MetroWest

METROWEST PHASE 1

OUTLINE BUSINESS CASE

# Chapter 1 Strategic Case

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire councils working together to improve your local transport

December 2017

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CHAPTER 1

# Strategic Case

## 1.1 Introduction

### 1.1.1 The MetroWest Programme

The West of England (WoE) Councils comprising of Bath & North East Somerset, Bristol City, North Somerset and South Gloucestershire, shown in Figure 1.1, together with the West of England Combined Authority are progressing plans to deliver a series of strategic enhancements to the local rail network over the next five years and beyond, through the MetroWest Programme. The aim of the MetroWest Programme is to establish a 'Metro' local rail network, similar to comparable sized city regions, through targeted investment in strategic rail corridors, including existing lines, freight only lines and dis-used lines.

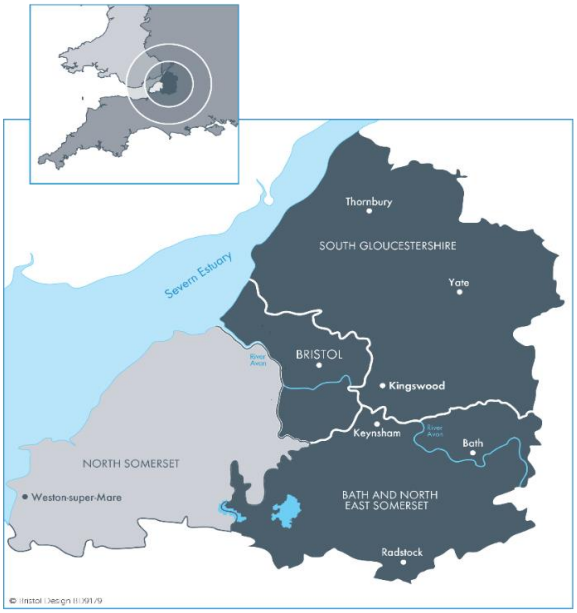
The MetroWest Programme currently comprises:

- the MetroWest Phase 1 scheme,
- the MetroWest Phase 2 scheme,
- the Portway Park & Ride station scheme,
- a range of new station/re-opening schemes, subject to separate business cases and smaller scale localised enhancement schemes

These are a diverse range of interventions from large schemes increasing the UK passenger train network (network mileage and number of stations) entailing both infrastructure and service enhancements, to more modest localised projects.

The MetroWest Programme is being jointly promoted by the four WoE Councils and the newly created WoE Combined Authority (WECA) which has responsibility for strategic and transport planning (together with Bath & North East Somerset, Bristol City and South Gloucestershire Councils), working alongside Network Rail, Great Western Railways and the wider rail industry.

**Figure 1.1 - The West of England Councils**



The combined MetroWest Phase 1 and Phase 2 proposals are shown in Figure 1.2 below. Each project has a lead authority, MetroWest Phase 1 is being led by North Somerset Council and MetroWest Phase 2 is being led by South Gloucestershire Council.

MetroWest Phase 1 proposes to enhance the Severn Beach Line and the Bath Spa to Bristol Line to operate a half hourly train service and re-open the Portishead Line with an hourly train service. Two new stations are proposed, at Portishead and Pill. The new train services will also service 16 existing stations.

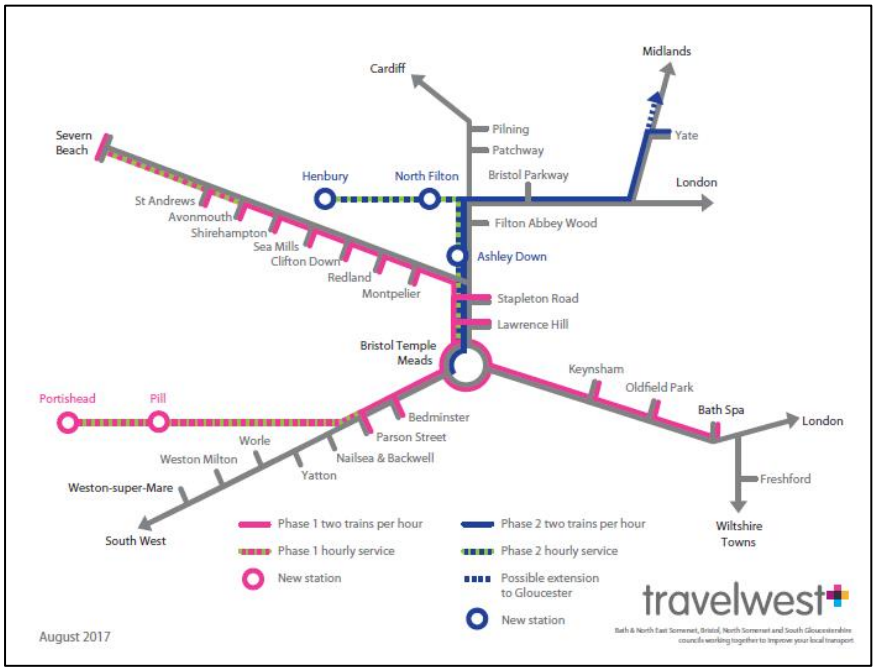
MetroWest Phase 2 proposes to enhance the Yate to Bristol Line to operate half hourly train service and introduce an hourly train service on the Henbury line (freight only) to Bristol. Three new stations are proposed at Henbury, North Filton and Ashley Down. The new train services will also serve 6 existing stations.

The current MetroWest Programme which is planned to be delivered by late 2021, is being taken forward as a third party promoted programme with an estimated total capital cost of over £150M, for delivery during the early stages of Control Period 6 (2019-2024). Further projects are expected to be added to the MetroWest programme in due course, potentially establishing a medium term investment programme.

Our MetroWest Phase 1 and Phase 2 proposals span **five local rail corridors**:

- Phase 1 - Severn Beach Line – upgrade to half hourly passenger service (hourly for St. Andrews Road station and Severn Beach station)
- Phase 1 - Bath Spa to Bristol Line – upgrade to half hourly passenger service
- Phase 1 - Portishead Line – re-open with an hourly passenger service
- Phase 2 - Yate to Bristol Line – upgrade to half hourly passenger service
- Phase 2 - Henbury to Bristol Line – re-introduce hourly passenger service

**Figure 1.2 – MetroWest Phase 1 and Phase 2**




The MetroWest Programme is has been developed in collaboration with the rail industry. Although the programme was established as a conventional third party promoted programme, it is not a standalone programme. It is a sub-programme within the Great Western Programme for delivery in early control period 6. For further information about the industry interface see section 1.7.2.

## 1.1.2 Structure of this Chapter

This chapter has been structured to take account of a number of different reader audiences, which in summary include:

- The Department for Transport – Large Majors and Local Growth, Local Infrastructure Group
- The Department for Transport – Rail Executive
- The Development Consent Order – Examining Body (to be appointed summer 2018)
- Wider stakeholders, interested parties and the public

Table 1.1 sign points to where particular elements of the Strategic Case can be found and to aid in particular the Department for Transport – Large Majors and Local Growth, Local Infrastructure Division.

**Table 1.1 - Structure of this Chapter**

| Issue | Description | Location |
|---|---|---|
| Business strategy | Provide the context for the business case by:<br>Describing the strategic aims and responsibilities of the organisation responsible for the proposal | 1.2 & 1.4 |
| Problem identification | Describe the problem identified and the evidence base underpinning this justification for Government intervention | 1.2, 1.4 & 1.5 |
| Impact of not changing | Explain the impact of not changing (not implementing the proposals) | 1.4.4, 1.6.1 & 1.7.3 |
| Internal and external drivers for change | Influences on the evolution of the proposals | 1.4 & 1.5 |
| Objectives | Establish specific, measurable, achievable, realistic and time-bound objectives that will solve the problem identified and how they align with the organisation's strategic aims | 1.3.4 & 1.5 |
| Measures for success | Set out what constitutes successful delivery of the objectives | 1.3.5 |
| Scope | Explain what the project will deliver and also what is out of scope | 1.3 |
| Constraints | High level internal/external constraints e.g. technological environment, is there capability to deliver in-house, major contracts with provider, etc | 1.9 |
| Interdependencies | Internal/external factors upon which the successful delivery of project are dependent | 1.9 |
| Stakeholders | Outline the main stakeholder groups and their contribution to the project<br>Note any potential conflicts between different stakeholder groups | 1.8 |
| Options | Set out all the options identified<br>Evaluate their impact on the proposal's objectives and wider public policy objectives<br>Risks associated with each option | 1.5 |

# 1.2 Sub-Regional Context

## 1.2.1 Sub-Region Overview

The West of England is a dynamic city region, with a population of more than 1.1 million people, over 43,000 businesses and an economy worth over £31 billion a year. It is a highly productive economy, with GVA per capita higher than the national average. The city region is one of the few areas of the UK that is a net contributor to the Treasury. The area is home to world-leading businesses, a growing visitor economy and a rising population attracted by the high quality of life on offer. For example, Bristol is regularly cited as one of the best places to live in the UK, Bath is the only destination in the UK to have the whole city designated as a World Heritage Site by UNESCO and Weston-super-Mare is the gateway to the coast of the South West.

Recent economic growth has been driven by a diverse sectoral base with strengths in aerospace, creative and environmental industries, IT and microelectronics, finance and tourism. A high proportion of local employment is, therefore, in high-value knowledge intensive industries. The area is also home to four universities producing cutting-edge research. Economic growth over the last decade has been driven by these sector strengths and the availability of high quality business space with good access to the transport networks, particularly in the North Fringe area close to the M4 and M5. There has also been rapid growth recently seen in Bristol city centre as businesses are attracted by the large skilled workforce, dynamic local business community and availability of appropriate workspaces.

The West of England Local Enterprise Partnership developed a Strategic Economic Plan in 2014 that draws on these sectoral and locational strengths, with strong ambitions for growth. Temple Quarter is one of the UK's strongest performing Enterprise Zones, and new Enterprise Zones were designated in Bath Riverside and the Somer Valley in 2017. Enterprise Areas have also been allocated at Weston-super-Mare, Filton, Emersons Green and Avonmouth / Severnside. South Bristol is also a priority for urban regeneration.

## 1.2.2 Sub-Region Strategic Aims

**Bristol City Council Corporate Strategy 2018 to 2023**

The strategy sets out the Council's vision for the economic, social and environmental wellbeing of Bristol. The key themes of the strategy to make sure the council plays its part in creating a city that is successful for everyone are; Empowering and Caring, Fair and Inclusive, Well Connected, Wellbeing and Belonging.

**Bath & North East Somerset Council Corporate Strategy 2016 to 2020**

The strategy describes how the Council will deliver its 2020 vision for Bath and North East Somerset and how it will build on our progress and create efficiencies through innovation, improving the way we work and increasing income. Four corporate priorities have been identified, which will drive the work of the Council going forward; a strong economy and growth, a focus on prevention, a new relationship with customers and communities and an efficient business.

**North Somerset Council Corporate Plan 2015 to 2019**

The plan aims to be concrete and practical by identifying the specific projects, initiatives and performance measures which will achieve the ambitions. Some of these are focussed outwards on the outcomes we want for the area, while others are about the internal changes needed for the council to be able to deliver these outcomes. This plan will help us to get the balance right between change projects and 'business as usual'. The overall corporate aim is to achieve the following outcomes; Prosperity and opportunity, Health and wellbeing and Quality places.

**South Gloucestershire Council - Council Plan 2016 to 2020**

The plan sets out a shared vision of the people who live, work and visit South Gloucestershire which outlines the context for the area's key priorities and provides a high level framework for integrated delivery by focusing on four broad themes which aim to; enhance the natural and built environment, maximise opportunities to access first class education, engage people of all ages so they feel they belong and can help provide local solutions and promote personal well-being. The priorities of the plan are being delivered through three themes people, places and resources.

**West of England Combined Authority**

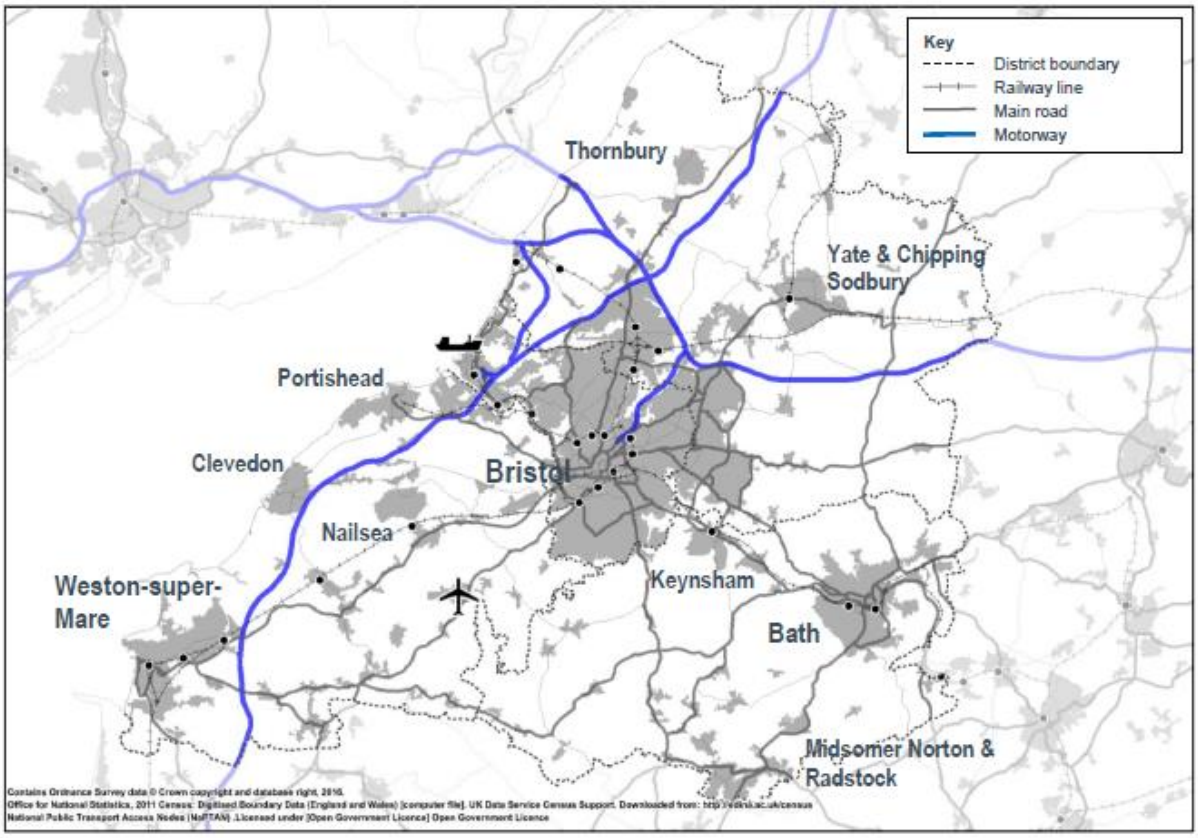
Economic growth that benefits every resident is at the core of the West of England draft strategy Regional Strategy. The vision is for all residents to benefit from more job opportunities, a stronger economy and higher quality of life. Three priorities have been identified 'Businesses that succeed', 'Infrastructure fit for the future' and 'world class skills'. A final version of the strategy will be published in the spring 2018.

## 1.2.3 Sub-Region Transport Network Overview

The West of England has a well-defined transport strategy and policies within the current Joint Local Transport Plan (2011-2026), which sets out the current 15-year Transport Vision. This has delivered significant investment during the last five years, including investment in improved cycling facilities in Bristol and multi-modal packages in Bath and Weston-super-Mare. The MetroBus programme is currently being delivered with completion expected in 2017/18. Figure 1.3 shows the strategic sub-regional transport network.

However, the West of England faces serious transport challenges and these will become more acute with the anticipated scale of growth in the area. The forecast numbers of people living and working in the area will increase demands on the transport system, which will have significant economic, social and environmental impacts. Whilst the West of England has benefited from a strong economy over the last decade, the sub-region's economic prosperity is beginning to be constrained by its transport network. As demand on the transport network increases as a result of economic and population growth, further investment is needed to ensure the transport network is sufficiently accessible and has sufficient capacity and resilience to continue to meet the sub region's needs. Longer-term problems of sustained traffic growth and car dependency also need to be tackled, in addition to wider long-term issues of carbon emissions and social wellbeing.

**Figure 1.3 - Strategic Sub-regional Transport Network**




The WoE Joint Transport Study (October 2017) provides the basis for developing a new strategy and investment programme to enable the area to respond to these challenges. The WoE Joint Transport Study identifies current major problems including; increasing congestion on key corridors, increasing problems of poor transport network resilience, transport inequality, environmental problems and

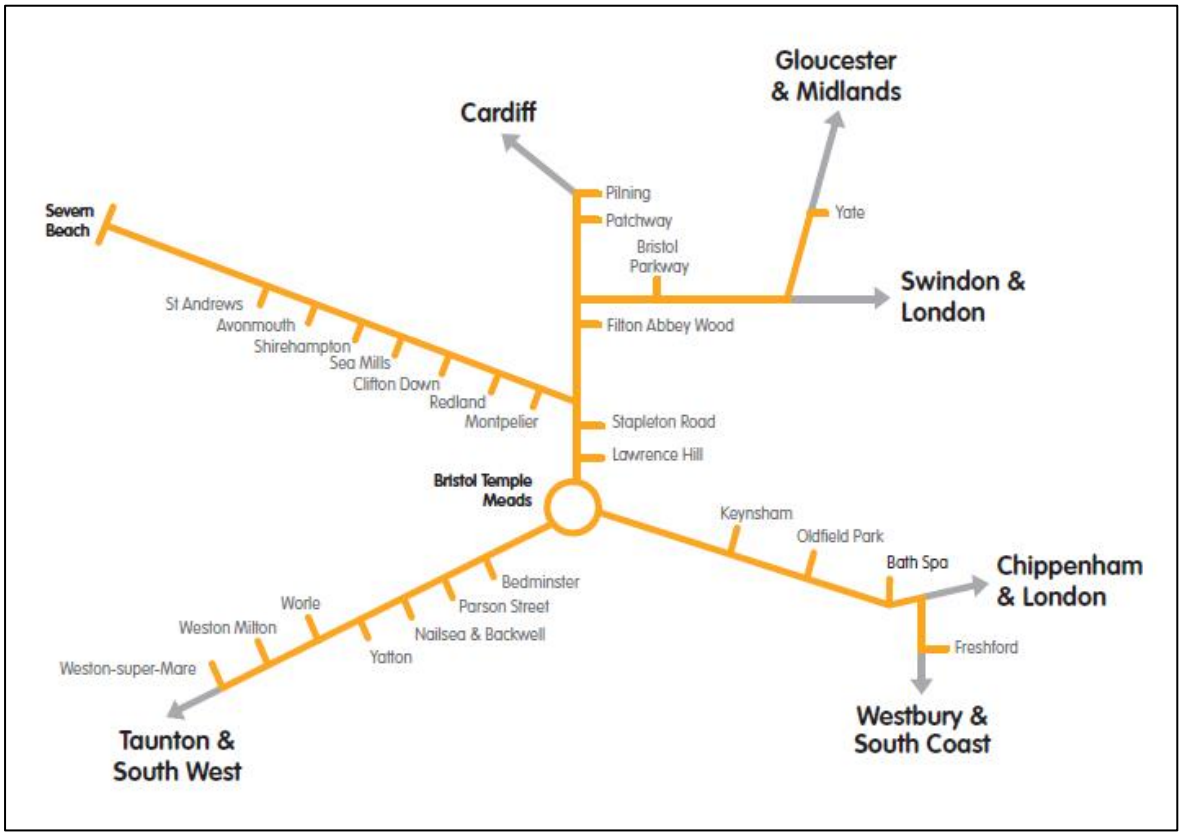
poor public transport provision in some areas. The Study highlights that "… without action to improve travel choices, this will result in increased motorised traffic, congestion and continued problems of poor air quality."

