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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 Partnership office, are in the process of preparing a Joint Spatial Plan (JSP) and Joint Transport Study (JTS). The Plan area covers the whole of the West of England area, including Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire.

The purpose of the Joint Spatial Plan 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, the most appropriate locations for the housing and employment growth, and transport and other infrastructure requirements in the Plan area.

The purpose of the Joint Transport Study 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 Joint Transport Study will also inform, and be informed by, the Joint Spatial Plan, and will therefore consider alternative spatial scenarios and facilitate work to identify a preferred spatial strategy.

The first phase of work has included a focus on Issues and Options for the Joint Spatial Plan. This has considered the strengths of the area and particular challenges that are faced, both now and looking into the future. The Joint Transport Study has provided evidence on current and future transport issues to inform the assessment of potential strategic locations for future development.

1.2. Purpose of this Report
This report describes technical work that has been undertaken to inform the Joint Spatial Plan Issues and Options document. It is structured as follows:

- Chapter 2 sets out the key transport challenges in the West of England, and explains why it is important to take these issues into account in considering issues relating to the growth of the area;

- Chapter 3 takes baseline data to provide the context and methodology for the assessment of strategic locations and spatial scenarios described in Chapter 5 of the Issues and Options document;

- Chapter 4 describes the assessments of the strategic locations, provides the supporting explanation for the development of the transport-focused scenario and provides assessments of all scenarios; and

- Chapter 5 sets out the conclusions from this work.

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1 West of England Joint Spatial Plan: Issues and Options for consultation, located at https://www.jointplanningwofe.org.uk
2. Transport Challenges

2.1. Introduction

The West of England faces a number of challenges relating to transport and travel. These can be considered as follows:

- **Direct transport challenges** – a lack of attractive travel choices, high levels of congestion and a lack of resilience within the transport network to incidents or wider disruption; and

- **Wider challenges impacting / impacted by transport** – including quality of the environment, people’s health and quality of life, delivery of new housing to accommodate a growing population and capacity to unlock the economic potential of the area.

This chapter first addresses the direct transport challenges, focusing on **travel options** (with high levels of car dependence in many areas) and **congestion** (high levels of car use causing overloaded road networks, delays, unreliable journeys and wider impacts). The wider consequences (environmental, social and economic impacts) are then considered.

2.2. Travel options are limited in many areas

The West of England has an area of influence that extends beyond its boundary into South Wales, west Wiltshire, southern parts of Gloucestershire and northern parts of Somerset. This has implications for travel choices in the area, including movements across the Severn Estuary from South Wales and movements from nearby towns and rural areas in Gloucestershire, Wiltshire and Somerset.

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.

In terms of transport accessibility and choices, the West of England area has historically experienced:

- Very high levels of car use in rural areas and urban fringes (with slightly lower levels in urban areas);

- Low levels of public transport use across the whole area, including urban areas, although there is evidence that this is growing; and

- A relatively high and growing level of cycle use in the urban areas, when compared to equivalent UK cities.

Figures 2-1 to 2-3 illustrate these issues, in terms of proportions of people across the West of England using private transport, public transport and active modes to travel to work.
Figure 2-1  Proportion of residents using private transport to travel to work

Source: 2011 Census (as visualised at www.datashine.org.uk). LQ = Location Quotient, which is the ratio of private transport use in each location compared to the national average (national average = 45.5%). Areas with a higher LQ have higher use of private transport and areas with a lower LQ have lower use of private transport.

Figure 2-2  Proportion of residents using public transport to travel to work

Source: 2011 Census (as visualised at www.datashine.org.uk). National average = 11.5%.
Figure 2-3  Proportion of residents who walk, cycle or use a mode other than car or public transport to travel to work

These maps demonstrate high levels of car use, not just in the rural areas, but also in many of the towns and in the eastern and northern fringes of Bristol. The areas on the eastern fringe of Weston-super-Mare, eastern side of Portishead and eastern and northern fringes of Bristol have all been developed during the last three decades. In the case of Weston-super-Mare and 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. The North and East Fringes have high levels of commuting to Bristol city centre (radial movements) and to the North Fringe (orbital movements), with long public transport journey times and high car use.

