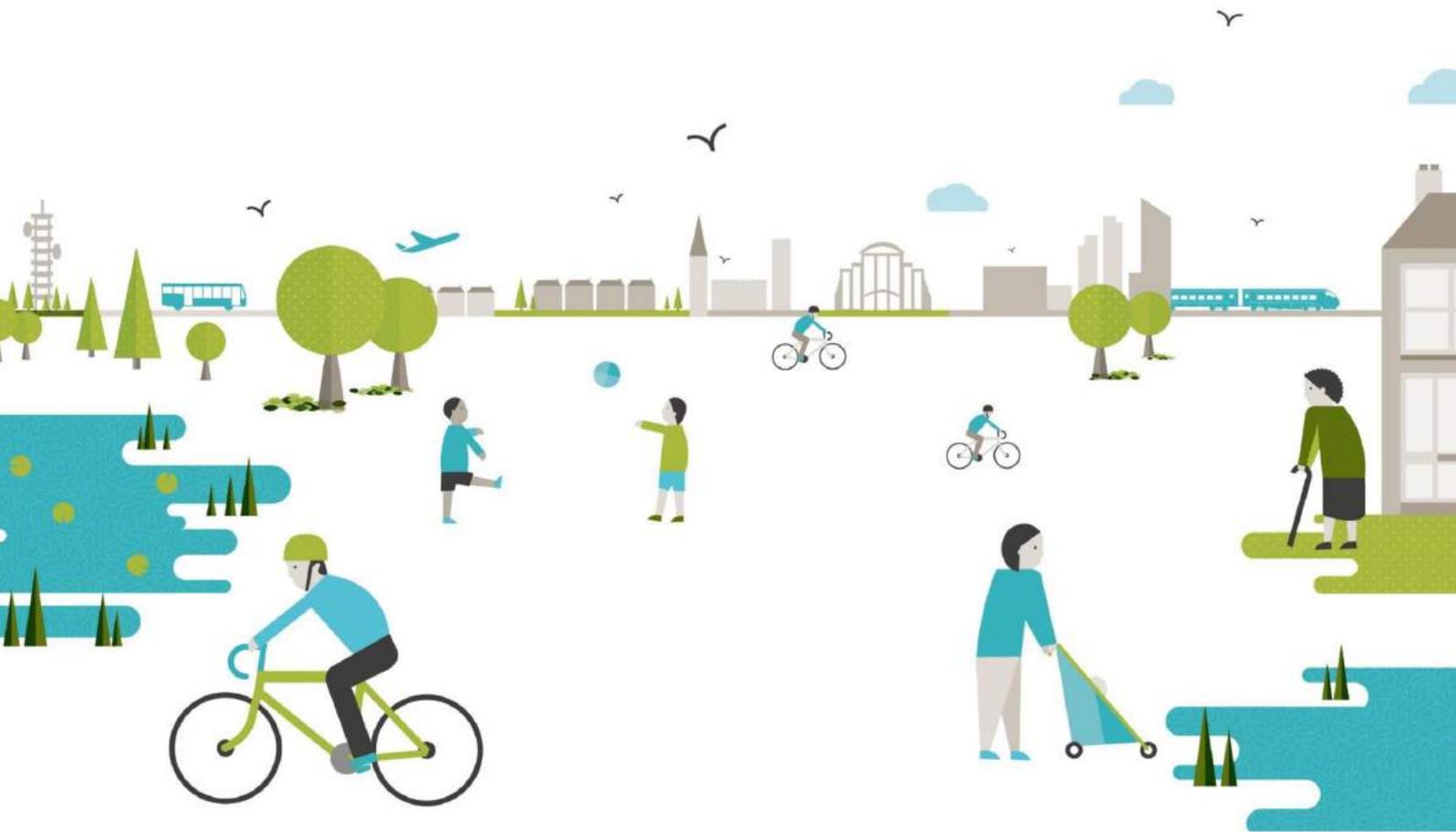


West of England Joint Transport Study Executive Summary

October 2017



West of England Joint Transport Study

Final Report Executive Summary

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1. Introduction

This is the Executive Summary for the Final Report of the West of England Joint Transport Study. It has drawn on extensive evidence and stakeholder engagement to develop a long-term Transport Vision for the West of England, which includes Bristol, Bath & North East Somerset, North Somerset and South Gloucestershire.

The purpose of the Joint Transport Study was to provide a clear direction for the long-term development of the transport system in the West of England to 2036 and beyond. The study was required to address the combined impact of current challenges on the network, growth from committed development in Local Plans and additional longer term growth up to 2036.

The outputs from the Joint Transport Study, including the Transport Vision, will assist the authorities in developing the next Joint Local Transport Plan (JLTP) and future transport investment programme.

A Joint Spatial Plan has been developed in parallel with the Joint Transport Study. The Joint Spatial Plan has considered options for delivering new housing and employment to meet future needs to 2036. Work on the Joint Spatial Plan is ongoing, with consultation on the Draft Plan scheduled from Autumn 2017 and an Examination in Public programmed to take place in 2018.

Transport evidence from the Joint Transport Study was used to inform the assessment of potential locations for housing and employment growth. The proposed growth strategy within the Joint Spatial Plan was then used in forecasts of future travel demand and to help shape the development of the long-term Transport Vision.

