MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011
Applicant: North Somerset District Council

8.4 Outline Business Case 2017, Part 2 of 3, Executive Summary & Chapters
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(q). NB. required by para 4.5 of NN NPS Planning Act 2008

Author: North Somerset District Council
Date: November 2019

Document Purpose

Part 2 of 3 comprises:

- Contents & Executive Summary
- Chapter 1 The Strategic Case
- Chapter 2 The Economic Case
- Chapter 3 The Management Case
- Chapter 4 The Commercial Case
- Chapter 5 The Finance Case

This document evidences the technical case for intervention into the transport network, through the investment in and the delivery of the DCO Scheme (and wider MetroWest Phase 1 project), based on outline engineering design/approval in principle design.

The document refers to the promoters business name North Somerset Council, rather than its legal name North Somerset District Council.

Outline Business Case

CONTENTS

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

Executive Summary

The West of England (WoE) Councils comprising of Bath & North East Somerset, Bristol City, North Somerset and South Gloucestershire, 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

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

- Phase 1 - Severn Beach Line – upgrade to half hourly passenger service
- 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

The 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. The MetroWest Programme is has been developed in collaboration with the rail industry.

This Outline Business Case is for MetroWest Phase 1, which 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.

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 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.

While the West of England has frequent rail links to London, the Midlands, South Wales and the South West, the local rail network is under-developed for the size of the city region. 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.

This Outline Business Case sets out a compelling case for intervention to deliver MetroWest Phase 1, through five chapters including the Strategic Case, Economic Case, Management Case, Commercial Case and Financial Case.

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

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METROWEST PHASE 1

OUTLINE BUSINESS CASE

Chapter 1 Strategic Case

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

December 2017

Tables

Figures

Appendices

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.

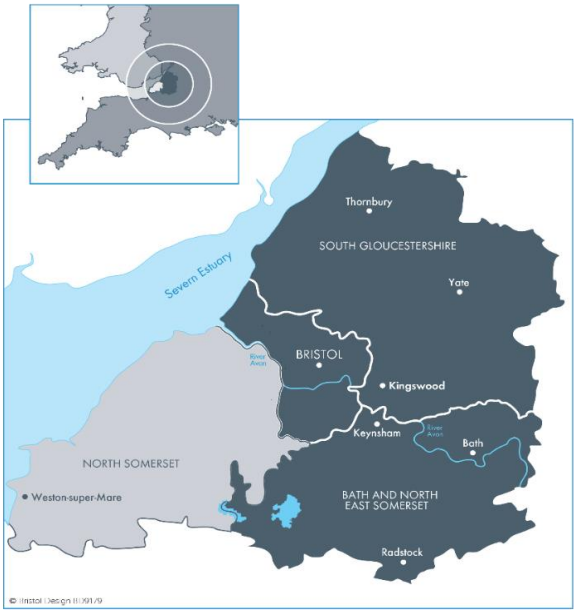
The MetroWest Programme currently comprises:

- 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.

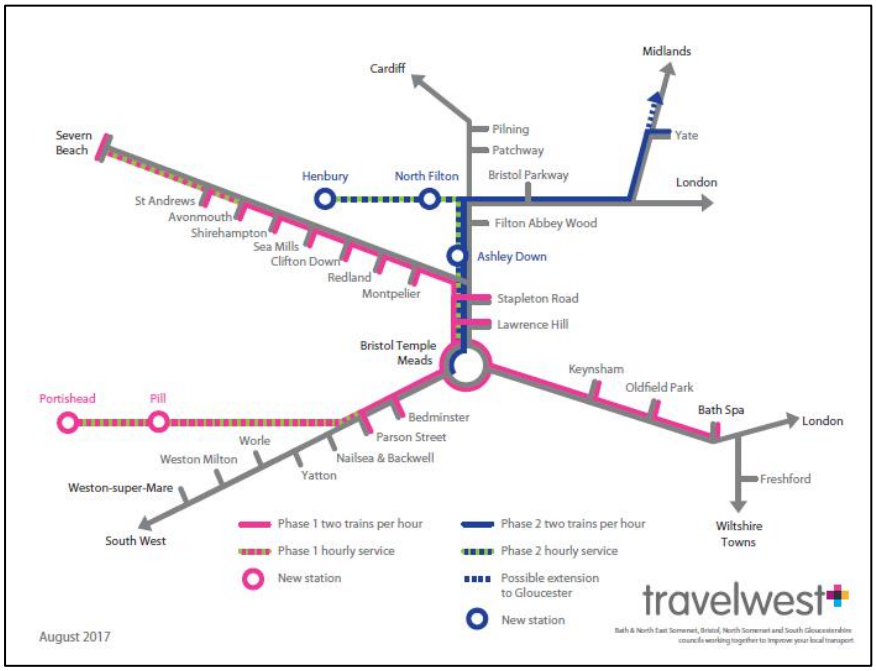
MetroWest Phase 2 proposes to enhance the Yate to Bristol Line to operate half hourly train service and introduce an hourly train service on the Henbury line (freight only) to Bristol. Three new stations are proposed at Henbury, North Filton and Ashley Down. The new train services will also serve 6 existing 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: 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 Note any potential conflicts between different stakeholder groups	1.8
Options	Set out all the options identified Evaluate their impact on the proposal's objectives and wider public policy objectives 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

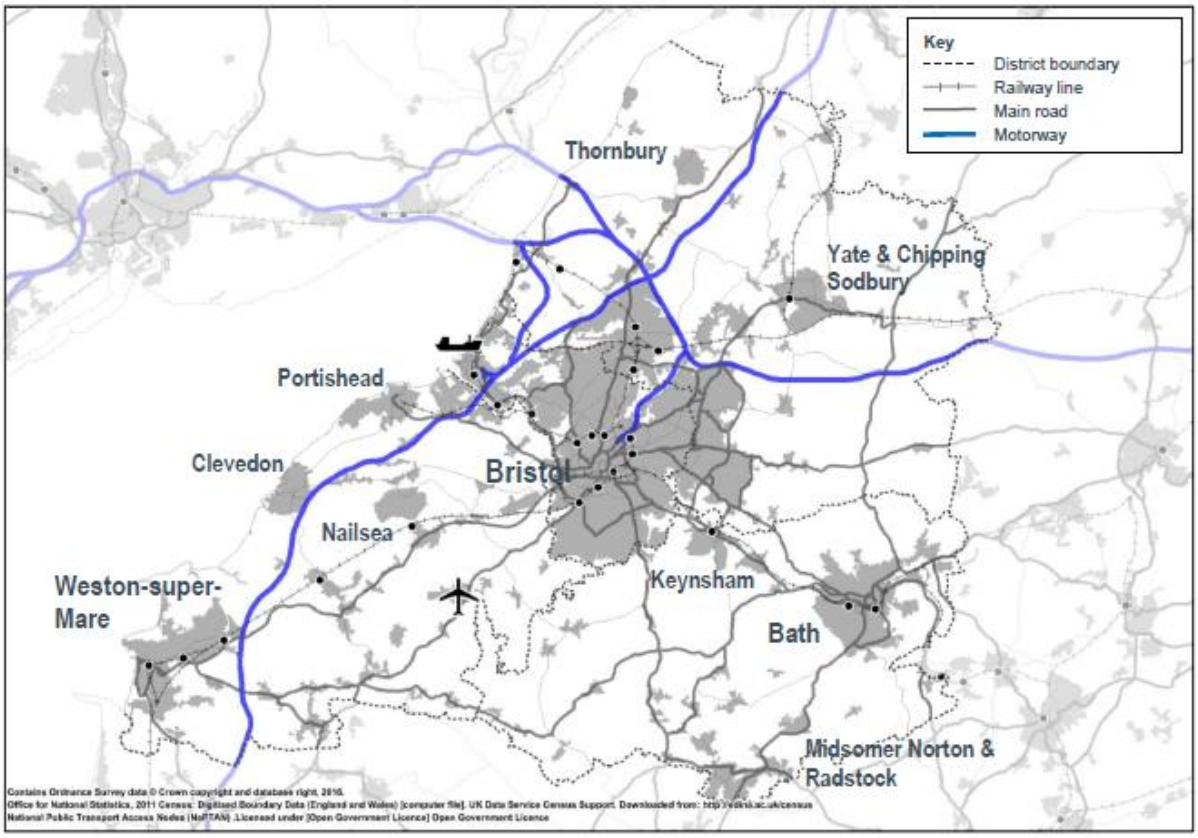
Economic growth that benefits every resident is at the core of the West of England draft strategy Regional Strategy. The vision is for all residents to benefit from more job opportunities, a stronger economy and higher quality of life. Three priorities have been identified 'Businesses that succeed', '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

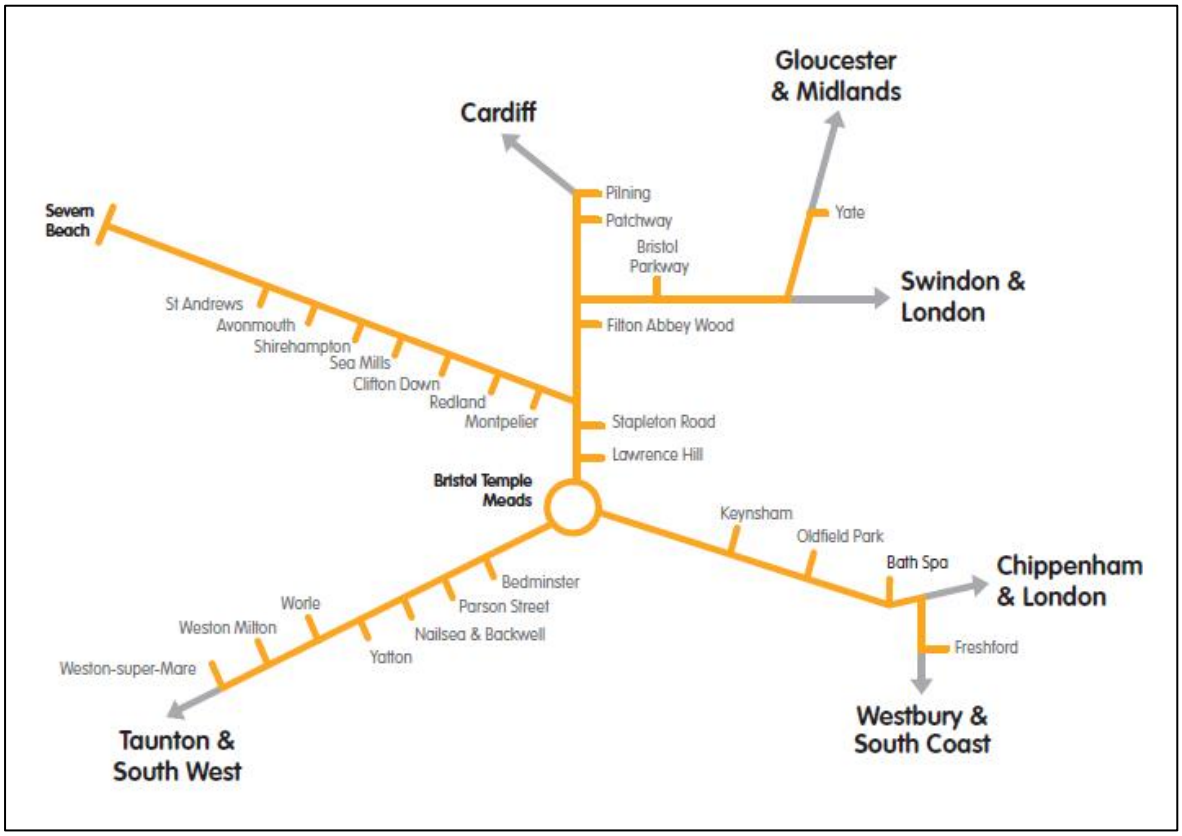
poor public transport provision in some areas. The Study highlights that "… without action to improve travel choices, this will result in increased motorised traffic, congestion and continued problems of poor air quality."