Public transport use is generally low across the area. Slightly higher levels are seen along key bus corridors and in inner urban areas, and patronage has recently grown significantly in the Bristol urban area. It is particularly low in many of the towns, including Yate, Thornbury, Midsomer Norton, Clevedon and Portishead, although recent investment has been made in some areas to improve the attractiveness of services. There are high levels of walking and cycling in much of Bath and the inner part of Bristol, together with parts of the North Fringe, inner Weston-super-Mare and in the centres of towns including Clevedon, Nailsea, Portishead, Yate and Thornbury. Recent monitoring data has shown significant increases in cycling, growth in bus use and a very large increase in rail use since 2008.

The current programme of investment in the West of England will contribute to improving the attractiveness of walking, cycling and public transport. Investment in improvements to the cycling network are forecast to increase the numbers of people cycling. The MetroBus system, which is now under construction, is forecast to attract new users to the public transport network, and the planned MetroWest project will attract new users to the rail system. Together these will help to reduce reliance on cars, contributing to a shift from cars to more sustainable modes. However, the growing numbers of people living and working in the West of England will mean that there will be continued growth in the numbers of cars and vehicle traffic.
2.3. Congestion is impacting on many areas
The West of England is a prosperous area that has experienced significant traffic congestion over a number of years on the motorway network, core radial routes and around main employment centres. Traffic congestion causes a number of problems including:

- Longer and more unreliable journey times – for business, commuting and leisure journeys;
- Reduced resilience in the event of incidents;
- Reduced economic competitiveness;
- Reduced accessibility to jobs and services;
- Worsened reliability of bus services;
- Dominance of road traffic on the urban environment; and
- Idling traffic causing air quality and health problems.

Figure 2-4 shows the problems of road congestion across the West of England. This is sourced from transport model data and observed conditions on the road network. It also shows key locations where the resilience of the network is a problem. These locations tend to be particularly vulnerable when traffic accidents or other incidents occur, causing widespread disruption across the wider network.

Figure 2-4 Road congestion and resilience challenges in the West of England

The map shows the current scale of the challenge, with congestion problems in Central Bristol and on radial routes in East Bristol and North Bristol. There are also significant problems on the A4174 Ring Road in
South Bristol and in the North and East Fringes. The M32 into Central Bristol experiences queueing at present: these are forecast to extend in the future, although the North Fringe to Hengrove MetroBus scheme will improve travel choices and mitigate delays for buses.

The North Fringe already experiences significant problems, with a complex mix of radial, orbital and more local movements. These are forecast to worsen in future, although the North Fringe to Hengrove Package will help mitigate these issues by providing new infrastructure and improving travel choices. Yate also has problems on the A432 approach to the town centre from the west. The Cribbs Causeway area is forecast to experience growing levels of congestion in future, including the M5 motorway junctions. Significant issues are also faced on the A369 from Portishead to M5 Junction 19, M5 Avonmouth Bridge and the A38 from Thornbury to the North Fringe (particularly approaching M5 Junction 16) and onwards to Bristol.

Existing congestion problems have been identified on the network within Weston-super-Mare. Many of these challenges have been mitigated with the recent completion of the Weston Package, but future challenges are likely to emerge as the town continues to grow. The operation of the M5 between Junctions 20 and 21 will become an increasing challenge, due to increasing numbers of trips between Weston and the Bristol urban area. There are also high traffic flows on the A370 through villages in North Somerset, creating both congestion and environmental problems in these communities, and the village of Barrow Gurney also suffers high traffic flows. The completion of the South Bristol Link (SBL) will provide an alternative route across the south-west quadrant of Bristol which will help to relieve Barrow Gurney. The additional capacity provided by the SBL will help to accommodate traffic growth on the A38 associated with the expanding Bristol Airport.