The WoE Joint Transport Study together with the emerging WoE Joint Spatial Plan is informing the infrastructure priorities for delivery of 105,000 new homes and creation of 82,500 new jobs up to 2036. MetroWest Phase 1 & Phase 2 are included in the base case as committed schemes for the WoE Joint Transport Study and the emerging WoE Joint Spatial Plan (to be adopted in 2018). This effectively means for land use and transport planning purposes, the sub-region is assuming that MetroWest Phase 1 and 2 will be delivered early in the planning horizon. For further information about the WoE Joint Transport Study and the emerging WoE Joint Spatial Plan refer to section 1.6.3.

## 1.2.4 Sub-Region Rail Network Overview

The West of England has frequent rail links to London, the Midlands, South Wales and the South West and the network within the WoE area is comprised of 26 stations served by four main lines and one branch line, see Figure 1.4.

**Figure 1.4 - WoE Rail Network**




The electrification of the Great Western Main Line via Bath Spa and Bristol Temple Meads is now deferred for an unknown period. Bi-modal trains (electric and diesel powered) are currently being introduced with the full timetable planned for rollout in December 2018. The new class 800 trains will provide two additional trains per hour between Bristol Temple Meads via Bristol Parkway and London Paddington (with two trains per hour via Bath continuing as at present), giving four trains

per hour to London. This major upgrade will deliver journey time reductions, an increase in rail capacity in terms of seats per hour and a host of other improvements for rail customers.

Average journey speeds between Bristol Temple Meads and London Paddington are around 70 mph, compared to 91 mph from Manchester, 87 mph from Birmingham and 84 mph from Leeds. In order for the West of England to remain competitive further investment will be needed in control period 6 and beyond to reduce journey times between Bristol and London Paddington, through the completion of electrification of the Great Western line or through other interventions identified by the rail industry. High Speed 2 (HS2) will significantly reduce future journey times from Birmingham, Manchester and Leeds to London. The journey time from Birmingham to London will be significantly lower than the corresponding time from Bristol, and journey times from Manchester and Leeds will be similar to those from Bristol.

This will mean that other UK cities will benefit from closer rail proximity to London, which will enhance their future competitiveness and connectivity. The combination of the deferment of the electrification of the Great Western main line via Bath Spa and Bristol Temple Meads, along with reduced journey times to be reaped by other Core Cities via HS2 and the continuing growth in passenger demand, creates a challenge for the West of England.

During the last decade, there has been rapid growth in demand on the rail network in the West of England. The Office of Rail and Road's published passenger trip figures show a 63% increase between 2006/07 to 2015/16, (see Table 1.2). Furthermore our annual West of England Rail Survey which counts all passengers, not just ticket sales, shows higher total growth at 93% across all local stations and average growth per annum of 6.9%.

**Table 1.2 - ORR Historic Patronage Growth in the West of England**

| **Station Groupings** | **2006/07 to 2015/16 Total** | **2006/07 to 2015/16 Per Annum** |
|---|---|---|
| Main stations (Bristol Temple Meads, Bristol Parkway & Bath Spa) | 54% | 4.9% |
| Severn Beach Line[1] | 185% | 12.3% |
| Other Bristol City urban stations[2] | 143% | 10.4% |
| Bath & North East Somerset stations | 91% | 7.4% |
| North Somerset Stations | 52% | 4.7% |
| South Gloucestershire stations (excluding Bristol Parkway) | 128% | 9.6% |
| **Overall** | **63%** | **5.6%** |

Notes [1] Excludes Lawrence Hill and Stapleton Road stations

[2] Parson Street, Bedminster, Lawrence Hill and Stapleton Road stations

However, there are now challenges with acute overcrowding on many services, which is not confined to just the am and pm peak. Demand forecasts developed through the Network Rail Market Studies forecast show there will be significant growth in rail demand in the West of England over the next 20-30 years. Table 1.3 shows Network Rail's forecasts for key markets. However, it should be noted that the West of England has long expressed concerns about Network Rail's passenger forecasts not reflecting historic or current trends.

**Table 1.3 - Forecast Growth in Demand for Rail Travel 2013-2043**

| Market | Growth in Demand |
|---|---|
| Bristol Area | +121% |
| Bristol – London | +118% |
| Bristol – Birmingham | +97% |
| Bristol – Manchester | +123% |

While there has been rapid growth in passenger demand across the West of England rail network, Great Western Railways and other local train operators have responded by adding additional capacity incrementally. The increases on the supply side have not kept pace with the increased demand particularly in respect of the local rail network (all stopping services). The barriers to increased capacity for the local rail network have until very recently focused on the unavailability of additional diesel multiple units, but also there are infrastructure barriers in respect of achieving an increase to the service frequency for the Severn Beach line and the Bath Spa to Bristol Line (stopping service).

**A more fundamental issue is the geographic reach of the local rail network is limited and the train service frequency is irregular in places and some corridors have a poor frequency or not clock-face. There are connectivity issues for cross-Bristol Temple Meads trips and most of the local rail network does not have a basic half hourly service, falling well short of most other comparative Core Cites in England.** Table 1.4 below summaries the West of England's current local rail network in terms of service frequency.

**Table 1.4 - WoE Local Rail Network Overview**

| Local Rail Corridor | Daytime Frequency |
|---|---|
| Severn Beach to Bristol Corridor | Avonmouth to Bristol TM every 40 mins<br>Severn Beach to Bristol TM every 2 hours |
| Cardiff to Bristol Corridor | Cardiff to Bristol local station Patchway every ½ hour (Cardiff to Portsmouth service). Pilning is semi mothballed and only served in eastbound direction one journey on Saturdays |
| Yate / Parkway to Bristol Corridor | Yate to Bristol TM every hour (regional services to / from Gloucester / Worcester)<br>Parkway to Bristol TM every ½ hour (CrossCountry non-stopping service) |
| Bath Spa to Bristol Corridor | Bath Spa to Bristol TM local stations Keynsham & Oldfield Park every hour, (trains to and from Westbury or Weymouth), supplemented by occasional peak time Cardiff to Portsmouth services<br>Bath Spa to Bristol TM every ½ hour (GWR non stopping service to and from London Paddington)<br>Freshford to Bath Spa mixed service pattern (Weymouth to Bristol service) |
| Weston-super-Mare to Bristol Corridor | Weston-super-Mare to Bristol TM every ½ hour supplemented by some peak HST services to/from Weston-super-Mare, Bristol Temple Meads and London Paddington |

Comparison of the West of England local rail network with similar sized city regions shows very clearly how under-developed the network is, see Table 1.5. The limited nature of the local rail network (while having overcrowding problems) explains the relatively low proportion of journeys to work by rail across the West of England (2011 census: WoE 2.3%, compared with 5.6% average for England).

**Table 1.5 - Comparison of WoE Rail network with similar sized City Regions**

| City Region | Population 2015 mid-year estimate | Reach of the Local Rail Network | Train Service Frequency |
|---|---|---|---|
| West of England | 1,119,000 | 5 rail corridors with 26 stations | Irregular frequencies ranging from ½ hourly to every 2 hours |
| Sheffield | 1,375,000 | 4 corridors, 3 tram corridors with 48 stations, and one tram-train corridor | Mainly every 8 to 10 minutes, tram-train every 20 minutes |
| Cardiff | 1,505,000 | 6 rail corridors with 20 stations across the city with over 70 more stations across the South Wales region. | Mainly every 12 or 15 minutes, some lines every 30 minutes |
| Liverpool | 1,525,000 | 7 rail corridors with 67 stations | Mainly every 15 minutes, some lines every 30 minutes |

There are some major inconsistencies in the current service patterns, for example the Bristol/Bath main line has a half hourly service to London, yet the service pattern provided for intermediate stations (Keynsham and Oldfield Park) is approximately hourly. Likewise the Severn Beach line is also considerably less frequent than long distance services to London, with trains every 40 minutes to Avonmouth and every two hours to Severn Beach. This fundamental supply side problem needs to be addressed in order to realise the potential of the West of England local rail network.

The current passenger experience of the local rail network falls short of what could be expected for a City Region of a population of over 1.1 million. The biggest issues that passengers raise are the poor levels of service (frequency), poor travel conditions (overcrowding) and poor network reach. There has been a growing feeling of frustration and dis-satisfaction and increasing calls from the public and stakeholders, over the last five plus years for strategic investment in the local rail network.

In 2011 the West of England Councils undertook a series of local rail studies to identify what interventions were required to address the deficiencies of the local rail network, in response to calls from the public and local stakeholders. These studies led to the mobilisation of the MetroWest Programme in 2013.

# 1.3 Project Overview

## 1.3.1 Scheme Scope

MetroWest Phase 1 will deliver a strategic enhancement to the West of England local rail network. The scheme will increase the UK passenger rail network by 14 kilometres, deliver two new stations and enhance the service frequency for 16 existing stations, across three local lines. The scope of MetroWest Phase 1 includes the delivery of infrastructure and passenger train operations to provide:

- a half hourly service for the Severn Beach Line (hourly for St. Andrews Road station and Severn Beach station);
- a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol Line; and
- an hourly service (or an hourly service plus) for a reopened Portishead Line with new stations at Portishead and Pill.

Figure 1.5 below shows the proposed MetroWest Phase 1 passenger network with a more harmonised service frequency, providing the foundation for 'Metro' local rail network.

**Figure 1.5 - Proposed MetroWest Phase 1 Network**

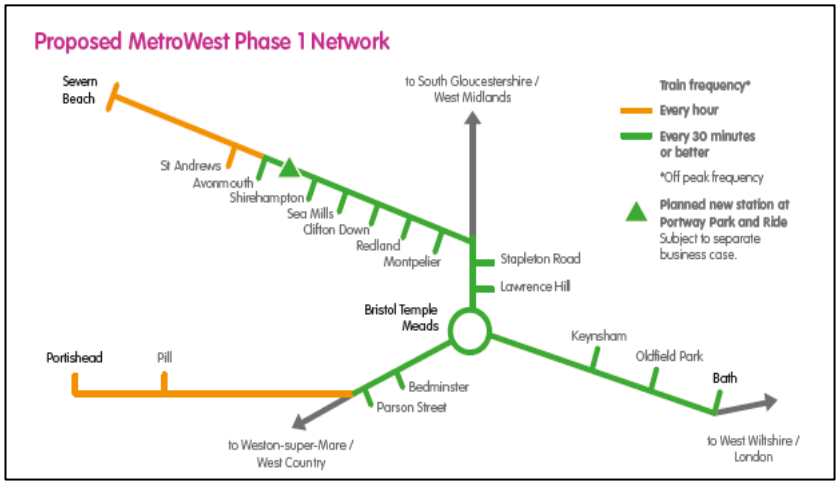



**Figure 1.6 - Existing MetroWest Phase 1 Network**

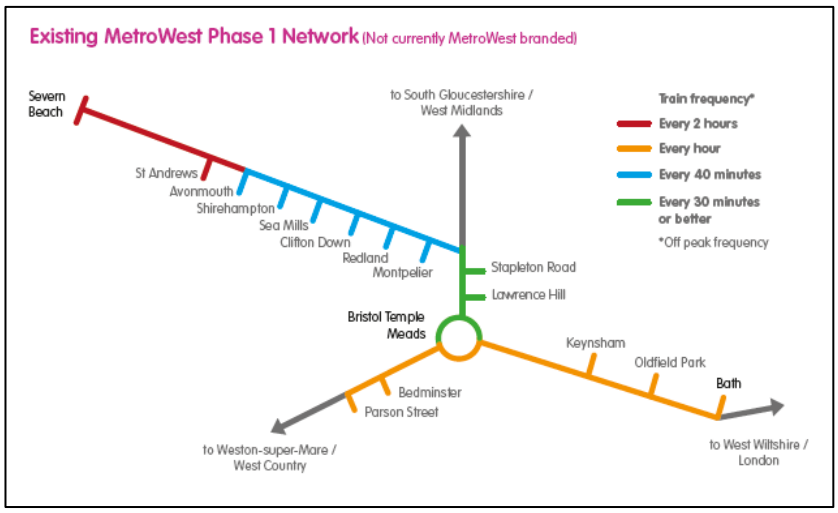


Figure 1.6 above shows the existing level of service for the three local rail lines, with no defined hierarchy of service frequency and with a relatively limited reach (Portishead Line is currently partly a freight line and partly dis-used).

For the Portishead Line we are proposing either an hourly or an hourly plus passenger train service. The difference between an hourly service and an hourly service plus is:

i) Hourly service – Passenger trains operating hourly all day between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. Providing up to 18 trains in each direction per day (Mon-Sat), and up to 10 trains on Sundays. Utilising one train set all day.

ii) Hourly service plus – Passenger trains operating every 45 minutes during the am and pm peak and hourly off peak, between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. Providing up to 20 trains in each direction per day (Mon-Sat), and up to 10 trains on Sundays. Utilising one train set all day and an additional train set during the am and pm peak only.

Detailed train path modelling undertaken by Network Rail (using Railsys software) has confirmed a journey time from Portishead to Bristol Temple Meads of 23 minutes, calling at Pill, Parson Street and Bedminster. The modelling has also confirmed that there is no difference between the infrastructure required for the hourly service vs the hourly service plus. The key difference between the two levels of service is the hourly service requires just one train set, while the hourly service plus requires two train sets, although one train set operates during the peak only. Figure 1.7 shows the existing layout of the Portishead Line, which includes the Portbury Freight Line. Figure 1.8 shows the proposed layout required to operate one passenger train per hour to and from Portishead and maintain the existing freight train paths (hourly path in each direction).

**Figure 1.7 - Existing layout of the Portbury Freight Line**

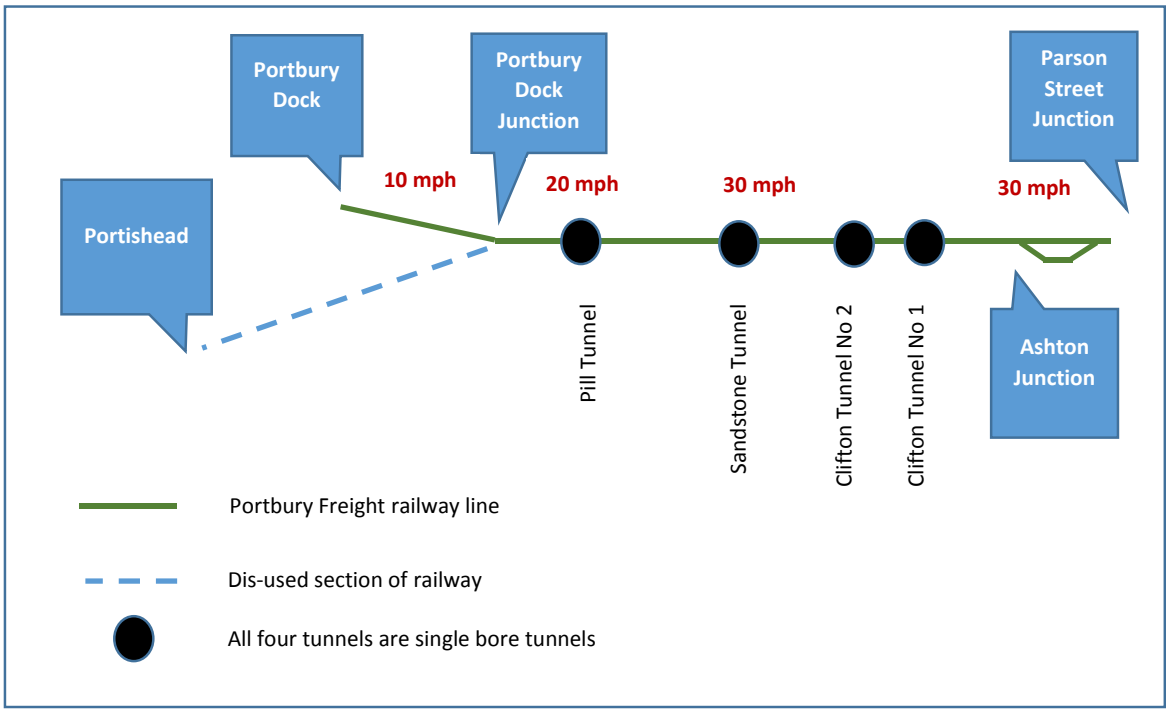
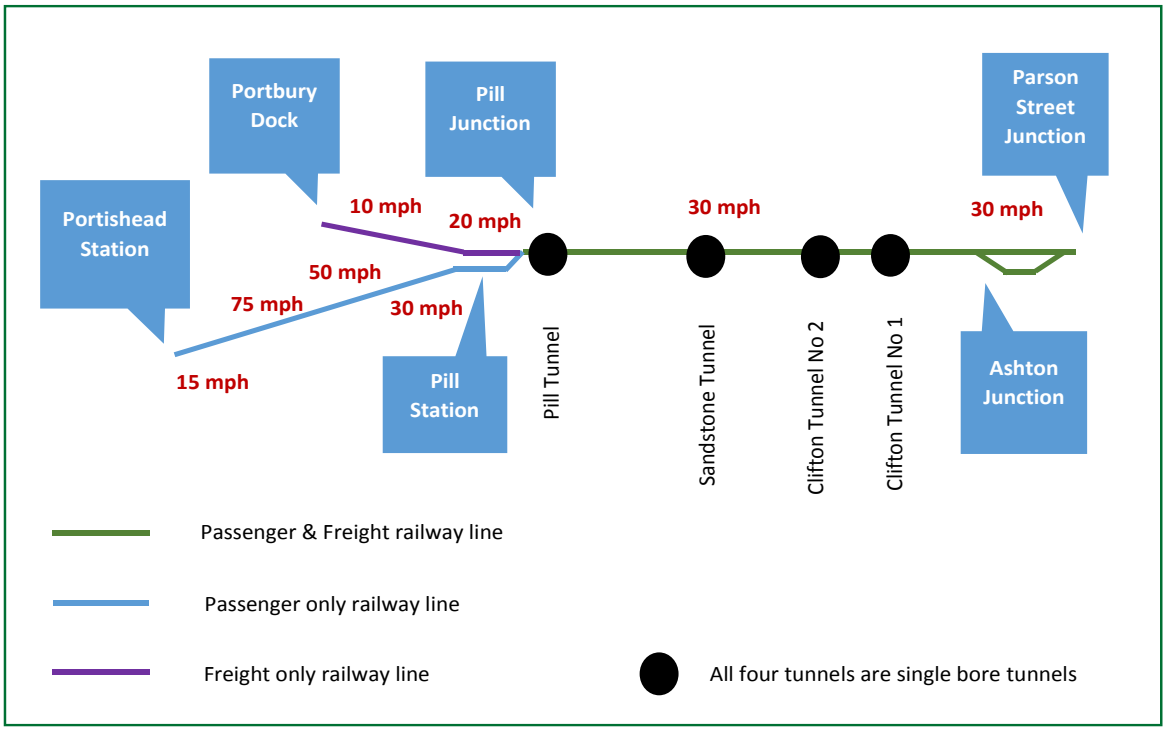


