen. Higher levels of new local employment will help to reduce the need to commute out of the town, but there will continue to be high levels of commuting towards Bristol, which will continue to place pressure on the local and strategic road network.

The Transport Vision includes schemes that are already in North Somerset’s Core Strategy, which are key to addressing challenges to 2026. It also includes an area package for the town centre (to improve public realm, walking and cycling and bus connections), strategic cycle routes to improve local connections, a MetroBus route between Junction 21 and the town centre and a Park & Ride site in the vicinity of Junction 21 to intercept trips into the town. In addition, the delivery of Junction 21A will help to relieve traffic at Junction 21 and will facilitate improved connections into the town from the east.

The Transport Vision proposes continued improvements to rail services to Bristol: together with the rapid transit network in Bristol, this will help to improve travel choices to the Bristol conurbation and reduce dependence on the M5. In addition, there is an ambition for more direct train services from Weston-super-Mare to London via Bristol.
3.5.3. **Nailsea and the A370, Clevedon and Portishead**

From Clevedon and Nailsea there are relatively long journey times by bus to Bristol and other parts of the West of England. There are also significant problems with traffic delays on key routes, including the A370 at Flax Bourton, Backwell and Congresbury and routes through Tickenham, Wraxall and Long Ashton, which also impact on bus services. The Emerging Spatial Strategy proposes significant growth at Nailsea and Backwell, which will further increase travel demand in this area.

It will be necessary to substantially improve public transport connections in this area. These will include enhancements to Nailsea and Backwell station to include better integration with the local bus network and creation of a new MetroBus route to serve Clevedon and Nailsea, which will connect onto the A370 Long Ashton Bypass and the existing MetroBus network. This will require significant new infrastructure to connect around the south of Nailsea, across the railway and to connect to the A370. This will also include new infrastructure to tackle long delays at the traffic signals in Backwell and other roads from Nailsea joining the A370. New road infrastructure, incorporating a MetroBus route, will connect Nailsea and Backwell to M5 Junction 20, which will help reduce traffic in Tickenham and Wraxall. This will also help to support the infrastructure needs of new development in Nailsea and Backwell, which has been identified in the Emerging Spatial Strategy.

In the case of Portishead, there are high levels of out-commuting to the Bristol area, and access from Portishead is via a single road, with no rail access. MetroWest Phase 1, which is already committed and planned to open in 2019, will re-open the Portishead rail line, which will dramatically improve travel choices and connectivity from the town.

3.5.4. **M5 from Bristol to the South West**

The West of England benefits from its location on the UK’s motorway network and its role as gateway to the South West. However, there are major challenges with the resilience of the road network. Incidents on the M5 often cause widespread disruption. There are high levels of traffic in the holiday period and on Fridays – resulting in long traffic delays – due to the role of the M5 as the main route to Devon and Cornwall.

The operation of the M5 between Junctions 15/16 and 21 will become an increasing challenge due to increasing volumes of traffic, both longer-distance and regional between Weston-super-Mare and the Bristol urban area. Flows are particularly high between Junctions 19 (Portbury) and 20 (Clevedon): climbing lanes have been added during the last few years but there remains a significant constraint on the split-level section by Clapton-on-Gordano where the motorway curves around the side of the hill.

In response to growing traffic and increasing levels of congestion on the motorway between Bristol and Weston-super-Mare, the Transport Vision proposes the extension of the existing Smart Motorway from Junction 17 to Weston-super-Mare. This will involve the use of technology to detect slow traffic and introduction of lower speed limits to help stabilise traffic flows. Other Smart Motorways elsewhere in England have included widening or conversion of the hard shoulder to ‘all lane running’. There are likely to be major constraints to this type of operation on certain parts of the M5 – namely the Avonmouth Bridge and the split-level section. The length of treatment would be around 20 miles, which is equivalent to major Smart Motorway schemes that are currently being delivered in other parts of England, and the costs could be substantial. Careful consideration of the available options will therefore be required.

**Junction 19 and Royal Portbury Dock**

Junction 19 provides access to Portishead and Royal Portbury Dock and significant operational problems impact on access to this part of Bristol Port. Southbound traffic leaving the motorway queues back in the nearside lane over the Avonmouth Bridge, which causes both a safety hazard and impacts on the operation of the main carriageway. This will progressively worsen as traffic increases on both the motorway and at the junction. In addition, traffic modelling indicates that traffic joining the northbound carriageway from Junction 19 will be delayed due to a bottleneck on the slip road. It will be necessary to increase capacity on this slip road, whilst also paying attention to traffic capacity on the Avonmouth Bridge. A comprehensive solution will therefore be needed to address the long-term needs of this junction.

3.6. **South East: Bath to Bristol**

This corridor includes Bath, Keynsham and other parts of Bath & North East Somerset and routes into Bristol from the south east. The priorities on this corridor are to:
The proposals in this area are shown in Figure 3-5. In Bath, these include further expansion of Park & Ride to intercept trips into the city and a package of strategic cycle routes to encourage active travel. Improved road infrastructure connecting the A4 at Hicks Gate with the A37 at Whitchurch and the Ring Road at Hengrove will significantly improve orbital connectivity around the south of Bristol and relieve radial routes. This will also help tackle the impacts of traffic ‘rat-running’ on rural lanes around the edge of the urban area and enable public transport improvements to be delivered.

A rapid transit route between Bristol and Bath will transform travel choices along this corridor, which would be delivered in conjunction with a Saltford Bypass and the Callington Road Link to facilitate roadspace reallocation on the A4 into Bristol. New and expanded Park & Ride sites are proposed as an integral part of the rapid transit network, including a new Park & Ride site at Hicks Gate.

**Figure 3-5 South East Area**

### 3.6.1. Bath

Within Bath, the Vision includes further expansion of Park & Ride to provide effective travel choices for the large numbers of people travelling into the city for work, shopping and tourism. Further expansion of existing sites will be considered over the longer term, but there is also a strong need for a new Park & Ride site to the east of the city. At present, the only choices for people travelling to the city from the east are to route northwards to the site at Lansdown, or southwards to the site at Odd Down. Neither option is attractive so many choose to drive into the city centre. A new Park & Ride site will be a highly effective means of intercepting traffic from the east of Bath.
Significant residential and employment development is taking place in the Bath Western Riverside area, which will substantially increase the numbers of people living and working in this part of the city but will also include new sustainable transport infrastructure, including new river bridges, walking and cycling routes and new bus connections. This sustainable transport infrastructure will become increasingly important to the whole city due to the need to increase walking, cycling and bus use to combat congestion.

A rapid transit corridor, connecting Bath with Bristol, will follow an east-west axis through the city, and options will need to be considered to provide sufficient roadspace to enable this to work effectively. Early scoping has identified a route corridor from the A4 west of Bath to the city centre via Lower Bristol Road, Windsor Bridge Road, the safeguarded sustainable transport route through Bath Western Riverside, Pines Way, Green Park and James Street West.

The Vision also includes provision of a series of strategic cycle routes connecting different parts of the city. The city is in a ‘bowl’ and is surrounded by high terrain to both the north and south, which could constrain the attractiveness of cycling, but major destinations including Bath Royal United Hospital (on the north side) and University of Bath (on the south side of the city) mean that there are strong sources of travel demand.

Bath has historically been the meeting point of several major roads: the A4 to London and Bristol, A46 to the Cotswolds and A36 to Salisbury and Southampton. Long-distance east-west through traffic has long since been removed following completion of the M4 but north-south through traffic, between the A46 and A36, still passes through the middle of the city, which includes large volumes of goods vehicles. There are no adequate alternatives to the route: an ancient toll bridge allows cars to cross the river at Bathampton, but heavy goods vehicles are banned, and the only other route is the A363 through the centre of historic Bradford-on-Avon.