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 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) 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 Bath Spa to Bristol TM every ½ hour (GWR non stopping service to and from London Paddington) 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

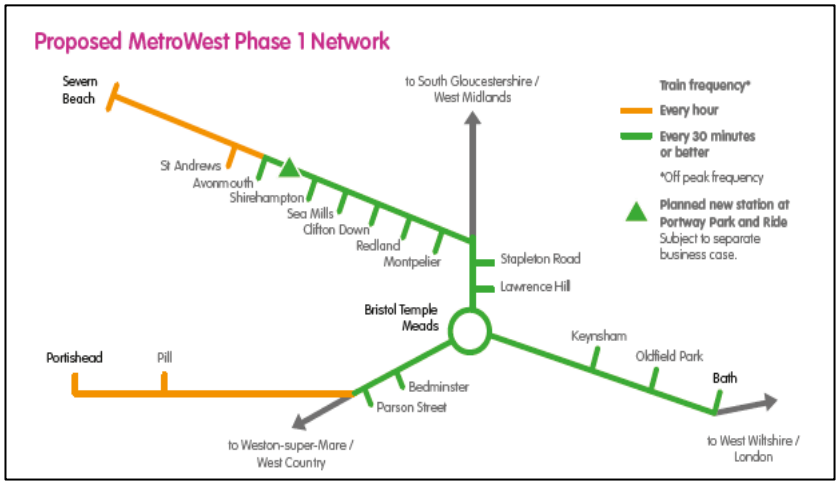


Figure 1.6 - Existing MetroWest Phase 1 Network

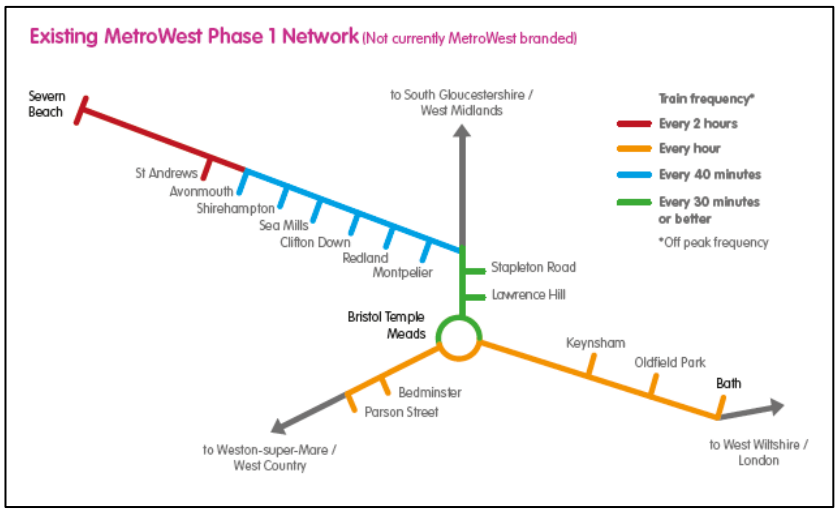


Figure 1.6 above shows the existing level of service for the three local rail lines, with no defined hierarchy of service frequency and with a relatively limited reach (Portishead Line is currently partly a freight line and partly dis-used).

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

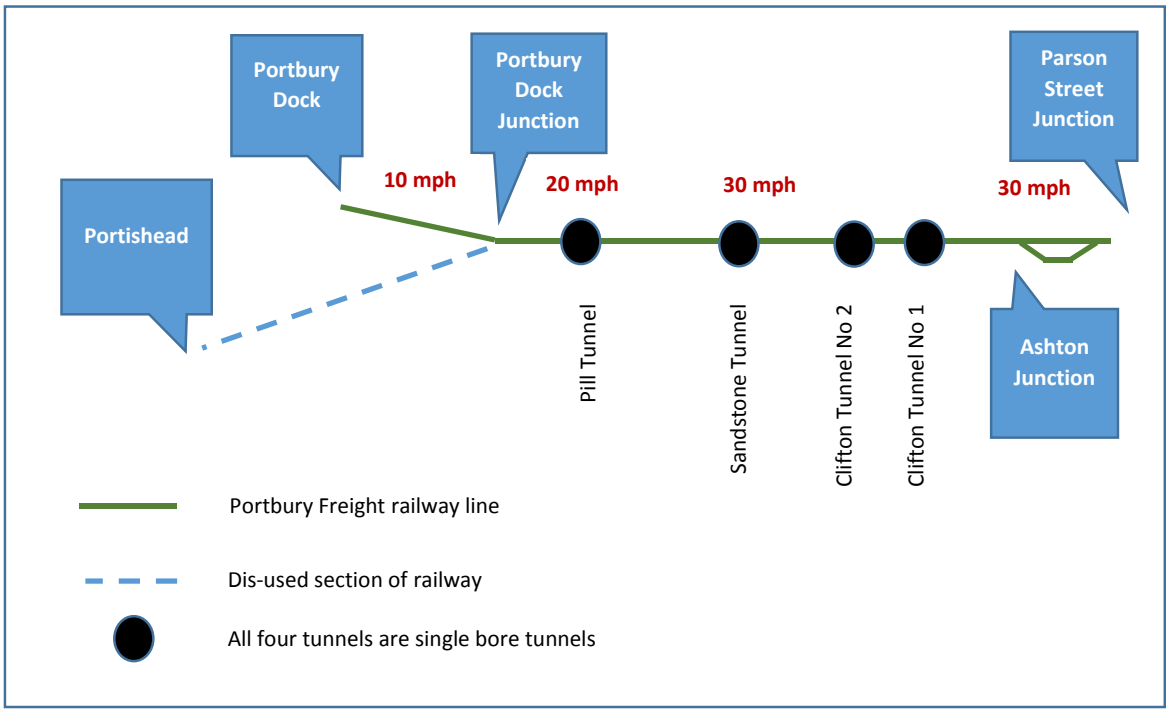
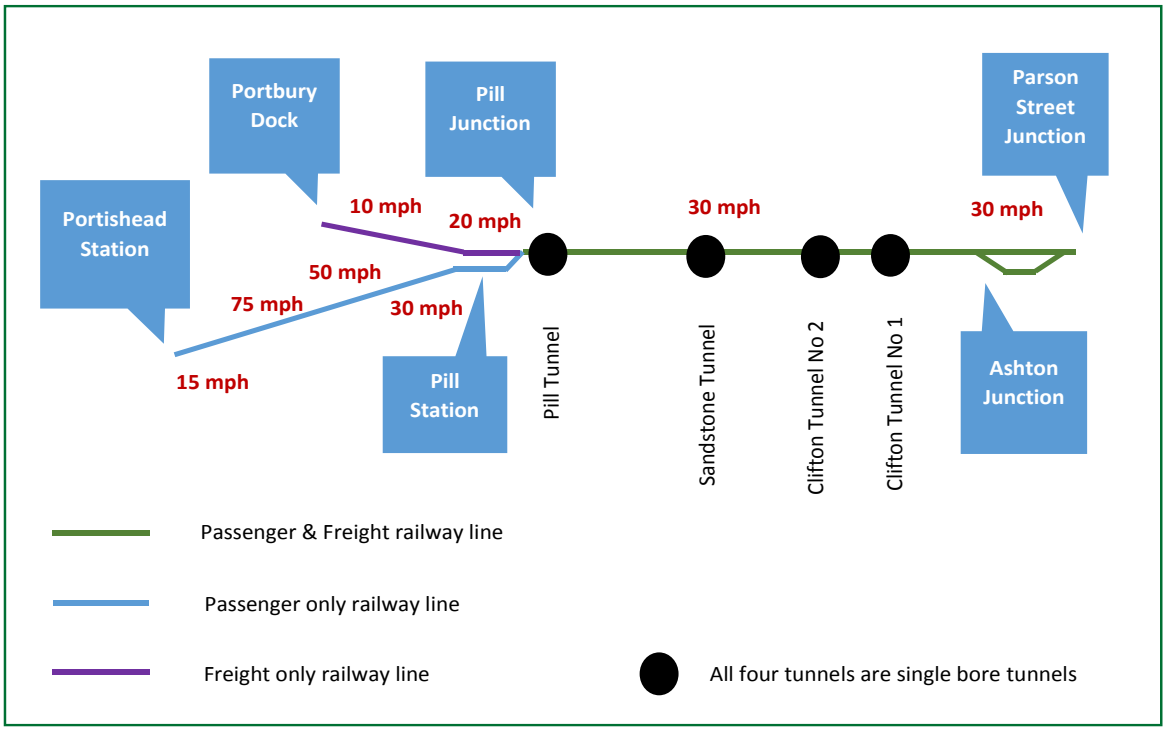


Figure 1.8 - Proposed layout of the Portishead Line



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 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 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 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 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 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 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 	Category F2 small unstaffed station 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 
Shirehampton 	Category F2 small unstaffed station 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 
Avonmouth 	Category F1 small unstaffed station 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 
St.Andrews Road 	Category F2 small unstaffed station 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 
Severn Beach 	Category F1 small unstaffed station 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 
Keynsham 	Category F1 small unstaffed station 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 

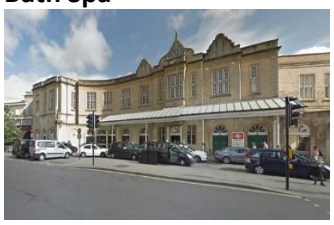
Oldfield Park 	Category F2 small unstaffed station The station is located in Bath on the main line between Bristol and London Paddington. It has two platforms with double track. To the south of the station is mainly a residential area and to the north of the station is a retail/ industrial park and residential 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 
Bath Spa 	Category C1 important feeder station 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 	Category F1 small unstaffed station 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 
Parson Street 	Category F2 small unstaffed station 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 
Pill (Proposed) 	Category F2 small unstaffed station 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 
Portishead (Proposed) 	Category D medium staffed station 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 

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 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

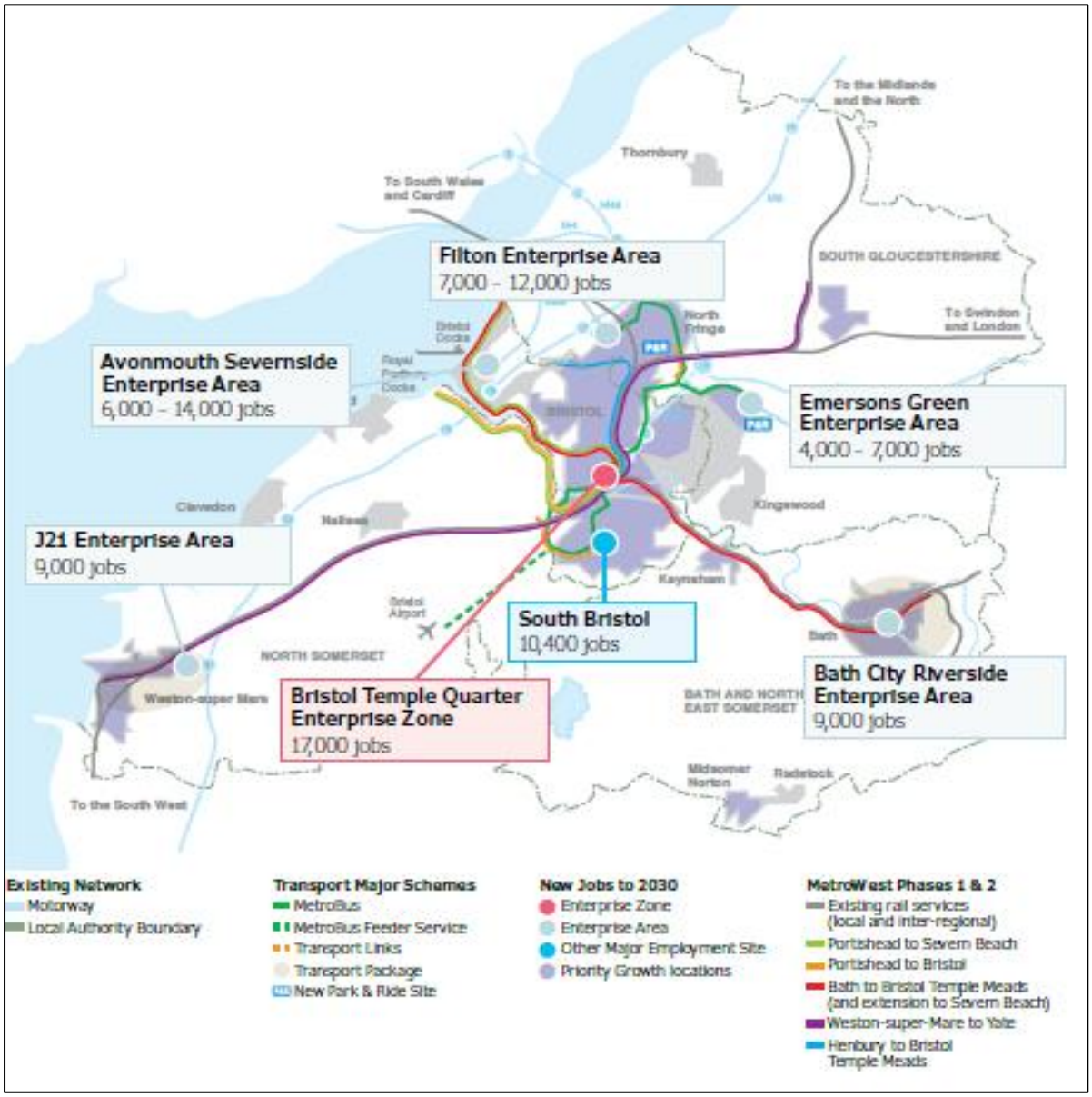
The West of England is a dynamic city region, with a population of more than 1.1 million people, over 43,000 businesses and an economy worth over £31 billion a year. It is a highly productive economy, with GVA per capita higher than the national average. The city region is one of the few areas of the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