West of England Transport Vision

The technical work in the Joint Transport Study was used to develop the Transport Vision for the West of England. The Transport Vision includes all modes of travel and comprises a programme of complementary schemes that are designed to achieve a significant mode shift from the car and ensure a more efficient, resilient transport network. The Transport Vision is designed to address existing transport problems and respond to the challenges associated with the high levels of forecast growth in the West of England.

The principles of the Transport Vision can be summarised in the following mission statement.

Mission Statement for the Transport Vision

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

Study Goals

The Transport Vision has been designed to expand travel choices and improve the performance of the transport network to support the five study goals:

Figure 1 Study Goals



The Vision has been developed to address current problems and issues associated with future growth, looking ahead to 2036 and beyond.

Building on the current investment programme

The Transport Vision will build on the recent and current transport investment programme in the area:

- Programmes to facilitate travel behaviour change and increase cycle and bus use delivered under the Local Sustainable Transport Fund, Access Fund, Better Bus Area Fund and Cycling Ambition Grant.
- The Weston Package, completed in 2015, is already delivering benefits: this has included improvements to the local transport network and M5 Junction 21.
- The Bath Transport Package has expanded the capacity of Park & Ride, delivered improvements to the city's bus network 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 underway¹. On completion, this will provide a new fleet of diesel-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 progress², 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 reconfiguration of the road layout at Temple Gate, and work is progressing on investment in Temple Meads station.
- Highways England is planning the delivery of a new M49 junction to improve access to Severnside.
- 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.

¹ The Government recently announced that, following significant escalation of costs of the GWEP, electrification works would terminate at Thingley Junction between Bath and Chippenham, with the new trains running under diesel traction to Bath Spa and Bristol Temple Meads. Full electrification has been deferred.

² Network Rail has recently reported significant cost escalations for the reopening of the Portishead line to passenger services. Work is taking place to consider the implications and re-programme the works on the Portishead line.

2. Transport Vision

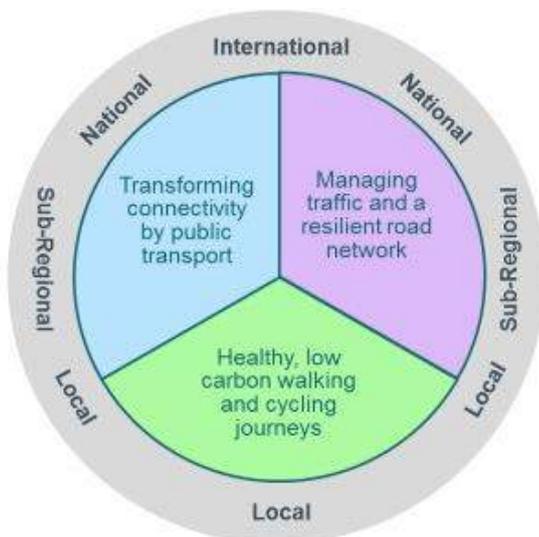
The Transport Vision will build on the current investment programme, with a continued strong focus on shifting travel behaviour towards sustainable modes and tackling congestion on the road network. If implemented, it will significantly accelerate investment to transform the ways that people travel in future in the West of England. It will more than double the trips made by cycling and public transport, resulting in a significant reduction in the mode split for journeys by car.

It sets a target for no overall increase in the number of trips by car across the sub-region in the context of 105,000 new homes being delivered by 2036. The Vision is required to unlock the delivery of new homes and jobs, improve economic performance and competitiveness, tackle health and inequality challenges and support the delivery of ambitious CO₂ reduction targets.

The Vision has a strong emphasis on integration of different modes, with complementary roles for walking, cycling, different forms of public transport, travel by car and freight. It includes a series of complementary measures designed to improve travel choices and support mode shift to active forms of travel and public transport. This will help to reduce car traffic and respond to the growth in travel with more people living and working in the area. It also considers the different needs of local, sub-regional, national and international travel demands.

The concept of the Transport Vision is shown in Figure 2.

Figure 2 Concept of the Transport Vision



A step change in the number of healthy, low carbon walking and cycling journeys

Active travel will be promoted for shorter and intermediate-length journeys, with roadspace reallocation to improve conditions for walking and provide safe, direct routes for cycling. This will have multiple benefits in helping to tackle congestion by removing car trips and encouraging more efficient use of limited roadspace, reducing carbon emissions from intermediate trips and promoting higher levels of physical activity.

Transforming connectivity by public transport

A fully integrated public transport network will be developed, with significant improvements to the bus network to cater for most journey needs, complemented by an expanded MetroBus network, a new mass transit network, Park & Ride and enhanced rail services catering for the full range of journey needs in the West of England. This will also deliver significant reductions in congestion and reductions in carbon emissions by reducing a wide range of car journeys, many of which are currently made by car because of the lack of public transport alternatives.

Managing traffic demand and a more resilient road network

Significant investment in the road network will support the ambitions for changing people's travel behaviour, through enabling reallocation of roadspace to walking, cycling and public transport on congested urban corridors and directing traffic to more appropriate corridors. New and improved road infrastructure will be designed to support the needs of pedestrians, cyclists and public transport users, including multi-modal transport corridors to support the ambitious growth proposals in the area and to unlock the economic potential of areas including South Bristol.