The A420 corridor east of Bristol is likely to become an increasing challenge, as is Keynsham on the A4 corridor. 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 traffic and congestion. The road network to the east of Bath is a worsening problem, with high levels of through traffic (including goods vehicles) between the A36 and A46 passing through the middle of the city. The A46 corridor between Bath and M4 Junction 18 also carries high volumes of traffic.

### 2.4. Wider challenges

The transport issues described above have a number of wider implications, in terms of impacts on the environment, people and the economy of the West of England.

In terms of the environment, high levels of car use in the area result in high carbon emissions, contributing to global climate change. High traffic flows impact on both urban and rural areas: in many areas, traffic, parked cars and road infrastructure dominate the streetscene and there are high levels of noise adjacent to busy roads. There are serious problems with air quality in some areas, which impacts on people's health and causes premature deaths, and Air Quality Management Areas have been declared in Bristol, Bath, Keynsham and at localised hotspots in the East Fringe of Bristol.

A number of communities face significant social challenges, including poor skills, worklessness, poor health and low incomes. These areas include South Bristol, eastern inner Bristol, parts of North Bristol, parts of inner Weston-Super-Mare and parts of Bath and Keynsham. In some cases, there are problems caused by poor access to jobs, shops and services, but communities often face complex challenges and transport is only one of many issues. Road safety is also an important issue, although good progress is being made in reducing casualties. Measures to reduce the dominance of road traffic, reduce traffic speeds and improve conditions for pedestrians and cyclists are all important in helping to improve road safety.

The West of England is already one of the UK’s best performing economies and there are strong ambitions for growth over the next two decades, with an objective to deliver 95,000 new jobs by 2030\(^2\). However, the transport network is a major constraint to delivering these growth ambitions. The business community frequently reports problems caused by poor connectivity, including time wasted in traffic queues, unreliable journeys, constraints to the labour market and difficulties in connecting with customers and suppliers. There are significant costs to the economy from congestion: this will increase as traffic grows, hampering productivity and preventing the creation of new jobs. There is also strong population growth in the area,

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generating demand for new housing. However, failure to tackle transport problems will constrain the delivery of new housing.

2.5. **Current and future challenges**

These issues are relevant to the West of England both now and in the future and can be considered in the context of three time horizons:

- **Current challenges** – certain challenges are being addressed in part by the current transport infrastructure investment programme (both the major schemes and smaller schemes) 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 environment;

- **Impacts of growth associated with development defined in the Core Strategies to 2026 and beyond** – the Core Strategies and the JLTP3 have identified transport measures to mitigate the impacts of new development, although not all of these schemes are fully funded at this stage. Challenges may continue to emerge as the transport system fails to keep pace with growth in travel driven by economic growth and increased levels of activity. Developers are expected to mitigate the impacts of their developments, but in many cases infrastructure packages are not sufficient to fully mitigate the impacts of background growth; and

- **Longer term growth to 2036 and beyond** – longer-term growth options will have further impacts on the transport network, generating new patterns of travel. This will require planning of development in locations with good travel choices and minimising the impacts of congestion, but it is likely that this will place further pressures on the transport system.

The evidence indicates that failure to act will have serious consequences for the West of England. At present, the shortcomings in the transport network are mainly seen as ‘direct’ impacts, in terms of limited travel options and high levels of congestion, which reduce connectivity across the city region. The current major scheme programme will make some progress in addressing these challenges. However, these schemes are due to be completed by 2021 and there is no investment programmed beyond these schemes.

Planned housing and employment growth to 2026 will place additional pressure on the network. Infrastructure packages will at least partially mitigate planned development, but will not fully address the impacts of background growth in travel demand. Challenges will remain in 2026 and traffic conditions are likely to deteriorate. Air quality is likely to remain a challenge without a significant mode shift: improvements in emissions technology could help to mitigate some of the problems, but traffic growth will further exacerbate the challenges. A mix of vehicle technology, engineering, education and enforcement will help to reduce road casualties, although patterns could change with increasing numbers of people walking and cycling. The deterioration in connectivity and network capability could, however, have a significant effect on the competitiveness of parts of the West of England, which will impact on future job creation.