**Figure 1.8 - Proposed layout of the Portishead Line**




The train path modelling along with the GRIP stage 3 AIP engineering design, has confirmed that the infrastructure works required to operate the enhanced train service for the Severn Beach Line and the Bath Spa to Bristol Line is relatively modest, comprising of signalling works at Avonmouth/Severn Beach and a turnback facility at Bathampton (essentially a crossover). Table 1.6 sets out a summary of all the infrastructure works required in order to operate the proposed MetroWest Phase 1 passenger train services, across the three rail corridors.

**Table 1.6 - Overview of Infrastructure Works**

| Description | Development Consent | Rail Corridor |
|---|---|---|
| Rebuilding 4.7km of dis-used railway between Portishead and Portbury Dock Junction and associated civil engineering works | DCO | Portishead Line |
| Partial re-alignment of Quays Avenue, Portishead to create space for a new Portishead station and car parks | DCO | Portishead Line |
| Stopping up of historic railway crossings and provision of alternative access where necessary | DCO | Portishead Line |
| 750m of double track works through Pill including bridge replacement and building a station at Pill on the site of the former station | DCO | Portishead Line |
| Some track renewal works and track sluing to the line through Avon Gorge to provide sufficient ride comfort for passengers | DCO | Portishead Line |
| Some remedial works to bridges, tunnels, retaining walls and other existing assets to meet passenger operating and safety standards | DCO | Portishead Line |
| Signalling works for the whole branch line | DCO | Portishead Line |
| Minor highway works at Winterstoke Road and Ashton Vale Road, Bristol | DCO | Portishead Line |

| | | |
|---|---|---|
| Temporary and permanent construction/maintenance compounds | DCO | Portishead Line |
| Pedestrian, cycle & PROW alterations and enhancement works | DCO | Portishead Line |
| Environmental mitigation works | DCO | Portishead Line |
| A buffer stop and trap points at the entrance to Liberty Lane Freight Depot | PD | Portishead Line |
| Renewal of Parson Street Junction | PD | Portishead Line |
| Minor platform and drainage works are required to bring platform 3 back into use at Parson Street Station | PD | Portishead Line |
| A new crossover (turnout) and renewal of approximately 1 km of track on the Down Carriage Line and associated signalling for the Bedminster Down Relief Line | PD | Portishead Line |
| Minor signalling works are required to enable a longer layover period for passenger trains at Avonmouth and Severn Beach stations | PD | Severn Beach Line |
| A new crossover between the existing Up line to London and the Down line to Bristol at Bathampton to create a train turnback facility | PD | Bath Spa to Bristol Line |

Note: DCO – Development Consent Order, PD – Permitted Development

Re-opening the Portishead Line is a Nationally Significant Infrastructure Project (NSIP), under the 2008 Planning Act and consequently requires a Development Consent Order for powers to build and operate (the 4.7km of dis-used railway). Any rail project that includes 2km or more continuous track outside the existing operational rail network, is deemed an NSIP under the 2008 Planning Act.

The existing part of the Portishead Line which operates as freight line only from Parson Street to Royal Portbury Dock, passes through the Avon Gorge which is an environmentally sensitive area. The Avon Gorge is a Special Area of Conservation (SAC) and consequently, falls under the requirements of the Habitats Regulation Assessment (HRA) process. The HRA process runs in parallel with the wider environmental assessment process to support the DCO process which requires an Environmental Statement. For this project, the timescales for the HRA process mirror the timescales for the DCO process. Further details of the DCO process and HRA process are set out in chapter 3 the Management Case.

MetroWest Phase 1 includes 16 existing stations and two new stations across a large geographic area. Bristol Temple Meads station is a national hub station (category A station) and Bath Spa station is an important feeder (category C1 station). The remaining 14 stations are all small unstaffed stations (category F1 and F2 stations). The proposed new stations at Pill and Portishead are category F2 and D stations, respectively. The physical characteristics of each station and socio economic context of the stations, varies widely reflecting the diversity of the West of England area. Table 1.7 provides a summary profile of each station, including a scoring based on the index of multiple deprivation for the station locality. Figures 1.7 and 1.8, show visualisations for the proposed new stations at Portishead and Pill.

**Table 1.7 - MetroWest Phase 1 Stations Overview**

| Station | Profile Summary | Deprivation 1 = in the 10% most deprived |
|---|---|---|
| **Bristol Temple Meads**  | Category A national hub station<br>The station has 13 platforms and is situated on the south eastern side of the city centre in the heart of the Temple Quarter Enterprise Zone. The area has seen considerable commercial development over the last 10 years and Temple Gate development will complete the rejuvenation of the whole area. | n/a |
| **Lawrence Hill**  | Category F2 small unstaffed station<br>The station has two platforms with double track. It sits in an inner city area, which is a mixed area of residential, retail and industrial units. The A420 is to the south of the station. The socio-economic employment classifications are equal for the area. | Index of multiple deprivation = 2.5   |
| **Stapleton Road**  | Category F2 small unstaffed station<br>The station has two platforms with double track. The station is in a mostly residential area and to the North of the station is the M32 motorway. Beyond the M32 is a retail and industrial estate. No one socio-economic classification dominates this area. | Index of multiple deprivation = 1   |
| **Montpelier**  | Category F2 small unstaffed station<br>The station has one platform as the line is single track at this point. It sits within a mostly residential area of Bristol to the north of the city centre. The A38 is just to the east of the station. The majority of residents in area are employed in professional occupations with 11.73% of people living in the area being students. | Index of multiple deprivation = 6   |
| **Redland**  | Category F2 small unstaffed station<br>The station has one platform and is single track at this point. Redland station is in a largely residential area that is within a couple of miles of the city centre. The area is dominated by people in Higher and Lower managerial/ professional occupations. | Index of multiple deprivation = 7   |
| **Clifton Down**  | Category F2 small unstaffed station<br>The station has two platforms with double track. Clifton Station is on Whiteladies Road (A4018) a busy shopping area. It is surrounded by a residential area. Most people are employed in professional services i.e solicitors and the nearby BBC. 8.72% of the area is made up of students. | Index of multiple deprivation = 8   |

| | | |
|---|---|---|
| **Sea Mills**<br>  | Category F2 small unstaffed station<br>The station has one platform and is single track at this point. Sea Mills Station is next to the A4 Portway and serves the residential areas of Sea Mills and Stoke Bishop in Bristol's suburbs. The south-west side of the station is characterised by those in Higher and Lower managerial/ professionals and to the north of the station people in routine/ semi routine and lower managerial positions. | Index of multiple deprivation = 4.5<br>  |
| **Shirehampton**<br>  | Category F2 small unstaffed station<br>The station has one platform and is singe track at this point. The A4 (Portway) is just north of the station. The area is mostly residential that surrounds the station in Bristol's outer suburbs. The majority of people within the area work within lower managerial and professional jobs. | Index of multiple deprivation = 7<br>  |
| **Avonmouth**<br>  | Category F1 small unstaffed station<br>The station has two platforms with double track at this point. The area is in an outer suburb of Bristol east of the M5. It is a mixed residential and industrial area with some large warehouses. Bristol Port's Avonmouth docks are located west of the station. The majority of people work within routine and semi routine occupations. | Index of multiple deprivation = 4<br>  |
| **St.Andrews Road**<br>  | Category F2 small unstaffed station<br>The station has one platform and although the line has additional tracks these are for freight trains. The station is located next to Avonmouth Docks. It is in an industrial area with some large warehouses. The majority of people work within routine and semi routine occupations in the area. | Index of multiple deprivation = 4<br>  |
| **Severn Beach**<br>  | Category F1 small unstaffed station<br>The station has one platform and the line is single track. A new shelter, fencing, information boards, planters and cycle facilities were installed in 2016. The station is within the village of Severn Beach, in South Gloucestershire, in a largely residential area. The majority of people work in lower managerial jobs in the area surrounding the station. | Index of multiple deprivation = 6<br>  |
| **Keynsham**<br>  | Category F1 small unstaffed station<br>The station is on the main line between Bristol and London Paddington. It is located close to Keynsham Town centre and serves a town of 24,692 (2011 census). The station has two platforms with double track. The majority of people living in the area surrounding the station work in lower managerial jobs. | Index of multiple deprivation = 8<br>  |

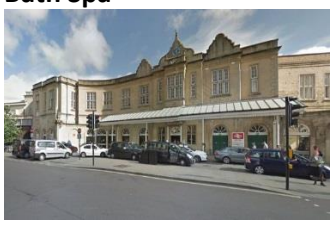
| | | |
|---|---|---|
| **Oldfield Park**<br>  | Category F2 small unstaffed station<br>The station is located in Bath on the main line between Bristol and London Paddington. It has two platforms with double track. To the south of the station is mainly a residential area and to the north of the station is a retail/ industrial park and residential area. The majority of the people that live in the area close to the station work in lower managerial jobs. | Index of multiple deprivation = 8<br>  |
| **Bath Spa**<br>  | Category C1 important feeder station<br>Build in 1840 this Grade II* listed building has seen considerable improvement over recent years. The station has two platforms, being located on the Bristol to London Paddington main line. Situated on the south eastern side of the historical city centre, with high quality interchange facilities nearby. | n/a |
| **Bedminster**<br>  | Category F1 small unstaffed station<br>The station is the first station south of Bristol on the Bristol to Exeter main line. It has two platforms with double track. The station is in a largely residential area within a couple of miles of the city centre. The station is close to a local shopping area. The majority of people work in lower managerial or routine/ semi routine occupations. | Index of multiple deprivation = 3<br>  |
| **Parson Street**<br>  | Category F2 small unstaffed station<br>The station is the second station south of Bristol on the Bristol to Exeter main line. It has two platforms in use with multiple track. Parson Street is in a mixed residential and industrial estate area. The majority of people are employed in lower managerial occupations. | Index of multiple deprivation = 4<br>  |
| **Pill (Proposed)**<br>  | Category F2 small unstaffed station<br>The villages of Pill/ Easton in Gordano/ Ham Green are located south of the M5 and had a population of 4851 according the 2016 population estimate. There will be one platform at Pill station serving both directions and the station is within 5 min's walk of the village centre. The majority of people living in the station area work in routine occupations. | Index of multiple deprivation = 4<br>  |
| **Portishead (Proposed)**<br>  | Category D medium staffed station<br>The town of Portishead is located north of the M5 and has a population of over 25,000. Portishead is the terminus of the branch line and there will be one platform. The majority of people living in the area of the station work in professional occupations or associate professional occupations. | Index of multiple deprivation = 7<br>  |

**Figure 1.9 - Portishead Station Visualisation**


**Figure 1.10 - Pill Station Visualisation**


### Scope Opportunities

In discussion with rail industry partners, there is an opportunity to extend the MetroWest Phase 1 train service proposals beyond Bath to West Wiltshire, to address wider capacity issues on the Westbury to Bristol corridor. Early investigations suggest such an extension could be achieved with an efficient utilisation of rolling stock across the corridor, subject to further train path modelling (Railsys). The modelling also needs to examine whether there any infrastructure enhancement would be required. The extension is currently under consideration by DfT Rail Executive.

### Not in Scope

While MetroWest Phase 1 does not include the delivery of a station at Ashton Gate, passive design provision has been made for a station (small suburban station) and the delivery of the station could be added to the MetroWest Programme in due course, pending business case development, further work to inform the scope of the station and the outcome of wider land use planning proposals for the area (via the Joint Spatial Plan). Bristol City Football Club's Ashton Gate Stadium is located 200 metres to the east of potential site for the station (which is on the Portishead Line) and the football club have aspirations for a rail station to serve the stadium.

## 1.3.2 Scheme Programme

The delivery programme for the scheme is complex given the multiple major process that are required in parallel, including the Network Rail Governance for Railway Investment Projects (GRIP) process, the Development Consent Order process overseen by the Planning Inspectorate and the Habitats Regulation Assessment process determined by Natural England.

The scheme has completed GRIP Stage 3 (Option Selection) Approval in Principle (AIP) design. GRIP Stage 4 (Detailed Option Development) is commencing in February 2018 and following competitive tending via Network Rail, GRIP stage 5 (Detailed Design) commences in early 2019. GRIP stage 6 (Construction, testing & commissioning) commences in May 2020, after receiving the Development Consent Order from the Secretary of State and Habitats Regulation Assessment approval by Natural England, for the Portishead Line.

The construction phase for the works on the Severn Beach Line and the Bath Spa to Bristol line (which is permitted development) is approximately 6 to 9 months subject to confirmation of line possessions. Allowing sufficient timescale for signalling data validation, it may be feasible to commence the enhanced train service for the Severn Beach Line and the Bath Spa to Bristol line earlier than December 2021. The construction phase for the Portishead Line is 15 to 18 months, and allowing for commissioning and testing, gives an opening date of December 2021. GRIP stages 7 and 8 (Handback and Project Close out) are programmed to be completed by late 2022. A summary of the scheme stages and timescales is set out in Table 1.8. Note a more detailed scheme programme is set out in chapter 3 the Management Case.

**Table 1.8 - Scheme Stages and Summary Timescale**

| Scheme Stage | Stage Description | Timescale |
|---|---|---|
| **Stage 1** | Feasibility (including GRIP 1-2) | Summer 2013 to Summer 2014 |
| **Stage 2** | Option development, DCO pre application consultation, and outline business case (including GRIP 3) and DCO application submission* | Autumn 2014 to Winter 2017/18 (December 2017) |
| **Stage 3** | Planning powers and procurement (including GRIP 4-5) | Spring 2018 to Winter 2019/20 |
| **Stage 4** | Full business case, construction and opening (including GRIP 6-8) | Spring 2020 to Winter 2021/22<br>Train services commencing December 2021, with the possibility of the Severn Beach Line & Bath Spa train service commencing at an earlier stage |

* May/June 18 is effectively the deadline date for securing the residual capital funding for the scheme for completing the Funding Statement for DCO application which must be submitted by June/July 2018 in order to achieve the rest of the programme.

In terms of wider interfaces with the rail industry CP5 and CP6 programme, train path modelling undertaken by Network Rail concludes that in order to achieve capability to operate the proposed MetroWest Phase 1 train service, the following Network Rail projects need to be delivered:

- Filton Bank Four Tracking – planned completion Q4 2018
- Bristol Area Signalling Renewal & Enhancement – planned completion Q3 2019
- Bristol East Junction Enhanced Renewal – planned completion Q2 2020

While the Bristol East Junction Enhanced Renewal project will be in its final stages of completion as construction commences on MetroWest Phase 1, there is no physical interface between the two projects. The works on the Severn Beach Line are located near Avonmouth, the works on the Bath Spa to Bristol Line are located east of Bath and the nearest works on the Portishead Line are located near Bedminster station, all of which are some distance from Bristol East Junction which is located immediately east of Bristol Temple Meads station.

In summary the MetroWest Phase 1 train services are programmed to commence from December 2021 with the possibility of the Severn Beach Line & Bath Spa train service commencing at an earlier stage.

## 1.3.3 Scheme Estimated Cost

The estimated scheme capital out-turn cost is £106,071,658 excluding preparation costs to date (technical work and engineering design prior to the submission of this Outline Business Case), excluding provision for potential Part 1 claims and excluding scheme monitoring and evaluation costs. These three cost areas in total amount to £10,391,057, in addition to these costs are operational costs which are to be dealt with separately (see chapter 5 Financial Case). Therefore the total estimated scheme delivery cost (excluding operational costs) to be borne by the Authorities including cost of work to date, Part 1 claims and monitoring and evaluations is £116,462,715.