It will be necessary to consider how to more proactively manage traffic demand, particularly in congested centres and corridors. A combination of a Workplace Parking Levy and Road User Charging would help to encourage mode shift and improve the performance of the transport system. There will also be a more proactive approach to the management of freight, to tackle the challenges of increased goods vehicles in urban areas, with an increased emphasis on rail freight and new approaches to urban logistics.

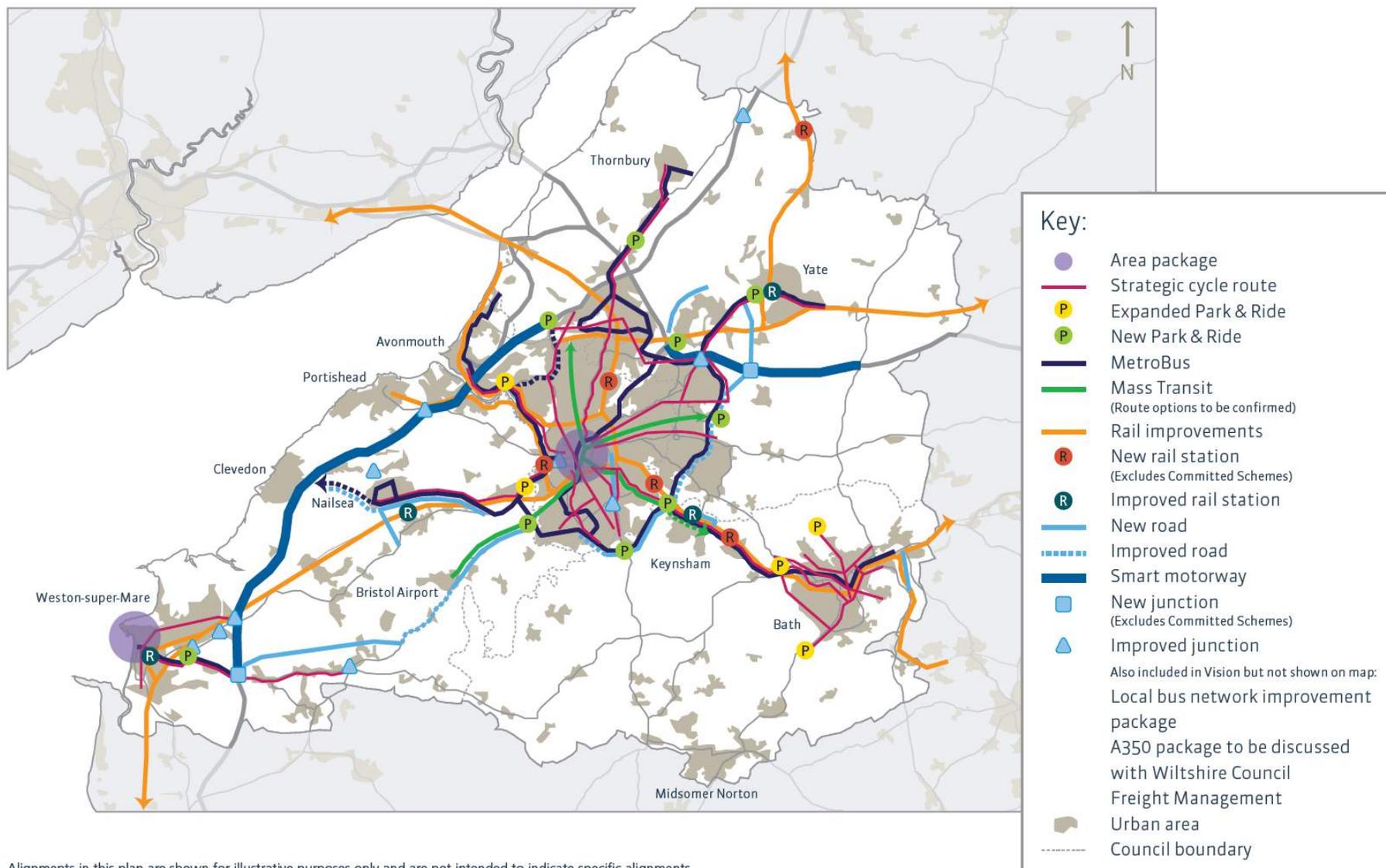
Effective connectivity at the local, sub-regional, national and international scales

The Transport Vision has a strong emphasis on local, sub-regional, national and international connectivity, with analysis of connectivity needs at different geographic scales. It has considered connectivity to Bristol Port and Bristol Airport, the national road and rail networks serving the West of England, and the complex local transport networks serving the area. Integrated multi-modal packages of measures have been developed to meet the needs of different parts of the West of England. This will ensure a seamless approach to future travel, with a strong focus on the needs of the different groups of customers using the network.

Central to the Transport Vision will be changing travel behaviour, in which people become less habituated in using cars, effective travel choices are provided and people understand the choices that are available. This will require significant investment in new infrastructure to provide these choices, and marketing, communications and technology to facilitate this change in behaviour.

Figure 3 shows the schemes in the Transport Vision.

Figure 3 West of England Transport Vision



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

Areas covered by the Transport Vision

The Transport Vision can be considered in terms of four quadrants with interrelated issues and integrated solutions: south west, south east, north east and north west. Bristol is then considered separately because the city is at the heart of the network.