A new road is therefore required, which will remove traffic currently routing through the city centre between the A36 and A46, and will also improve the routing of east-west movements through the city. Further work is being undertaken to establish the most suitable alignment for this key link. At the same time, B&NES Council is working with partners including Wiltshire Council to examine the role of the A350 corridor in providing for north-south movements.

Bath is currently served by a freight consolidation centre at Avonmouth. The Vision proposes a new freight consolidation centre to the east of Bath because of the reduced travel distance of the service vehicles to/from central Bath. This facility would therefore help to reduce the numbers of heavy goods vehicles entering the city to make deliveries to shops and other businesses.

### 3.6.2. A4 corridor via Keynsham and Saltford

There are currently high levels of traffic demand between Bristol and Bath resulting in congestion and long journey times. The A4 through Saltford and routes to the south of Bath (avoiding the city centre) are already a significant problem, and most of Bath experiences high levels of peak hour traffic congestion. The Emerging Spatial Strategy proposes strategic allocations at Whitchurch and Keynsham, in addition to the high levels of growth in the current Local Plan, which will further increase travel demand in this area.

Rapid transit between Bristol and Bath is proposed to complement an improved rail corridor and better accommodate a wider range of trip patterns. A new Saltford Bypass would help to remove through traffic in the village and release roadspace for effective rapid transit through the village. Options would need to be considered for the best mode for this rapid transit route: this could initially be a MetroBus standard route, but the longer-term ambition would be for a light rail solution. The initial focus would be the route from Keynsham to central Bristol but in the longer term would extend to Bath, most likely via Lower Bristol Road and through Bath Western Riverside.

This would require substantial re-engineering of the road network along the whole corridor, including at Bath, Saltford and Keynsham. The rapid transit route would serve a new Park & Ride site at Hicks Gate, to replace the existing site on the A4 at Brislington, which will enable people to access rapid transit services towards both Bristol and Keynsham. It would then follow the A4 through Brislington to Temple Meads and the city centre.

This would necessitate completion of the Callington Road Link, a new road link between A4320 St Philips Causeway and A4174 Callington Road, which would enable diversion of through traffic from the A4 onto St Philips Causeway. This would provide a number of benefits: it would dramatically reduce the volumes of...
traffic through the heavily congested A4/A4174 West Town Lane junction and would allow major reengineering of the current A4 through Brislington to allow the creation of the new rapid transit route, together with other improvements to sustainable transport and public realm.

The rapid transit route would be complementary to further improvements in passenger rail services. Consideration would be given to the case for expanding access to the rail network by re-opening stations at Saltford and St Annes Park. However, these need to be assessed in the context of limited track capacity between Bristol and Bath, and the impacts on longer-distance services from Bristol to London. The long-term transport strategy for this corridor could recommend other options, such as the improvement of Keynsham station instead of a new station at Saltford.

### 3.6.3. South East Bristol (Whitchurch and Keynsham)

The south east of Bristol suffers from high levels of congestion and poor access to the wider transport network. The completion of the Callington Road Link will help to reduce flows at the most serious congestion blackspot – A4 / A4174 West Town Lane traffic signals – but a number of other parts of the network will continue to be under strain. There are large numbers of vehicles making orbital movements around the south of the city, which travel into the congested Bristol road network, resulting in high flows and congestion on the Bath Road, A4174 West Town Lane, A37 Wells Road and other routes. This also results in significant volumes of traffic on rural lanes between Whitchurch (on the A37), Hicks Gate and Keynsham.

The Emerging Spatial Strategy proposes a strategic allocation at Whitchurch, which will further increase these traffic pressures. There is therefore a strong case for a new or improved highway connection between the A4 and the A37 at Whitchurch. Improved transport connections on to the A4174 at Hengrove Roundabout would significantly relieve these pressures and provide new capacity for sustainable forms of travel in this area. This will be complemented by Park & Ride to the south of Whitchurch and new MetroBus routes, which would connect to the North Fringe to Hengrove route (at Hengrove Park) and A4 rapid transit corridor (at Hicks Gate). There is potential to integrate new transport infrastructure with new development in these areas, which will help to both mitigate the impacts of this development and tackle the underlying transport problems in this area. The combination of Park & Ride and improvements to orbital connectivity will enable a transfer of road capacity to public transport and cycling, particularly along the A4 Bath Road.

### 3.6.4. Midsomer Norton and Radstock

At present, there are high traffic levels of out-commuting from Midsomer Norton and Radstock to Bath and Bristol, which reflects relatively limited numbers of jobs in the area. The focus in the Emerging Spatial Strategy is on increasing employment to improve the economic vitality of this area, which will also be important in helping to reduce the need to commute to jobs outside.

There are high levels of car use for journeys from this area to Bristol and Bath, with significant traffic on the A37 towards Whitchurch and Bristol, the A39 / B3116 towards Keynsham and A367 towards Bath. Analyses have shown that there is not a strong case for major transport improvements on these corridors: the major focus will instead be on managing traffic demand on the approaches to the cities. In Bath, Odd Down Park & Ride has recently been expanded, and further expansion could be considered in future to help intercept travel demand from the A367. At Whitchurch, Park & Ride will intercept travel demand before entering Bristol, while improved orbital connections to Hicks Gate and the Ring Road will significantly improve access from the south.

Analyses indicate that there is not a strong case for significant transport investment on the transport corridors in this area. Although there are problems caused by traffic on the A37 through Pensford, Temple Cloud and Clutton, the business cases for bypasses are not likely to be strong. However, it is recognised that measures are required to better manage the impacts of traffic through these communities. This could include reviewing the status of the A37 as a Primary Route between Yeovil and Bristol, and identification of alternative routes for goods vehicles from Somerset to the north.

The main focus will be in the development of the bus network to improve bus services within the Somerset Valley and key routes to Bath and Bristol, as part of the bus network package described in Section 3.3.4. This will include improvements to bus stops, real time information, service frequencies and vehicle specifications.
3.7. **North East: Yate and East Fringe to Bristol**

This corridor includes Yate, Chipping Sodbury, Frampton Cotterell, the East Fringe of Bristol, other parts of the eastern side of South Gloucestershire and routes into Bristol from the east and north east. The evidence indicates that the priorities on this corridor are to:

- Improve connectivity to towns in South Gloucestershire.
- Improve connectivity and travel choices in the East Fringe and East Bristol.
- Improve regional connectivity to London, Thames Valley, South Wales and the Midlands.

This area already benefits from links to the motorway and rail networks. This will be further enhanced with the completion of the Great Western Electrification Programme (GWEP), which will increase train frequencies and significantly reduce rail journey times to Cardiff, Swindon, Reading and London. This is likely to further enhance the attractiveness of this area for inward investment and business growth, including the Enterprise Zone at Emersons Green, which will also require improved connectivity to the M4 and on the local transport network. The MetroWest project will also significantly improve train services to Yate.

The proposals in this area are shown in Figure 3-6 and focus on improving public transport and highway connectivity to the East Fringe and Yate. A new rapid transit corridor, between the East Fringe and Bristol city centre, is suggested to tackle the connectivity problems in this part of the conurbation. A new motorway junction on the M4 (Junction 18A), with connections to the Ring Road and Yate, will help to tackle traffic issues at M32 Junction 1 and provide a high quality route to Yate. This will unlock highway capacity for MetroBus improvements on the A432 corridor between Yate and Bristol, connecting into the North Fringe to Hengrove Package infrastructure which would also be further upgraded. Orbital MetroBus connections will also improve access to employment from south Bristol to Emersons Green.

**Figure 3-6 North East Area**
3.7.1. East Bristol and East Fringe

East Fringe Rapid Transit
The sector of the urban area between the East Fringe and Bristol city centre is not well connected by public transport and experiences substantial traffic congestion, and consequent noise and air pollution problems. The delivery of MetroBus to Emersons Green and the continuing popularity of the Bristol to Bath railway path for cycling and walking will provide some relief but this whole sector has been identified by the study as needing further, significant investment in sustainable transport. The scope of this covers the full range of sustainable modes and looks broadly across the area.