The scheme capital cost estimate has been, informed by both internal processes within Network Rail including inter-disciplinary reviews (across eight engineering disciplines) and also has been subject to independent review via Mott MacDonald (Independent Cost Estimation Reviewer). Mott MacDonald have been appointed based on their considerable experience undertaking similar work in the rail industry including major projects with Transport for London and Cambridgeshire County Council. Their work has included examining scheme costs including engineering design, construction methodology, project management, industry fees and approaches to risk and inflation.

The scheme operational costs have been calculated in parallel with on-going discussions with the Department for Transport Rail Executive about the extent of operational costs to be met locally by the Councils, the revenue streams generated by the scheme into the long term and the wider train operator procurement options for the scheme. While these discussions continue, we have set out in this Outline Business Case the operational costs that would fall to the Councils under the DfT's three year rule.

The train operator costs comprise the largest element of operational cost. The estimated first year total for train operator costs is £5,372,299, which is largely off-set by forecast revenue of £4,385,000. By year six the estimated operational cost is exceeded by the forecast revenue and the service makes a revenue surplus. By year 10 the forecast revenue surplus is close to £1m per annum. Further information about the scheme operational costs, forecast revenue and consideration of the train operator and long term revenue surpluses is set out in the chapter 2 the Financial Case.

## 1.3.4 Scheme Objectives

The scheme has four principal objectives and three supporting objectives, these are set out in Table 1.9 below along with an explanation of how the objectives will be addressed by the scheme proposals.

**Table 1.9 - Scheme Objectives**

| **Principal Objectives** | **How the objective will be addressed** |
|---|---|
| To support economic growth | through enhancing the transport links to the TQEZ and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors |
| To deliver a more resilient transport offer | by providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach |
| To improve accessibility to the rail network | with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents |
| To make a positive contribution to social well-being | by enhancing life opportunities, which will improve the quality of life, across the three arterial corridors |
| **Supporting Objectives** | **How the objective will be addressed** |
| To contribute to reducing traffic congestion | relative to a 'Do Minimum' scenario (as opposed to current levels of congestion) on the Portishead, Bath and Avonmouth, and Severn Beach arterial corridors; |
| To contribute to enhancing the capacity of the local rail network | through the delivery of strategic infrastructure enhancement and through the operation of enhanced / new train services which increase the seats per hour in the AM and PM peak |
| To contribute to reducing the overall environmental impact of the transport network | By enhancing the public transport network offer which in turn reduces car dependency |

## 1.3.5 Scheme Outputs & Benefits

The central case forecast passenger demand for the scheme is 958,980 passenger trips per annum in the opening year. The forecast is based on a Rail Demand Model developed in conjunction with CH2M and Network Rail, comprising of three main elements; Network Rail MOIRA model for the increase in demand at the 16 existing stations, a new stations model for Portishead and Pill stations and the WoE GBATS4 multi-model model for the non-user benefits. For robustness the model output for the two new stations has been analysed against comparative existing stations for bench marking. The forecast demand for both of the new stations is very close to the median average

comparative station. Further information about the economic performance of the scheme is set out in the Economic Case chapter 2 and for details about the financial performance including revenue surpluses generated by the scheme refer to the Financial Case chapter 5.

The scheme outputs and benefits are wide ranging and demonstrate the extensive total value of the investment in the scheme for the sub-regional economy. In additional there are also important unquantified benefits in terms of the positive social wellbeing, health and environmental benefits of the scheme to the lives of people across the sub-region.

The benefits of the scheme are:

- **an increased local economy** by generating £264M of Gross Value Added (GVA) in first ten years from opening) and creating 514 net new permanent jobs
- **enhanced rail capacity** by delivering over 800 additional seats per hour for the local rail network, which in turn will extend the benefits of Network Rail's Western Route Modernisation Programme
- **a reliable and more frequent public transport service**, directly benefitting 180,000 people within 1km of 16 existing stations, with enhanced train service frequency
- **an increased number of people living within 30 minutes travel time of key employment areas**, such as TQEZ,
- **reduce highway congestion** on arterial corridors, including A369 between Portishead and Bristol, significantly improving network resilience
- **competitive journey times** from Portishead and Pill to Bristol Temple Meads (around 23 minutes)
- **improved accessibility** to sites for new homes and employment development in proximity to the rail corridors and bring an additional 50,000+ people within the immediate catchment of the rail network with new stations at Portishead and Pill
- **reduced overall environmental impact**, resulting in improved air quality, on key arterial highway routes
- **an attractive mode choice** and capacity for journeys to work (alternatives to single occupancy car-based travel) addressing long-term car dependency
- wide ranging **social/health benefits**

The wider scheme outputs include:

- high value for money with a **Benefit to Cost Ratio of 3.48** with wider economic impacts, giving £3.48 of quantified benefits for every £1 invested to implement the scheme
- **forecast revenue** surplus every year from year 6 onwards
- supporting the **delivery of the 105,000 new homes and 82,500 new jobs** identified in the WoE Joint Transport Study and WoE Joint Spatial Plan

For full details of the benefits of the scheme refer to the Economic Case chapter 2. Also see the Monitoring, Evaluation and Benefits Realisation Plan appended to chapter 3 Management Case.

# 1.4 Policy Context & Business Strategy

## 1.4.1 Transport and Land Use Policy Context

The WoE Joint Local Transport Plan 3 (JLTP3) 2011-2026 covers Bristol City Council, Bath & North East Somerset, North Somerset and South Gloucestershire Council areas. The JLTP3 vision is to provide an "affordable, low carbon, accessible, integrated, efficient and reliable transport network to achieve a more competitive economy and better connected, more active and healthy communities." The JLTP3 aims to deliver:

- "A transport system that recognises the whole journey. Where cycle routes and footways feed into the public transport network
- A transport system where both bus and rail play their part. Where buses serve the movements around and within towns, cities and rural communities. Where rail serves both short and longer journeys
- Where marketing, through ticketing, timetable coordination and interchanges make public transport more desirable than the private car
- Where customer satisfaction is the driver behind encouraging public transport use
- Whilst recognising the car will still provide personal mobility for many."

The four WoE authorities have recently completed (October 2017) a Joint Transport Study (JTS). The purpose of the study was to identify transport schemes and infrastructure that will assist the sub-region in meeting the challenges arising from a growing economy and population in the medium-term. The study has identified potential future strategic transport proposals, for delivery up to 2036.

The JTS assumes that the MetroWest Phase 1 and 2 programme will be delivered in the short-term. These schemes will act as building blocks for the JTS proposals. It assumes that MetroWest will support cross-region movement, contributing towards addressing current challenges on the network and providing infrastructure to reduce reliance on private cars.

Alongside the JTS, the four WoE authorities are progressing strategic land use planning proposals through the Joint Spatial Plan. This will support the authorities in meeting the challenge of delivering 105,000 new homes and creating 82,500 new jobs up to 2036. To translate the JTS and the infrastructure requirements of the JSP into firm proposals, the authorities have commenced early work on scoping Joint Local Transport Plan 4.

## 1.4.2 Business Context & LEP Strategic Economic Plan

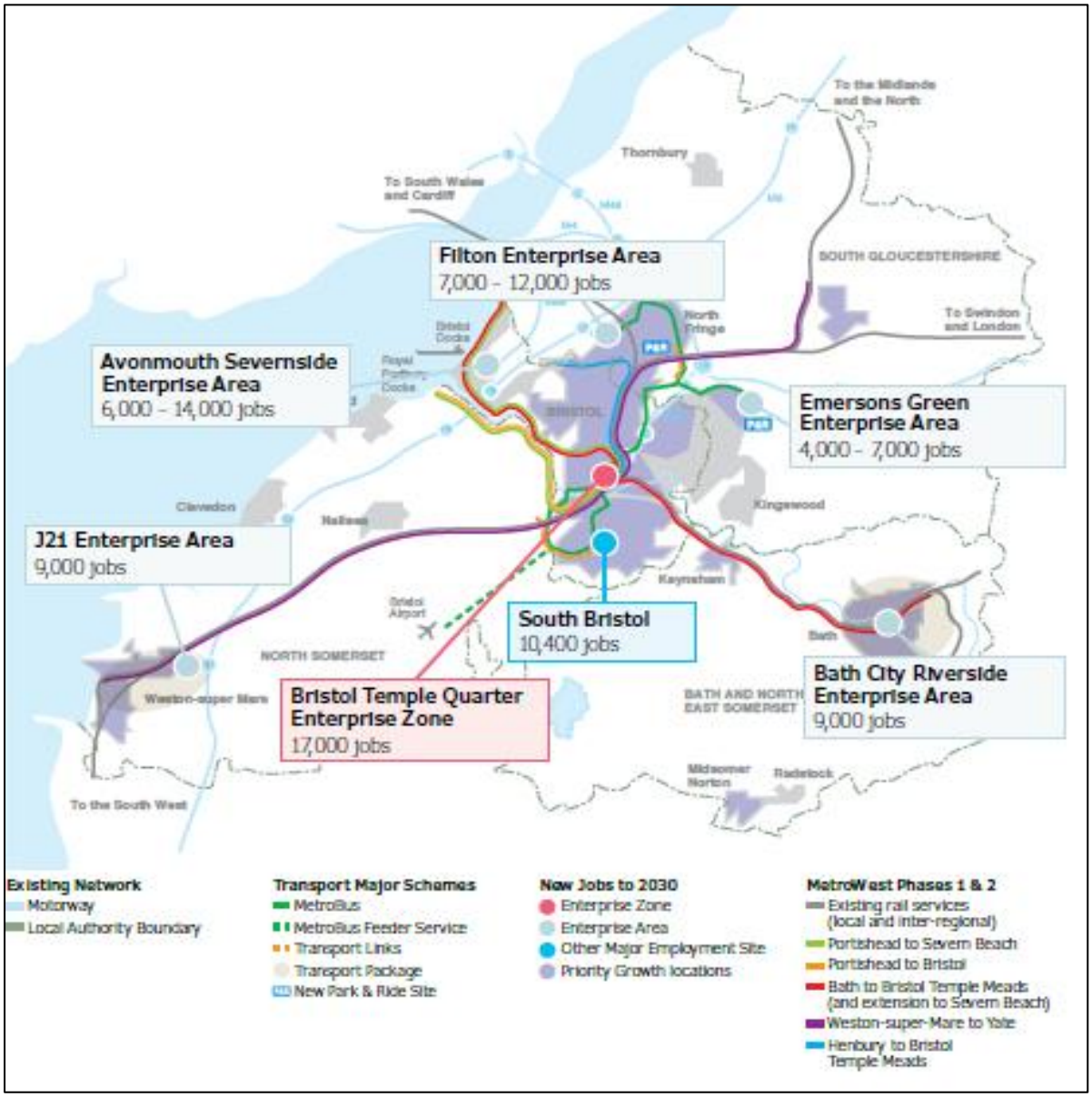
The West of England is a dynamic city region, with a population of more than 1.1 million people, over 43,000 businesses and an economy worth over £31 billion a year. It is a highly productive economy, with GVA per capita higher than the national average. The city region is one of the few areas of the UK that is a net contributor to the Treasury.

Recent economic growth has been driven by a diverse sectoral base with strengths in aerospace, creative and environmental industries, IT and microelectronics, finance and tourism. A high proportion of local employment is, therefore, in high-value knowledge intensive industries. The area is also home to four universities producing cutting-edge research. Economic growth over the last

decade has been driven by these sector strengths and the availability of high quality business space with good access to the transport networks, particularly in the North Fringe area close to the M4 and M5. There has also been rapid growth recently seen in Bristol city centre as businesses are attracted by the large skilled workforce, dynamic local business community and availability of appropriate workspaces.

The West of England Local Enterprise Partnership Strategic Economic Plan 2015 to 2030 (March 2014) draws on these sectoral and locational strengths, with strong ambitions for growth. Temple Quarter is one of the UK's strongest performing Enterprise Zones, and new Enterprise Zones were designated in Bath Riverside and the Somer Valley in 2017. Enterprise Areas have also been allocated at Weston-super-Mare, Filton, Emersons Green and Avonmouth / Severnside. South Bristol is also a priority for urban regeneration. Figure 1.11, shows the Enterprise Zones and Enterprise Areas along with high priority transport proposals, extracted from the 2014 Strategic Economic Plan. Note the job creation numbers have since be revised.

**Figure 1.11 - Strategic Economic Plan 2014 – Priority Transport Investment Map**



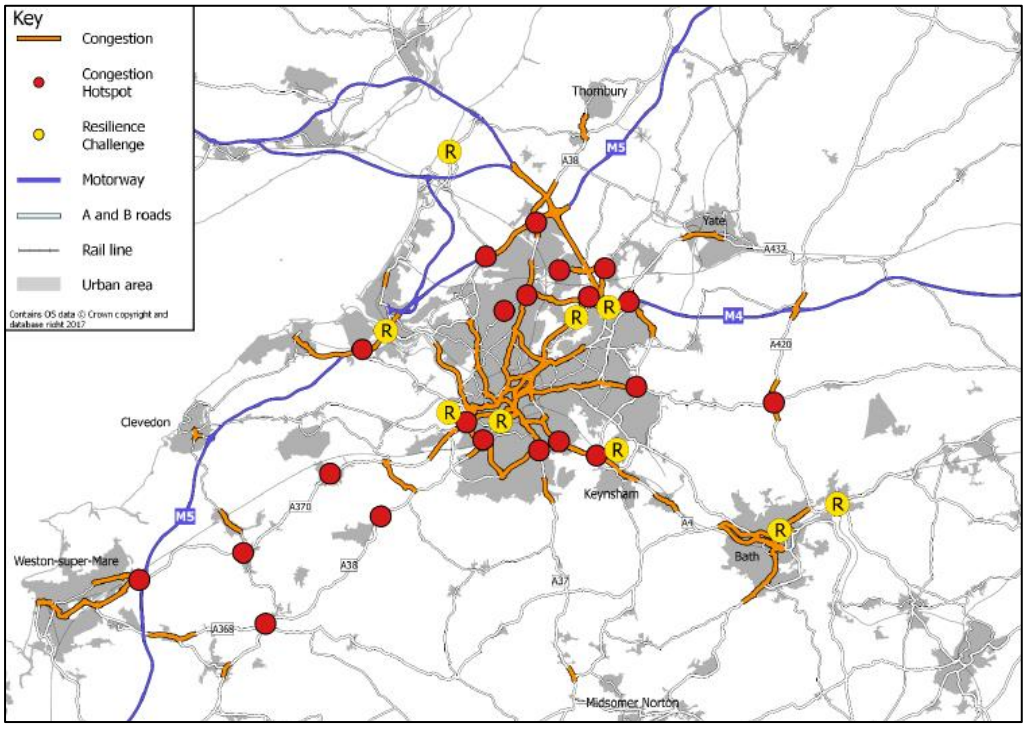
However, the West of England faces serious transport challenges and these will become more acute with the anticipated scale of growth in the area. The forecast numbers of people living and working in the area will increase demands on the transport system, which will have significant economic, social and environmental impacts. Whilst the West of England has benefited from a strong economy over the last decade, the sub-region's economic prosperity is beginning to be constrained by its transport network. As demand on the transport network increases as a result of **economic and population growth**, further investment is needed to ensure the transport network is **sufficiently accessible** and has **sufficient capacity and resilience** to continue to meet the sub region's needs. Longer-term problems of **sustained traffic growth and car dependency** also need to be tackled, in addition to wider **long-term issues of carbon emissions** and **social wellbeing**.

## 1.4.3 Strategic and Local Road Network Performance

Major arterial routes across the road network are congested. There are very heavy traffic volumes on the M4 and M5 motorways, due to longer distance traffic and increased local movements. On the M4 Junction 18 to 20 including the Almondsbury junction with the M5 has particularly heavy volumes and on M5 there are major hot spots between junction 18 and 19 (Avonmouth Bridge) and at junction 21. There is also heavy traffic on the M32, reflecting heavy commuting into Central Bristol, other radial routes (A4 Bath Road, A4 Portway, Cumberland Basin, A37 and A420), the A4174 Ring Road, the A4 and the A36. There are also heavy traffic volumes on roads connecting towns across the sub-region, including the A370, A38, A36, A46 and A432.

Figure 1.12 shows the problems of road congestion across the West of England. This is sourced from traffic count data and transport modal data. 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, and cause widespread distruction across the wider network as the local road network quickly becomes satuarated with divereted traffic.

**Figure 1.12 - Congested Corridors and Hot Spots across the West of England**



The heavy traffic volumes reflect high levels of economic activity, the relatively limited travel choices and the high levels of car ownership and car dependency. This results in significant problems with traffic congestion in many parts of the sub-region affecting both the local and strategic road networks. DfT data (2013/14) shows that Bristol has particularly slow traffic, averaging less than 15 mph during the morning peak, slower than Core Cities outside London.

Road journey times on the three corridors served by MetroWest Phase 1 are shown the Table 1.10 below. The table shows that peak hour journey times are generally more than twice the corresponding free flow journey times.

**Table 1.10 - Free flow vs AM Peak Journey Times on Key Highway Routes**

| Route | **Observed AM Peak (Oct 2013)** | | **Observed AM Peak (May 2013)** | |
|---|---|---|---|---|
| | Free Flow JT (mins) | Net Peak hour JT (mins) | Free Flow JT (mins) | Net Peak hour JT (mins) |
| A4 (Keynsham to Bath Bridge) | 11.4 | 29.5 | 10.2 | 22.5 |
| A4 Portway (Avonmouth to Hotwells) | 10.6 | 21.4 | 9.5 | 17.0 |
| A369 (Portishead to Ashton Gate) | 11.8 | 22.7 | 11.5 | 17.6 |

Free Flow JT = minimum journey time recorded in the period 06:00-10:00

Observed data from Strategis – used in GBATS4 updates

Traffic congestion causes longer and less reliable journey times, reduced resilience in the event of incidents, reduced bus service reliability, rat-running of traffic through residential areas and idling traffic, all of which causes air quality problems and loss of productivity.

There are currently significant challenges with the resilience of the strategic and local road network. For example, in addition to the very heavy traffic volumes on major routes, the occurrences of major incidents on the M5 in particular is increasing. Data published by Inrix shows that the West of England is the sixth most congested city region in the UK, after London, Edinburgh, Glasgow, Birmingham and Manchester (see appendix 1.1 for more details). The West of England had a recorded 619 traffic hot spot incidents over 12 months with the worst recorded incident at J20 on the M5 with a 15 hour delays which resulted in traffic problems up to 36 miles away.