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 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, a new mass transit route from Bristol to the Airport, a new multi-modal transport corridor (including MetroBus) connecting Clevedon, Nailsea and Bristol, and improved orbital connectivity around south Bristol.

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 future public transport 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 both by public transport and by road. Access to Royal Portbury Dock will be improved through extension of the Smart Motorway and significant improvements to M5 Junction 19.

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 main proposals focus on addressing issues in Bath, the Bristol – Bath corridor and orbital movements around South Bristol. The proposals in Bath include further expansion of Park & Ride to intercept trips into the city and a package of strategic cycle routes to encourage active travel. A new East of Bath Link will help to take traffic out of the city and facilitate reallocation of roadspace.

A mass transit route between Bristol and Bath will transform travel choices along this corridor, which would be delivered in conjunction with 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 future public transport network, including a new Park & Ride site at Hicks Gate.

Improved road infrastructure connecting the A4 at Hicks Gate with the A37 at Whitchurch and 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.

North East: Yate 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 proposals focus on improving connectivity to the East Fringe and Yate. The Enterprise Area at Emersons Green will enhance the attractiveness of this area for inward investment, which will necessitate improved connectivity to the M4 and local transport networks.

A new mass transit corridor, between the East Fringe and Bristol city centre, is proposed 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 improved connections to Yate.

A new Park & Ride site on the M32 is also recommended. A new Winterbourne Bypass will unlock highway capacity for MetroBus improvements on the A432 corridor between Yate and Bristol, complemented by Park & Ride on the A432, and interchanging with improved facilities at Yate railway station. It will also connect 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.

North West: Thornbury 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 proposals focus on improving connectivity from Thornbury, Avonmouth / Severnside and North Fringe to the city centre. The Great Western Electrification Programme will enhance the competitiveness of the area, which will necessitate investment in improved local connectivity. The motorway network is under pressure and the Transport Vision proposes extension of Smart Motorway running east to M4 Junction 18 and on the M5 south across the Avonmouth Bridge.

A new mass transit corridor, between the North Fringe, North Bristol and Bristol city centre, is proposed to transform connectivity in this part of the conurbation. A new MetroBus and strategic cycling route on the A38 corridor will improve connectivity to Thornbury, which will extend services from the MetroBus corridor in the North Fringe. Improvements to M5 Junction 14 will accommodate growth in the area.

A new MetroBus route will serve Severnside and an expanded Portway Park & Ride, and a network of new Park & Ride sites will intercept traffic on the edge of the Bristol urban area on the A38, A4018 and M32. These will be complemented by reopening of railway stations, further improvements to local rail services and better rail connections between Bristol and South Wales.

Bristol

Bristol is at the centre of the West of England transport network and transport issues in the city have consequences for the rest of the West of England and the wider South West region. Many of the major routes in the Bristol urban area 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. Many of the major components of the Transport Vision, described in the four quadrants, are required to address these challenges in Bristol.

The primary focus in Bristol will be significant investment in active travel and public transport to secure substantial mode shift from the car, which will tackle the problems caused by poor accessibility, congestion, poor air quality and physical inactivity. This will also be needed to accommodate the growing numbers of people living and working in the city.

Strategic cycle routes will help to tackle barriers to cycling on the city's busiest traffic routes and will form a key part of the city's wider cycling network. The network of Park & Ride sites in the Transport Vision will intercept traffic heading into the city and will help reduce traffic on radial routes and the city centre, contributing to a reduction in congestion, air pollution and collisions.

A new mass transit network will comprise high-capacity, segregated corridors connecting major destinations and integrating with other modes to transform public transport across the Bristol urban area. This includes routes to Bristol Airport, North Bristol and the North Fringe, East Bristol and East Fringe, and Hicks Gate and potentially Keynsham. In some sections, underground running may need to be considered due to streetspace constraints.

Large infrastructure schemes are only part of the solution and, in many cases, more localised schemes and revenue funding are most effective and provide the greatest return on investment. In addition to the JLTP, a more detailed Bristol Transport Plan is being developed by the Bristol Congestion Task Group, with the intention to consult on the plan in mid-2018. The Plan will be informed by the Joint Transport Study and will seek to create better places and help people move around by continuing to improve sustainable transport provision.

Bristol City Council is developing a City Centre Movement Strategy (or City Centre Framework) as part of the Bristol Transport Plan. This will tackle challenges of high volumes of traffic heading to city centre destinations and traffic passing through the city centre because of limited orbital connections. The City Centre Movement 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.

3. Components of the Transport Vision

The components of the Transport Vision are described by mode: technology and smarter choices, active travel, public transport, the road network and freight. Major schemes in the Transport Vision are highlighted under each mode.

Technology and Smarter Choices

Behaviour change will be critical to ensure that people consider more sustainable forms of travel: walking, cycling, public transport and car-sharing. New technologies, including on-demand information and smart-ticketing, will also support the shift to more sustainable travel choices. Connected and Autonomous Vehicles could change the way that people use cars, and the transport network needs to be future-proofed to accommodate these changes.