Planning for growth to 2036 will pose further challenges. Fundamental challenges are likely to remain, even if new technologies transform society through new forms of mobility. Without investment in new infrastructure there will be issues associated with lack of network capacity. If new capacity is not provided, together with policies to encourage sustainable travel choices, the transport network is unlikely to be able to cope with a significant increase in demand. This would cause major problems with congestion, reliability, resilience and connectivity in many areas, which will damage the competitiveness of the West of England, and act as a major barrier to delivering new growth.
3. Assessment Methodology

3.1. Introduction

This chapter describes the approach that was taken to assessing the transport issues associated with the different strategic locations identified in the Joint Spatial Plan Issues and Options document. This draws on the insights from the previous chapter to focus on the two critical drivers of travel choices and congestion. It also demonstrates the importance of considering both conditions at present and likely conditions in the future when new development takes place. This work has focused on the assessment of potential locations for new housing. This has considered likely travel movements from these locations to other destinations, including potential travel to work movements.

3.2. Strategic Locations

The strategic locations considered in the Issues and Options document are presented in Figure 3-1.

Figure 3-1 Strategic Locations

Mapping the strategic locations

Urban intensification
Urban extension
Town expansion
Other settlements/locations

Motorway
A Road
Railway line
Council line
River

Note: Locations are illustrative only and must not be taken to imply any specific development site or a preference for identified options

Source: Figure 9, West of England Joint Spatial Plan: Issues and options for consultation

These potential locations are grouped under different typologies: urban intensification, urban extensions, town expansions and other settlements / locations. Each location has been considered individually in the assessments, because there are very specific issues at each location. The assessments for each location are then used to inform the overall assessments for different typologies and different spatial scenarios.
The assessment of the strategic locations is proportionate to the level of detail that is currently available. These are very broad options and the analysis is therefore based on the broad issues relating to the area under consideration, using high-level data to undertake a comparative assessment of the different options.

In the case of the urban intensification options, it was necessary to identify typical locations for the purposes of analysing transport issues. In Weston-super-Mare, it was assumed that intensification would be focused around the town centre. In Bristol, four locations were considered: city centre, St Philips Marsh, Hengrove and Avonmouth/Shirehampton. In the North and East Fringes of Bristol, analysis focused on the Filton and Staple Hill areas. It should be noted that these would not necessarily be the focus for future development: these were only selected for the purposes of analysis of transport issues.

### 3.3. Travel Choices

In planning for new development, it is critical to take into account the quality of travel choices. New housing should be served by good quality walking connections to local facilities, quality infrastructure for cycling and good public transport connections to key destinations. Failure to provide adequate travel choices in new developments means that residents become reliant on cars, and it then becomes very difficult to encourage them to consider more sustainable travel choices.

The previous chapter demonstrated the problems that are faced: poor travel choices impact on people’s ability to access opportunities and constrain the labour market. High levels of car dependency cause congestion on over-stressed road networks, high carbon emissions, poor air quality and impacts on local communities.

The fundamental principle is that new development should be provided with good travel choices to maximise opportunities for sustainable development. The starting point is to ensure, wherever possible, that good travel choices are already in place or can be improved without the need for large-scale investment.

For each strategic location, a high-level qualitative assessment was undertaken to assess the potential travel demand from the area. This was based on analysis of existing travel to work data (from the 2011 Census) from existing nearby areas to assess likely commuting patterns. The travel options available were then considered, in terms of the quality of local walking and cycling connections, provision of bus services, and proximity to rail stations.

Quantitative data on mode split for travel to work in the local area was used to validate the assessment. Figures 2-1 to 2-3 (see Chapter 2) show the variations in mode splits across the area: this evidence was used to assess the potential scale of demand by car, public transport and active modes (walking and cycling) for each location. In general, this evidence shows that there would be lower car use in the inner urban areas, and higher car use in the rural areas, many of the towns and on the urban fringes.

Using this data, each location was assigned a Red / Amber / Green rating based on the quality of travel choices that are currently available.