The consultation on the Transport Vision is seeking people’s views on the types of interventions that would be most appropriate to deliver this upgrade to sustainable travel between the East Fringe and Bristol city centre.

Orbital MetroBus
There are currently significant challenges in connecting between south Bristol and employment opportunities in the East (and North) Fringe of Bristol, by both bus and by car. The North Fringe to Hengrove Package component of MetroBus will significantly improve journey times but people will still face long journeys to the Emersons Green area. A new orbital MetroBus service, following a route along or close to the A4174 Ring Road, would connect into the North Fringe to Hengrove Package infrastructure at Emersons Green. This would improve access to jobs for residents in south Bristol and connectivity to the strategic allocation at Whitchurch in the Emerging Spatial Strategy.

This would also significantly improve connectivity from Oldland Common and Kingswood to Emersons Green, Bristol Parkway station and the North Fringe, which would help to reduce dependence on the car for journeys around the Ring Road, potentially providing significant congestion relief on this critical transport corridor. Consideration would also be given to expansion of Park & Ride facilities in the Emersons Green area and/or a new Park & Ride site at a location along the corridor (currently assumed to be near the A420 junction, east of Kingswood) to enable interchange with bus services heading towards Kingswood and the city centre.

M4 Junction 18A to Ring Road
There is severe congestion on the north side of Bristol, which impacts on the strategic road network (M32, M4 and M5). This impacts on resilience: small incidents have major impacts on the whole network due to multiple conflicting movements at critical points in the network. The construction of a new M4 Junction 18A and a new link to the A4174 Ring Road will provide additional capacity and significantly improve routings for traffic movements in the north-east part of the Bristol urban area.

Improved road connectivity will unlock growth potential at the Emersons Green Enterprise Zone. The scheme will significantly improve the choice of routes around the east side of Bristol. From the west it will reduce traffic at M4 Junction 19, M32 Junction 1 and on the A4174 Ring Road, and from the east it will help to reduce rat-running of traffic through villages between Junction 18 and the East Fringe. Traffic modelling forecasts that there will be significant reductions in traffic flows on the Ring Road between M32 Junction 1 and Emersons Green, which will give the opportunity to reallocate roadspace to MetroBus services, including the new Orbital services and services from Yate.

3.7.2. Connections to Yate

M4 Junction 18A Link to Yate
There are heavy flows of traffic between Yate and the North Fringe and Bristol, which reflect the relatively limited travel choices that are available: train services are currently only hourly (but will be increased to two trains per hour with MetroWest) and bus journey times are long. The heavy traffic flows result in congestion along the A432 corridor, with significant delays at the junction with the Ring Road, and on the B4058 through Winterbourne. This also results in rat-running of traffic on lanes through nearby villages. The congestion on the A432 and B4058 causes delays to bus services, reducing the attractiveness of buses and entrenching car dependence for travel on this corridor.

The Transport Vision proposes a new road link from Yate to the new Junction 18A, which will enable traffic to Yate to directly access Emersons Green and the east of Bristol. It will also improve connectivity from Yate to
the M4, significantly improving the attractiveness of the town for inward investment and promoting local economic growth. The new road link will connect to the A432 at Nibley and will also provide the opportunity to connect to the B4058, west of Yate, and serve potential development in Yate proposed as part of the Emerging Spatial Strategy.

**MetroBus to Yate and Connections to North Fringe**

The completion of a new transport link from Junction 18A to Yate will result in a diversion of traffic from the A432 and unlock capacity for improved public transport along the corridor. The Transport Vision proposes significant improvements to the A432 to create a new MetroBus corridor between Chipping Sodbury, Yate and the Ring Road. This will include improved interchange in Yate town centre and at Yate station, together with new bus priority measures to help tackle congestion within the town. A new Park & Ride site at Nibley will also help to intercept trips from the wider area around Yate and Chipping Sodbury and encourage a transfer of trips onto the MetroBus services to the North Fringe and Bristol.

Bus lanes (and cycling infrastructure) will be provided along the A432 between Nibley and Coalpit Heath. Management of roadspace in Coalpit Heath will be challenging, with limited opportunity to create new bus lanes, and there will be a need to provide effective access to the new development proposed in the Emerging Spatial Strategy. Further bus lanes will then be provided between Coalpit Heath and the Ring Road, with a major improvement (including a new bridge over the M4) at the junction with the Ring Road. MetroBus services would then connect with the infrastructure currently being constructed as part of the North Fringe to Hengrove Package. This is expected to result in significant improvements to bus journey times between Yate and the North Fringe.

There will still be a need to accommodate traffic flows from Yate and Chipping Sodbury to the North Fringe, with significant increases in traffic resulting from development at Yate and Coalpit Heath in the Emerging Spatial Strategy. The B4058 will be under increasing pressure, with significant delays in Winterbourne village, and there will be a requirement for a bypass around the village to mitigate the impacts of these additional flows.

**3.7.3. M32 and M4 from Bristol to London**

The M32 is, by far, the most heavily trafficked road corridor into Bristol. Large volumes of traffic use the motorway to access central Bristol during peak periods, resulting in significant traffic delays in the central area. The North Fringe to Hengrove Package will help to encourage mode shift from the North Fringe to Bristol, but at present there is no means of intercepting longer-distance traffic approaching from the motorway network. Traffic from the M5 is signed to Park & Ride on the A4 Portway, to the west of the city, but many drivers continue into the city via the M32. There are currently no Park & Ride facilities to intercept traffic on the M4 from the east.

A new strategic Park & Ride site near to M4 Junction 19 or M32 Junction 1 would enable the interception of traffic entering the city from the motorway network. This could potentially attract large numbers of trips, and a large site would need to be considered. However, this would require significant re-modelling of the road network in this area: this would be facilitated by traffic to/from the East Fringe re-routing to a new Junction 18A to the east.

The new M4 Junction 18A will result in changes in traffic flows on the M4 around the north of Bristol between Almondsbury (Junction 20) and Junction 18 at Tormarton. At present, traffic on the motorway from both the east and the west uses Junction 19: heavy conflicting flows at the junction cause long delays on the slip roads, impacting on the capacity of the main carriageway. There are then heavy flows leaving the M32 at Junction 1, with congestion in the Hambrook area.

The new Junction 18A would result in significant re-routing of traffic in the area. Traffic from the M4 west, heading towards the East Fringe, would instead continue on the motorway to Junction 18A, resulting in large reductions in queueing traffic at Junction 19. Traffic from the east currently uses a number of routes to reach the East Fringe, including Junction 19 and minor country lanes from Junction 18 at Tormarton. In future, this traffic will instead exit at Junction 18A, significantly reducing traffic using the other routes.

Overall, the rationalisation of traffic flows in this area will result in major benefits, although there will be increased traffic on the motorway. Modelling indicates that this could draw more traffic from the M5 to the south onto the M4 to access the East Fringe at Junction 18A. The M4 and M5 will already be under acute pressure in this area, and action will therefore be taken to mitigate this effect by encouraging mode shift on
key movements, with high quality rapid transit options from North Somerset connecting with the North Fringe and East Fringe.

It has been assumed that this would necessitate the extension of the Smart Motorway from Junction 19 to Junction 18, to help manage the effects of changes in traffic flows on this section. This is considered to reflect an appropriate balance between the need to improve connectivity into the east of the Greater Bristol conurbation and the strategic function of the M4 itself.

### 3.8. North West: Thornbury, North Fringe and Avonmouth / Sevenside to Bristol

This corridor includes Thornbury, the Bristol North Fringe, Avonmouth / Severnside, rural parts of South Gloucestershire and routes into Bristol from the north. The evidence indicates that the priorities on this corridor are to:

- Improve connectivity to towns in South Gloucestershire.
- Improve connectivity across North Bristol, the North Fringe and Avonmouth-Severnside.
- Improve regional connectivity to London, the Midlands, South Wales and the South West.