These major incidents cause widespread congestion and long traffic delays across the West of England with traffic diverted on local roads, due to the lack of suitable alternative routes. In the future, with increasing traffic demand and congestion on the road network, transport modelling shows incidents will have increasingly serious impacts on the road network. For example modelling using the GBATS4 model indicates that a full closure of the M5 motorway would result in a doubling of delay on the local road network compared with normal day to day conditions, with serious implications for both strategic and local connectivity.

## 1.4.4 Transport Network Impacts on Business

The problems caused by limited travel choices and increased congestion impact on the labour market and place extra costs on business due to increased operating costs of vehicles, more non-productive time spent travelling and wider productivity impacts from the reduction in the potential for business clustering.

**Ability to find suitably skilled staff** – people choose their area of search for a job based on the time and costs of travel to the job. Employers offering higher paid jobs can attract staff from a wide area, but lower paid jobs are only able to attract applicants from a relatively narrow defined area. The balance between the labour market and recruitment and retention of staff is particularly challenging in areas with relatively strong economic performance such as the West of England.

**Business operating costs –** transport costs are significant for certain sectors including logistics and manufacturing. Logistics activity therefore tenders to cluster in places such as Avonmouth/Severnside on the M5. Other sectors are reliant on staff travelling as part of their role, including meeting with clients and colleagues and it is frequently not possible to work during the journey. This non-productive time is a direct cost to business.

**Wider productivity impacts** – businesses tend to cluster together to facilitate knowledge sharing, innovation and tapping into deep, skilled labour markets. This is collectively termed 'agglomeration' and there are strong clusters in several sectors in the West of England, including aerospace, creative industries and professional services. Problems caused by poor connectivity and congestion hold back the economic potential of these sectors and act as a drag on the wider economy.

As set out in section 1.4.3 the existing traffic congestion situation across the strategic and local road network is already a problem for business, however without intervention the problems are set to get much worse over the next decade and beyond. Transport modelling using the GBATS4 model shows that the cost of congestion is forecast to rise to over £500 million per annum in 2026 and £800 million per annum in 2036, if there is no further investment in strategic transport improvements. Source: Analysis by Atkins: Costs of congestion are based on calculation of the total vehicle delays in the network and application of values of time for business travel, commuting and other journey purposes.

The increasing costs of congestion will directly impact on businesses through lost productive staff time and increased costs of moving goods. This will also have impacts on the economy through constraining the operation of the labour market and constraining potential business agglomeration, which will reduce productivity and competitiveness of businesses in the region.

# 1.5 Options Assessment

## 1.5.1 Brief History of the Scheme

The reopening of the Portishead branch line was initially considered in 1986, but the proposing organisation went into liquidation. During the early 1990's different modal options were looked at for the corridor, with heavy rail not considered fully until 1999. Subsequent studies considered the technical feasibility, affordability and patronage of a heavy rail option compared to bus based and light rail options.

A heavy rail based solution was identified as a preferred long-term scheme in JLTP2 (2006), with feasibility work commencing in 2008. JLTP3 (2011) provided the policy basis, programme prioritisation and stakeholder support for taking Portishead rail project forward.

Following the WoE Rail Study (2011), a formal decision was made in 2012 to accept the study recommendations to combine the Portishead Branch Line re-opening project into the Greater Bristol Metro project, with delivery through a staged approach. MetroWest Phase 1 was mobilised in 2013.

The Preliminary Business Case was prepared in September 2014, based on GRIP stage 2, and is available from www.travelwest.info/projects/MetroWest. This Outline Business Case was completed in December 2017, based on GRIP stage 3 Approval in Principle design and is also available from www.travelwest.info/projects/MetroWest

## 1.5.2 Options Assessment Process

The options assessment process has been undertaken following DfT Transport Analysis Guidance. A detailed Options Assessment Report has been produced and can be found in appendix 1.2. The options assessment process entails seven steps from identifying the current situation and problem to development of the preferred option. Table 1.11 provides a brief overview of how the scheme has progressed through each step.

**Table 1.11 - Scheme Options Assessment Process**

| Option Assessment Step | Informed by |
|---|---|
| Step 1: Understanding the Current Situation | Current transport and land use policy<br>Current growth in rail passenger demand<br>Current local rail network overview<br>Transport network opportunities and constraints |
| Step 2: Understanding the Future Situation | Transport and land use policy development for the future<br>Changes to the transport network<br>Future passenger demand |
| Step 3: Establishing the Need for Intervention | Current transport network context<br>Current local rail network level of service<br>Current and future transport problems |

| | |
|---|---|
| Step 4a: Identifying Objectives | Sub-regional business objectives – LEP Strategic Economic Plan<br>Sub-regional transport goals and proposals -Joint Local Transport Plan 3<br>How the scheme objectives benefits address the problems identified and supports wider objectives |
| Step 4b: Define Geographic Area to be Addressed by the Intervention | Geographic scope of the scheme<br>Geographic extent of problems |
| Step 5: Generating Options | Identifying wide range of options<br>Long List of Options |
| Step 6: Initial Sifting | Early Assessment Sifting Tool (EAST)<br>Initial sift of options<br>Options discarded |
| Step 7: Development and Assessment of Potential Options | Development of options<br>Methodology for Assessing options<br>Appraisal Specification Summary Table<br>Public consultation<br>Headline results |

## 1.5.3 Option Assessment Steps 1 to 4

The options assessment process is a detailed technical process. Key elements of the findings of the process are set as follows.

The primary problems identified across the three corridors in summary are:

- The A369 is the only transport corridor directly linking Portishead with Bristol, which is 10 miles to the east. Capacity constraints are exacerbated by the corridor crossing junction 19 of the M5, one of the busiest parts of the motorway, with the Avonmouth Bridge immediately to the north
- Poor transport network resilience, particularly related to the knock-on effects of incidents on the M5, with high volumes of traffic using a constrained local road corridor with few alternative route options, consequently causing substantial loss of productivity and wider disruption to transport network users (the public)
- Lack of real alternatives to the car for some residents and businesses (for example, Portishead and cross-Bristol trips
- Poor air quality in areas of Bristol and Bath
- High levels of car dependency across the West of England exacerbated by limited travel choices in many areas, which will continue into the medium to long term if sustainable travel choices are not broadened
- Areas of multiple deprivation, for example north-western parts of Bristol (alongside the Severn Beach line) and parts of Bristol City

While the three corridors are local rail corridors, as set out in section 1.2.3 (Sub-Regional Rail Network Overview) the WoE local rail network has a number of problems, which in summary are:

- the geographic reach of the local rail network is limited with just five rail corridor feeding into Bristol Temple Meads, which is less than all other comparative Core City Regions,
- the local train service frequency is irregular in places and some corridors have a poor frequency or not clock-face and most of the local train network does not have a half hourly a basic half hourly service and there connectivity issues for cross-Bristol Temple Meads trips,
- there are operational capacity problems causing overcrowding problems (arising from a combination of poor train service frequency short formation rolling stock).

These fundamental supply side problems need to be addressed in order to realise the potential of the West of England local rail network.

The wider policy text that frames these problems is set out in the WoE Local Enterprise Partnership (LEP) and WoE Joint Local Transport Plan (JLTP). Both of which identified the need for strategic investment in the local rail network.

The scheme objectives were identified and agreed at the outset of the scheme in 2013 informed by the business and transport specific problems identified and the outcome of a sub-regional rail study in 2011.

The Vision for the West of England LEP is summarised as:

- Supporting growth
- Driving innovation
- Developing people
- Promoting business
- Creating a sense of place

The five key transport goals set out in the West of England JLTP3 are:

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

This context has shaped the MetroWest Phase 1 objectives. The principal scheme objectives are:

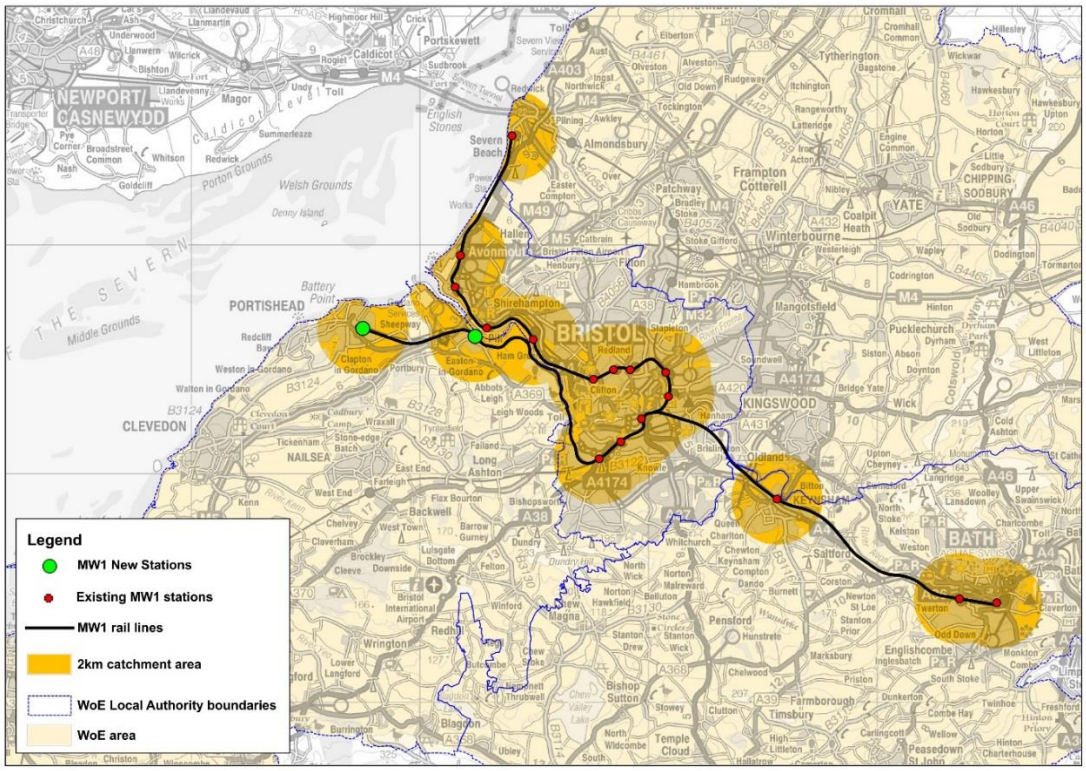
- To support economic growth, through enhancing the transport links to the Temple Quarter Enterprise Zone (TQEZ) and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors;
- To deliver a more resilient transport offer, providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach;
- To improve accessibility to the rail network with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents; and
- To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors.

In addition, the supporting scheme objectives are:

- To contribute to reducing traffic congestion relative to a 'Do Minimum' scenario (as opposed to current levels of congestion) on the Portishead, Bath and Avonmouth, and Severn Beach arterial corridors;
- To contribute to enhancing the capacity of the local rail network, in terms of seats per hour in the AM and PM peak; and
- To contribute to reducing the overall environmental impact of the transport network by enhancing the public transport network offer which in turn reduces car dependency

The geographic scope of the travel market, assuming a 2km catchment area for the new and existing stations, is shown in Figure 1.13.

**Figure 1.13 - Geographic Scope of Travel Market**




## 1.5.4 Option Assessment Steps 5 to 7

The West of England network provides a range of travel options for different areas and corridors. A number of constraints (such as lack of highway space) and opportunities (such as disused railway lines and freight only lines) have influenced the strategic optioneering. On the A4 between Bath and Bristol, and the A369 Portishead corridors, systemic levels of congestion would significantly impact on the feasibility of making improvements to highway based modes including a bus option, resulting in unattractive journey times, unreliability and poor resilience. This, combined with the availability of the existing rail corridors, makes rail-based solutions the most appropriate option for these corridors.

MetroWest Phase 1 enables the West of England Authorities and the West of England LEP to realise the strategic potential the local rail network can play in meeting the transport needs of the sub-region. The scheme also complements investment currently being delivered by the rail industry during Control Period 5 (2014 to 2019) through the Great Western Programme, including electrification of the Great Western line and the Intercity Express Programme.

The West of England Authorities and Network Rail have undertaken a considerable number of feasibility studies on MetroWest in its current and former guises. This has resulted in the generation of an option that is well-positioned to be taken forward. In summary, the MetroWest Phase 1 option has:

- Full backing across all four West of England authorities, including funding for project development, as well as from the rail industry, so the scheme can be taken forward alongside committed CP5 schemes
- A robust policy context
- A full body of feasibility work and evidence
- On-going detailed technical interface with Network Rail and Great Western Railways
- Endorsement as a priority scheme from the West of England LEP
- Endorsement by the West of England Joint Transport Board (now the WoE Joint Committee) as the top priority scheme for devolved major scheme LGF funding, subject to business case approval

In the early stages of MetroWest Phase 1, the West of England Authorities, Network Rail and the train operating companies held optioneering workshops. The purpose was to identify the services and infrastructure required to meet provide the foundation of a Metro service pattern. The workshops also considered current passenger demand characteristics and the known infrastructure constraints across the West of England rail network.

The optioneering workshops resulted in the identification of the following long list of options:

- Option 1: Shuttles (base case)
- Option 2a and b: Portishead to Bath Spa and Severn Beach shuttle
- Option 3a and b: Portishead to Severn Beach and Bath shuttle
- Option 4a and b: Severn Beach to Bath Spa and Portishead shuttle
- Option 5a and b: Severn Beach to Bath and Severn Beach to Portishead (timetable proposed Halcrow)
- Option 6a and b: Portishead to Bath and Portishead to Severn Beach

The long list was assessed using the Early Assessment Sifting Tool (EAST) which is appended to the Options Assessment Report in appendix 1.2.

The EAST assessment showed that option 5b and 6b were identified through the initial sifting as options to take forward to the Preliminary Business Case. These two options were shown as being achievable and affordable, as well as supporting wider policy, offering value for money and being considered commercially viable. Following the initial sift of options, option 5b and 6b were identified to be progressed for further development. The next step was the development of the engineering design, GRIP deliverables and supporting technical work to enable the costs, benefits and impacts of both options to be assessed. This enabled the identification of the better performing options to be taken forward.

As part of the work to progress the two short-listed options, further work was undertaken to develop them to a sufficient level of design. This included the identification of alternatives within options.

In terms of the route for the provision of a railway between Portishead and Pill, there is little purpose in considering alternative alignments. This is because:

- NSC and NR between them own the land forming the former railway corridor
- All the principal structures required for the railway are already in place
- The railway is on a relatively straight alignment between Portishead and the connection to the existing rail network at Portbury Dock Junction
- The corridor has been reserved for transport proposals in relevant planning policy documents

Two strategic options were considered for MetroWest Phase 1:

- An all day, half hourly service to Portishead and Pill
- A lower cost option to reopen the railway to passengers, with a less frequent service pattern

Options for service frequencies were assessed in the Preliminary Business Case (West of England Partnership, September 2014). Half hourly and hourly services for the reopened Portishead Branch Line were considered. The economic assessment, based on the GRIP 2 costs, found an hourly off peak service frequency provided lower value for money than a half hourly option.

However, following the completion of the scheme's outline design including GRIP 3 (Option Selection) for two trains per hour in March 2017, along with an updated scheme capital cost estimate, the amount of works required for a half hourly hour service were considerably higher than estimates made at the feasibility design stage (GRIP 2). This makes the half hourly scheme presently unaffordable.

As a result, the West of England Authorities determined to take a staged approach to the delivery of the MetroWest Phase 1 project:

- The proposals for the Severn Beach Line and Bath Spa to Bristol Line remain unchanged i.e. half hourly services and associated infrastructure.
- For the Portishead Line either an hourly or an hourly plus passenger train service is proposed. The difference between an hourly service and an hourly service plus is explained in section 1.3.1.

Detailed train path modelling undertaken by Network Rail (using Railsys software) has concluded that there is no difference between the infrastructure required for the hourly service vs the hourly service plus. The key difference between the two levels of service is the hourly service requires just one train set, while the hourly service plus requires two train sets, although one train set operates during the peak only.

In essence the deduced scope of MetroWest Phase 1 (with an hourly or hourly service plus for the Portishead Branch Line) is in effect the delivery of the scheme Lower Cost Option (revised version since the preliminary Business Case 2014 version).

The Appraisal Specification Summary table for the resultant MetroWest Phase 1 scheme is set out in the Economic Case chapter 2. Throughout the option selection process considerable public and statutory consultation has been undertaken. For further details about the scheme consultation refer to section 1.8 of this chapter.

# 1.6 Alignment with National Transport Objectives

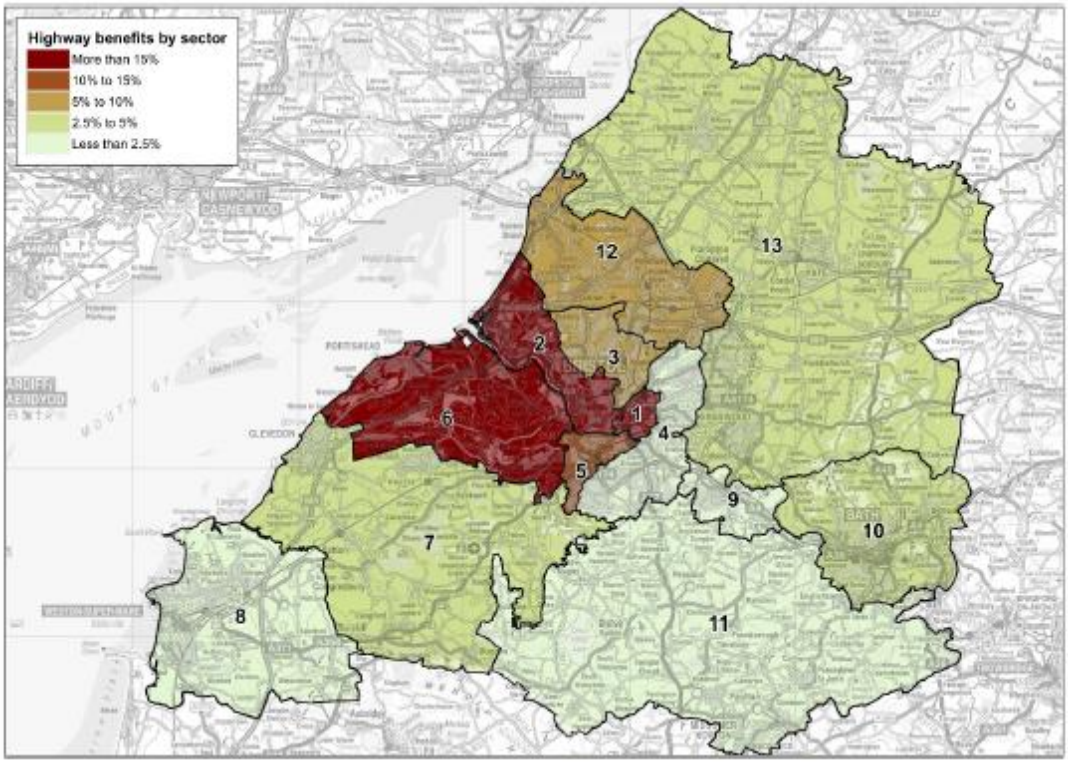
## 1.6.1 Easing Congestion

Modelling indicates that the enhanced connectivity offered by the scheme should attract trips away from the local highway network. However the impacts are network wide and as a result although rail demand increases, with a proportion of these trips being former car trips, the changes are distributed across the wider modelled area according to origin and destination. Detailed information on both the without intervention and with intervention case is set out in the Forecasting Report which is appended to chapter 2 the Economic Case.