<table>
<thead>
<tr>
<th>Table 3-1 Assessment of Quality of Travel Choices</th>
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</thead>
<tbody>
<tr>
<td>Rating</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>
3.4. Congestion

Congestion is an important consideration: more people living and working in the West of England will increase travel demand, resulting in more vehicles on the road network and causing more congestion. As discussed in Chapter 2, this is a critical issue in the West of England, and planning of development should actively aim to minimise impacts on road congestion.

Even if there is a good range of travel choices available, there will still be a need for vehicle access to/from each development location. A structured approach is therefore required to consider the potential impacts of development in each location on the road network. Two components were considered in the congestion assessment:

- **Impacts on congestion in the immediate vicinity of the development location** – this is the most obvious impact. Traffic generated by development impacts on the road network in the immediate locality: this is directly experienced in the local community and there is a clear relationship between the development and increased congestion in the local area; and

- **Impacts on congestion on the wider West of England network** – in many cases this is less obvious. Traffic from the development heads to other destinations, including jobs, shopping and leisure. These destinations – and the routes taken – will differ depending on the location of the housing development. This traffic will impact on a wider network, in many areas not obviously apparent. However, this must be taken into account to ensure a comprehensive assessment.

Two components were therefore assessed: local impacts and wider area impacts. Defined congestion problem areas were identified and agreed as the basis for the assessments.

The assessment of local impacts was based on identifying congestion problems in the vicinity of the development area and considering the scale of the challenges that were faced. This was scored as follows:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Criterion</th>
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<tbody>
<tr>
<td>High</td>
<td>High levels of congestion in the vicinity of the development area, in terms of widespread network-wide problems, serious delays experienced at particular locations, particular problems of network vulnerability to disruption or a combination of these factors.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate levels of congestion in the vicinity of the development area, with some hotspots identified but delays are relatively moderate.</td>
</tr>
<tr>
<td>Low</td>
<td>Relatively low levels of congestion experienced in the vicinity of the development area, with no significant traffic delays or problems with unplanned network disruption.</td>
</tr>
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The assessment of wider impacts took the following approach:

- Assessment of potential patterns of movement from the location, drawing on existing census travel to work data;
- Identification of likely routes for traffic making these movements;
- Identification of congestion hotspots on these routes, and assessment of the likely scale of the impact on each route;
- Assessment of the overall scale of the potential impacts on congestion on the wider network, based on the number of locations impacted and the likely scale of impact; and
- Determination of the relative scale of overall impact of each location, in comparison with other locations.
This was scored as follows:

**Table 3-3  Assessment of Scale of Wider Congestion**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Criterion</th>
</tr>
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<tbody>
<tr>
<td>High</td>
<td>Traffic generated by development would impact on a large number of points on the road network that suffer from congestion: in many cases congestion at these locations is high.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Traffic generated by development would impact on a moderate number of points on the road network that suffer from congestion.</td>
</tr>
<tr>
<td>Low</td>
<td>Traffic generated by development would impact on relatively few points on the road network that suffer from congestion, in most cases congestion at these locations is of a relatively limited scale.</td>
</tr>
</tbody>
</table>

The overall assessment, comprising the assessment of local and wider congestion impacts, was determined as shown in Table 3-4 below. This therefore adopted an approach in which the overall assessment was red (high) if either local congestion or wider congestion were scored as red (high).

**Table 3-4  Assessment of Overall Scale of Congestion**

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<table>
<thead>
<tr>
<th>Local</th>
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<tbody>
<tr>
<td>Strategic</td>
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<tr>
<td>G</td>
<td>G</td>
<td>A</td>
<td>R</td>
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<tr>
<td>A</td>
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<td>A</td>
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4. Results of Assessments

4.1. Introduction
This chapter describes the results of the assessment for the strategic locations, with regard to how they are likely to perform in transport terms, using the methodology described in the previous chapter. It describes the findings for both the existing situation and forecast conditions, which take into account committed growth and committed transport schemes.