The proposals in this area are shown in Figure 3-7 and focus on improving connectivity between Avonmouth/Severnside, the North Fringe and city centre, for both passengers and freight movements. The Vision includes rapid transit links, a MetroBus extension and cycling infrastructure to Thornbury and Park & Ride sites to intercept trips towards Bristol, as well as local rail improvements and better rail connections between Bristol and South Wales.

**Figure 3-7 North West Area**
### 3.8.1. North Bristol and North Fringe

The North Fringe already experiences significant problems, with a complex mix of radial, orbital and local movements. These are forecast to worsen in future, although the MetroBus North Fringe to Hengrove Package will help to mitigate some problems by providing new infrastructure and improving travel choices. The Cribbs Patchway MetroBus Extension (CPME) will provide a new MetroBus route between Cribbs Causeway and Bristol Parkway station, serving the new Filton Airfield development, which will significantly improve orbital public transport connections through the North Fringe, including addressing the major pinchpoints at Gypsy Patch Lane and Hatchet Road.

The A38 between M5 Junction 16 and Bristol city centre is a major challenge. In the North Fringe it is a key route serving the employment clusters at Aztec West, Airbus and Rolls Royce and it will be a major point of access into the new Filton Airfield development. Southmead Hospital is a major destination, generating significant traffic but also acting as a hub in the city’s bus network. As the route enters into Bristol, it becomes an urban radial road, with retail activity, on-street parking and deliveries and a mix of heavy flows of cyclists, buses, cars and goods vehicles.

Growth in travel demand and the future focus on Urban Living in the Emerging Spatial Strategy will require a new approach to the management of this corridor. There is already high demand for cycling at the southern end of the corridor but there is much less cycling in the outer parts of North Bristol. This is due in part to the poor conditions for cycling across the network. On much of the A38, conditions are very poor, with cyclists forced to share roadspace with cars, buses and lorries. The Transport Vision therefore proposes a strategic cycle route along the A38, which will require roadspace reallocation and measures to reduce traffic at the most critical points of the network. This is also an important public transport corridor, with buses serving both Bristol and the North Fringe.

The Transport Vision proposes a rapid transit corridor along the A38, with an ambition for light rail. However, it will be challenging to deliver the level of priority and roadspace reallocation that would be required for successful delivery of a fast and reliable service. A range of options – including potential underground running in places – could therefore be considered to meet the long-term needs of the corridor.

The A4018 corridor between Cribbs Causeway and Bristol carries significant volumes of traffic into different parts of North Bristol, with the route playing different functions as it approaches the city centre. The high volumes of inbound traffic result in significant congestion on the approach to Westbury-on-Trym, whilst high numbers of buses converge on the route from the Downs towards the Centre. The Vision proposes Park & Ride in the vicinity of Junction 17, at a location to be determined, to intercept trips into North Bristol, reduce traffic and facilitate reallocation of roadspace for a new strategic cycle route connecting to the city centre.

### 3.8.2. Bristol Port and Avonmouth/Severnside

Bristol Port, at Avonmouth, benefits from direct access to the M5 and M49 at Junction 18A, but much of Severnside suffers from relatively poor connections to the strategic road network. This is vital, because Severnside is the most important logistics location in the West of England, but logistics operators are constrained by poor accessibility. A new junction on the M49 is currently programmed for delivery by Highways England, which will significantly improve accessibility into the area and improve its attractiveness for logistics operators.

However, the area also has poor accessibility to other areas, which impacts on the ability of businesses to recruit staff and people to take jobs. Given the planned growth in the Avonmouth / Severnside Enterprise Area, this will become a progressively more important issue. The Vision includes provision for different means of improving access into this area, including a MetroBus route to the city centre, which would serve the Portway Park & Ride site, or an option to convert the Severn Beach Line to light rail and connect to Henbury and the North Fringe. These options would require substantial further work to examine their feasibility.

### 3.8.3. A38 to Thornbury and Beyond

There are high volumes of commuting from Thornbury, other settlements in South Gloucestershire and from the Stroud area along the A38 corridor towards the North Fringe. There are high levels of car dependence for most movements, resulting on congestion on the A38, particularly on the approach to M5 Junction 16 at Almondsbury. Journey times by bus from Thornbury to the North Fringe and Bristol city centre are long, further exacerbating car dependence for these movements. The Transport Vision proposes a MetroBus.
corridor to Thornbury and the Buckover Garden Village proposed as part of the Emerging Spatial Strategy. This would extend from Aztec West the infrastructure that is currently being delivered as part of the North Fringe to Hengrove Package.

This would be complemented by a Park & Ride site on the A38, north of Almondsbury, which would intercept car trips from places in the wider A38 corridor, and encourage a shift to the new MetroBus services. Bus priority on the A38 southbound approach to Junction 16 would be required to enable fast and reliable bus services. A number of improvements will be required to junctions along the A38 to mitigate the effects of increased traffic flows and provide effective priority for the MetroBus services. In addition, a new strategic cycle route would be delivered as part of the MetroBus infrastructure, to cater for shorter-distance trips along the corridor, particularly from the southern end into the Aztec West area.

Charfield has been identified as a potential strategic location in the Emerging Spatial Strategy. At present, this area has high levels of car dependence, with infrequent and long journey times by bus to Yate and North Bristol. A re-opened station at Charfield could be served by trains extending from Yate to Gloucester, which would provide rapid access to the North Fringe and Bristol.

3.8.4. M4 and M48 Severn Crossings

The M4 and M48 Severn Crossings play a critical role in connecting South Wales to the rest of the UK, and as part of the Trans European Network connecting Ireland with Continental Europe. There are also significant commuting flows from South Wales into the West of England, with journey times by car of less than 20 minutes from Chepstow to the North Fringe. The M4 in the Newport area is currently heavily congested, but the proposed New M4 to the south of the city will significantly improve traffic conditions and connectivity between South Wales and the West of England. Furthermore, tolls on the Severn Crossings are due to be reduced by half in 2018. These changes could increase the levels of commuting between South East Wales and the West of England, and are likely to result in increases in traffic on the Severn Crossings, which could have a significant impact on the M4/M5 Almondsbury Interchange.

Measures will therefore be required to mitigate these impacts, which should include a strong focus on mode shift for movements across the Severn. This should include improved service frequencies and capacity on trains between Cardiff, Bristol and Newport, and consideration of opportunities for strategic Park & Ride on the M48 in the Chepstow area.

3.8.5. M5 to the Midlands

The M5 plays a critical role in connecting the West of England and wider South West with the Midlands and North of England. It also facilitates connections between Gloucester and Cheltenham and the West of England and supports commuting from Stroud and Gloucester into the North Fringe and Bristol. The M4 / M5 Interchange will be under increasing pressure in future due to increased traffic from South Wales and increased commuting into the North Fringe. This will increase delays on the M5 southbound approach to the Almondsbury Interchange, which will impact on both long distance flows and commuting traffic.

The completion of the Smart Motorway between M4 Junction 19 and M5 Junction 17 has improved operating conditions on this part of the motorway network, which can be considered to be the most critical in the whole of the South West. However, there is very limited potential to further improve Almondsbury Interchange to accommodate significant increases in flow. Consideration should therefore be given to improving public transport options for movement into Bristol and the North Fringe from the north, including improved rail services from Gloucestershire.

M5 Junction 14 is a particular challenge. This junction is already at capacity and there are safety issues due to queuing back onto the M5 main carriageway. This will require significant improvement – both to tackle existing challenges and to help accommodate growth from Thornbury, Buckover and Charfield in the Emerging Spatial Strategy. Junction 16 is also a particular challenge, but in this case, the focus in the Transport Vision is on Park & Ride and bus priority on the A38 corridor to encourage mode shift and manage the flow of traffic into the North Fringe.