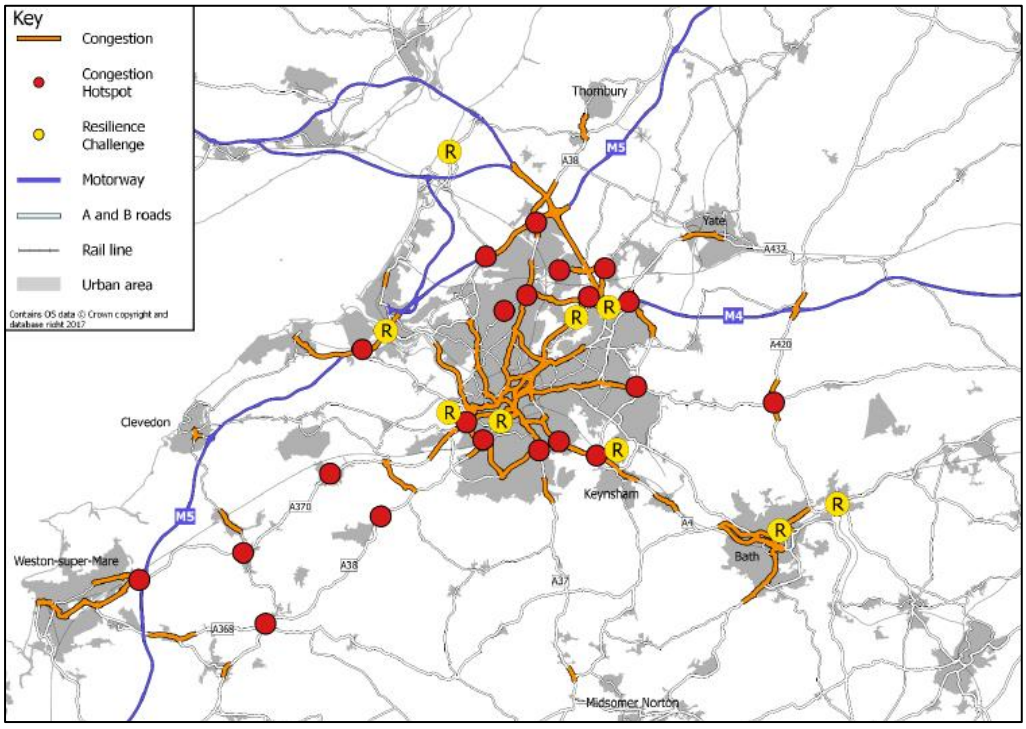
However, the West of England faces serious transport challenges and these will become more acute with the anticipated scale of growth in the area. The forecast numbers of people living and working in the area will increase demands on the transport system, which will have significant economic, social 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 Current growth in rail passenger demand Current local rail network overview Transport network opportunities and constraints
Step 2: Understanding the Future Situation	Transport and land use policy development for the future Changes to the transport network Future passenger demand
Step 3: Establishing the Need for Intervention	Current transport network context Current local rail network level of service Current and future transport problems

Step 4a: Identifying Objectives	Sub-regional business objectives – LEP Strategic Economic Plan Sub-regional transport goals and proposals -Joint Local Transport Plan 3 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 Geographic extent of problems
Step 5: Generating Options	Identifying wide range of options Long List of Options
Step 6: Initial Sifting	Early Assessment Sifting Tool (EAST) Initial sift of options Options discarded
Step 7: Development and Assessment of Potential Options	Development of options Methodology for Assessing options Appraisal Specification Summary Table Public consultation 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:

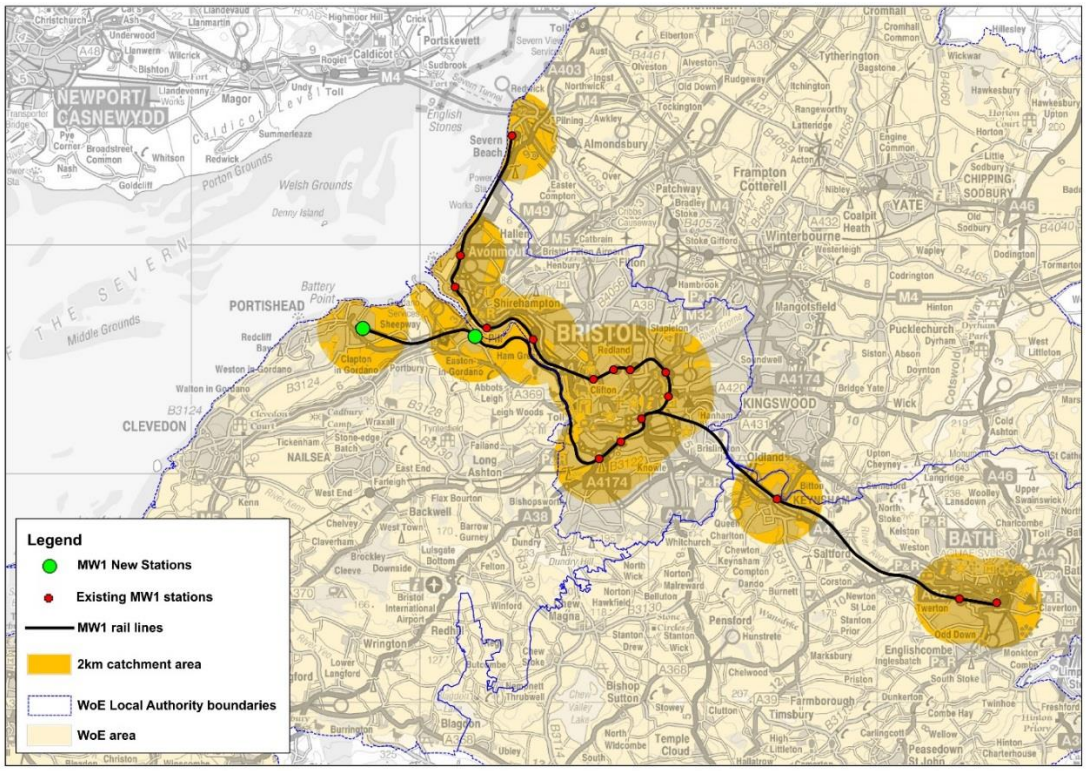
- To support economic growth, through enhancing the transport links to the Temple Quarter Enterprise Zone (TQEZ) and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors;
- To deliver a more resilient transport offer, providing more attractive 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

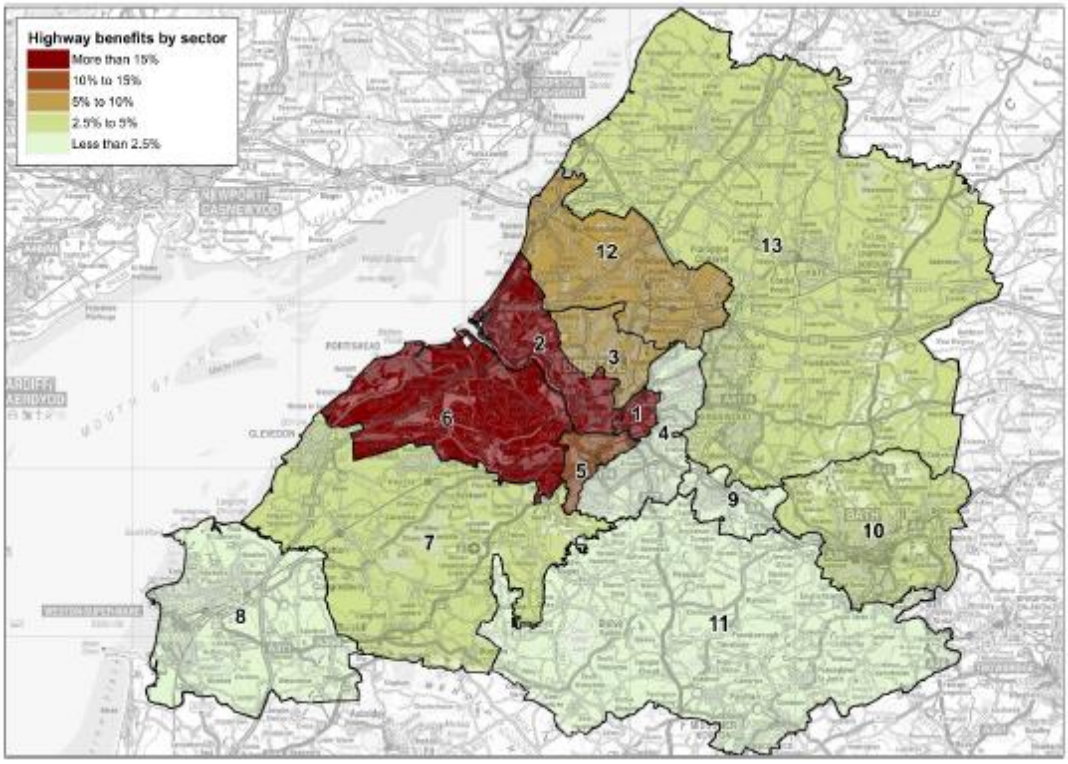
1.6.1 Easing Congestion

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

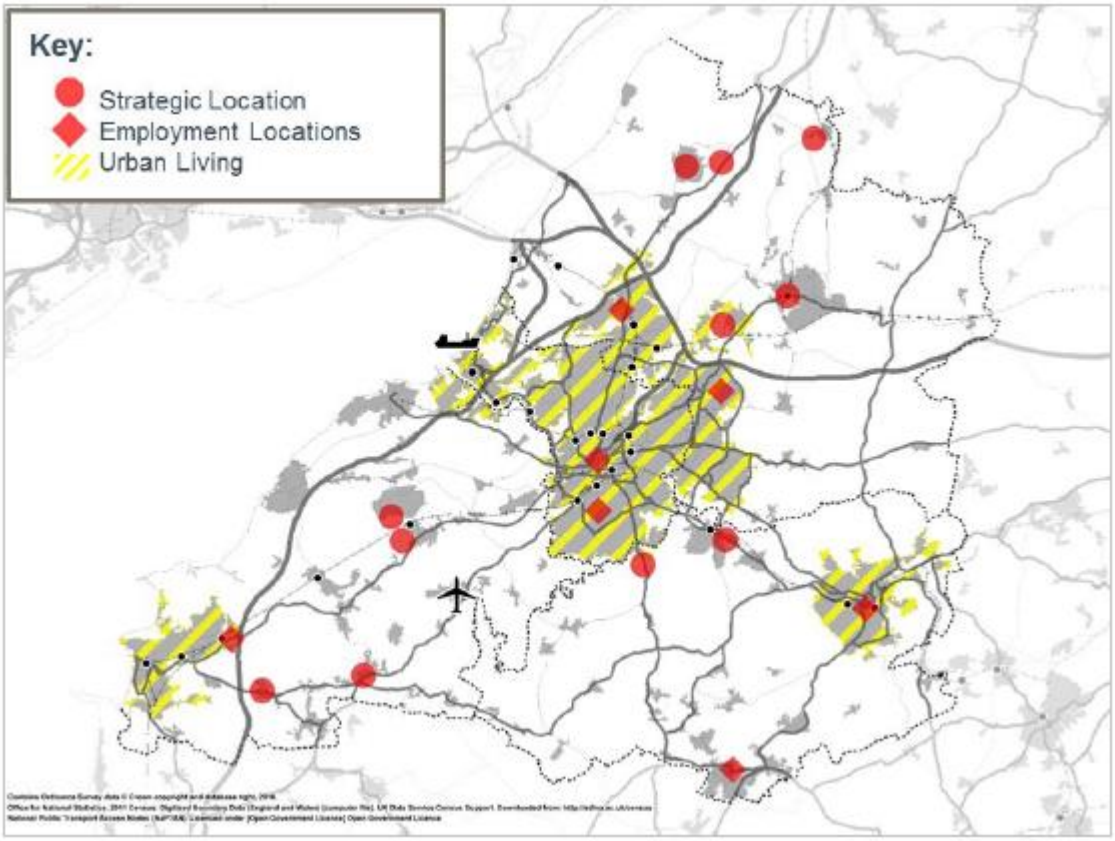
North Somerset Core Strategy, adopted January 2017

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)