Active Travel

Walking and cycling are the healthiest forms of travel and should play the primary role in catering for short trips. The Transport Vision includes major investment in modifying the use of urban roadspace to create new strategic cycling routes across the Bristol urban area, Bath and Weston-super-Mare, together with connections along major corridors to Thornbury, Yate, Keynsham and Nailsea.

Greater Bristol Cycle Network	New strategic cycling routes across the Bristol urban area, with routes extending to Nailsea, Thornbury, Yate and Bath. The package will include reallocation of roadspace on major arterial routes and traffic management measures, complementing investment in quiet routes and off-road network, to create a comprehensive, easy to use network for journeys across the urban area.
Bath Cycle Network and City Centre Package	Focus on east-west corridors through the city, with reallocation of roadspace and off-road network, to create a high-quality network through the city, complemented by improved permeability and investment in public realm in the city centre.
Weston Cycle Network	Focus on east-west routes from Worle and Weston Villages to the town centre, with reallocation of roadspace in Worle and provision of segregated routes in Weston Villages.

Buses

Local bus services form the backbone of the public transport network in the area. Further investment in the local bus network will support continued mode shift to buses, in the urban areas and on key corridors connecting towns. The Vision includes a Bristol city centre movement strategy, Weston Bus Network and the next generation Greater Bristol Bus Network.

Greater Bristol Bus Network 2	Further enhancements to the sub-regional bus network, including improved vehicle specification, upgraded stops (consistent with MetroBus standard), ticketing and bus priority. Enhanced interchange facilities across the network.
Bristol City Centre Movement Strategy (City Centre Framework)	Reconfiguration of road network in city centre to give greater priority to walking, cycling and buses and redefined traffic routings, with improved journey reliability by all modes. Significant reconfiguration of bus routings to improve journey speeds and reliability.
Weston-super-Mare Bus Network	Redesign of bus network to accommodate the requirements of Weston Villages, support regeneration in the town centre and ensure effective connectivity to key destinations, including stations, Weston College and Junction 21 Enterprise Area.

MetroBus

The Vision will build on the recent investment in MetroBus, with further enhancement to the existing routes and extensions to the growing communities of Nailsea, Yate and Thornbury, together with investment on the corridors to Severnside and Bath and development of new orbital connections, to create a comprehensive rapid transit system serving the area.

MetroBus in Weston-super-Mare	Route connecting Weston Villages, Junction 21 Enterprise Area and proposed Park & Ride site at A370 / A371 junction.
MetroBus to Clevedon and Nailsea	Route from Clevedon and Nailsea to Bristol, supporting new growth at Nailsea, using Long Ashton Bypass and a new transport link from Long Ashton to Nailsea.
MetroBus to Severnside	Route following A4 Portway to city centre, serving Portway Park & Ride and expanded employment areas in Avonmouth/Severnside. This could be used by a feeder service from the A4018 Park & Ride, running via Canford Lane / Sylvan Way.
MetroBus to Thornbury	Route via A38, serving new development on the A38 corridor and new Park & Ride site north of Almondsbury, connecting into the North Fringe to Hengrove route at Aztec West to city centre.
MetroBus to Yate	Route via A432, serving new development west of Yate, and serving new Park & Ride site at Nibley, connecting into the North Fringe to Hengrove route west of Emersons Green.
MetroBus to Keynsham, Saltford and Bath	Route via A4, connecting from Hicks Gate, with the option to run along the Keynsham Bypass, through Saltford Village and then running through Bath to the east of the city.
Orbital MetroBus	Route connecting South Bristol to Emersons Green via Ring Road, serving new development at Whitchurch and new Park & Ride sites at Whitchurch, Hicks Gate and Warmley.

Mass Transit

On some corridors in the Bristol urban area there will be a limit to which the bus system can accommodate more demand, and new transit options will be needed to meet growing travel demand. On major corridors, rail-based mass transit should be considered to accommodate future demand (through higher operational capacity than bus-based options) and to provide the quality of service to maximise mode shift from car-based trips. The priority focus will be the corridors to Bristol Airport, North Fringe, East Fringe and towards the Hicks Gate / Keynsham area. Constraints imposed by the road network mean that underground running will need to be considered in places.

Mass Transit Bristol to Airport	Fully segregated mass transit connecting Bristol Airport and South Bristol to city centre, with options to be considered for underground running.
Mass Transit Bristol to North Fringe	Fully segregated mass transit connecting Cribbs Causeway and North Bristol to city centre, with options to be considered for underground running.
Mass Transit Bristol to East Fringe	Fully segregated mass transit connecting East Fringe and East Bristol to city centre, with options to be considered for underground running.
Mass Transit Bristol to Bath	Initial priority for MetroBus corridor to Bath, with longer-term ambition for light rail between the Hicks Gate / Keynsham area and Bristol city centre, to serve Hicks Gate Park & Ride (and potentially beyond) and Temple Meads.

Interchange and Park & Ride

The public transport networks, in the future, will operate as a more integrated system. Effective interchange between all modes (bus, MetroBus, mass transit and rail) will be essential. Park & Ride facilities will also intercept traffic at the edges of the urban areas to facilitate reallocation of roadspace to active modes and public transport on radial routes.

The Park & Ride sites will help to 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 Joint Spatial Plan by freeing roadspace for sustainable travel modes in the urban areas. The performance of Park & Ride sites will be dependent on restricting parking provision in central areas and managing the cost of parking, to ensure that Park & Ride is the more attractive option compared to driving into the central areas. It will also be important to plan Park & Ride so that traffic impacts are adequately managed around each site, and demand is not abstracted from existing bus services.