3.9. Bristol

With a rich cultural heritage, prosperous economy, vibrant communities and world class universities, Bristol is consistently ranked as one of the best places to live in the UK. The city has a strong national and international reputation, which has added to the attractiveness of the city for inward investment. For the city
to remain an attractive place to work, live and visit, it needs a transport network that not only supports the local economy and keeps the city moving, but also enhances the urban environment and contributes to high-quality, people friendly places.

Bristol is the centre of the West of England transport network and the operation of the network in the city has consequences for the rest of the West of England and the wider South West region. The majority of congestion and delay in the region occurs in the Bristol urban area, with the city consistently ranked as one of the most congested places in the country, which is adding to business costs and damaging the competitiveness of the city and the region as a whole. In the case of Bristol, all of the priorities listed above apply, but there are also further priorities to:

- Improve travel choices for movements within Bristol.
- Reduce impacts of traffic in Inner Bristol.

In recent years Bristol has taken positive steps to improve sustainable transport provision and tackle congestion. Sustained investment has resulted in large increases in active travel across the city, with more people now cycling to work in Bristol than in Sheffield, Nottingham, Newcastle and Liverpool added together. Although public transport patronage is low compared with other core cities, it is rising rapidly and bucks the national trend for declining bus patronage.

The city is experiencing the biggest investment in living memory with around £800 million being invested in its transport infrastructure to 2020. This investment includes the first three routes of the MetroBus network linking the city centre to the North Fringe and South Bristol. The MetroWest suburban rail scheme includes re-opening the railway to Portishead and introducing a number of new cross city services and better timings. The two Cycle Ambition Fund programmes are helping to improve cycle infrastructure and transport investment linked to the Temple Quarter Enterprise Zone will provide sustainable transport access to new jobs.

The major components of the Transport Vision within Bristol are described in the sections above. These include:

- Strategic cycle routes along radial routes;
- A package of improvements to local bus services building on the Greater Bristol Bus Network, including integrated smart ticketing;
- A ring of new and enhanced Park & Ride transport hubs around the city, served by high quality bus or rapid transit services;
- New and enhanced rapid transit routes along the M32, and towards Bath, East Bristol, North Bristol, Avonmouth and Bristol Airport. Significant constraints would need to be addressed, particularly roadspace and the ability to successfully achieve fast and reliable journey times. This will require traffic restrictions and reconfiguration of the road network on these corridors. In some cases this may not be sufficient and it will be necessary to consider options for light rail running underground. However, it is recognised that this would be very costly and the length of underground running would need to be minimised;
- Rail improvements including new stations and the regeneration of Temple Meads Station, which will provide improved sustainable transport links to unlock growth at the Temple Quarter Enterprise Zone;
- Callington Road Link, which will remove through traffic from the city centre and create the space to provide an improved rapid transit route on A4 Bath Road, whilst also freeing up capacity on the A37 Wells Road for improved sustainable transport provision; and
- Orbital highway improvements to mitigate congestion and unlock road space to provide sustainable transport options.
In addition, the majority of other transport schemes outlined elsewhere in this document will benefit Bristol by improving transport provision and reducing journey times for trips across the region, including the large numbers of cross boundary trips. Around 60,000 people drive to work in Bristol from other local authorities, and 60% of those driving to work in the city centre do so from other local authorities. Conversely, around 40,000 Bristol residents drive to work in other local authorities. Working in partnership with neighbours, as demonstrated by the Joint Transport Study, will be crucial to tackling congestion problems in the city. For example, improving transport provision to the south west and the Airport will strengthen and enhance Bristol’s role as an international gateway. In the south east, improved links to Bath will bolster the economies of both cities, and in the north east, the highway improvements and new motorway junction will relieve congestion across this section of Bristol. In the north west, the new Park & Ride transport hubs on the M32 and elsewhere will reduce congestion on key corridors into the city.

In the Bristol urban area, many of the key transport routes into the city are also high streets and there is limited space available to provide additional capacity. Transport schemes must focus on improvements that move the most people in the limited space available, improving the comfort, speed and reliability of sustainable modes of transport. While adding more road capacity may solve local issues in the short term, it has the potential to encourage more car travel. In some cases, such as the Callington Road Link, additional road capacity can be used to free up capacity on surrounding routes including the A4 Bath Road to allow for improved cycling and rapid transit schemes. However, in the remainder of Bristol there are very limited possibilities to add either rapid transit or alternative road space due to the limited space available in the city’s streets and lack of alternative alignments. As such, on many corridors the only remaining option is to consider the viability of running public transport services underground, which while expensive, would be more deliverable than services that run at ground level.

3.9.1. Bristol Transport Plan

It is recognised that large infrastructure schemes, as set out in the Transport Vision, are only part of the solution and for many transport issues more localised schemes and revenue funding are most effective and provide the greatest return on investment.

As announced in the Bristol City Council Corporate Strategy, a comprehensive Bristol Transport Plan will be developed with stakeholders and the public, with the Plan to be published in early 2018. The Plan will be informed by the feedback to the Joint Transport Study and will seek to create better places and help people move around by continuing to improve sustainable transport provision. The city needs to make a transition, from being a largely car dependent, fossil-fuelled city into a place that serves the wider needs of its citizens and businesses and protects the environment.

As noted previously, fiscal measures (such as congestion charging, as implemented in London, or workplace parking charges) have not to date been implemented in the West of England. However, there is an opportunity to explore these measures as part of this work for urban areas across the region including Bristol.

3.9.2. City Centre Movement Strategy

Bristol City Centre is the largest employment cluster and one of the largest shopping centres in the South West. Significant expansion is taking place with the development of Temple Quarter Enterprise Zone, with capacity for up to 17,000 new jobs. This will expand the city centre to the east, focusing around Temple Meads station. The city also has a rapidly growing visitor economy, with large numbers of people attracted to the city’s heritage, waterfront and creative reputation. These factors are all driving large volumes of travel demand, which will grow significantly in the future, and are placing significant pressures on the city’s transport network.

There are high volumes of traffic to city centre destinations, generated by large shopping car parks and parking provided by employers across the city centre. There is also traffic passing through the city centre because of limited orbital connections, particularly to/from the A37. All of this causes major congestion problems, particularly during peak periods but increasingly throughout the day and during weekends. This also causes delays and unreliable bus services, and worsens conditions for walking and cycling.

To tackle these challenges, Bristol City Council is developing a City Centre Movement Strategy as part of the Bristol Transport Plan. The strategy aims to create better places and improve the reliability and resilience of the transport network in central Bristol. It proposes a range of measures including enhanced traffic management, increased bus priority, continuous safe cycle routes, and enhanced public realm.
4. Case for Investment

4.1. Introduction
This chapter sets out the case for investment in the Transport Vision, by setting out the strategic case, potential impacts and estimated costs. It then discusses the key issues in delivering the Transport Vision.

4.2. Strategic Case
The Transport Vision has been developed to respond to the challenges, goals and objectives identified in Chapter 2 of this report. It has the fundamental principle of improving travel choices, and in so doing, helping to reduce car dependence, tackle congestion and improve resilience on the transport network. In some cases, it is necessary to invest in the road network to better manage traffic movements, reduce traffic flows on key parts of the network and unlock capacity for walking, cycling and public transport. In some other cases, targeted investment on the road network is needed to improve strategic connections, support the delivery of the Emerging Spatial Strategy and support economic growth.

4.2.1. Addressing the transport challenges
The Transport Vision will help tackle the challenges facing the area, which were discussed in Chapter 2, as shown in Table 4-1.