On the Portishead to Bristol corridor there are some notable reductions to assigned highway trips. Congestion is therefore eased on links such as the M5 Avonmouth Bridge. This results from changes in trip patterns to/from Portishead. It should be noted that there are some localised increases in highway trips as a result of re-routeing on a congested network. For example, the Portbury Hundred in the AM peak has increased traffic movement. This is caused by reductions in car trips from Portishead towards the M5 (transferring to rail), resulting in the Portbury Hundred becoming a more attractive route than it was. This in turn draws trips back onto the Portbury Hundred that were using alternative (less suitable) routes. As such, traffic flows reduce markedly on Clapton Lane and Naish Hill.

The overall position is the enhanced connectivity offered by the scheme across the three corridors results in reductions in local highway demand, commensurate with increases in rail demand. There are also some specific reductions in traffic as a result of the sensitivity of a congested network to changes in demand, both local to and slightly away from the scheme. Figure 1.14 presents the spatial distribution of highway benefits from the scheme based on trip origins. This is consistent with the areas expected to benefit from MetroWest Phase 1.

**Figure 1.14 - Spatial Distribution of Highway Benefits – Based on Origin Sector**



## 1.6.2 Supporting Economic Growth & Job Creation

MetroWest Phase 1 is a strategic intervention across three rail corridors that will play a key role in enhancing access to major growth areas including Temple Quarter Enterprise Zone and five Enterprise Areas across the sub-region. The project will bring these major employment centres closer to the skilled workforce catchment, by simultaneously enhancing access to the local train network and increasing train service frequency. Major employers will have a larger skilled workforce pool to draw on within a 30-minute commute and this will assist in removing barriers to inward investment. Full details of the user and non-user benefits including journey time savings are set out in the Economic Case Chapter 2.

Transport infrastructure can play a key role in regenerating and making an area's economy more productive. Improved infrastruture can lead to improved access to markets and customers, higher mobility anf flexibility of the labour market and more reliable supply of goods and services. These wider economic impacts of the scheme have also been calculated in terms of Gross Value Added to the economy and job creation. Table 1.12 sets out a summary of the regeneration impacts of the scheme.

**Table 1.12 - Gross Value Added (GVA) and Job Creation Impacts**

| GVA Element | Temporary / Permanent Impact | GVA Estimated Output |
|---|---|---|
| GVA Total | Temporary (during construction) | £57.12M |
| Additional Jobs | Temporary (during construction) | 1,441 jobs |
| GVA Total per annum | Permanent (post scheme opening) | £31.86M |
| Additional jobs | Permanent (post scheme opening) | 514 jobs |
| Aggregate Impact (first 10 years) | Permanent (post scheme opening) | £264.78M |

Notes

- Calculation of the construction GVA and job creation follows the approach outlined in the West of England LEP's 'Impact Guidance Note'
- Calculation of the permanent GVA and job creation is derived from two sources: operational (directly related to enhanced services and new station provision) and wider impacts (resulting from enhanced connectivity across the West of England)
- All GVA figures are £m in 2017 values
- Temporary impacts are totals for the construction period, both jobs and GVA
- Permanent impacts are quoted as permanent jobs and GVA per annum post opening
- Aggregate GVA impact is for the construction period plus the first 10 years of operation, discounted to 2017 values

## 1.6.3 Supporting Delivery of New Housing

The WoE Joint Transport Study (October 2017) together with the emerging WoE Joint Spatial Plan is informing the infrastructure priorities for delivery of 105,000 new homes and creation of 82,500 new jobs up to 2036. MetroWest Phase 1 & Phase 2 are included in the base case as committed schemes for the WoE Joint Transport Study and the emerging WoE Joint Spatial Plan (to be adopted in 2018).

This effectively means for land use and transport planning purposes, the sub-region is assuming that MetroWest Phase 1 and 2 will be delivered early in the planning horizon.

The JSP Strategic Priorities are:

1. **Economic**: To identify and meet the need for housing and accommodate the economic growth objectives of the LEP Strategic Economic Plan
2. **Social**: To ensure that the JSP benefits all sections of our communities
3. **Environment**: To protect and enhance the sub-region's diverse and high quality environment and ensuring resilience including through protection against flood risk
4. **Infrastructure**: To ensure a spatial strategy where new development is properly aligned with infrastructure

**Current Planned Growth**

The West of England has committed to high levels of housing and employment growth in the short to medium term. Table 1.13 summarises the Core Strategy commitments of each of the four local authorities. These commitments are being reviewed and extended through the emerging Joint Spatial Plan which has a longer planning horizon to 2036.

**Table 1.13 - Current Planned Growth (Core Strategy Commitments)**

| Area | Homes | Employment |
|---|---|---|
| **Bath & North East Somerset (2011-2029)** | **12,960** | **10,300 jobs** |
| Bath | 7,020 | 6,950 jobs |
| Keynsham | 2,150 | 1,600 jobs |
| Somer Valley | 2,470 | 900 jobs |
| Rural areas | 1,320 | 700 jobs |
| **Bristol (2006 – 2026)** | **36,600 (min 26,400)** | **21,900 jobs** |
| City Centre | 7,400 | |
| South Bristol | 8,000 | 150,000 $m^2$ office in city centre |
| Inner East | 2,000 | 10 ha industry + 60,000 $m^2$ |
| Northern Arc | 3,000 | office in S Bristol. |
| Rest of City | 6,000 | 26,000 $m^2$ office across the city |
| Smaller sites | 4,200 | |
| **North Somerset (2006 – 2026)** | **20,985** | **10,100 jobs** |
| Weston urban area | 6,300 | |
| Weston villages | 6,500 | Employment focus is town |
| Clevedon, Nailsea & Portishead | 5,100 | centre regeneration in Weston |
| Service villages | 2,100 | and mixed use employment |
| Rural areas | 985 | In Weston villages |
| **South Gloucestershire (2013 – 2027)** | **22,545** | |
| Existing Local Plan allocations | 7,060 | |
| Cribbs Patchway New Neighbourhood | 5,700 | Focus on Enterprise Areas in |
| East of Harry Stoke New Neighbourhood | 2,000 | Filton & Science Park in |
| North Yate New Neighbourhood | 2,700 | The East Fringe |
| Thornbury | 800 | |
| Other areas and small windfall sites | 965 + 2,100 | |

Bath & North East Somerset Core Strategy, adopted July 2014

Bristol Core Strategy, adopted June 2011

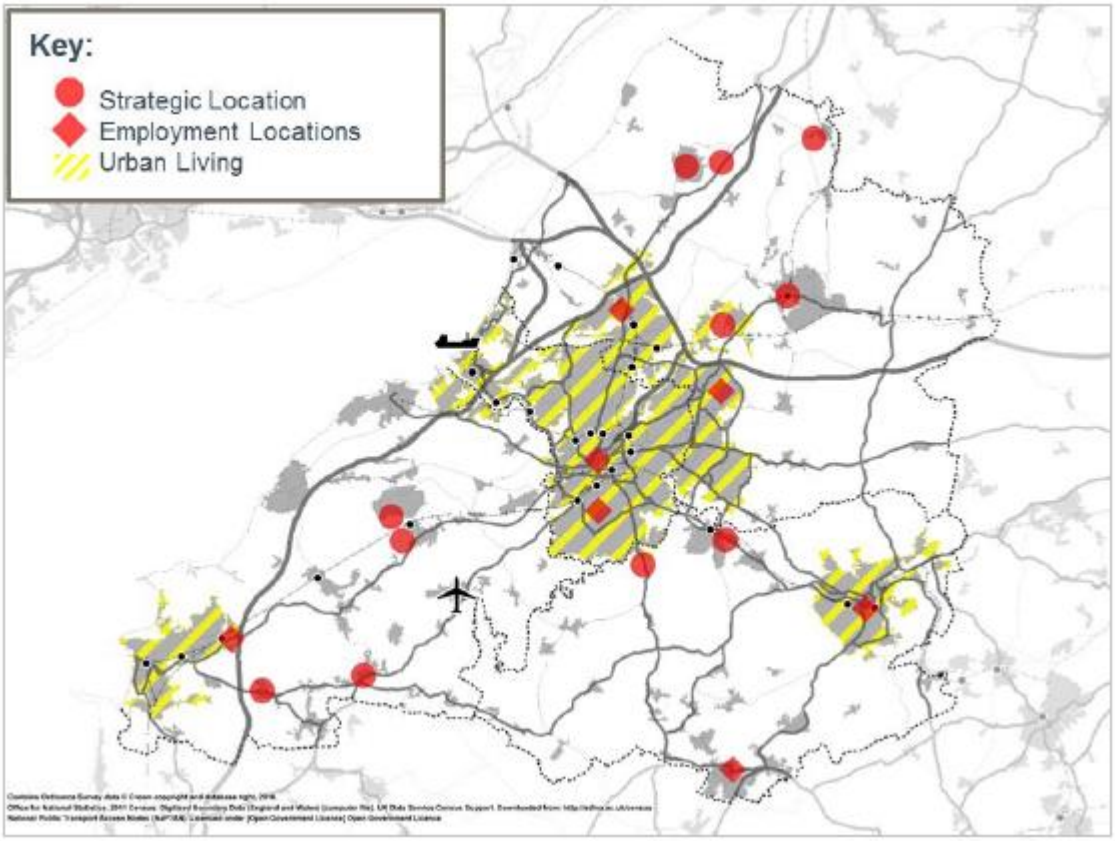
North Somerset Core Strategy, adopted January 2017

South Gloucestershire Core Strategy, adopted December 2013

### Longer Term Growth

The Joint Spatial Plan is intended to meet the needs arising from the West of England housing market areas to 2036 and the plan will provide the framework to deliver 105,000 net additional new homes between 2016 and 2036, including committed growth within the four Core Strategies as set out in the Table 1.13, above. The four authorities existing Core Strategies currently make provision for around 66,800 new homes. This means there is a requirement for 39,000 additional new homes (to 2036) that need to be accommodated in the emerging Joint Spatial Plan. Figure 1.15 shows the strategic development locations proposed in the emerging Joint Spatial Plan.

**Figure 1.15 - Proposed Development Locations in the emerging Joint Spatial Plan (2026-2036)**

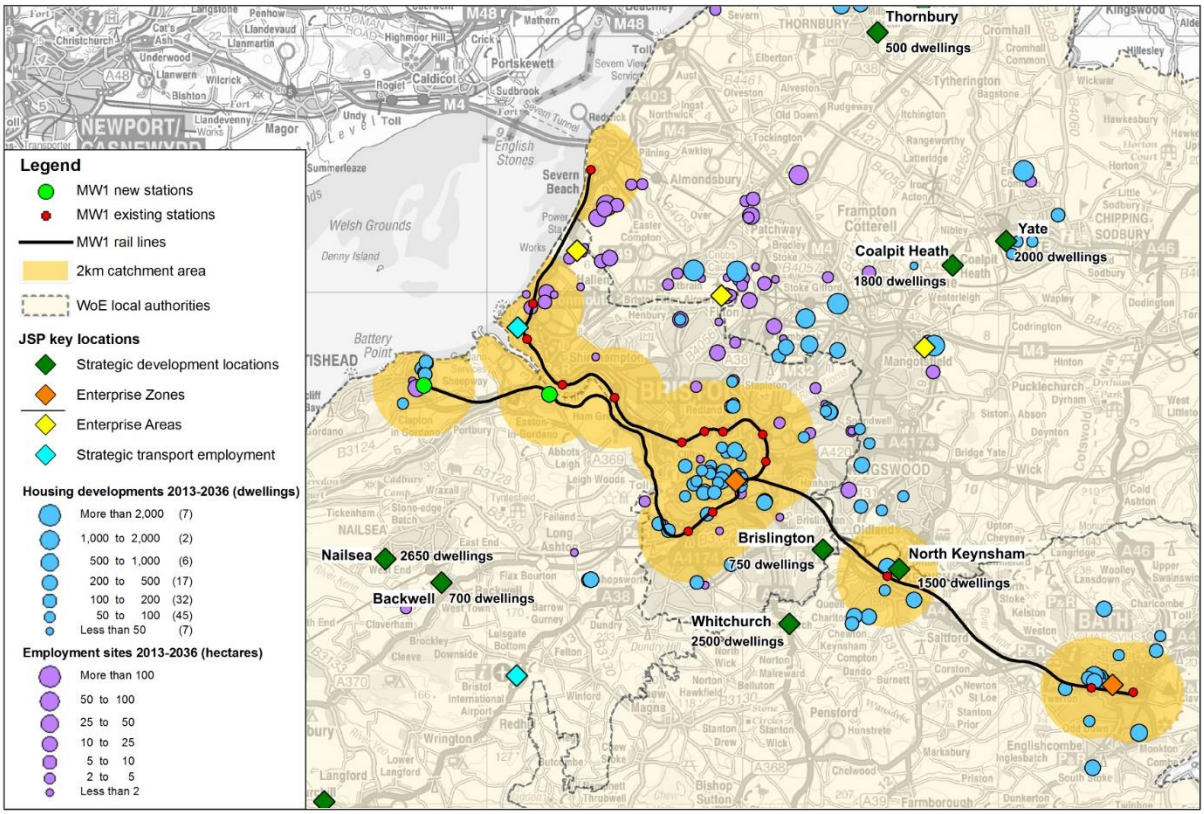



Overall, the requirement for 105,000 new homes is equivalent to an increase of more than 20% on current housing provision and represents major growth for the sub-region. This will pose significant challenges in terms ensuring that the locations for new development maximise opportunities for sustainable modes of transport, reducing reliance on the car. There are significant challenges for the delivery of transport infrastructure to ensure the transport network can accommodate this level of growth. The delivery of MetroWest Phase 1 and Phase 2 early in the planning horizon will provide the foundation for establishing a Metro local rail network, to meet both existing and future needs.

### Site Specific Proposals

Figure 1.16 shows the housing and employment allocations used in the GBATS4 modelling work in the scheme catchment and the Joint Spatial Plan allocations.

**Figure 1.16 - Committed housing and employment allocations in the scheme catchment & JSP allocations**

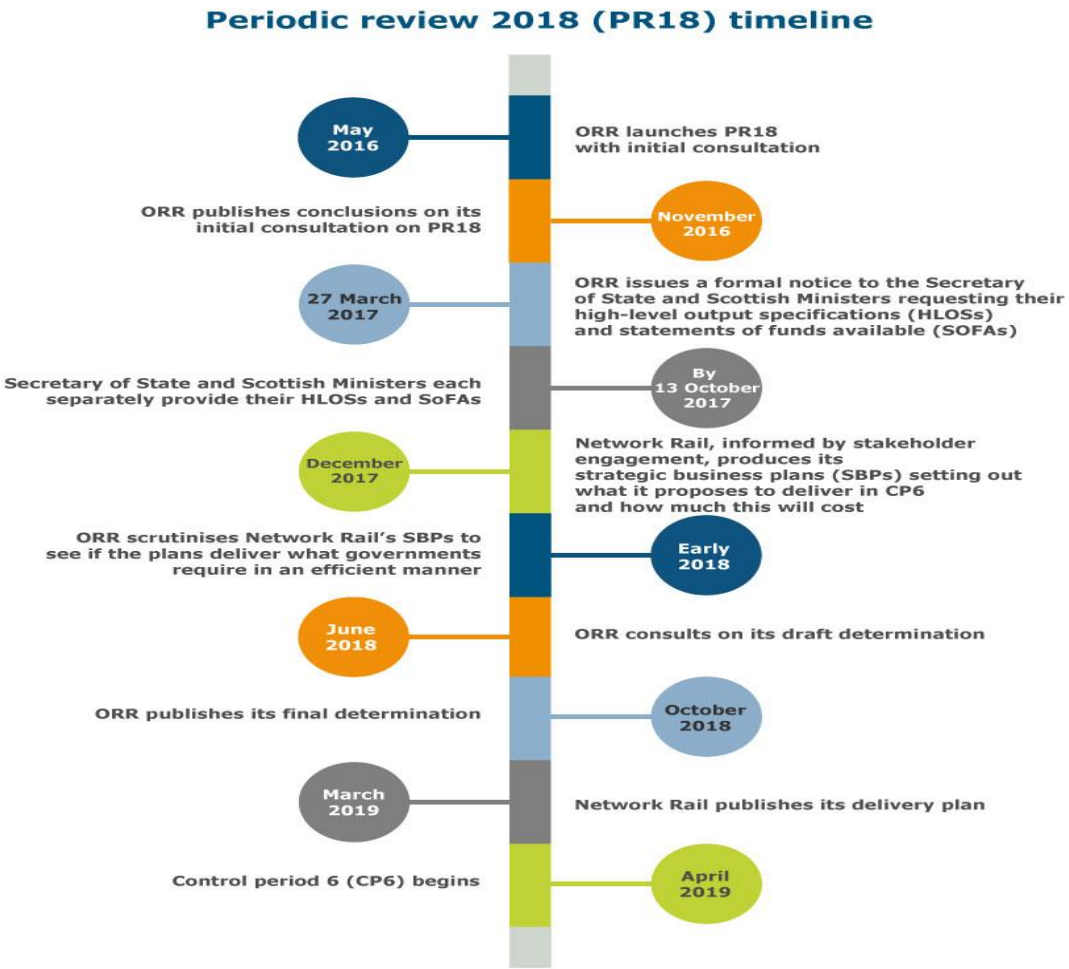


# 1.7 Interface with the National Transport Network

## 1.7.1 Alignment with the Regulatory Framework & Government Strategy

Period Review 2018 (PR18) is the regulatory process for decision making on setting the budget for the System Operator Network Rail for the next Control Period (CP6) 2019 to 2024. In July 2017 the Government published its High Level Output Specification (HLOS) setting out broadly its priorities for investment in the rail network for 2019 to 2024 (Control Period 6). The HLOS sets out five priority areas for investment; infrastructure enhancement, operations maintenance and renewal, safety, performance & reliability and demand & capacity. In September 2017 the Government published its Statement of Funds Available (SOFA), setting a budget ceiling of £47.9 Billion for Network Rail for 2019 to 2024 (Control Period 6) of which £34.7 Billion is to be grant funded directly by the Government. Figure 1.17 explains the PR18 timetable and process in more detail.