Firstly, it describes the assessment of travel choices and congestion impacts for the strategic locations. This evidence is then used to draw conclusions on the broader transport issues associated with the different spatial typologies described in the Joint Spatial Plan Issues and Options document. Secondly, it sets out the approach to developing a transport-focused scenario, for consideration in the Issues and Options process. Finally, it then uses the evidence on travel choices and congestion impacts for the strategic locations to inform the assessment of the spatial scenarios in the Issues and Options document.

This analysis is not intended to prioritise one scenario over others. Instead, it is intended to set out the transport strengths and weaknesses of different options, which will help inform choices and decisions in developing the draft Joint Spatial Plan.

4.2. Travel Choices
The assessment of travel choices for the existing situation is shown in Figure 4.1.

Figure 4-1  Travel Choices: Existing Conditions
This demonstrates, as expected, that the highest levels of travel choice are available in the inner urban areas, with medium levels of travel choice in many suburban areas and places located on key transport corridors. The lowest levels of travel choice are in the more rural communities and those places not located on established public transport corridors.

An assessment was also made of future conditions, to take into account the potential impacts of the current programme of investment to improve conditions for active travel and public transport. This assessment (assuming 2026, which takes into account current growth commitments) is shown in Figure 4.2.

**Figure 4-2  Travel Choices: Forecast Conditions**

![Quality of Travel Choices Map]

Note: Locations are illustrative only and must not be taken to imply any specific development site or a preference for identified options.

This shows that the relative performance of most of the strategic locations is not forecast to significantly change between now and 2026. However, Portishead and Pill will, in future, benefit from the re-opening of the Portishead rail line and regular rail services to Bristol and the wider sub-region. Filton and the North Fringe area will significantly benefit from the completion of the North Fringe to Hengrove MetroBus scheme, together with other planned investments, which will significantly improve travel choices in this area.

### 4.3. Congestion

The assessment of congestion impacts for the existing situation is shown in Figure 4-3.
This comprises two components: local congestion in the area in the vicinity of each location, and impacts on the wider network resulting from development in each location. The assessment is based on the worst case from the two components, in accordance with the method described in Section 3.4.

This shows that congestion is a widespread challenge across the West of England. All of the strategic locations assessed face challenges from either congestion impacts in the local area near to the development, or impacts from traffic generated on the wider road network. Locations within inner Bristol would benefit from relative short journeys, as most people would both live and work in the central area. This would therefore have a limited impact on the wider network, because journey distances would be short and concentrated within inner Bristol. However, the road network in inner Bristol is heavily congested. As a consequence, traffic generated from new development would have a significant impact on the local road network unless measures are in place to control demand. This area also benefits from high levels of travel choices and car use should be relatively low, which means that, overall, the performance of these locations should be relatively strong.

In many other areas, there is a combination of challenges relating to local and wider congestion impacts. Hicks Gate, Portishead and Banwell have acute localised congestion challenges (and are therefore scored red). Meanwhile, development in Charfield, Thornbury, Severnside, Portishead and the eastern side of Weston is forecast to generate significant amounts of traffic through congestion hotspots along the motorways and in the North Fringe (and are therefore scored red).

An assessment was also made of future conditions, to take into account the potential impacts of growth in traffic demand in the area. This assessment (assuming 2026, which takes into account current growth commitments) is shown in Figure 4.4.
This shows that the relative performance of most of the strategic locations is not forecast to change significantly between now and 2026. However, a significant increase in congestion is forecast in Filton and Keynsham, due to the high levels of growth in these areas and the impacts on the local road networks.

### 4.4. Assessments of different typologies

These analyses can be used to help inform assessments for the different typologies that were shown on the map in Figure 3-1: urban intensification, urban extensions, town expansions and other settlements/locations. In addition, a commentary is provided on the potential issues associated with new settlements.

**Urban intensification** options would, in general, benefit from the wider range of travel choices available in the urban areas. However, there could be significant impacts on congestion if action is not taken to minimise car use and encourage alternative travel choices. These options would be characterised by high-intensity development in places with good access by public transport, walking and cycling to jobs and local services. There could be opportunities for promoting largely car-free development to support high quality placemaking and encourage sustainable travel choices.