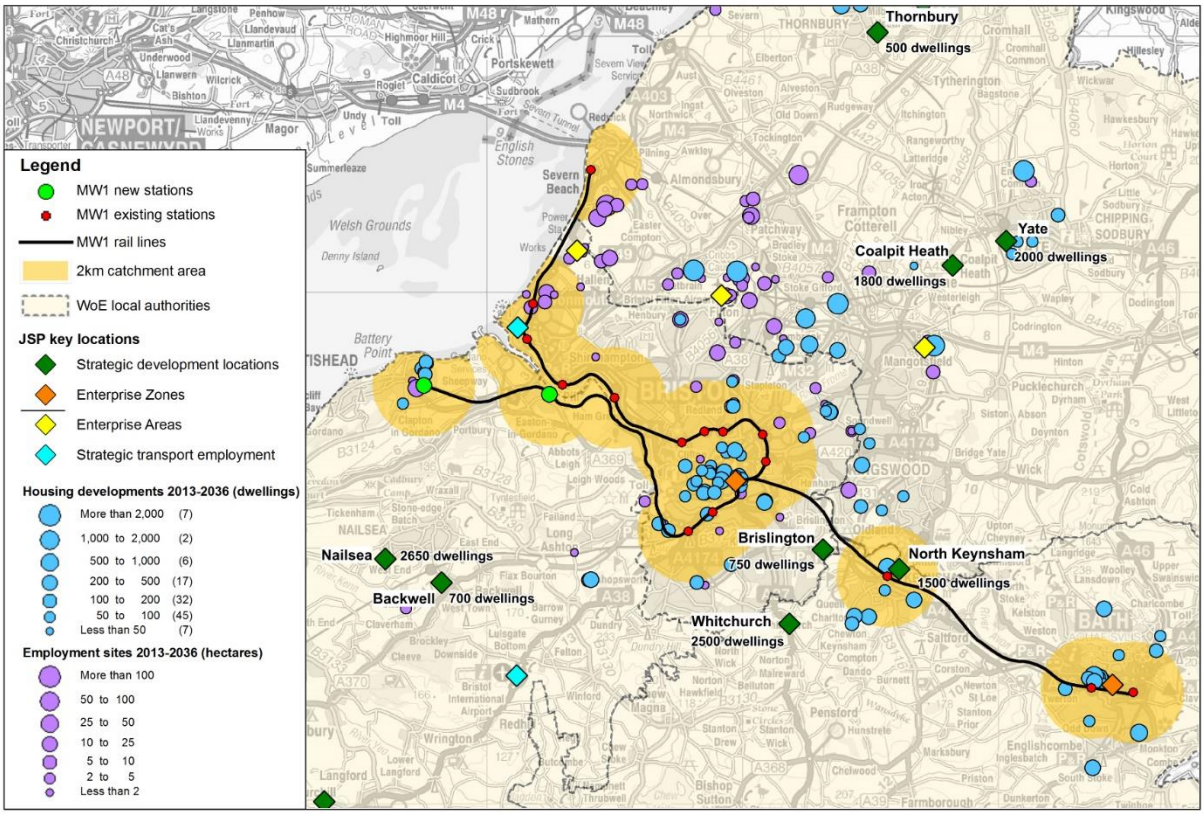


Overall, the requirement for 105,000 new homes is equivalent to an increase of more than 20% on current housing provision and represents major growth for the sub-region. This will pose significant challenges in terms ensuring that the locations for new development maximise opportunities for sustainable 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

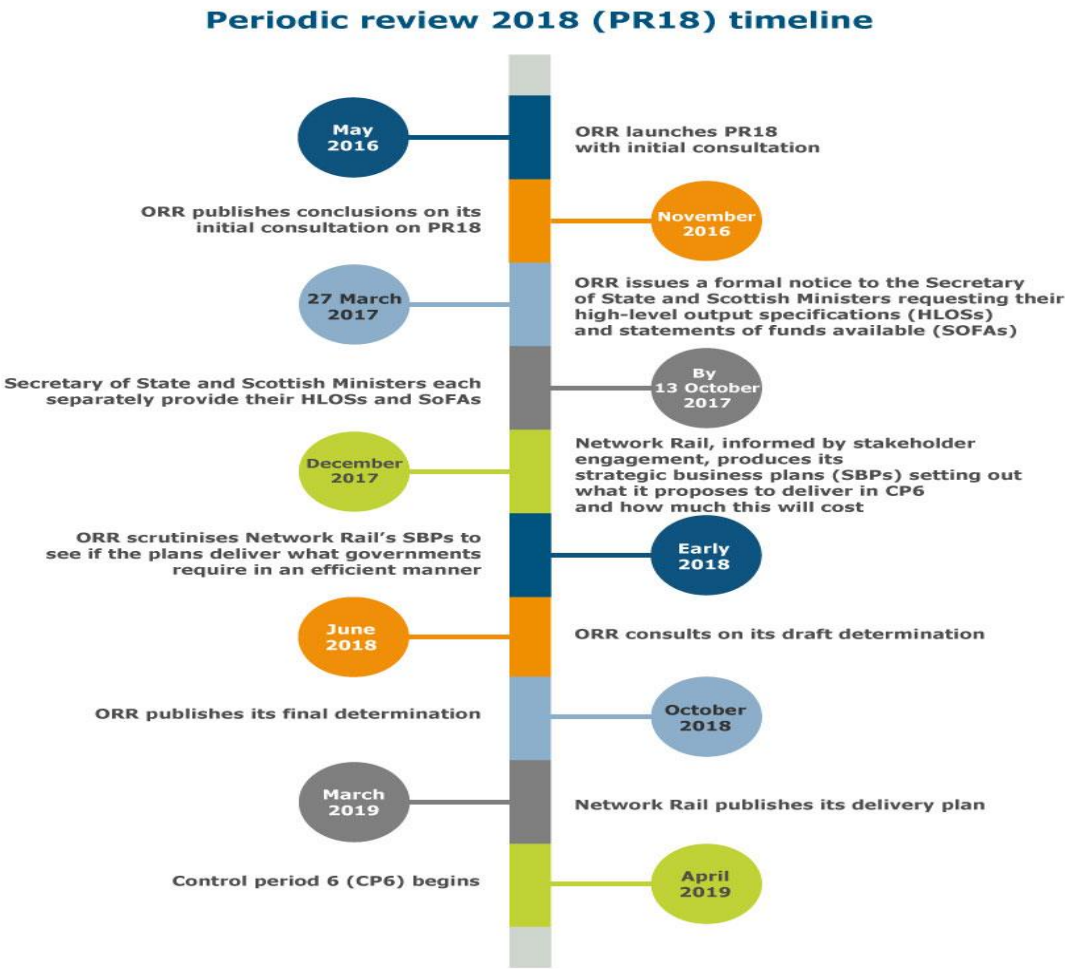


1.7 Interface with the National Transport Network

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:

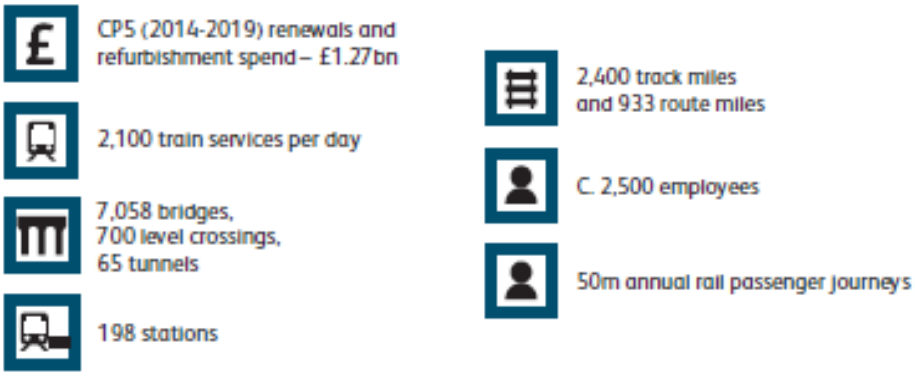
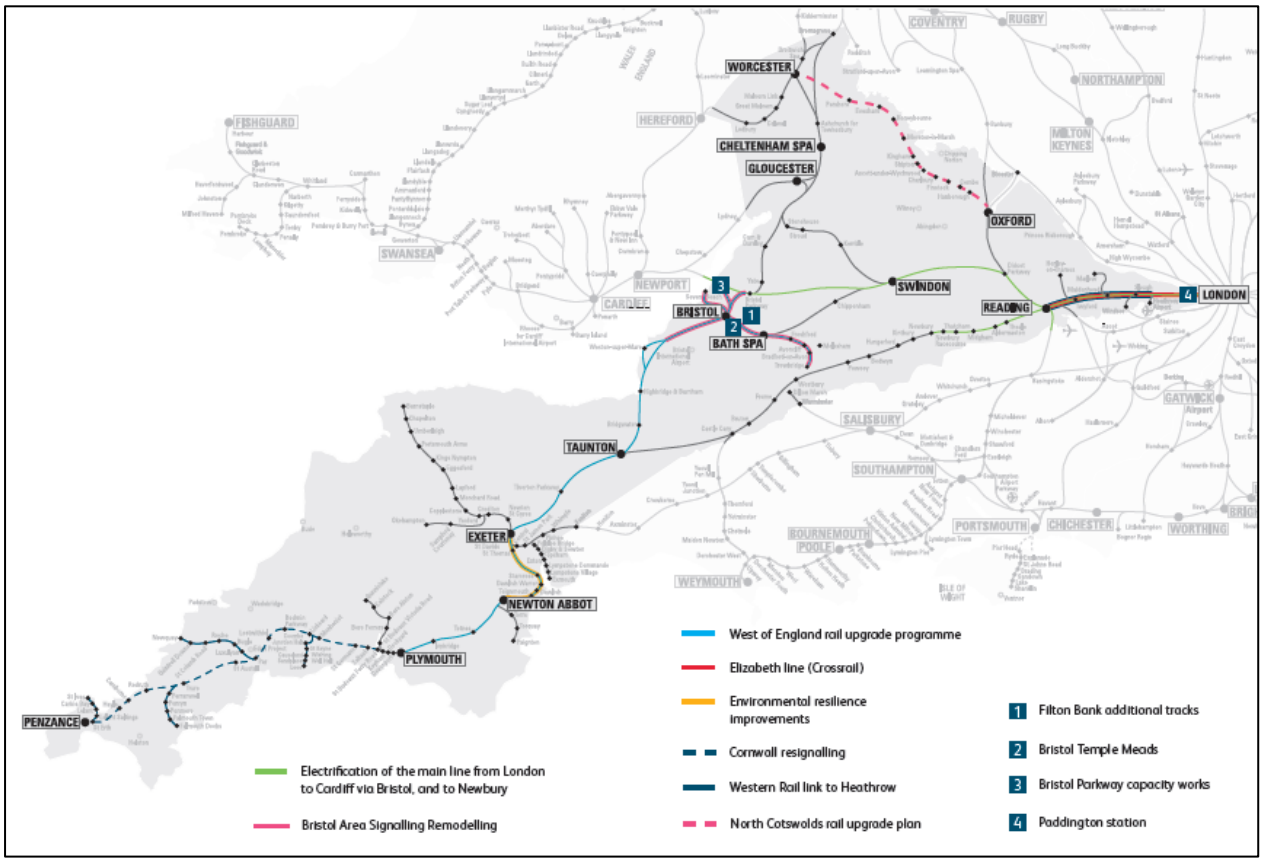
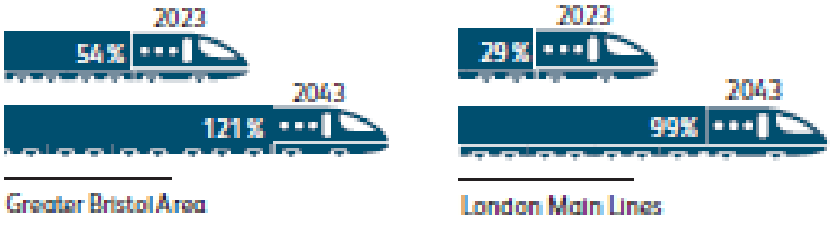