**Figure 1.17 – Periodic Review 2018 (PR18) Timetable and Process**



In November 2017 the Government published a national rail strategy, Connecting People: a strategic vision for rail. The strategy sets out five key themes:

- A more reliable railway
- An expanded network
- A better deal for passengers
- A modern workforce
- A productive and innovative sector

The strategy has been developed around a vision for rail, over four periods of time; the near term, 2019 to 2024 (Control Period 6), 2024 to 2029 and Beyond 2030. For the 2019 to 2024 (Control Period 6) which is the period when MetroWest Phase 1 is to be delivered (by Dec 2021), the central theme is a more reliable, efficient and modern railway, with an emphasis on:

- A step-change in renewal to maintain safety and improve reliability
- The next generation of passenger service contracts
- A new generation of long term integrated rail partnerships
- New connections and new capacity
- New partners for infrastructure development, design and delivery
- New sources of funding and finance

MetroWest Phase 1 is well aligned with the strategy. The scheme has been developed in collaboration with the rail industry over several years and the delivery of the scheme is supported by Network Rail, Great Western Railways and other industry partners. The close technical work between the councils and Network Rail on MetroWest Phase 1 and Phase 2 has already been beneficial in creating better understanding of the issues and priorities of the respective organisations. This is enabling the councils to develop its transport strategy and investment plans (through the JTS, JSP and JLTP4), in a more informed way, enabling better decision making. Furthermore the successful delivery of MetroWest Phase 1 and Phase 2 will provide an opportunity for further integration with the rail industry, potentially leading to an on-going medium term MetroWest investment programme. To date the councils have committed £69.5M to MetroWest Phase 1 and £43.1M to MetroWest Phase 2 and there is a considerable support among local stakeholders and politician's for further investment in the local rail network.

Under the heading of 'The Next Generation of Schemes' para 2.39 states *"We will help partners find the support and expertise they need, including by working closely with Network Rail. Network Rail has a vital role in providing the analysis and advice to support work by potential investors, developers and third parties and we welcome their commitment to encourage and enable investment".* Para 2.43 states *"Some examples of proposals currently being looked at and candidates for further consideration include Bristol to Portishead and Bristol to Henbury, part of the MetroWest project promoted by the West of England…"*

In November 2017 the Government also published 'Great Western Rail Franchise Public Consultation'. The document sets out the Government's franchise strategy for the Great Western franchise through a period of considerable planned change, with the delivery of a range of major projects across the franchise. The Government intend to exercise their contractual option to extend the existing franchise to March 2020 and also to negotiate a further extension March 2022.

The consultation document has four key themes:

1. The current franchise and improvements to be completed by 2020
2. The franchise through the 2020's
3. Key structural choices for the next franchise

4. Key priorities for the next franchise specification

In chapter 4. Key priorities for the next franchise specification, para 4.4 states:

*"MetroWest: A scheme being promoted by the West of England, to provide half hourly services at most stations in the Bristol area, as well as restoring passenger services to Portishead and opening other new stations. Subject to the local promoters deciding to proceed with this scheme, we will work with them to deliver the planned service enhancements. We are also examining the potential for the new MetroWest service to be extended beyond their currently planned termini, to serve Gloucester and Westbury. We will request proposals from the current franchisee to source the additional rolling stock that such extensions would require."*

## 1.7.2 Interface with the Greater West Programme and the Network Specification - Western

MetroWest Phase 1 will deliver a strategic enhancement to the West of England local rail network. The scheme will increase the Western Route passenger rail network by 14 kilometres, deliver two new stations and enhance the service frequency for 16 existing stations, across three local lines.

Re-opening the Portishead Line is a Nationally Significant Infrastructure Project (NSIP), under the 2008 Planning Act and consequently requires a Development Consent Order (DCO) for powers to build and operate (the 4.7km of dis-used railway). Any rail project that includes 2km or more continuous track outside the existing operational rail network, is deemed an NSIP under the 2008 Planning Act. The Planning Inspectorate oversees the DCO process and a panel of independent examiners is appointed by the Secretary of State to undertake an examination in public and to make a recommendation to the Secretary of State. The decision to grant or reject a DCO is made by the Secretary of State. Further detail about the Development Consent Order process and the timescales is set out in chapter 3 the Management Case.

The MetroWest Programme has been developed in collaboration with the rail industry, over several years. Although the programme has been established as a third party promoted programme, it forms a sub-programme of the Western Route delivery programme for control period 5 / 6. There is a high level of engagement and interface between the councils and Network Rail at Director level and all technical levels across the two MetroWest projects. Network Rail have committed significant resources to both MetroWest Phase 1 and Phase 2, which ordinarily would not be noteworthy. However given the huge scale of the Great Western Programme for Control Period 5 and 6, the allocation of these significant resources to MetroWest by Network Rail provides recognition of the importance of the delivery of the MetroWest projects.

Network Rail's Western Route Strategic Plan (Feb 17), sets out its strategic priorities *"our priority for Control Period 6 is to deliver passenger benefits through the completion of the Greater West Programme, which will deliver a generational upgrade to our region's transport infrastructure."* The Western Route vision for the future is shown in Figure 1.18.

**Figure 1.18 – Network Rail Western Route Strategic Plan: Vision for the future**


**Western Route Context**

The spine of the Western Route is Brunel's Great Western Main Line which runs from London Paddington to Bristol, down to Penzance. The main line provides direct links between London, Wales, the South West, as well as supporting radial routes to Oxford, the Cotswolds, Birmingham and the South Coast. Furthermore the route contains numerous branch lines from the commuter focused London suburbs to providing key local rail services into Core Cities such as Bristol and Bath, and linking rural areas and towns across, Somerset, Devon and Cornwall. The route also contains several dedicated freight lines and the Great Western Main Line is the second busiest freight corridor into London. The full extent of the Western Route is shown in Figure 1.19.

The Western Route at a glance:

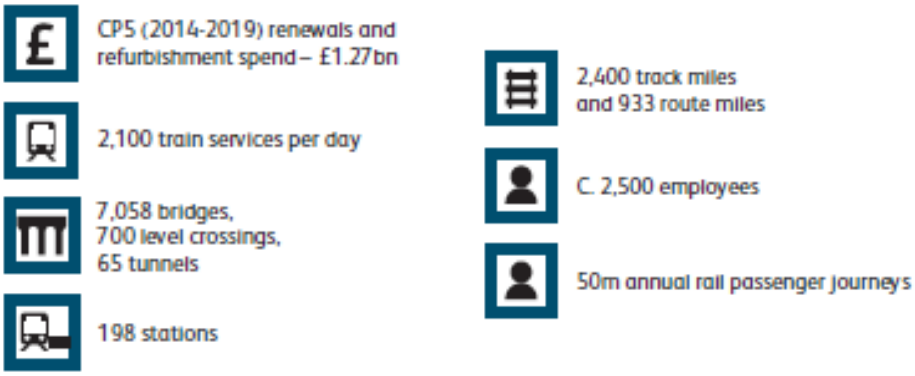
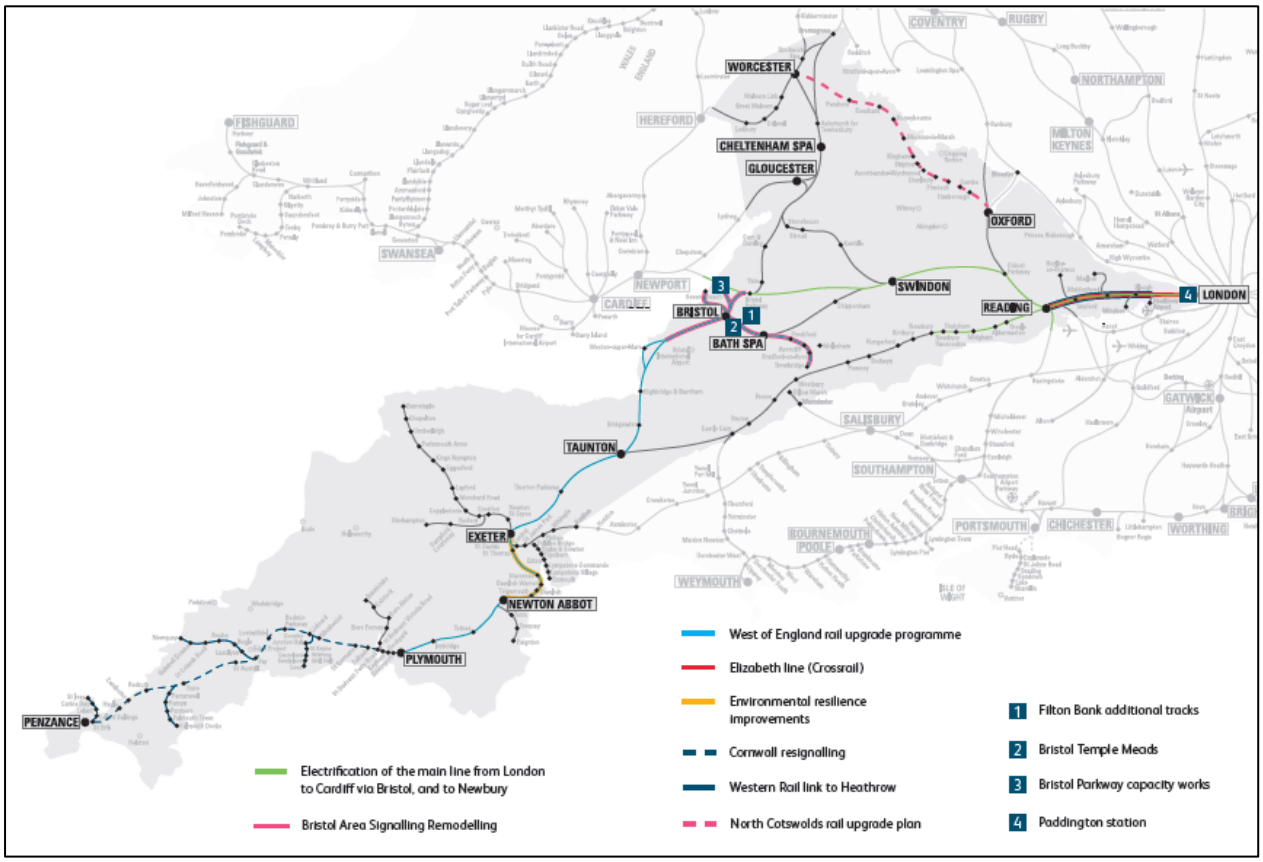
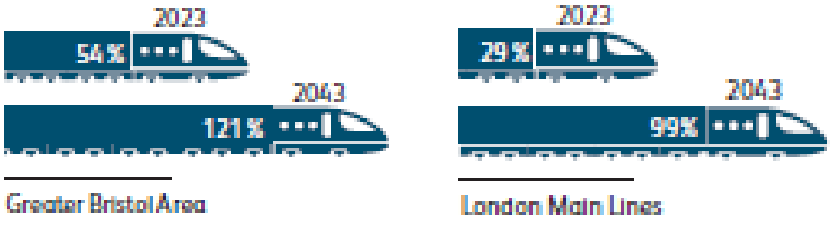


**Figure 1.19 - Western Route Map**




**Network Rail Network Specification - Western (Sept 2017)**

The Network Specification describes the Western Route in its geographical context, outlining train service provision to meet current and future markets, and traffic flows for passenger and freight businesses. The specification outlines and identifies capability improvements set out in relevant Route Utilisation Strategies (RUS) to meet future growth for the medium to long term. This is further enhanced with the conditional outputs from the Market Studies and the outputs from the Western Route Study. The forecast growth in passenger journeys to 2023 and 2043 in the West of England exceeds, most other markets:




The Network Specification - Western refers to Strategic Route Sections (SRS), which cover specific sections of the Western Route. The Strategic Route Sections for the West of England area are:

- K.01 Bristol Temple Meads – Exeter St Davids
- K.15 Swindon – Bristol Temple Meads (via Bath)
- K.16 Bristol – Birmingham Line
- K.17 Weston-super-Mare Loop
- K.18 Severn Beach branch

Alongside the Network Specification - Western, a Route Specification - Western has been developed by Network Rail giving greater details on the current priorities and current operational capability for the Strategic Route Sections. An overview of enhancement and renewal programme for Strategic Route Sections in the West of England for Control Period 5 and 6, is outlined in the Network Specification. The following italic text is an extract of page 10 of the document.

> ***Greater Bristol Programme Capacity Improvements***
> *To reduce journey times, increase capacity and service frequency in and around Bristol, a programme of improvements is being developed following their recommendation in the Great Western RUS, to provide the infrastructure necessary to deliver the proposed SET service level of four trains per hour between Bristol and London Paddington, and reduce journey times from the South West into Bristol and northwards onto Birmingham. The programme includes:*
>
> - *Additional infrastructure between Dr Days Junction and Filton Abbey Wood*
> - *Station capacity improvements at Bristol Temple Meads station*
> - *Incremental enhancements to planned junction renewals into / out of the station area*
>
> *A Station Masterplan for Bristol Temple Meads and the surrounding area has been developed by Network Rail working in partnership with the West of England Local Enterprise Partnership (LEP), Bristol City Council, the Homes & Community Association, First Great Western and English Heritage. The progression of the outputs from the masterplan study is subject to funding for further development and implementation.*

The Network Specification - Western provides an overview of the MetroWest Programme and sets the investment context for future schemes, the following italic text is extracted from page 13.

> ***Further Potential Schemes Identified by the Route Study***
>
> *The Western Route Study has been undertaken as part of the Long Term Planning Process, looking at the medium to long term strategy for the railway. Options have been identified to accommodate growth in passenger and freight demand, and increases in the number of trains which might be operated to deliver improved passenger connectivity through an indicative train service specification for the year 2043.*
>
> *Schemes have been prioritised for Control Period 6 (CP6) where there is a driver to do so, using the agreed prioritisation criteria:*
>
> - *To accommodate passenger and freight demand in CP6*
> - *To deliver enhanced connectivity to High Speed 2 Phase 1*
> - *To deliver identified funder priorities for CP6*
> - *Schemes which reduce whole-industry costs where there is a renewal due which presents an opportunity to deliver an enhancement at reduced Whole Life Cost*.
>
> *Taking these criteria into account, the following choices have been presented as proposed priorities for CP6. Further development will be required to refine requirements, to consider and refine options and costs, and to confirm the affordability and value for money represented. Subject to the above, the Route Study has identified the following themes:*
>
> - *Additional capacity would be required to accommodate peak passenger demand into the key centres of London, **Bristol** and Exeter.*

- *There are choices to improve connectivity during CP6 as a result of renewals anticipated on the approach to London Paddington station, at Bristol East Junction, and in the Worcester and Gloucester areas.*
- *Electrification of the Birmingham – Bristol route is a stated funder priority. As part of this provision, requirements for future growth will be considered further.*

The Network Specification - Western has been informed a various studies and plans including Network Rail's Enhancement Delivery Plan for Control Period 5 (updated Sept 2017), Railway Upgrade Plan Western (Sept 2017) and the Western Route Study (2015).

Independent reviews of the rail industry have been undertaken recently and are now informing structural changes and transformation programmes. Published in March 2016, the Shaw Report emphasised the industry should give more focus to customer needs and made a number of recommendations. The recommendations have now been integrated into a transformation plan by Network Rail. The Hansford Review (June 2017) was commissioned to investigate how to encourage competition into railway projects and attract more private sector involvement to fund and finance major railway projects. In July 2017 Network Rail published its response to the review 'Network Rail Open for Business', which sets out a five key themes it is putting in place; transforming asset protection, encourage the industry to challenge NR standards, capacity and capability, overseeing contestability effectiveness and appropriate risk sharing.