Park & Ride Package for Bristol urban area	A network of new and expanded Park & Ride sites on the edge of the Bristol urban area, enabling traffic to be intercepted and facilitating multi-modal interchange. Includes sites on M32, A370, A38(S), A37, A4(E), A420, A432, A38(N) and A4018.
Park & Ride for Bath	Further expansion and improvement of sites at Newbridge, Lansdown and Odd Down and consideration of options for Park & Ride to serve the east of the city.
Park & Ride for Weston-super-Mare	A new Park & Ride site east of the town centre, potentially located near to the A370 / A371 junction and served by Weston MetroBus services.

Rail

The rail network is playing an increasingly important role for travel in the area and the Vision proposes continued investment beyond the current MetroWest programme. It will be necessary to consider the needs of local and longer-distance rail services in future network planning. Bristol Temple Meads will be a critical transport hub for Bristol, the West of England and the wider region.

New Stations Package	New stations proposed at Constable Road, Ashton Gate, St Annes, Charfield and Saltford, with supporting infrastructure including waiting facilities, real time information, cycle parking, bus stops and car parking.
Service Improvements and Station Upgrades	Target for all stations to be served by at least two trains per hour in each direction, with increased capacity rolling stock to accommodate demand. Improved waiting facilities and interchange at stations, with consistent MetroWest branding.

Road Network

The Vision would facilitate substantial mode shift from the car to other modes, but there will still be large numbers of cars on the network given the planned growth in the area. Significant investment will be required to unlock new development, tackle congestion blackspots and re-route traffic onto new transport links to facilitate reallocation of roadspace to sustainable modes in the urban areas.

East of Bath Link	New highway link connecting the A36 (south of Bathampton) to the A363 (near Bathford, south of A4 roundabout) or the A4, to provide a high-quality north-south route connecting the A36 and A46 to the east of Bath, either single or dual carriageway. This route will enable north-south traffic to avoid passing through Bath.
Winterbourne Frampton Cotterell Bypass	New transport corridor to bypass Winterbourne and Frampton Cotterell on the B4058, to improve traffic routing from Yate and to relieve congestion in the villages.
M4 Junction 18A to Ring Road	New motorway junction and road connection to the A4174 Ring Road to improve resilience of the network and unlock economic growth in the East Fringe.
M4 Junction 18A to Yate	A new transport link from the proposed M4 Junction 18A to the A432 near Yate will help unlock economic growth in the town. This is dependent on prior delivery of the new Junction 18A motorway junction with a connection to A4174 Ring Road.
South Bristol Orbital Corridor	New multi-modal transport corridor (highway, MetroBus, cycle route) connecting the A4 at Hicks Gate, A37 south of Whitchurch and A4174 Hengrove Roundabout to improve accessibility to South Bristol and unlock growth in the south of the city.
M5 Junction 21A to A38 Corridor	New multi-modal corridor connecting a new M5 Junction 21A at Weston-super-Mare with the A38, together with major improvements to A38 between Langford and South Bristol, to improve connectivity to Bristol Airport and South Bristol and overall network resilience.
Nailsea Corridor Improvement	Multi-modal corridor improvement (highway, MetroBus, strategic cycling route) between Bristol / A370, Nailsea and connecting to Clevedon / M5. Focus to the east of Nailsea, joining the A370 west of Long Ashton, with a new crossing of the railway line west of Backwell to join the A370. This will help to unlock growth at Nailsea and improve connectivity and travel choices between Nailsea and Bristol.

Smart Motorway: M4 Junction 18 – Junction 19	Smart motorway to accommodate future traffic flows between M4 Junctions 18 and 19 and to facilitate new traffic movements generated by new Junction 18A in South Gloucestershire.
Smart Motorway: M5 Junction 17 – Junction 21A	Smart motorway to accommodate future traffic flows and to facilitate improved management of incidents, to be integrated with new links from M5 Junction 20 and Junction 21A in North Somerset.
M5 Junction 14 Improvements	Capacity improvements at M5 Junction 14 to address existing problems and issues caused by growth in Stroud and the Joint Spatial Plan. Significant improvements are identified to tackle the problems of queueing on the slip roads.
M5 Junction 19 Improvements	Capacity improvements at M5 Junction 19 to address problems of queueing traffic on the M5 southbound slip road (to reduce disruption to traffic on the Avonmouth Bridge) and delays for traffic joining the M5 northbound.
A4 to Avon Mill Lane Link	New highway link from the A4, east of Keynsham, crossing railway to connect to Avon Mill Lane and A4175 north of Keynsham. This will improve traffic routing around the east of the town and will facilitate access to new development north of Keynsham,

Freight

The West of England is a major freight origin as home to Bristol Port and major logistics activity at Avonmouth / Severnside and in servicing the needs of residents and businesses in the area. The Vision strengthens the approach to managing freight into the urban areas, particularly given the importance of tackling air quality problems. This would need to give renewed focus to consolidation of freight, with support for the existing centre at Avonmouth and exploring options to reduce the number of lorries entering Bath.