Figure 1.19 - Western Route Map



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

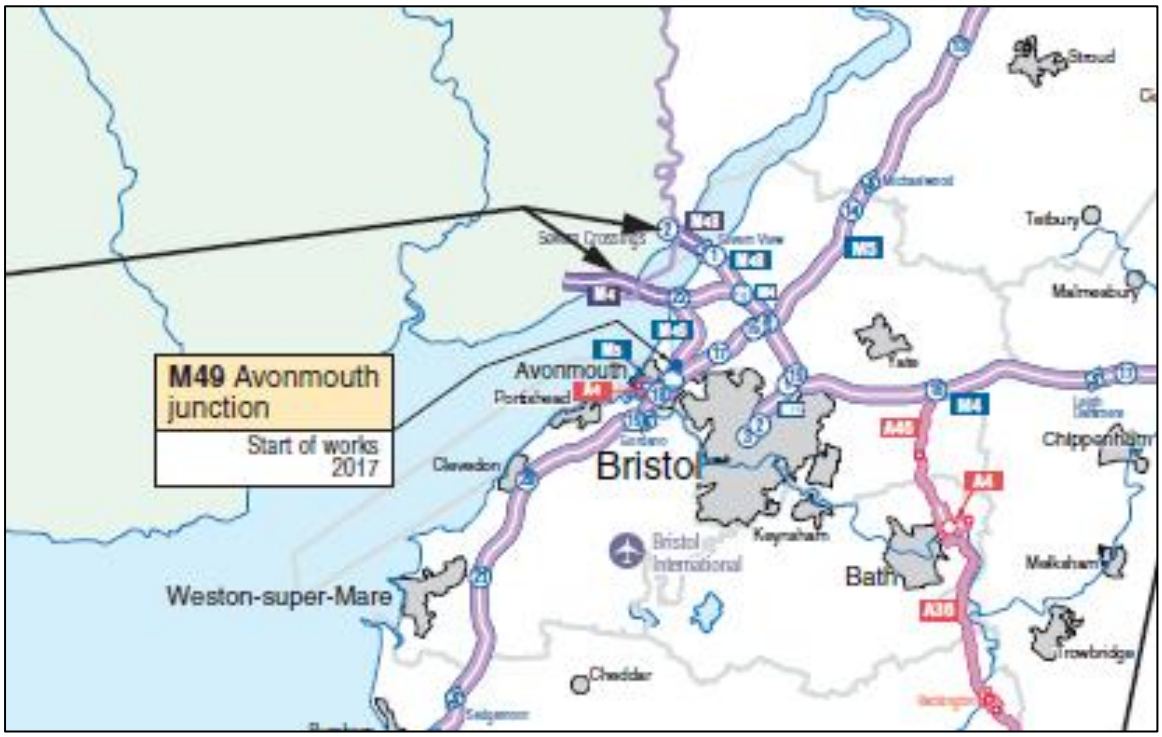
The catchment areas for the stations on the three MetroWest Phase 1 rail corridors intersect with the Strategic Road Network (SRN) at a number of locations. Modelling indicates that the connectivity offered by the scheme should attract trips away from the SRN, but as with car use changes across the local 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

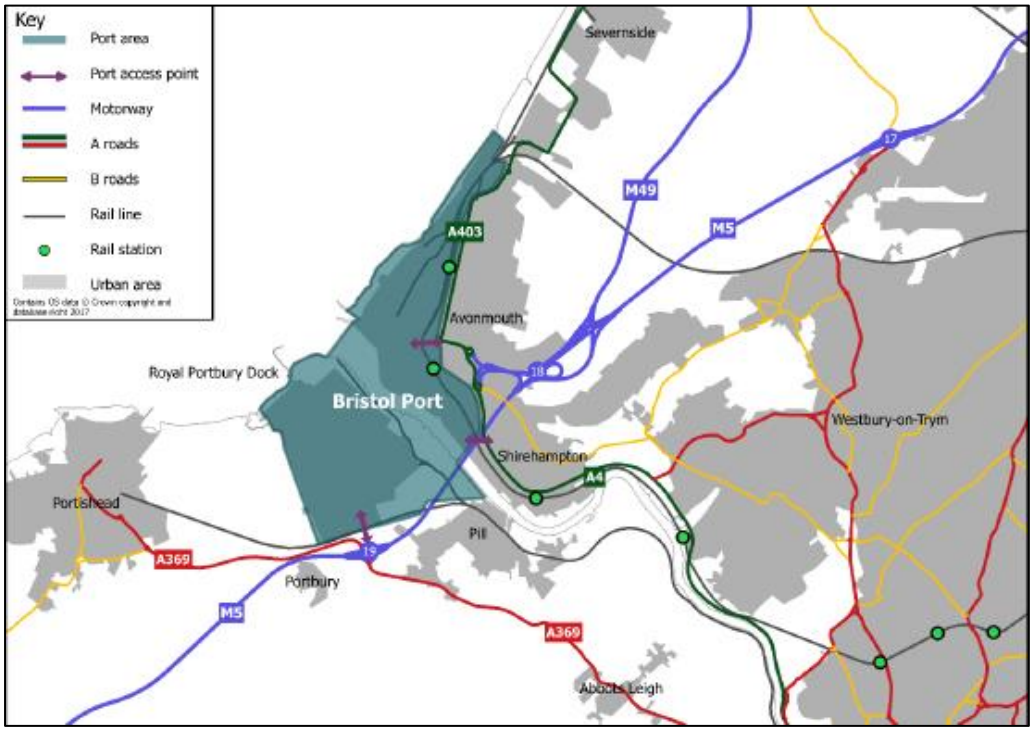
MetroWest Phase 1 is not geographically close to HS2, however the medium term aspiration for a national electrified spine with electrification of the Bristol to Birmingham main line, would potentially provide a feeder for trips onto HS2. The West of England is eager to ensure it does not lose any of 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 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 Developing in a built environment (particularly new two new stations) Ecology season constraints on the scheme programme	Need for environmental licenses 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 Alignment between the Network Rail GRIP process and the Development Consent Order process 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 Provision for MetroWest Phase 2 in parallel with Phase 1 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 DCO process technical requirements	DCO Examination and DCO decision to be made by the Secretary of State 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

MetroWest

METROWEST PHASE 1

OUTLINE BUSINESS CASE

Chapter 2 Economic Case

travelwest

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

December 2017

Chapter 2: Economic Case

Contents Page

Section Page

Tables

Figures

Appendices

CHAPTER 2

Economic Case

2.1 Introduction

The West of England (WoE) councils are progressing plans to invest in the local rail network over the next ten years through the MetroWest programme. The MetroWest programme comprises:

- The MetroWest Phase 1 project;
- The MetroWest Phase 2 project;
- A range of station re-opening/new station projects; and
- Smaller scale enhancements projects for the WoE local rail network.

MetroWest is being jointly promoted and developed by the four WoE councils: Bath & North-East Somerset Council (B&NES), Bristol City Council (BCC), North Somerset Council (NSC) and South Gloucestershire Council (SGC). The MetroWest programme will address the core issue of transport network resilience, through targeted investment to increase both the capacity and accessibility of the local rail network. The MetroWest concept is to deliver an enhanced local rail offer for the sub-region comprising:

- Existing and disused rail corridors feeding into Bristol;
- Increased service frequency; cross-Bristol service patterns (e.g. Bath to Severn Beach); and
- A Metro-type service appropriate for a city region.

The MetroWest programme will complement the investment being made by Network Rail (NR) and extend the benefits of projects such as the electrification of the Great Western main line. The programme is to be delivered over the next five to ten years during Network Rail Control Period 5 (2014 to 2019) and Control Period 6 (2019 to 2024).

2.1.1 Structure of this chapter

Following this introductory section, this chapter contains:

- Section 2.2 Scheme appraised
- Section 2.3 Transport modelling overview
- Section 2.4 Summary of modelled scheme impacts
- Section 2.5 Key economic assumptions
- Section 2.6 Economy impacts
- Section 2.7 Environment impacts
- Section 2.8 Social impacts
- Section 2.9 Public Accounts impacts
- Section 2.10 Performance of option variants
- Section 2.11 Summary of impacts

2.2 Scheme appraised

The MetroWest Phase 1 project includes the delivery of infrastructure and passenger train operations to provide:

- Half hourly service for the Severn Beach Line as far as Avonmouth (hourly for St. Andrews Road and Severn Beach stations);
- Half hourly service for the Keynsham and Oldfield Park local stations on the Bath Spa to Bristol Line; and
- Hourly service (or an hourly service plus) for a reopened Portishead Line, with new stations at Portishead and Pill.

Enhancements to services on the Severn Beach line will open in 2020 and re-opening of the Portishead line will follow in 2021.

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:

- 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.
- Hourly service plus – 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 set during the am and pm peaks.

Note though that, while the 'hourly service plus' is a realistic aspiration for the Portishead line, as the infrastructure required to deliver this level of service is identical to that required for an hourly service, it has not been appraised as part of the OBC. Only the hourly service has been considered at this stage.

Figure 2.1 shows the proposed MetroWest Phase 1 passenger network with a more harmonised service frequency, providing the foundation for 'Metro' local rail network.

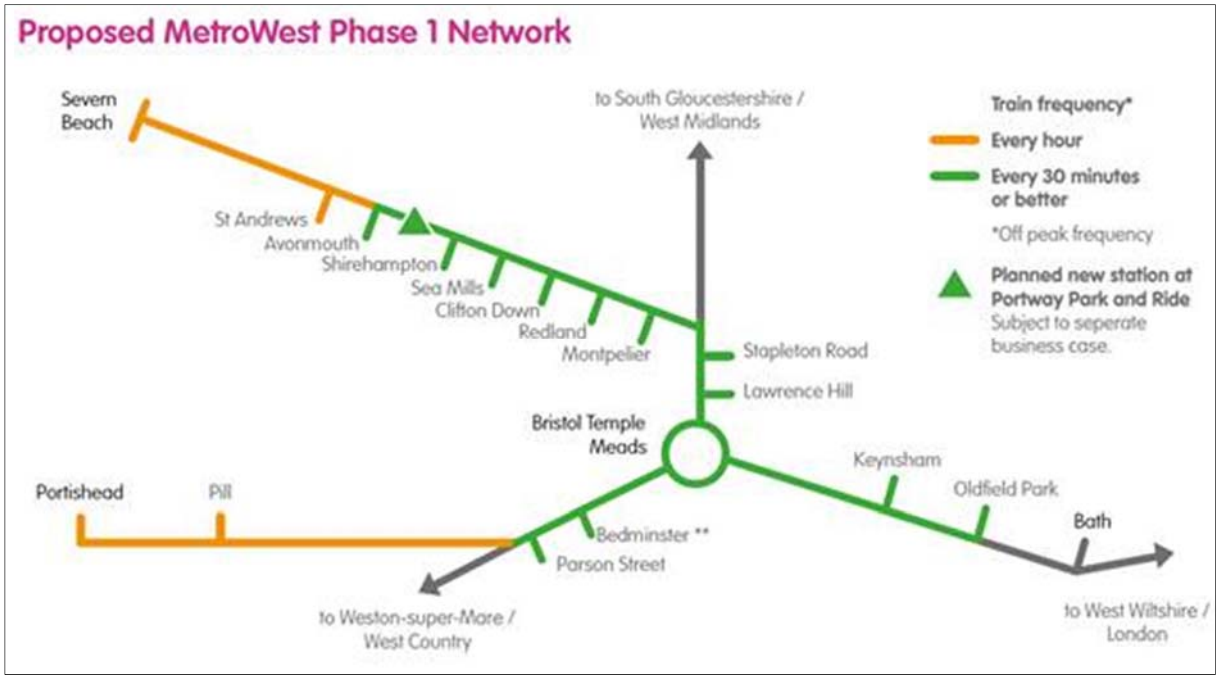


Figure 2-1: MetroWest Phase 1 network

2.3 Transport modelling overview

The key rationale of the transport modelling methodology is that it makes best use of available tools. In particular, the approach utilises tools and approaches accepted by the rail industry such as MOIRA and the West of England's GBATS4 multi-modal demand model, a WebTAG compliant demand model. The methodology is in accordance with both WebTAG and Governance of Railway Investment Projects (GRIP) demand forecasting requirements.

Advice relating to demand forecasting of rail-based schemes is in TAG Units M1-1 and M4, noting in the first instance that there are two main approaches to modelling rail passenger demand. 'Multi-stage' modelling may be employed, such as making use of an existing multi-modal transport model. Alternatively, an elasticity based approach may be used.

The guidance notes there are advantages and disadvantages to both. In particular though, multi-stage models are cited as often being less accurate (than elasticity approaches) when forecasting rail. This is not necessarily a problem specific to rail but to 'minority modes' in general (rail accounts for only about 2% of all journeys in the UK). Multi-stage models do not always reflect growth in the demand for travel by modes, as they concentrate on overall demand modelled as a function of demographic characteristics and car ownership trends. For instance, the National Travel Survey (NTS) indicates a disconnect between demographic changes and growth in rail use, such that the rate of rail trip making has risen by more than simply population.

Elasticity approaches are therefore commonly used in rail forecasting. Those suggested in TAG Unit M4 (section 8) draw heavily on the Passenger Demand Forecasting Handbook (PDFH), which sets out relationships between rail demand and service related characteristics, and are enshrined in MOIRA.