Table 4-1 Impacts of Transport Vision on Transport Challenges

<table>
<thead>
<tr>
<th>Transport Challenge</th>
<th>Impacts of Transport Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are limited travel options</td>
<td>Significant improvements to facilities on corridors served by strategic cycle routes and measures to reduce traffic in urban areas will help to improve conditions for both walking and cycling. Continued investment in the bus network, new MetroBus routes, light rail corridors, improved rail services and Park &amp; Ride will significantly improve travel choices in both urban and more rural areas.</td>
</tr>
<tr>
<td>Congestion on the road network</td>
<td>Improved travel choices will encourage mode shift and mitigate increases in car use to 2036. Improvements to orbital transport connections will help to reduce the need for traffic to pass through urban areas. Targeted improvements will help tackle pinchpoints on the network. New road connections will significantly improve connectivity and reduce delays on the most congested parts of the network.</td>
</tr>
<tr>
<td>Transport problems are a barrier to economic growth</td>
<td>The Transport Vision will improve connectivity to the most important economic drivers of the West of England: the city centres, Enterprise Zone and Enterprise Areas. By improving travel choices and journey reliability, the Transport Vision will tackle barriers to accessing the labour market and enable businesses to better connect with customers and supply chains in the West of England and beyond, helping to improve productivity and create new jobs.</td>
</tr>
<tr>
<td>Demand for housing will create new pressures</td>
<td>The Emerging Spatial Strategy takes into account the transport challenges facing the area, and the Transport Vision incorporates measures to mitigate the effects of increased travel demand generated by new housing. The first principle is to improve travel choices for new housing, including improved cycling, bus and MetroBus connections, and the second principle is to ensure mitigation of traffic impacts.</td>
</tr>
<tr>
<td>There are a number of social challenges</td>
<td>Investment in strategic cycle routes will encourage more physical activity to help tackle problems caused by lack of exercise. Continued investment in the bus network will help to expand the reach of commercially viable bus services, tackling problems caused by poor accessibility to jobs and services. Measures to reduce traffic on busy radial routes will improve air quality and tackle severance of local communities.</td>
</tr>
<tr>
<td>The transport network impacts on the environment</td>
<td>The Transport Vision will reduce the forecast increase in traffic across the West of England, contributing to cuts in carbon emissions. Reductions in traffic in urban streets will cut noise and pollution and improve public realm in the urban environment. Some transport schemes (e.g. improved roads and MetroBus corridors) could impact on landscape in some rural areas but impacts will be carefully mitigated. The Vision avoids, wherever possible, areas with outstanding environmental value, but trade-offs will be required where the issues are most challenging.</td>
</tr>
</tbody>
</table>
4.2.2. Supporting the transport goals

The Transport Vision will also play a critical role in delivering the goals and objectives, identified in Chapter 2, as shown in Table 4-2.

**Table 4-2 Impacts of Transport Vision on Transport Goals**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Impacts of Transport Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support economic growth</td>
<td>The Transport Vision will support growth by significantly improving connectivity to strategic economic assets. Improved access to Bristol Airport will support growth at this major gateway, which will in turn help improve connectivity to international markets and supply chains. Improved access to Bristol Port will maintain its national competitiveness and facilitate efficient movement of goods to and from the rest of the UK. Improved transport capacity and connectivity will enhance the competitiveness of Bristol and Bath city centres, the Enterprise Zones and Enterprise Areas across the West of England.</td>
</tr>
<tr>
<td>Reduce carbon emissions</td>
<td>Improved travel choices will encourage mode shift and help manage future car use, contributing to reductions in emissions. Increased levels of active travel will help to reduce car use for short urban trips. Improved public transport will reduce the need to travel by car within and into urban areas. Continued investment in Ultra Low Emissions Vehicles will play an important complementary role in reducing emissions in the vehicle fleet.</td>
</tr>
<tr>
<td>Promote accessibility</td>
<td>Investment in strategic cycle routes will improve active travel connections for short urban trips. Continued investment in the bus network will help to expand the reach of commercially viable bus services, improving connectivity to employment destinations, shops and social facilities. Measures to reduce traffic will help tackle severance and facilitate movement within local communities.</td>
</tr>
<tr>
<td>Contribute to better safety, health and security</td>
<td>Investment in strategic cycle routes will facilitate more active travel, promoting more exercise and healthier lifestyles. Reductions in traffic flows and better management of traffic will help to reduce exposure to traffic, reduce road safety problems and tackle poor air quality and its health impacts. More people travelling by public transport and improved waiting facilities will improve people’s perceptions of security in using the transport system.</td>
</tr>
<tr>
<td>Improve quality of life and a healthy natural environment</td>
<td>Improved facilities for active travel, improved connectivity by public transport, reduced traffic flows and improved public realm will significantly improve quality of life in the urban areas. These will also support the Urban Living component of the Emerging Spatial Strategy. Effective masterplanning to incorporate a range of travel choices will enhance quality of life in other areas with development in the Emerging Spatial Strategy. Measures will be taken to mitigate the impacts of new transport infrastructure on the rural environment, including application of appropriate design standards and landscaping.</td>
</tr>
</tbody>
</table>

4.3. Potential Impacts

The success of the Transport Vision should be considered in terms of its ability to change travel behaviour, secure a sustained shift to walking, cycling and public transport and deliver improved connectivity by all modes.

Transport modelling and other sources of data have been used to estimate the volumes of travel by mode, at present and for a 2036 forecast year. The transport model uses a base year of 2013 and has been used to estimate growth in demand to 2036. It assumes the completion of MetroBus, MetroWest and other schemes such as the re-modelling of the road network around Temple Meads, and then considers the impacts of new public transport and road schemes in the Transport Vision. The model includes bus and rail travel, cars and goods vehicles but does not include walking and cycling. It is therefore necessary to make estimates about walking and cycling, based on data from the National Travel Survey.

4.3.1. Future Travel Choices

It is estimated that there will be a 28% rise in trips by all modes in the West of England, due to the increased numbers of people living and working in the area and reflecting delivery of the Emerging Spatial Strategy. To provide a snapshot of the potential impacts of the Transport Vision, Figure 4-1 shows the forecast differences in commuting between 2011 and 2036. Two pie charts are shown: the first shows the shares of commuting trips in 2011, derived from the 2011 Census, and the second shows the estimated shares of commuting trips with the Transport Vision in 2036.
The forecasts for 2036 reflect a number of assumptions but show important changes in future modes of travel in the West of England:

- New technologies will enable increased working from home in the future. The pace of technological change means that it is difficult to estimate how this will impact on travel behaviour, but it is estimated that this could almost double the numbers of people working from home.

- The focus on Urban Living, ongoing investment in active modes and the transformational investment in strategic cycle routes is forecast to result in an increase of more than 60% in the numbers of people walking and cycling (from the already high levels in the area, particularly Bristol and Bath).

- The investment in the next generation bus network, Park & Ride, MetroBus routes, light rail and the rail network is forecast to result in a more than doubling of public transport use.

- Continued investment in smarter choices and the advent of new models of car use, including ‘mobility as a service’, will result in significant increases in car sharing.

- Future numbers of people driving will depend on the scale of shift to other modes and, increasingly, the adoption of new models of car ownership. People are increasingly choosing to avoid buying cars and instead use car clubs and other forms of mobility as a service. Furthermore, measures to introduce congestion charging in the urban centres will significantly affect travel choices.

- The largest shifts from driving to walking, cycling and public transport will take place in the Bristol urban area, which will reflect the ability to make journeys using different travel options. In contrast, smaller towns and rural areas will tend to have higher levels of car use, reflecting the types of journey and travel choices that will be available.

The forecast above indicates a potential reduction in the numbers of trips by car. This would be dependent on continuing to rapidly grow the numbers of people choosing active travel options and securing a large shift to the new forms of public transport in the area. This will depend on the ability to encourage high levels of walking, cycling and public transport use as part of the Urban Living agenda and effective masterplanning will be critical. Furthermore, it will be critical to encourage high levels of public transport use from the strategic locations in the Emerging Spatial Strategy. Failure to do so will jeopardise the delivery of these aspirations.