There is potential for a new rail-based rail freight facility at Avonmouth, which could form part of a multi-modal interchange with good access to both the motorways and long-distance rail networks. At present, loading gauges in the West of England are a constraint to the movement of more rail freight: improved loading gauges have the potential to increase rail freight capacity in the area. There is also the opportunity to transport smaller items from outside the West of England to Bristol Temple Meads, from where they could be transported to destinations in the city centre and beyond using low carbon freight options.

Financial Measures and Other Controls

There is an important role for financial measures to both help to manage travel demand and to generate new sources of funding to help deliver the Transport Vision. The two main options are a Workplace Parking Levy and Road User Charging. Road User Charging is likely to have a more significant beneficial impact in reducing general traffic movements and generating larger amounts of revenue to be reinvested back into funding the Transport Vision.

The availability of parking plays a major role in influencing the choices that people make. Large areas of free parking result in people continuing in habitual use of cars and present a relatively inefficient use of space. On the road network, this results in space being used that could otherwise have been used for active travel, buses or essential loading requirements. On-street parking requirements will need to be considered at the corridor level but there is a strong case for more effective management of the limited space that is available.

4. Strategic Case and Outcomes

Supporting the Transport Goals

The Transport Vision will play a critical role in delivering the goals and objectives that were defined through the study. Table 1 describes these impacts.

Table 1 Impacts of Transport Vision on Transport Goals

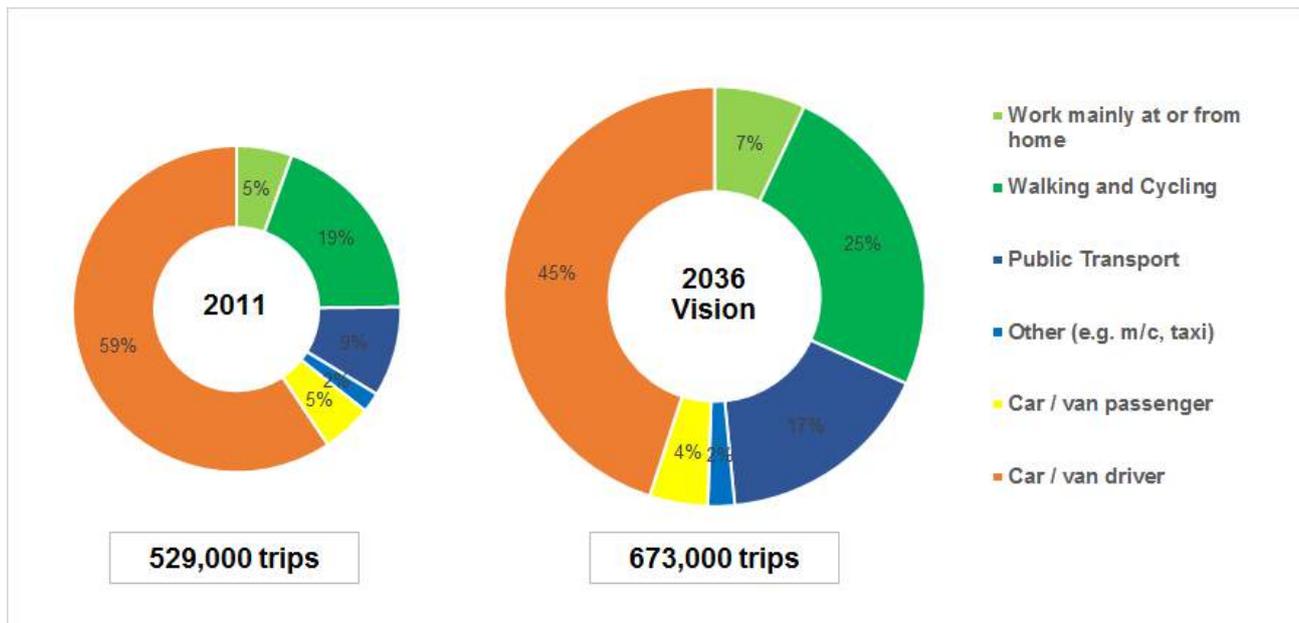
Goals	Impacts of Transport Vision
Support economic growth	The Transport Vision will support growth by significantly improving connectivity to strategic economic assets. Improved access to Bristol Airport will support growth at this major gateway, which will in turn help improve connectivity to international 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.
Reduce carbon emissions	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 Emission Vehicles will play an important complementary role in reducing emissions in the vehicle fleet.
Improve quality of life and a healthy natural environment	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 Joint Spatial Plan. Effective masterplanning to incorporate a range of travel choices will enhance quality of life in other parts of the West of England with development in the Joint Spatial Plan. Measures will be taken to mitigate the impacts of new transport infrastructure on the rural environment, including application of appropriate design standards and landscaping.
Contribute to better safety, health and security	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 the effects of severance, 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.
Promote accessibility	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.

Impacts on travel behaviour

The West of England will experience significant growth in the next two decades. This will result in significant increases in the volume of future travel. There are also changes taking place in the ways that people travel, with strong growth in the numbers of people cycling and travelling by bus and rail for everyday journeys. The evidence also indicates that new technologies could reduce the need to travel, including faster, more reliable broadband enabling more people to work from home. The gradual adoption of Connected and Autonomous Vehicles could also mean that, in the future, people could summon driverless cars, with fewer people owning their own vehicles.