A combination of bespoke spreadsheet models and MOIRA were used to assess rail enhancements offered by MetroWest Phase 1, before bringing the results together in an aggregate forecast for use in subsequent analyses. There are two main elements covered:

- Changes in demand at existing stations from new or amended services (including suppression of demand by extra station calls); and
- Demand at newly opened stations (including assessment of the number of trips that are made by people who are already rail users, albeit using other stations).

A full explanation of the transport modelling approach and modelled impacts is set out in the MetroWest Phase 1 Forecasting Report contained in Appendix 2.1 to the Outline Business Case.

2.4 Summary of modelled scheme impacts

2.4.1 Rail demand

Demand forecasts for the new stations Portishead and Pill are shown in Table 2.1, showing initial 2016 forecasts of demand and revenue, as well as opening year 2021 and future year 2036 figures. For illustration of the potential for increased demand, this table also includes an assessment of the demand at the new stations for a 45 minute interval peak time only infill service at Portishead and Pill, based on 45 minute interval services during the morning and evening peaks.[1]

Future year figures were derived using the growth profile discussed in chapter 2. Note that these figures also include uplifts to demand assumed to take into account an enhanced tourism market on the line compared to other local stations (5%) and an uplift to account for the potential for greater demand from local stations to take advantage of enhanced London services with the introduction of

[1] The methodology of building the 45 minute peak infill demand and revenue assumes that demand for the 3 hour morning and 3 hour evening peak periods is taken from the 45 minute interval forecasts for Portishead and Pill, with the remainder of the day being based on the 60 minute interval service forecasts.

IEPs (2.6%). The uplifts were derived from investigation of demand and revenue information from MOIRA base data and do minimum forecasts (including IEP).

Table 2.1: New stations demand forecasts

All forecasts assume shuttle services between Bristol Temple Meads and Portishead
Two-way journeys, annual totals for the years indicated

	OBC scheme		**'Hourly service plus'**	
	Severn Beach & Bath Spa local services and 1tph Portishead		Severn Beach & Bath Spa local service & 45 min peak Portishead	
	Journeys	Revenue	Journeys	Revenue
PORTISHEAD				
2016 initial	242,945	£1,488,680	284,816	£1,697,215
2016	261,725	£1,603,755	306,832	£1,828,410
2021	321,014	£1,967,057	376,340	£2,242,604
2036	433,529	£2,656,511	508,247	£3,028,637
PILL				
2016 initial	40,497	£196,667	47,791	£224,880
2016	43,628	£211,869	51,485	£242,263
2021	53,511	£259,864	63,148	£297,143
2036	72,266	£350,947	85,281	£401,292

Except for '2016 initial', demand and revenue shown include uplifts of 5% for tourism effects and 2.6% for an IEP effect.

Early years ramp-up is not factored into the figures in this table.

The effects of service enhancements at existing stations has been modelled using MOIRA. This used the latest available update of MOIRA at the time (December 2016) to test MetroWest Phase 1 services. By far the greater majority of the effects modelled in MOIRA are as a result of improved services on the Severn Beach Line and to Bath Spa local stations. New services to the re-opened Portishead line only provide minimal enhancements at existing stations, specifically only at Bedminster and Parson Street stations. The total number of new journeys forecast by MOIRA are shown in Table 2.2.[2]

Table 2.2: MOIRA demand forecasts – new journeys per annum

Year	**OBC scheme**	**'Hourly service plus'**
	Severn Beach & Bath Spa local services and 1tph Portishead	Severn Beach & Bath Spa local service & 45 min peak Portishead
2016	492,694	497,126
2021	604,305	609,742
2036	816,114	823,456

Note: Early years' ramp-up is not factored into the figures in this table.

Table 2.3 illustrates the number of new journeys that MetroWest Phase 1 generates on the rail network, for each of the scenarios being considered in this technical note. The figures in this table

[2] Note that no specific MOIRA analysis has been carried out to determine the effects of 45 minute interval infill peak time services on the Portishead line. The greater proportion of the effects of this service are already captured by the new stations forecasts. As such, the effects at existing stations are based on interpolation between the 60 and 30 minute interval service tests.

show the total of new journeys at existing stations and new stations, net of those journeys at the new stations that previously travelled by rail via an existing station.

Table 2.3: MetroWest Phase 1 demand forecasts – net annual new journeys on the rail network

Year	OBC scheme	'Hourly service plus'
	Severn Beach & Bath Spa local services and 1tph Portishead	Severn Beach & Bath Spa local service & 45 min peak Portishead
2016	781,863	836,469
2021	958,980	1,025,957
2036	1,295,103	1,385,555

Notes:

Net of transfers from existing rail users to new stations. New stations demand forecasts considered the amount of potential transfer from existing stations. At Portishead, some 6.1% of demand was modelled to have come from existing rail users transferring to Portishead from existing stations. At Pill the figure was much lower, reflecting the more local nature of the catchment of Pill, at 0.5%

Early years' ramp-up of demand is not factored into the figures in this table.

2.4.2 Highway impacts

The proportion of additional rail trips that are forecast to switch from highway have been identified from the GBATS4 multi-modal assessment results, which vary by time period. These have been applied to the AM peak, inter-peak and PM peak rail demand figures (the resulting changes in highway trips are also shown in Table 2.4).

Table 2.4: Change in rail and highway trips

Change in rail/car demand (from do minimum)	2021				2036			
	Annual	Average day			Annual	Average day		
		AM	IP	PM		AM	IP	PM
Existing stations	492,700	370	60	370	816,100	610	100	610
Portishead	321,000	240	40	240	433,500	330	50	320
Pill	53,500	40	10	40	72,300	50	10	50
TOTAL	781,900	650	110	650	1,295,100	990	160	990
Approx. reduction in car trips		380	20	180		580	30	280

Table 2.5 shows model summary statistics from across the model area of GBATS4, with changes from 2021 and 2036 do minimum scenarios to MetroWest Phase 1 scheme in Table 2.6. Whereas changes from the 2013 base to the 2021 do minimum and 2036 do minimum are generally reflective of worsening traffic conditions, particularly in the 2036 do minimum, Table 2.6 indicates that changes as a result of MetroWest Phase 1 are mostly improvements to traffic. However, the scale of impact is much lower than that modelled between the base and do minima, with reductions in highway trips of around 0.5% feeding through to similar order changes in the other metrics (around 1% improvements in peak period travel times and average vehicle speeds being the most notable).

Table 2.5: MetroWest Phase 1 scheme effects – GBATS4 model statistics

Network Statistics		2021 OBC scheme			2036 OBC scheme		
	units	AM	IP	PM	AM	IP	PM
TOTALS – all modelled area, for hour modelled							
Delay	pcu.hrs/hr	582	325	567	823	538	838
Travel time	pcu.hrs/hr	27,957	19,777	27,921	32,790	23,399	32,401
Travel distance	pcu.kms/hr	1.193m	0.958m	1.221m	1.331m	1.116m	1.359m
Trips loaded	pcu/hr	129,583	111,493	128,517	146,360	129,251	144,266
AVERAGES – per modelled vehicle							
Travel time	mins	12.9	10.6	13.0	13.4	10.9	13.5
Distance	kms	9.2	8.6	9.5	9.1	8.6	9.4
Speed	kph	42.6	48.4	43.7	40.6	47.7	41.9

Table 2.6: MetroWest Phase 1 scheme effects – GBATS4 model statistics - % CHANGES

Network Statistics		2021 Do Min to OBC scheme			2036 Do Min to OBC scheme		
	units	AM	IP	PM	AM	IP	PM
TOTALS – all modelled area, for hour modelled							
Delay	pcu.hrs/hr	-1.3%	-0.2%	-1.0%	-0.5%	-	-0.3%
Travel time	pcu.hrs/hr	-0.8%	-0.1%	-0.4%	-1.3%	-0.1%	-1.2%
Travel distance	pcu.kms/hr	-0.5%	-0.1%	-0.3%	-0.3%	-0.0%	-0.1%
Trips loaded	pcu/hr	-0.4%	-	-0.2%	-0.3%	-0.0%	-0.1%
AVERAGES – per modelled vehicle							
Travel time	mins	-0.4%	-0.1%	-0.2%	-1.0%	-0.1%	-1.1%
Distance	kms	-0.1%	-0.03%	-0.1%	-0.0%	-	-0.0%
Speed	kph	0.5%	-	0.2%	1.0%	0.2%	1.0%

Note: Negative changes to travel times, travel distances and trips loaded reflect improvements in conditions on the highway network. Similarly, positive changes to speeds are also an improvement

2.5 Key economic assumptions

The main non-project specific economic appraisal parameters and assumptions are drawn from the requisite units of the DfT's appraisal guidance contained in various WebTAG guidance units and the WebTAG databook. These are also enshrined in the Network Rail DCF model used for scheme appraisal, as well as TUBA, used for highway benefits assessments. Key assumptions made for the economic assessment are as follows.

General assumptions

- Opening year 2021, preparation and construction profile from 2017-2021
- Appraisal period = 60 years
- Network Rail Discounted Cash Flow model = current model year 2017, first year of benefits 2021
- Price base year and base year for discounting = 2010

- Discount rate = 3.5% for 30 years from current year then 3% thereafter
- The appraisal approach identifies cost items that will be inflated above the prevailing inflation rate

Cost assumptions

- Train operating staff costs to increase in line with average earnings index (AEI)
- Cost of train operating company profit as a percentage of any change in operating costs = 8%
- Optimism bias level for capital costs = 18% (GRIP3)
- Optimism bias level for operating costs = 1% per annum (GRIP3)
- Capital expenditure is assumed to be funded by devolved major scheme funding, Local Growth Fund and the four Authorities
- Future renewal expenditure is assumed to be Regulatory Asset Base (RAB) funded
- The new infrastructure and assets are to be renewed every 30 years except some elements of the new tracks (ballast is assumed to be renewed every 20 years)
- Each train is assumed to be formed of 3-car 165/166 diesel multiple units (currently being cascaded into the area for used for local services in the area)
- TOC revenue and operating cost transfer = 100% after expiry of the franchise that is operating at the time of opening
- Network Rail operating cost transfer = 0% during current control period, 100% after current control period

Transport demand assumptions

- Values of time in the DCF model are £11.50 per hour for business users, £9.95 per hour for commuters and £4.54 for other users (all in 2010 prices) – WebTAG Databook, July 2017
- Value of time is assumed to grow in line with GDP
- The 'Rule of a Half' is applied to time savings for new users in calculating benefits
- Average fare increases (above RPI) = 1% up to 2013 and after 2021, and 0% between 2014 and 2020 inclusive (based on current Government policy for regulated rail fares)
- Highway network growth has been forecast using the GBATS4 multi-modal model, which is in turn based on local development assumptions controlled to DfT's Tempro7 forecasts
- Growth in background rail demand is assumed to initially carry on from historic trends, tending towards future year forecast rates over time. As such, background rail demand growth in 2016 is assumed at 5.6% per annum, declining to 1.6% per annum by 2036. From 2036, no further growth is assumed.

2.6 Economy impacts

Further details of the economic assessment process and results are set out in the MetroWest Phase 1 Economic Assessment Report contained in Appendix 2.2 of the OBC, as well as in the WebTAG workbooks included in Appendix 2.5.

2.6.1 Business users and transport providers (TEE)

The Economic Efficiency of the Transport System (TEE table) for the MetroWest Phase 1 OBC scheme is shown in Table 2.7. Note that, in addition to impacts for business users, the TEE table also shows impacts for commuting and other users.

Table 2.7: MetroWest Phase 1 OBC Scheme, Economic Efficiency of the Transport System (TEE)

Consumer - Commuting user benefits	**All Modes**	**Road**		**Rail**	
Travel Time	143,130	18,809		124,321	
Vehicle operating costs	1,420	1,420		0	
User charges	0	0		0	
During Construction & Maintenance	-106	0		-106	
NET CONSUMER - COMMUTING BENEFITS	**144,444**	**20,229**		**124,215**	
Consumer - Other user benefits	**All Modes**	**Road**		**Rail**	
Travel Time	53,969	7,092		46,877	
Vehicle operating costs	536	536		0	
User charges	0	0		0	
During Construction & Maintenance	-106	0		-106	
NET CONSUMER - OTHER BENEFITS	**54,398**	**7,628**		**46,771**	
Business	All Modes	Personal	Freight	Personal	Freight
Travel Time	43,662	3,678	15,626	24,358	0
Vehicle operating costs	2,996	706	2,290	0	0
User charges	0	0	0	0	0
During Construction & Maintenance	-212	0	0	-212	0
Subtotal	**46,447**	**4,385**	**17,916**	**24,146**	**0**
Private Sector Provider Impacts					
Revenue	0	0		0	
Operating costs	0	0		0	
Investment costs	0	0		0	
Grant/subsidy	0	0		0	
Subtotal	**0**	**0**		**0**	
Other business Impacts					
Developer contributions	0	0		0	
NET BUSINESS IMPACT	**46,447**				
TOTAL					
Present Value of Transport Economic **Efficiency Benefits (TEE)**	**245,290**				

Notes:

Benefits appear as positive numbers, while costs appear as negative numbers.