## 1.7.3 Impact on the Strategic Road Network

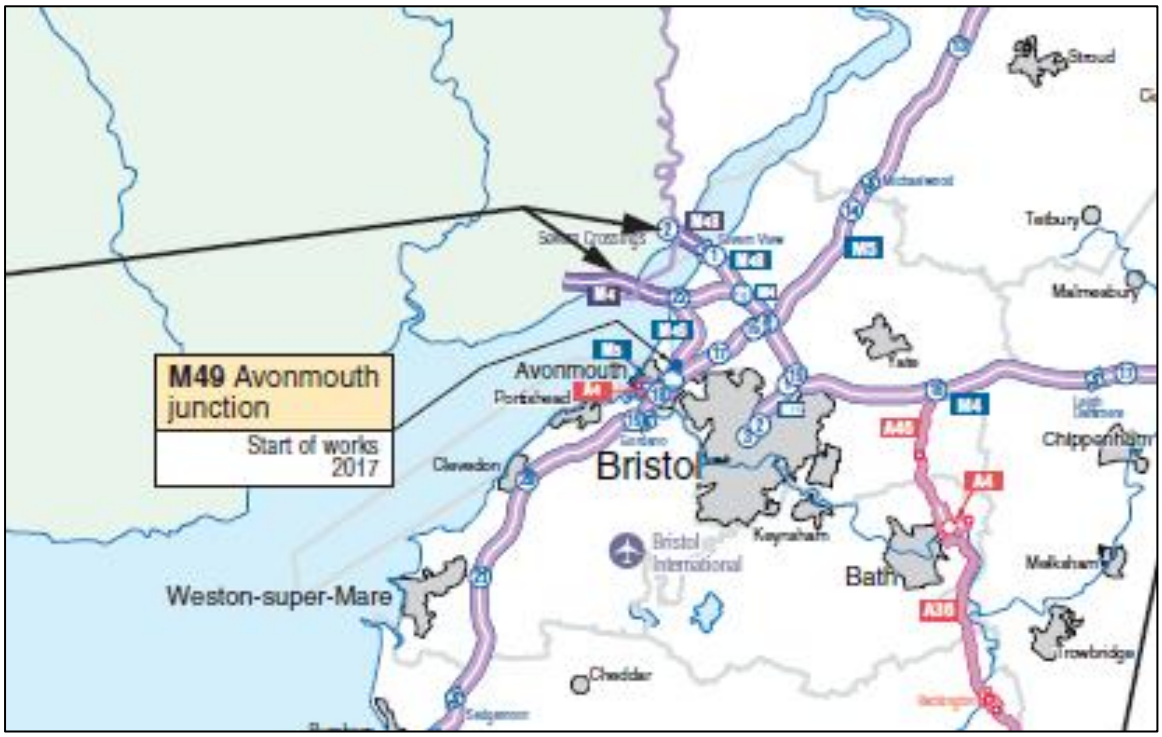
The catchment areas for the stations on the three MetroWest Phase 1 rail corridors intersect with the Strategic Road Network (SRN) at a number of locations. Modelling indicates that the connectivity offered by the scheme should attract trips away from the SRN, but as with car use changes across the local network, demand falls but reductions are modest as the impacts are network-wide. The main themes from the analysis on corridor impacts is as follows. Figure 1.20 shows the Strategic Road Network in the West of England, extracted from Highway England's national map.

**Portishead Corridor**
The A369 Portishead corridor is intersected by the M5 at junction 19. Delays at this junction can affect the operation of the main M5 carriageway, and have been known to have a knock-on negative impact on accessibility to Bristol Port. Analysis suggests that demand at this junction is reduced with MetroWest Phase 1, as the catchment area for Portishead and Pill stations, and the connectivity that the rail line will offer, should attract some car trips using this junction onto the railway.

**The Severn Beach/Avonmouth Corridor**
Improvements to the rail corridor between Severn Beach/Avonmouth and Bristol should positively impact on the A4 and M32 into Bristol. Improved service for catchment areas for stations on the Severn Beach Line should reduce pressure on the A4. Likewise, for some stations closer to Bristol that will benefit from an enhanced rail service, trips from the catchment areas transferring from road to rail, should reduce pressure on the M32.

**Bath to Bristol Corridor**
The A4 Bath to Bristol corridor is part of the SRN. The catchment areas for Keynsham and Oldfield Park stations, which will see an improved level of rail service with MetroWest Phase 1, should contribute towards relieving some pressure on the A4 and at key routes feeding into the motorway network between Bath and Bristol.

**Figure 1.20 - Strategic Road Network in the West of England**




## 1.7.4 Access to Planned HS2 Stations and International Gateways

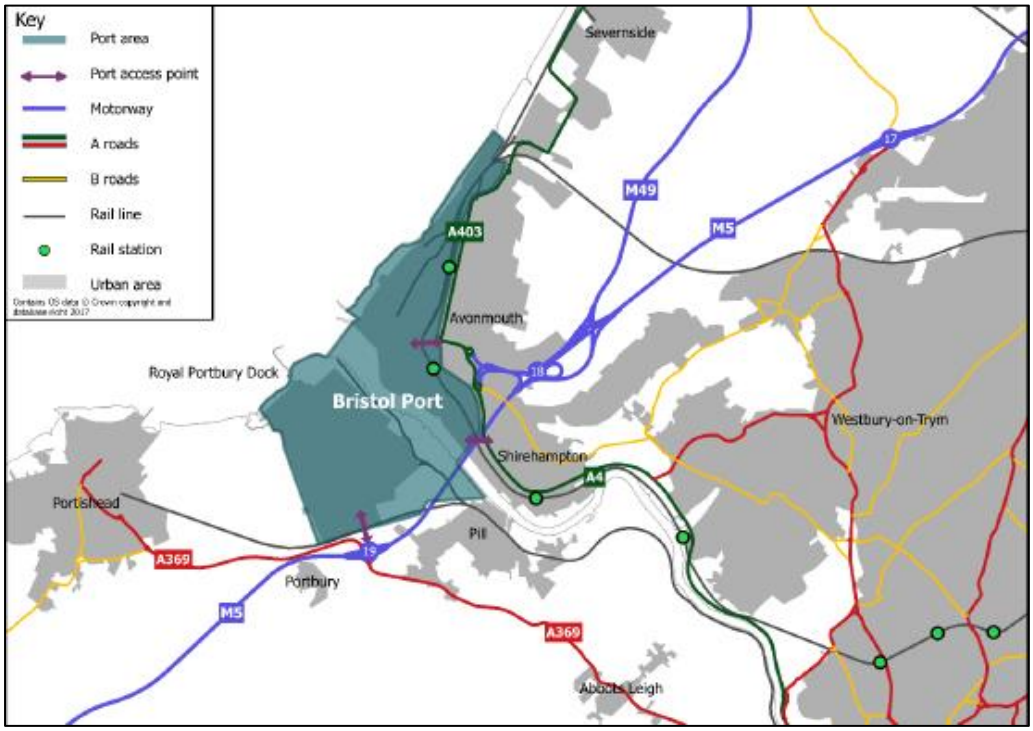
MetroWest Phase 1 is not geographically close to HS2, however the medium term aspiration for a national electrified spine with electrification of the Bristol to Birmingham main line, would potentially provide a feeder for trips onto HS2. The West of England is eager to ensure it does not lose any of its competitiveness as a result of HS2 bringing Birmingham and the Northern Hub closer to London through greatly reduced travel times. The electrification of the Bristol to Birmingham main line would in part address this and improve the connectivity of the sub-region.

MetroWest Phase 1 includes extensive asset renewal of the existing Portbury Freight Line serving Royal Portbury Dock which forms part of Bristol Port (on the southern side of the River Avon). These works include bridge replacement and repair, sections of track, sleeper and ballast renewal and replacement of the line signalling, which otherwise (without MetroWest Phase 1) would not have been undertaken for 10 to 20 years. The Portbury Freight Line forms part of the Portishead Line and the asset renewal works are required to provide capability to operate passenger services and to bring the line up to passenger safety standards. Avonmouth Dock (on the northern side of the river Avon) is served by a freight only line which forms part of the Henbury Line. MetroWest Phase 2 proposes to upgrade the freight line for passenger trains with a new station on the line at Henbury and North Filton (and a new station on the Filton Bank at Ashley Down). Figure 1.21 shows the location of Bristol Port and its transport connections.

Bristol Port is strategically located supplying diverse markets across central England and beyond and is the only deep sea port in the UK with direct motorway and rail access from all directions. There is direct access to the M5, M49 and M4, as well as the rail access at Royal Portbury Dock and Avonmouth. The supply chain markets served by the Port have traditionally being coal, cars and containers, however the Port is now serving a more diverse range of markets and has plans for future expansion. Both MetroWest Phase 1 and Phase 2 have included existing freight train path

commercial rights within the passenger train capability modelling (Railsys) to ensure that the MetroWest proposals do not compromise continuation of freight train operations.

**Figure 1.21 - Bristol Port Location and Transport Connections**




Bristol International Airport is located eight miles south west of Bristol city centre on the A38, it is not connected directly to the rail network but is served by the Bristol Flyer from Bristol Temple Meads; a high quality bus link operating every 10 minutes. The Airport is England's third busiest regional Airport and ninth busiest Airport in the UK, carrying 7.5 million passengers per annum in 2016. It serves 116 destinations in 30 counties, including 17 capital cities, with multiple daily services to international hubs.

The MetroWest Phase 1 proposals to upgrade the rail service frequency on the Severn Beach and Bath Spa to Bristol Line and re-open the Portishead line, will provide improved access to the Airport via Bristol Flyer. In the medium term the Airport together with the West of England Councils is investigating options for segregated public transport link with Bristol Temple Meads and the city centre. The Joint Transport Study (October 2017) states: *"there is a strong case for action to significantly improve surface connectivity to the Airport, both by public transport and road. The road network is already under significant strain and the problems will become acute with forecast growth in travel demand. It will be critical to achieve increase in public transport mode split, particularly for movements from the Bristol urban area, which will help to manage the scale of future growth in traffic demand on the corridor."*

# 1.8 Public and Statutory Consultation

Public consultation has been integral to the development of the scheme, since 2013. Consultation is also formal requirement for the elements of MetroWest Phase 1 that require a Development Consent Order (DCO). North Somerset Council acting as the lead authority for the four councils has held two consultation stages. In June 2015 Stage 1 of this process began, with the Council consulting the public, statutory bodies, and stakeholders including community and local interest groups on the plans.

Following the Stage 1 consultation in 2015 and further scheme development, two main areas were identified as requiring possible changes to the design; at Pill Station site and access to Ashton Vale Industrial Estate. The design changes were felt to be significant enough to consult with the local communities to explain the options and gauge opinion. These micro-consultations were carried out in February 2016 and enabled the scheme to be developed further and in more detail. A second micro-consultation which specifically focused on the Ashton Vale Industrial Estate area was undertaken in November 2016.

In October 2017 formal Stage 2 scheme consultation was undertaken, in connection with the Development Consent Order (DCO). This comprised of formally consulting land/property owners, statutory bodies, government agencies, other local bodies and affected parties, known as S42 consultees under section 42 of the 2008 Planning Act. The consultation also included consulting local interest groups and wider stakeholders, known as S47 consultees under section 47 of the 2008 Planning Act. Stage 2 formal consultation was undertaken for 6 weeks from 23rd October to 4th December 2017. It included a consultation brochure, six manned exhibitions, a post card drop to 5,000 homes, formal and informal letters, media releases, national and local newspaper advertisements, social media and a consultation website.

There was an unprecedented very high level of support for the delivery of the scheme, in response to the consultation. Over 650 people attended the exhibitions and over 1000 consultation responses were received. Over 95% of the consultation responses support or mainly support the scheme proposals. The emerging themes of the responses from S47 consultees are mainly associated around the two station sites in Portishead and Pill. The majority of the issues raised include concerns about on-street parking in residential streets, construction impacts to the local area, and some individual concerns from neighbouring property owners about noise, light and privacy. S42 consultees have raised a number of differing issues, the majority of which are specific in both nature and geographical area, but mainly concern impacts to the local environment. All responses are currently being reviewed in detail to determine what changes and alterations should be made to the scheme proposals before the DCO application is submitted to the Planning Inspectorate.

The DCO application is scheduled to be submitted in spring 2018, with an examination in public anticipated in autumn 2018 and a decision being made by Secretary of State in autumn/winter 2019. Technical work, and on-going engagement will also continue with key consultees throughout the DCO process.

# 1.9 Constraints and Dependencies

**Constraints**

The key constraints of the scheme are set out in Table 1.14.

**Table 1.14: Key Constraints**

| Category | Internal Constraints | External constraints | Further Details |
|---|---|---|---|
| Finance | Affordability of the scheme in respect of the scheme capital funding gap<br><br>Need for train service subsidy in the short term – although this is more than offset by an ongoing revenue surpluses after year six | Arrangements with the DfT Rail Executive for inclusion of the MetroWest Phase 1 train service in the Great Western Rail franchise | Finance Case |
| Environment | Sites of Special Scientific Interest/Special Area of Conservation<br><br>Developing in a built environment (particularly new two new stations)<br><br>Ecology season constraints on the scheme programme | Need for environmental licenses<br><br>Need for Habitats Regulation Assessment approval | Economic Case |
| Governance/ Organisational | Complexity of governance entailing a multi-party promoter proposing to undertake enhancement on an external parties network, i.e. a multi-party third party promoter | Alignment with rail industry processes and decision making of key parties including Network Rail and Great Western Railways | Management Case |
| Technological/ Engineering | New stations' designs must interface with adjacent highway designs and urban realm | Working within footprint of disused and current rail corridors<br><br>Alignment between the Network Rail GRIP process and the Development Consent Order process<br><br>Network capacity constraints at key locations and junctions | Management Case |

| Category | Internal Constraints | External constraints | Further Details |
|---|---|---|---|
| | | Need for timetable solutions acceptable to rail industry<br><br>Provision for MetroWest Phase 2 in parallel with Phase 1<br><br>Train operator constraints including availability of rolling stock and other operational resources | |
| Consents and Approvals | Local and Central Government funding assurance processes to be followed<br><br>DCO process technical requirements | DCO Examination and DCO decision to be made by the Secretary of State<br><br>Other consents outside the DCO process incl Natural England and Environment Agency licenses | Management Case |
| Asset Management | Need for new station car parks to have a charging tariff in order to meet car park operating costs and other highway maintenance costs, resulting from the scheme | Acceptance of assets by Network Rail to be owned, operated and maintained by them, as part of the national network | Management Case |

**Dependencies**

MetroWest Phase 1 is dependent on three major rail schemes currently being progressed by Network Rail in control period 5 and into control period 6, see Table 1.15. The MetroWest Phase 1 scheme programme takes account of all these dependencies. Table 1.16 sets out a number of rail schemes which MetroWest Phase 1 has an interface with but is not dependent upon.

**Table 1.15 - Projects which MetroWest Phase 1 is dependent upon**

| Project | Timetable/key dates | Extent to which MetroWest Phase 1 is dependent on this project |
|---|---|---|
| Filton Bank four-tracking | Delivered by 2018 Q4 | **Dependent** - Without four-tracking, there is insufficient capacity for the additional MetroWest Phase 1 trains. |
| Resignalling – Bristol Area Signalling Renewal and Enhancement (BASRE) | Delivered by 2019 Q3 | **Dependent –** Signalling renewal provides the basis for the MetroWest signalling design and commissioning. |
| Bristol East Junction Enhanced renewal | Delivered by 2020 Q2 | **Dependent –** This scheme is required in order to operate MetroWest Phase 1 services, subject to further Railsys modelling based on the final December 2018, which is expected to be available around Easter 2018. |

In addition MetroWest Phase 1 has indirect interfaces with the projects set out in Table 1.16.

**Table 1.16 - Projects which interface with MetroWest Phase 1**

| Project | Timetable/key dates | Extent to which MetroWest Phase 1 is dependent on this project |
|---|---|---|
| Electrification of Great Western main line and Intercity Express programme | Delivered by 2018 Q3 | **Related** - Electric trains will be quicker to accelerate and have higher top speed, allowing shorter journey times and releasing some network capacity. (The Bath to Bristol Temple Meads element has been deferred.) Staged introduction. |
| Bristol Temple Meads platform 1 extension and station environment improvements | Deferred | **Related** – Platform capacity enhancements will help operational robustness and provide greater timetable flexibility |
| Additional platform at Bristol Parkway | Delivered by 2018 Q4 | **Related** - Additional platform will help operational robustness |
| Great Western Franchise replacement | 2019 to 2022 | **Related** - MetroWest is identified as a third party scheme in the November 2017 DfT franchise consultation. The councils are making the case for MetroWest to be included in the franchise specification. |

**Other MetroWest Schemes**

MetroWest Phase 2 - is not dependent on MetroWest Phase 1. The train services of the two schemes overlap for a short section of railway between Bristol Temple Meads station and Narrows Ways Junction (taking in Lawrence Hill and Stapleton Road stations) but nether scheme is proposing infrastructure works on this section of railway. Additional infrastructure is however being delivered

by the Filton Bank Four Tracking scheme and consequently both MetroWest Phase 1 and Phase 2 are dependent upon the delivery of that scheme. It terms of programme, the MetroWest Phase 1 train service commences from December 2021, with the possibility of the Severn Beach Line & Bath Spa train service commencing at an earlier stage.

Portway Park & Ride station - is currently dependant on Bristol East Junction Enhanced Renewal and possibly MetroWest Phase 1. Train pathing modelling (Railsys) indicates that there are significant train performance risks for accommodating an additional station call on the Severn Beach Line without the delivery of Bristol East Junction Enhanced Renewal. This will be clarified by further Railsys modelling based on the final December 2018, which is expected to be available around Easter 2018. Furthermore Great Western Railways have advised that with the delivery of multiple major enhancement and renewal schemes over a short period of time there would be considerable practical challenges for calling at Portway Park & Ride station, before the rollout of the half hourly MetroWest Phase 1 train service.

# 1.10 Summary of the Strategic Case

In summary:

- There is a pressing need for intervention into the West of England local rail network
- MetroWest Phase 1 together with MetroWest Phase 2 provide the foundation for establishing a 'Metro' local rail network across the West of England
- MetroWest Phase 1 has clearly defined objectives, scope, programme, estimated cost and forecast benefits
- The impacts of not delivering MetroWest Phase 1 include increased journey times and worsening journey time reliability resulting in increased loss of business productivity and loss of business opportunity, together with the continuation of long term car dependency
- The scheme will ease pressure on the strategic road network and is highly supported by the West of England business community
- Extensive option testing and option development has been undertake over several years leading into the MetroWest Phase 1 proposals test out in this Outline Business Case
- The scheme will support the delivery of new homes and jobs and is included within the base line of the WoE Joint Transport Study and Joint Spatial Plan
- The scheme proposals are technically robust having completed GRIP 3 Approval in Principle design, are supported by the rail industry and have been subject to extensive public and stakeholder consultation
- There is an unprecedented very high level of support for the delivery of the scheme, with over 95% of in excess of 1000 consultation responses supporting or mainly supporting the scheme proposals
- The scheme is deliverable in a relatively short timescale, subject to the timely resolution of the remaining capital funding gap