The chart shows dramatic changes in future mode split for travel in the West of England. There would be large increases in mode split for both walking and cycling and public transport, and a reduction in the proportion of people driving a car to work (from almost 60% in 2011 to below 50% in 2036). This would enable continued rebalancing of the transport network – particularly in the urban areas – to active modes and public transport.
The transport modelling forecasts that there will be a large increase in goods traffic (in excess of 40%) between now and 2036. This reflects growth in the economy and increased consumption of goods. Increased internet home shopping and home deliveries will be a key factor in driving this growth. It will be very challenging to manage this impact, because much of this goods traffic will be to destinations across the West of England. There will be a need to identify funding sources for the Freight Consolidation Centres that will help to rationalise this goods traffic, improve utilisation of vehicles, reduce freight mileage and manage the impact of deliveries on the urban road networks.

4.3.2. Impacts on congestion

The transport model has also been used to estimate the impacts on congestion on the road network. This shows that, without action to improve the transport network, average delay across the network is likely to increase by more than 20%. This is the average for the whole network: delay will increase much more significantly at key hotspots, including Bristol city centre, Bath, Weston-super-Mare, the North and East Fringes and south Bristol. This will act as a significant barrier to growth – both new jobs and new housing – in these areas.

With the Transport Vision in place, it would be possible to significantly reduce traffic delays, but the impact would be dependent on a number of factors. It would require high levels of mode shift in the urban areas, enabling reductions in flow on the urban network. It would also require significant improvements to the road network, to re-route orbital traffic out of the road network in south Bristol, improve connectivity to the East Fringe from the M4 and improve connections between North Somerset and Bristol. Finally, it would require careful consideration of options for the future management of roadspace on radial routes into Bristol. Traffic modelling shows that measures to restrict traffic movements on radial routes would result in significant increases in delays and re-routing of traffic onto alternative routes. However, options to consider segregated running of light rail would give greater flexibility for the management of roadspace and traffic flows.

4.4. Estimated Costs of the Transport Vision

The costs of each component of the Transport Vision have been estimated using data from benchmarking from similar schemes and unit rates for equivalent types of infrastructure. The costs have first been estimated using a 2015 price base from existing rates. Many of the schemes would be delivered at a point significantly in the future, and it is therefore necessary to take account of future price inflation. The larger, more complex schemes in the Vision would be likely to be delivered at a later date and would therefore be subject to higher levels of construction inflation.

The estimated total cost of the Transport Vision is approximately £5.0 billion in 2015 prices and £7.5 billion in future outturn prices. The higher outturn prices reflect estimates about when in the future the schemes could be delivered. Figure 4-2 shows the proportion of this total expenditure on the themes in the Transport Vision.
There is a strong focus in the budget on programmes for travel behaviour change, walking and cycling and public transport. Collectively, these comprise 72% of the total £7.5 billion outturn budget. The largest single component is the light rail system, with an estimated total budget of £2.5 billion for the system of five lines. However, large budgets are also allocated for upgrades to the bus network (£1 billion) and rail network (£1 billion). A total indicative cost of £2.1 billion has been identified for the measures for future management and improvement of the road network.

4.5. Delivery of the Transport Vision

This Transport Vision is intentionally ambitious. It will require an unprecedented level of funding, with a large acceleration of spending from current levels. The components of the Transport Vision will require significant further work to develop business cases and, if they have a clear case, further consultation and statutory planning processes. There are also significant engineering challenges: in the future management of roadspace and, in particular, the delivery of a future light rail system. Finally, there will be very significant challenges in building these schemes. In order to minimise disruption, it will be critical to carefully plan the delivery programme to minimise delays to users of the transport network.

- **Funding**: the programme is equivalent to annual expenditure of almost £400 million per annum, which is a step-change from historic and current programmes. 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 case for investment in this part of the country.

- **Programme Development**: the Transport Vision is only the first step in bringing the programme to fruition. Significant further work will be needed to develop business cases for the projects and support the case for funding. Further consultation will be required with stakeholders and communities and, in many cases, statutory planning processes will be required.

- **Engineering challenges**: the preceding chapter highlighted the challenges in changing the balance of roadspace to support the delivery of the strategic cycle routes and improved public transport. This will mean that careful consideration is needed of the potential impacts on traffic in each area. There will also be significant engineering challenges with the light rail schemes, including potential feasibility of underground running in parts of Bristol.

- **Delivery programme**: the Transport Vision proposes comprehensive investment in most parts of the West of England. Major improvements to cycling facilities, public transport and management of the road network are planned on busy transport corridors, and it will be essential to effectively plan future construction works. There should be a clear future blueprint for each corridor, with a clear programme of improvement to achieve the future blueprint, avoiding repeated upgrading and abortive work.

4.6. Next Steps

Consultation on this Transport Vision will take place during November and December 2016. The responses to the consultation will be important in helping to shape the final version of the Vision and the recommendations from the Joint Transport Study. The Study is expected to report in spring 2017 and will be used to inform the next Joint Local Transport Plan and future transport investment programme for the area.
Appendix A: Summary of Key Challenges

Introduction
This section provides a summary of the key challenges facing the transport network, as outlined in Chapter 2 of this report.

There are limited travel options for many people
The West of England has made significant progress in improving options for travel by active modes, bus and rail. This is evidenced by the growth in demand in recent years, as shown in the figure below.

Figure A-1 Recent growth in sustainable travel in the West of England

However, there remain a number of challenges. Although walking and cycling are relatively popular compared with other UK cities, conditions are poor on many parts of the network, with limited facilities and cyclists exposed to risks posed by traffic in many places. Public transport use – both road and rail – is significantly lower than other major UK cities. Table A-1 shows the mode split for travel to work in the four authorities and West of England as a whole, based on data from the 2011 Census.

Table A-1 Mode of Travel to Work in the West of England

<table>
<thead>
<tr>
<th>Mode of travel to work</th>
<th>BANES</th>
<th>Bristol</th>
<th>North Somerset</th>
<th>South Gloucs</th>
<th>West of England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work mainly at or from home</td>
<td>7.7%</td>
<td>4.6%</td>
<td>6.6%</td>
<td>4.7%</td>
<td>5.5%</td>
</tr>
<tr>
<td>On foot</td>
<td>17.2%</td>
<td>19.3%</td>
<td>9.5%</td>
<td>3.2%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>3.0%</td>
<td>7.7%</td>
<td>2.8%</td>
<td>3.9%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Bus, minibus or coach</td>
<td>6.4%</td>
<td>9.6%</td>
<td>3.0%</td>
<td>4.9%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Train</td>
<td>3.6%</td>
<td>2.0%</td>
<td>2.4%</td>
<td>1.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Motorcycle, scooter or moped</td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.0%</td>
<td>1.4%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Other (including taxi)</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>0.7%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Passenger in a car or van</td>
<td>4.6%</td>
<td>4.9%</td>
<td>5.2%</td>
<td>5.1%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Driving a car or van</td>
<td>55.4%</td>
<td>49.9%</td>
<td>68.5%</td>
<td>69.8%</td>
<td>59.3%</td>
</tr>
</tbody>
</table>

Source: 2011 Census
Overall, 14% of people travel to work on foot, 5% by cycling, just under 7% by bus and 2% by train. 64% travel by car as a driver or passenger. These numbers vary significantly, with relatively high levels of walking, cycling and bus use by residents of Bristol and Bath, but much lower levels by people living in the more rural areas. Levels of car use are particularly high in the rural areas, reflecting the lack of travel choices that are available.

Bristol and Bath have high (and growing) numbers of residents walking and cycling compared to other major cities, but these tend to be concentrated in the inner urban areas that are closer to destinations. In many areas, there are lower levels of walking and cycling. However, there has been a strong rise in cycling in Bristol reflecting concerted investment in new facilities.