All entries are £'000s, present values discounted to 2010, in 2010 prices

2.6.2 Reliability impacts on business users

The overall reduction in congestion on the highway network set out in Section 2.6.1 will have some positive impact on journey time reliability. Highway reliability has also been specifically considered, with reference to WebTAG unit A1.3 section 6, based on variation in journey times caused by events unpredictable by the users such as incidents or recurring congestion in certain days (day-to-day variability). Predictable elements like varying levels of demand by time of day, day of week or seasonal effects are excluded, as travellers are assumed to be aware of them.

Results of the analysis indicate that highway reliability benefits of £1.82m could be realised as a result of MetroWest Phase 1. This does not distinguish between business users and commuting or other users.

More information about the assessment of reliability impacts is discussed in the MetroWest Phase 1 Economic Assessment Report.

2.6.3 Regeneration and wider impacts

Transport infrastructure can play a key role in regeneration and making an area's economy more productive. Improved infrastructure can lead to improved access to markets and customers, higher mobility and flexibility of the labour market and more reliable supply of goods and services. There is

a clear role for transport infrastructure, including public transport services, in driving regeneration and enhancing the economic output of an area.

This assessment adopts a bespoke methodology to estimate the economic development and wider regeneration impacts of the scheme. The methodology reconciles the West of England LEP's economic impact guidance with DfT's emerging Wider Economic Impact guidance and labour market modelling. The assessment uses a labour market balance sheet model, and was considered appropriate because if provides consistency with previous stages of assessment, as well as direct comparison to earlier results. It also adheres to many of the principles outlined in the emerging DfT Wider Economic Impacts guidance.

Key inputs to the balance sheets include labour supply by sector and employment demand across the labour market. These were adjusted to 2036 values to reflect growth forecasts and planning data. Based on these adjustments, changes in accessibility between labour supply and labour demand zones, leading to the facilitation of employment opportunities within the labour market, could be quantified.

The labour supply, labour demand and GBATS4 modelling outputs combine to forecast between 600 and 2,300 additional full time equivalent jobs in the West of England. However, this reflects labour supply and demand changes across all modes of transport. Where only changes in rail users are considered (27.4% of mode share for commuting trips to these zones), the scale of employment generated as a result of the scheme falls to between 150 and 650. This does not account for the operation of the additional train services and stations, which will generate some additional employment.

This level of employment facilitated by the scheme options can be translated to GVA uplift through the application of best practice GVA per benchmark figures. Applying these estimates outlined above results in GVA uplift forecasts of between £11m and £43m per annum (2017 prices and values).

The economic development and regeneration analysis outlined above demonstrates that the various schemes have the potential to facilitate significant positive economic impacts across the West of England, in the operational phase.

2.7 Environment

The environmental surveys and assessment have been used to inform a Preliminary Environmental Information Report (PEIR) for the scheme. Information is presented for the following technical areas:

- Noise;
- Air Quality;
- Greenhouse Gases;
- Landscape and Townscape;
- Heritage of Historic Resources;
- Biodiversity; and
- Water Environment.

This work is documented in full in the PEIR for the OBC. In addition to the PEIR, TAG assessments have been undertaken and the workbooks are presented in Appendix 2.5.

The Environmental Impact Assessment (EIA) procedures in European Union member states are based on the European Community Directive, 'The Assessment of the Effects of Certain Public and Private Projects on the Environment' (85/337/EEC) as amended by Council Directive 97/11/EC, Directive 2003/35/EC and Directive 2009/31/EC (subsequently replaced in 2011 by a new Codified EIA

Directive 2011/92/EU) – collectively termed the 'EIA Directive'. This has since been amended and superseded in 2014 by Directive 2014/52/EU and was transposed into UK law on 16 May 2017.

The Directive was implemented in the UK through the Town and Country Planning Assessment of Environmental Effects) Regulations 1988 (SI No 1199). This has subsequently been superseded by the Town & Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017 SI No 571) (hereafter referred to as the EIA Regulations).

Schedule 1 of the EIA Regulations identifies those developments for which environmental assessment is mandatory. The scheme for this application site does not fall in this category.

Schedule 2 of the EIA Regulations lists developments which require environmental assessment if the proposed scheme is likely to have significant effects on the environment 'by virtue of its nature, size or location'. The process of determining whether a Schedule 2 development requires an environmental impact assessment is referred to as "screening". Under Regulation 5 of the EIA Regulations, the applicant may request a Screening Opinion from the relevant Planning Authority to determine whether the proposed development requires an EIA. Alternatively, the applicant can voluntarily prepare an EIA normally following consultation with the relevant planning authority/ies.

The Local Planning Authorities (LPA) North Somerset and Bristol City Council have been consulted with regards to the Environmental Impact Assessment (EIA). Following consultation with the LPAs, a Screening Opinion was not sought because the scheme is located within the immediate vicinity of numerous environmentally sensitive sites and it was considered that there was potential for likely significant effects. In particular the scheme crosses the European designation Avon Gorge Woodlands Special Area of Conservation and the nationally designated Avon Gorge Site of Special Scientific Interest (SSSI) and Leigh Woods National Nature Reserve (NNR). The scheme also passes close to: the Severn Estuary Special Area of Conservation (SAC), SPA and Ramsar Site; the Severn Estuary SSSI and Ham Green SSSI; and potentially affects rare and protected species of flora and fauna. Figure 2.1 shows the key designations in the vicinity of the scheme. A scoping report was submitted to the Planning Inspectorate in June 2015 detailing the proposed scope of the EIA and contents of the ES. The Planning Inspectorate consulted with a large number of stakeholders and issued their Scoping Opinion in August 2015. An Environmental Statement (ES) will be prepared to accompany the Development Consent Order Application for the proposed scheme.

To inform both the scoping and the Environmental Statement, surveys have been undertaken at appropriate times of the year, including: ecological surveys; noise monitoring surveys; and air quality surveys.

As the scheme passes through a European designated site, a Habitats Regulations Assessment will also be undertaken.

Note that most of the environmental impacts for MetroWest Phase 1 are related to the Portishead line reinstatement works. Where this is the case, the term 'DCO Scheme' is used.

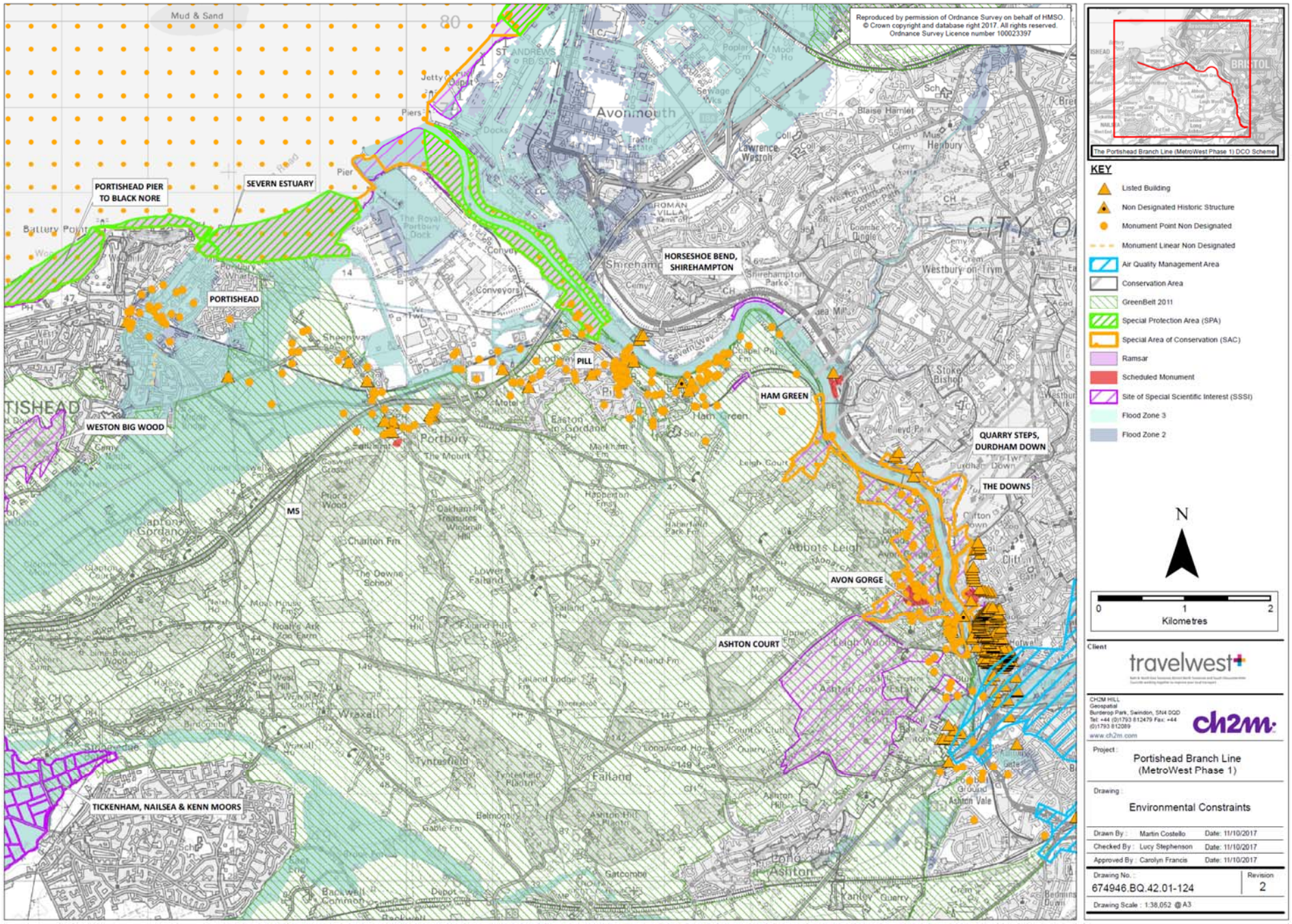


Figure 2.2: Key designations in the vicinity of the scheme

2.7.1 Noise

The Scheme has the potential to generate noise and vibration from operation as a result of the associated traffic and rail movements. In addition, the existing noise climate needs to be considered to ensure that noise sensitive receptors are protected.

The methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance was used, with a 'Noise Workbook' being completed and a summary provided within the Appraisal Summary Table (AST). The appraisal is based on the assessment in Chapter 13, Noise and Vibration, of the Preliminary Environmental Information Report (PEIR) for the scheme.

The noise appraisal has been undertaken using a combination of measured baseline noise levels the results from the noise model that was used for the completion of the PEIR. Inputs for the noise model are a combination of estimated MetroWest Phase 1 trains and traffic data from the GBATS4 model. The measured noise levels are from surveys undertaken in 2015 and 2016 and are assumed to provide an accurate representation of the noise levels on scheme opening. The noise model includes agreed and embedded mitigation.

The negative monetised score of -£511,247 is due to minor increases in noise at many locations along the route. These are mainly at locations close to the proposed route in Portishead and Pill, where there is currently no passenger railway and background noise is low. There are 523 households predicted to experience an increase in daytime noise. For the majority of these locations the change is less than 1dB, which is negligible, but in some cases sufficient enough to move a band within the WebTAG noise workbook. Some households have changes more than 1 dB, but none of these are significant impacts. For the majority of households within 600m of the route there is predicted to be no change in noise.

At the Trinity Primary School in Portishead there is predicted to be a **slight adverse** impact due to the noise from the railway. Within the Avon Gorge SSSI there are not predicted to be any impacts from noise. This is due to the background noise levels in the Avon Gorge already being high because to the presence of the A4.

There are not expected to be any impacts at night due to the service not operating during the night. The impacts from vibration in Portishead are expected to be **negligible** as the receptors are a sufficient distance from the railway line. In Pill, any levels of vibration would be no worse than those already experienced from the existing freight trains.

2.7.2 Air Quality

During operation, potential air quality impacts will be due to changes in traffic and rail movements on the roads and tracks. This will give rise to a change in the nature and location of vehicle and train emissions, with consequent impacts on local air quality.

The air quality appraisal has been undertaken using the methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance and relevant workbooks completed. Impacts relating to the scheme on both local and regional air quality were assessed.