The performance of **urban extensions** will vary, based on their location in relation to existing transport corridors and established urban centres. Proximity to the centre of the urban area is an important criterion, as levels of car use typically rise as this distance increases. Locations next to existing corridors, with the opportunity to provide high quality public transport connections, would be expected to perform better. Conversely, locations poorly related to existing transport networks or requiring considerable new infrastructure will perform less well. In all cases, there will be a need to provide comprehensive transport packages to provide a good range of travel choices and mitigate the impacts of additional traffic.
The performance of town expansions could also differ, depending on the quality of current transport choices. Most towns considered have higher than average car use, although areas within these towns that are close to rail stations have slightly lower levels of car use. Again, comprehensive transport packages would be required, although it should be recognised that there could be limited opportunities to improve travel choices, with a greater focus on mitigating the effects of additional traffic.

In other settlements / locations, including villages, travel options are limited, although local congestion is, in many cases, less severe than the more urban locations. There are generally limited opportunities to limit car dependency for new developments in these locations. Generally small-scale development would take place with relatively modest packages of transport improvements, but in most cases car use would remain high.

In the case of new settlements, it will be necessary to start from a very limited base in terms of travel choices. Large-scale development would be much more likely to create sufficient critical mass to support a strong business case for significant investment in transport improvements, which could include new rail stations and new bus connections. However, the locations of these developments would still tend to favour travel by car for many journeys and it would be difficult to mitigate the effects of additional traffic on other parts of the network.

4.5. Developing a transport-focused scenario

The evidence from the assessment of strategic locations and the typologies was used to develop a transport-focused scenario for the Joint Spatial Plan Issues and Options work. The principle of this scenario would be to focus on locations with sustainable travel choices and with opportunities to continue to improve travel choices. The approach taken was as follows:

- Sift out locations with low levels of travel choices;
- Take into account the congestion impacts at the remaining locations;
- Identify categories of location; and
- Develop the concept of the transport-focused scenario.

The first step resulted in a number of locations being discounted on the grounds of relatively limited travel choices, including Thornbury, Clevedon and Midsomer Norton and Radstock. The second step identified that there would be locations with very different types of transport challenges. Central Bristol, St Philips Marsh and the North Fringe benefit from high levels of travel choice but have significant levels of congestion. These would therefore benefit from high-intensity development, with limited levels of parking, capitalising on good travel choices to promote low levels of car use. A similar theme would also apply in Weston-super-Mare. Hicks Gate, Keynsham and Portishead have modest levels of travel choices and high levels of congestion: significant investment programmes would be needed to support growth in these areas. Other areas have moderate levels of travel choice and moderate congestion: these areas would require multimodal packages to support growth.

The transport-focused scenario is therefore focused on locations assessed to perform better in terms of access to sustainable travel choices and likely congestion impacts. These are categorised as follows:

- Urban areas that already have good travel choices would be the first priority for development. In these locations distances travelled tend to be shorter, encouraging walking and cycling. In addition, the critical mass of people in urban locations close to central Bristol would support more viable public transport;
- The second priority for development would be urban extensions in locations closer to central Bristol. A focus on development in south Bristol will help bring housing and future employment together; and
- The third priority would be to allow development at locations that have good rail links into the central areas.
It would not be appropriate to propose development at all the potential locations identified, as a smaller number of strategic locations may better support more effective investment in transport solutions. The impact of development on existing congestion within urban areas means that a multi-modal package of transport measures would be essential to support this scenario.

The resulting transport-focused scenario is shown in Figure 4-5.

**Figure 4-5  Transport-focused scenario**

![Transport focused scenario](image)

**Note:** Locations are illustrative only and must not be taken to imply any specific development site or a preference for identified options

### 4.6. Assessment of scenarios

The analyses of the performance of the strategic locations were used to inform the assessment of the spatial scenarios: Retention of Green Belt, Concentration at the Bristol urban area, transport focused, even spread of development and a new settlement.