It is estimated that there will be a 28% rise in people 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. Figure 4 shows the forecast differences in commuting by West of England residents between 2011 and 2036. Two charts are shown: the first shows the shares of commuting trips in 2011 and the second shows the estimated shares of commuting trips with the Transport Vision in 2036.

Figure 4 Current and Future Commuting in the West of England



The major investments in active travel and public transport are forecast to result in a significant reduction in mode split by car. In addition, measures such as Workplace Parking Levies and/or Road User Charging could have a further impact on the demand for travel by car, and would further complement and help lock-in the benefits of the measures proposed in the Transport Vision. A demand management scheme would also raise revenue that could be used to help fund major transport schemes in the Transport Vision.

Transport modelling forecasts that there will be a large increase in goods traffic (>40%) between 2013 and 2036 in the Do Minimum scenario. 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 challenging to manage this impact, because much of this goods traffic will be to destinations across the West of England. Measures including Freight Consolidation and including use of rail for distribution could significantly reduce the need for goods vehicles to enter the city centre. Demand management tools, including Road User Charging, should also be considered to help encourage mode shift.

Impacts on network performance

If no action is taken, the transport modelling indicates a 26% forecast increase in trips on the road network between 2013 and 2036. This is estimated to result in an increase in average delay per vehicle of almost 40% in the Do Minimum scenario. Traffic delays will increase much more significantly at major 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 will be possible to significantly reduce traffic delays, but the impact will be dependent on several factors. It will require high levels of mode shift in the urban areas, enabling reductions in flow on the urban network. It will also require significant improvements to the road network, to re-route orbital traffic out of the road network in South Bristol, enhance connectivity to the East Fringe from the M4 and improve connections between North Somerset and Bristol. It will also require careful consideration of options for the future management of roadspace in the urban areas.

The analyses demonstrate that the Transport Vision has the potential to significantly improve the performance of the transport network in the West of England, compared to the scenario without the JTS Vision. It is estimated that the time spent queuing in 2036 would increase by around 4% from the 2013 base year, compared to 40% in the Do Minimum scenario. The analyses should be treated with caution because the performance of the network will depend on routing options of the mass transit system, but these show that the Transport Vision has the potential to significantly reduce congestion in the West of England.

The introduction of demand management measures would be expected to have a further significant impact on congestion by targeting trips in the most congested parts of the network, over and above the benefits that would be achieved in the Transport Vision without demand management being in place.

Summary of Impacts of the Transport Vision

The Transport Vision will play a critical role in tackling the current and future transport challenges in the West of England and in helping to ensure that future growth will be sustainable. The Transport Vision has identified challenging but achievable targets for changing travel behaviour, with a large increase in active travel and use of public transport, which will help to control growth in the volume of traffic on the road network. The implementation of demand management measures, for example Road User Charging, would help encourage further mode shift and manage traffic volumes. The measures in the Transport Vision are forecast to result in significant benefits to transport users and improve resilience in the transport system.

These changes in travel behaviour and improved connectivity will have significant wider benefits for the economic, social and environmental future of the West of England. Poor connectivity has been cited by many stakeholders as a barrier to the competitiveness of the city region. The major improvements in connectivity in the Transport Vision will improve travel choices for commuting, reduce business costs and enhance business productivity, which will significantly enhance the competitiveness of the city region, attract new jobs and unlock the delivery of new housing.

The Transport Vision will help to deal with some of the most critical social challenges facing the sub-region, including lack of physical activity and health problems caused by poor air quality. The strong focus on active travel, including reallocation of roadspace to support walking and cycling, will play a key role in enabling people to incorporate physical activity into their daily lives. Providing better travel choices and controlling the volumes of traffic entering urban areas will be critical in helping to improve air quality.

The Transport Vision will directly address the critical challenge of delivering deep reductions in CO₂ emissions, through a combination of large-scale mode shift and supporting the uptake of Ultra Low Emission Vehicles (ULEVs). The analyses demonstrate that more will need to be done, at the national level, to ensure a sustained uptake of ULEVs over the next 20 years if ambitious targets are to be met. The analyses also demonstrate that there is a potential role for Road User Charging in encouraging mode shift and reducing vehicle trips, particularly in the most congested areas, in helping to meet ambitious CO₂ reduction targets.

5. Delivering 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 total capital cost of the Transport Vision is estimated to be upwards of £8.9 billion in future outturn prices. The breakdown of costs is shown in Table 2 below.

Table 2 Estimated Costs of Components of Transport Vision

Component of Vision	Estimated Outturn Cost
Behaviour Change	£0.65 billion
Strategic Cycle Routes	£0.4 billion
Bus Network	£0.35 billion
MetroBus	£0.63 billion
Mass Transit	£2.6 billion +
Park & Ride	£0.2 billion
Rail	£1.0 billion
Road Network	£3.1 billion
Total	£8.9 billion +

The proposals described in this report will be subject to further study and development work after completion of the Joint Transport Study. 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 the delivery of a mass transit 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.

This technical study has established that there is a transport case for considering these proposals, but further work will be required to establish detailed forecasts of demand, benefits, costs, business case and sources of funding. The delivery of schemes will be subject to the availability of funding and, in most cases, completion of statutory processes.

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