There are relatively low levels of public transport use. Even in Bristol, which is one of the UK’s Core Cities, fewer than 10% of employees commute to work by bus and 2% by rail. This compares with 22% of people commuting by public transport in other English core cities. However, bus use has recently been rising in the city, which could reflect the introduction of Residents Parking Schemes, reductions in fares and improvements to the bus network. Train use is modest, reflecting the relatively limited coverage of the network, but has grown strongly in recent years.

Data from the National Travel Survey (2014) shows that people make, on average, 920 trips per year. Of this, only around 16% is commuting, compared with 30% for leisure, 19% for shopping and 12% for education. The Census is the most comprehensive snapshot of people’s patterns of travel, but it concentrates on the journey to work and hence there are large volumes of travel that are not captured. The National Travel Survey and other sources of data can also be used to estimate the numbers of trips made by different modes for different journey purposes. These sources of data reinforce the importance of walking, cycling and bus use for many local journeys.

Travel demand is forecast to grow strongly in the West of England. MetroBus, which is currently under construction, is forecast to result in a shift to travel by bus, and the planned MetroWest project will result in a significant increase in the volume of travel by rail. However, both will impact on specific areas of the West of England. The overall mode split by bus and rail is forecast to increase slightly, with a reduction in the mode split by car, but cars will continue to be the dominant form of travel without further major intervention.

**Congestion on the road network**

There are high traffic flows on the M4 and M5 motorways, due to longer distance through traffic and more local movements within the area. There is also heavy traffic on the M32, reflecting strong commuting demand into Central Bristol, other radial routes (A4 Bath Road, A4 Portway, Cumberland Basin, A37 and A420), the A4174 Ring Road, the A4 and A36 in Bath and roads in Weston-super-Mare. There are also heavy flows on a number of roads connecting towns across the sub-region, including the A370, A38, A36, A46 and A432.

The heavy traffic volumes reflect high levels of economic activity, the relatively limited travel choices and high levels of car dependence for many people living in the area. This results in significant problems with traffic congestion in many parts of the city region, affecting both the local and strategic road networks. DfT data (2013/14) shows that Bristol has particularly slow traffic, averaging less than 15mph during the morning peak, slower than all other Core Cities outside London. Traffic is particularly slow on the A37 to the south and A420 to the east. However there are also significant problems on a number of other routes.

Traffic congestion causes a number of problems including longer and less reliable journey times, reduced resilience in the event of incidents, worsened reliability of bus services, rat-running of traffic through residential areas and idling traffic causing air quality problems. Slow journeys also reduce accessibility to jobs and businesses and act as a barrier to the competitiveness of the city region.

The forecast growth in overall travel demand will result in more cars, vans and goods traffic using the road network in the West of England. The increase in traffic is forecast to be slightly lower than the increase in overall travel due to more people using buses and trains. Whilst it is expected that an increase in home-working and other changes will reduce demand for travel in some areas, technological changes – including the arrival of driverless cars and new models of ‘Mobility as a Service’ – will raise new uncertainties about how people choose to travel and how the road network will operate.
However, it remains highly likely that congestion will grow significantly as traffic increases. The road network is already under major strain, and small increases in traffic result in larger increases in delays. The forecast growth in traffic is therefore expected to result in a significant increase in delay on the network. In general, those places that are already congested will experience a progressive worsening in conditions, but many other areas will also be affected.

Transport problems are a barrier to economic growth

The West of England Strategic Economic Plan (SEP) sets out the ambition for sustainable economic growth across the area, which includes planning for 95,000 new jobs by 2030\(^3\). This is equivalent to approximately 18% growth in the total number of jobs in the West of England between 2013 and 2030. Central to the Plan will be the delivery of the Temple Quarter Enterprise Zone, five Enterprise Areas and the priority regeneration area in South Bristol. These strategic development locations together have the potential to deliver around 70,000 new jobs by 2030.

Previous research for the West of England Authorities \(^4\) estimated that only around 14,000 of the 70,000 target jobs would be likely to be created without improved transport connectivity. The study estimated that the additional connectivity delivered by the current transport investment programme would help unlock a further 20,000 jobs. However, the ability to deliver the conditions for the remaining 36,000 jobs would be constrained unless additional infrastructure is provided to further improve transport connectivity. It is also important that regeneration in South Bristol and Weston-super-Mare, and economic restructuring in the Somer Valley, is supported by growth and investment in order to re-balance the economy across the area.

Demand for housing will create new pressures

The Joint Spatial Plan (JSP) will plan to meet the needs arising from both the Bristol and Bath Housing Market Areas to 2036. The Objectively Assessed Need (OAN) for both Housing Market Areas is 102,200, and the JSP will provide a framework to deliver up to 105,000 net additional new homes between 2016 and 2036, of which around 32,200 should be affordable homes. The four authorities’ existing Core Strategies currently make provision for around 66,800 dwellings. This means that there is a requirement for up to 39,000 additional dwellings (to 2036) that need to be accommodated in the JSP spatial strategy.

Overall, the requirement for 105,000 dwellings will be equivalent to an increase of more than 20% on current housing provision and represents major growth in the sub-region. This will pose significant challenges in terms of ensuring that the new homes are located in the most efficient locations, to maximise use of existing facilities and in maximising opportunities for walking, cycling and public transport. There will also be significant challenges in ensuring the deliverability of new infrastructure (including transport infrastructure) to support the requirements of this new housing.

There are a number of social challenges

In some communities a high proportion of people face multiple challenges of deprivation, health problems and poor basic skills. These areas include south Bristol, eastern inner Bristol, the Northern Arc of Bristol and parts of inner Weston-super-Mare. Parts of Bath also face challenges, including Twerton, together with parts of Keynsham. There is a number of complex issues causing deprivation. In many cases, deprived areas are close to job opportunities, but people’s skills are not well matched to the requirements of employers. However, in some cases, poor accessibility to jobs is a significant barrier to being able to take-up employment opportunities.

South Bristol faces particular challenges. There are relatively few jobs in the area and most people commute to the city centre. However, low skills levels and high levels of ill-health mean that many people are not able to work. Weston-super-Mare also has a relative lack of jobs in the town and high levels of out-commuting. Some people in the inner part of the town are relatively ill-equipped for work, with significant distances to jobs in the Bristol area adding to this challenge.

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\(^4\) GVA impacts of major transport schemes, Atkins for West of England Authorities, December 2012, located at [http://www.westofenglandlep.co.uk/place/transport-investment](http://www.westofenglandlep.co.uk/place/transport-investment)
Poor air quality has a significant impact on those with health conditions. Air Quality Management Areas cover radial traffic routes and the centres of Bath and Bristol. Poor air quality is now a critical issue that is recognised as a key factor causing ill health and early mortality. Obesity is a rapidly growing problem, due both to diet and sedentary lifestyles, associated with reduced physical activity, including walking. Walking more is a practical way to exercise and improve health. Road safety is an important issue, although good progress is being made in reducing the numbers of people killed and seriously injured on the road network.

**The transport network impacts on the environment**

Road traffic is one of the most important sources of carbon emissions. Good progress is being made in reducing emissions, reflecting mode shift to cycling and public transport and increased fuel efficiency. However, with more people living and working in the area, leading to significant increases in traffic, it will become progressively more challenging to reduce the overall carbon footprint.

Poor air quality, increased noise and the severance effects of traffic have a negative effect on the quality and experience of the urban environment across the area. These effects are particularly acute in Bath, Bristol urban neighbourhoods and parts of Weston-super-Mare. The dominance of traffic – including on-street parking – is a major challenge in reallocating roadspace to other modes and improved public realm.

There are also adverse environmental impacts of traffic in rural areas, where the tranquillity of areas such as the Cotswolds and Mendip AONBs are affected by traffic in some places, for example in the area to the north of Bath and in parts of North Somerset. However, there are also important opportunities to encourage access to the countryside, by sustainable modes of travel, to support the rural economy and as part of the unique quality of life on offer in the West of England.