**Retention of Green Belt:** some locations outside the Green Belt are peripheral to the main concentrations of population and facilities, and these locations are not generally well related to principal transport corridors. It would be expected that this would result in longer-distance commuting, increased reliance on car journeys and less use of other modes than other scenarios. It is also unlikely to provide the thresholds of development that would facilitate substantial new transport investment. Consideration needs to be given to those locations that already have significant growth proposed and the impact of any additional development on the delivery of sustainable places and balanced communities.

**Concentration at Bristol urban area:** this would be beneficial in focusing growth as close as possible to where the majority of travel needs arise, and it would be positive in terms of encouraging alternatives to the car. However, there would be issues about the effective delivery of infrastructure and potential to increase...
congestion. Not all the locations would perform equally: this would depend on their accessibility to the main employment centres and/or the extent of sustainable transport investment that could be justified.

**Transport focused**: locations would be prioritised based on performance in terms of access to sustainable travel choices and congestion impacts. There would be a combination of intensification, South Bristol focused urban extensions and public transport focused development, with further emphasis on walking and cycling, and with appropriate thresholds of development to support significant transport interventions.

**Even spread of development**: if the overall effect is a more dispersed pattern of development, then it is possible that this scenario would be much less effective in transport terms, although there might be opportunities for targeted investment in certain areas.

**New settlement**: this would be likely to require significant transport and other infrastructure, reducing the ability to address existing issues elsewhere. There would be opportunities to design in sustainable travel patterns, but the potential for this would depend on the location of the new settlement and its relationship with wider employment opportunities across the West of England.
5. Conclusions

5.1. Key Findings

This Topic Paper has demonstrated that there are significant transport challenges in the West of England. The current transport investment programme will play a part in helping to tackle some of these challenges, but the growth in the numbers of people living and working in the area will significantly increase the pressures on the transport network during the next two decades.

The evidence indicates that the two most critical transport challenges are the quality of travel choices and the scale of congestion on the road network. The patterns of travel in the West of England, coupled with limited travel choices to meet people's needs, means that there are high levels of car use, causing significant strain on the road network, increasing journey times, reducing resilience and reducing connectivity. These two factors (quality of travel choices and congestion) have significant wider implications for the environment, people and the economy of the area.

There is therefore a very strong case for these two factors to form an important part in the assessment of options for growth in the West of England. A proportionate approach has been taken to assessing the quality of travel choices and scale of congestion impacts for each of the strategic locations, reflecting the high level nature of the options being considered.

The assessments show potentially significant differences in the performance of different strategic locations. In general, the inner parts of the urban areas benefit from the highest levels of travel choices, with easy access by walking and cycling to jobs and local services and high levels of public transport accessibility. Rural areas and many of the towns in the area are dependent on longer distance commuting to jobs, with limited active travel and public transport options, and higher levels of car dependence. This challenge is also faced on the edges of the Bristol urban area and Weston-super-Mare, with long journey times to the urban centres and employment areas and high levels of car use.

Most of the strategic locations face challenges with congestion: either due to congestion in the immediate vicinity of the development area or due to the wider impacts on the road network of travel to places further afield. However, development in urban areas with good access to a wide range of travel choices provides the opportunity to minimise the need to travel by car, reducing potential congestion impacts. Conversely, locations with more limited travel options will in most cases result in higher levels of car dependence and congestion problems will be much more difficult to tackle.

These assessments for individual locations have been used to inform assessments for different typologies and spatial scenarios being considered in the Issues and Options consultation. While each scenario has strengths and weaknesses, a key factor to be considered as work progresses to prepare the draft Joint Spatial Plan is how locations perform in terms of maximising travel choices and reducing potential congestion. To help support this and understand how potential locations could perform, a transport-focused scenario has been identified for assessment alongside other possible spatial scenarios. It is recognised that large-scale investment in the transport network would be required. Investment would be required in all cases to mitigate the impacts of growth, but targeted new development in particular locations could be aligned with transport investment to ensure that growth is effectively managed.