The appraisal has been undertaken using the total predicted NO2 and PM10 concentrations for the Base Year (2013), Do-Minimum (2021) and Do-Something (2021) scenarios, that were used for the completion of the PEIR. Inputs for the air quality assessment refer only to the addition of diesel locomotives to the rail network, and exclude associated impacts on the surrounding road network.

Under the Local Air Quality Management regime, Local Authorities have a duty to make periodic reviews of local air quality against the air quality objectives. Where this indicates that the objectives are not expected to be achieved, they are required to designate an Air Quality Management Area (AQMA). An Air Quality Action Plan (AQAP) must then be formulated, outlining a plan of action to meet the air quality objectives in the AQMA.

A short section of the DCO Scheme crosses the Bristol Air Quality Management Area (AQMA) and the new passenger services between Portishead and Bristol will pass through the Bristol AQMA from Parson Street Station to Bristol Temple Meads. Air quality monitoring data suggest that AQS objectives are being met within the scheme extent. The scheme crosses one ecological designated site, the Avon Gorge Woodlands SAC, where baseline NOx levels are close to the critical level.

The regional assessment assumed NOx and PM10 concentrations, with and without the scheme, will be the same between the opening year and forecast year. Based on the DMRB criteria, no road links were screened into the assessment. Therefore, only rail links have been considered in WebTAG.

The negative monetised values are attributed to additional diesel locomotives, which are expected to lead to an increase in NOx and PM10 emissions. These changes are likely to lead to **adverse impacts** at receptors closest to the railway line, however the scheme is not predicted to result in any exceedances of the annual mean AQS objective.

It is expected that the increased rail emissions would be offset by a reduction in road emissions as a result of the scheme, however this is not possible to conclude at this stage based on the available information.

The montised impacts are as follows:

- Value of change in PM10 concentrations: NPV: £-0.0m
- Value of change in NOx emissions: NPV: £-0.5m
- Total value of change in air quality: £-0.5m

2.7.3 Greenhouse Gases

The Project is expected to lead to a decrease in vehicle kilometers travelled across the road network which will result in a decrease in CO_2 emissions. However, this benefit is expected to be partially impacted on by an increase in rail emissions associated with the Project that is expected to contribute to an increase in CO_2 emissions.

Monetised impacts on greenhouse gases have been calculated using the GBATS4 SATURN model and TUBA. At this stage CO_2 emissions for only the non-traded sector for the opening year (2021) was available. Based on the information available, a generated benefit of £548 is anticipated. The incorporated reduction in traded emissions as a result of the project, is expected to further increase the benefit.

2.7.4 Landscape

The landscape was divided into three key environmental resources for this assessment, generally derived from the North Somerset Local Authority Character Areas (Land Use Consultants, 2005. North Somerset Landscape Character Assessment Supplementary Planning Document), as shown in the Table 2.8. It was considered that the Natural England national character areas are too coarse for this assessment.

Table 2.8: North Somerset Local Authority Character Areas

Key environmental resources assessed	North Somerset Local Planning Authority Landscape Character Areas
Area north of Avon Gorge	• A2 Clapton Moor • C2 Portbury Settled Coastal Edge • J6 Avon Rolling Valley Farmland
Avon Gorge	• D1 Avon Gorge

Table 2.8: North Somerset Local Authority Character Areas

Area south of Avon Gorge	• E5 Tickenham Ridge • G2 Failand Settled Limestone Plateau • B1 Yeo and Kenn River Floodplain • J5 Land Yeo and Kenn Rolling Valley Farmland

The methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance was used and a 'Landscape Worksheet' has been completed. Each key environmental resource was assessed separately, then an overall score was given and included in the Appraisal Summary Table.

The appraisal was based on the assessment of the North Somerset Local Authority Character Areas in the Landscape and Visual Impact Assessment, Chapter 11 of the Preliminary Environmental Information Report for the scheme. Visual amenity was taken into account in the assessment of the 'Summary of Character' feature, as recommended in the guidance.

The DCO Scheme is likely to have a neutral/slight adverse effect on the landscape character of the area north of the Avon Gorge. In Portishead, the operational railway would increase the sense of urbanisation with the new station building and car park, and there will be an increased movement of trains in close proximity to people at Pill. However, existing features in this area already dilute the sense of tranquility, such as views towards the Royal Portbury Dock, the M5 and the edge of Bristol. Removal of larger trees alongside the disused line may open up views from the M5 and Junction 19 northwards to the factories at Portbury Docks, however the replacement mitigation planting associated with the DCO Scheme would re-establish hedgerows and tree belts and reinstate the screening effect.

The DCO Scheme is likely to have a slight adverse effect on the landscape character of the Avon Gorge itself due to vegetation clearance creating more open views of the railway primarily in the form of moving trains within the landscape when the scheme is in operation.

The DCO Scheme is likely to have a neutral effect on the landscape character of the area south of the Avon Gorge. Vegetation clearance alongside the track may also occur in this area, but the existing landscape is already dominated by urban landcover and transport infrastructure, including the existing operational railway so the DCO will fit in with the surrounding landscape.

Overall, the DCO Scheme is likely to have a **slight adverse effect** on landscape. It will affect areas of recognised landscape quality and will impact on certain views across the area.

2.7.5 Townscape

This townscape appraisal focused on the main urban area along the DCO Scheme this is the Ashton Gate/Ashton Vale area on the edge of Bristol. Townscape features along the rest of the DCO Scheme route were assessed as part of the landscape appraisal.

The methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance was used and a 'Townscape Worksheet' has been completed.

The appraisal was based on the assessment of the Site-Specific Character Areas of Ashton Gate and Ashton Vale in the Landscape and Visual Impact Assessment, Chapter 11 of the Preliminary Environmental Information Report for the scheme.

The DCO Scheme is likely to have a **neutral effect** on the townscape of the Ashton Gate/Ashton Vale area. This is due to transport infrastructure (including the existing operational railway) being an existing feature in the townscape. Many views are restricted by commercial/industrial buildings so the townscape character would not change with the DCO Scheme. Future trends in the area are likely to include increased development and expansion outwards into the urban/rural fringe, and increased traffic volumes, so the DCO Scheme would fit this trend.

2.7.6 Heritage of historic resources

The appraisal was based on the assessment methodology, which followed the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 2, HA 208/07 including Annexes 5 (Archaeological Remains), 6 (Historic Buildings) and 7 (Historic Landscape).

The methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance was used and a 'Heritage Worksheet' has been completed. Each key environmental resource was assessed separately, then an overall score was given (included in the Summary Table). The appraisal was based on the assessment in the Cultural Heritage, Chapter 8 of the Preliminary Environmental Information Report for the scheme.

The effect of the DCO Scheme on the setting of the designated cultural heritage assets along the route during operation is generally **Slight adverse/neutral** and **not significant** in regard to the EIA Regulations. This results largely from the lack of inter-visibility between the DCO Scheme and heritage assets.

2.7.7 Biodiversity

The biodiversity appraisal has been undertaken using the methodology outlined in TAG Unit A3: Environmental Impact Appraisal guidance and relevant workbooks completed. Each key environmental resource was assessed separately for potential impacts that may arise from the operational phase of the scheme. The appraisal was informed by the Ecology and Biodiversity chapter (chapter 9) of the Preliminary Environmental Information Report for the scheme.

During operation, potential biodiversity impacts will arise from routine maintenance of the railway corridor which will involve the removal of vegetation within 4 m of the track as well the risk of disturbance and/or collision of the trains with protected species and the fragmentation of habitats.

The Portishead to Pill line will have **slight adverse** effects on Field east of M5 Motorway, Lodway Wildlife Site due to loss of habitat. **Slight adverse** effects are also considered possible on protected species such as great crested newts, other amphibian species, badgers, otter and bats through the fragmentation of habitats and disturbance and death/injury from direct collision with trains. The operational maintenance of the railway corridor may also cause **slight adverse** effects on habitats such as woodland, trees and scrub due to direct loss, as well as Japanese knotweed due to the potential of facilitating the spread of this invasive species. The impact on North Somerset and Mendips Bats SAC is **to be assessed** following further bat survey in 2018.

The Freight Line section of the DCO is assessed to have a **slight adverse** effect on internationally and nationally important sites/species such as the Avon Gorge and Woodlands SAC/SSSI, Leigh Woods NNR and Ancient Woodland and the notable and the important plant species these sites support, these impacts are likely to arise through the routine maintenance and clearance of the railway corridor, however they will be mitigated through the implementation of a Site Vegetation Management Statement which will be developed in consultation with Natural England. A **slight adverse** effect is also anticipated on the internationally important site Bath and Bradford on Avon Bats SAC, however this assessment is ongoing due to further assessment on the use and value of the tunnels to bats. A number of Local Wildlife Sites are also predicted to have potentially **slight adverse** effects on the Freight Line section of the scheme. These include Bower Ashton BWNS, River Avon NSWS and River Avon SNCI, effects on these sites will arise due to habitat loss. A **slight adverse** effect may also occur on protected species such as badger, otters and bats through the fragmentation of habitats, disturbance and death/injury from direct collision with trains. Habitats that may be subject to a **slight adverse** impact includes ephemeral/short perennials which may be effected due to the routine maintenance and clearance of the railway corridor. In addition, a **slight adverse** effect may occur due to the potential spread of invasive plant species during routine maintenance and clearance.

2.7.8 Water environment

The key environmental resources have been identified from Appendix 17.3 of the Preliminary Environmental Information Report for the scheme. The water environment comprises mostly of small watercourses, primarily serving a drainage function (some man-made) of low to medium value / importance discharging directly into the tidal River (Bristol) Avon which is of High value due to its Good status under the Water Framework Directive (WFD). Also of high value/importance is the Easton-in-Gordano Stream due to its good potential under WFD. The three groundwater receptors are of medium or High value/importance based upon their WFD status and aquifer classification.

The methodology outlined in the TAG Unit A3: Environmental Impact Appraisal guidance was used and a 'Water Worksheet' has been completed. Each key environmental resource was assessed separately, then an overall score was given (included in the Summary Table). The appraisal was based on the assessment in the Water Resources, Drainage and Flood Risk, Chapter 17 of the Preliminary Environmental Information Report for the scheme. The draft Flood Risk Assessment has also been used to identify impacts and mitigation.

Given the proposals for ballast renewal, track and station drainage, and the appropriate management of wastewater from trains the impacts associated with the potential for pollutants to enter the surface water environment will be mitigated to acceptable levels resulting in a negligible magnitude of impact upon water quality during operation and a **neutral** significance effect on receptors.

Impacts upon groundwater quality during operation of the railway line are considered to be negligible due to the small quantities of pollutants produced, the localised nature of any contaminants and the presence of the ballast which will aid in the removal contaminants as well as the underlying geology. The effect of the DCO scheme upon groundwater quality is anticipated to be **neutral**.

Physical impacts upon water features through drainage from the track, stations, car parks and highways during the operational phase are anticipated to be of either **slight adverse** or **neutral** effect.

Impacts upon water quantity through drainage during the operational phase are anticipated to be of **neutral** effect. Runoff rates from the railway line would be no higher than from the existing footprint of the DCO Scheme, as there would be no increase in impermeable area. Runoff rates from the site of Portishead station and Pill station will increase as a result of the increase in impermeable areas for the new stations and car parks. For Portishead this is negligible and no mitigation is required. For Pill the design will include measures to minimise any potential increase in discharge.

A slight adverse impact relating to the increased flood risk to the railway line from the River (Bristol) Avon, which will worsen over time due to climate change has been identified in the assessment. This results in the flood risk to the railway to be of **low** significance. Areas where flood flow routes will be affected will be mitigated by providing alternative routes (through enlarged culverts). Floodplain compensation is not required as the scheme only encroaches upon the floodplain in two locations and these are **negligible**.

2.8 Social impacts

Social assessments have been undertaken to support the development of the scheme. A summary of the assessment outcomes is provided in the following sections:

- Commuting and other users
- Reliability impacts on commuting and other users
- Physical activity

- Journey quality
- Accidents
- Affordability
- Security
- Access to Services
- Severance
- Option values
- Distributional impacts

Further details of the economic assessment process and results are set out in the MetroWest Phase 1 Social Impact Appraisal Report contained in Appendix 2.3 of the OBC, as well as in the WebTAG workbooks included in Appendix 2.5.

2.8.1 Commuting and other users (TEE)

See section 2.6.1

The Economic Efficiency of the Transport System (TEE table) for the MetroWest Phase 1 OBC scheme is shown in Table 2.7. This TEE table shows impacts for commuting and other users, in addition to business users.

2.8.2 Reliability impacts on commuting and other users

See section 2.6.2

Assessment of highway reliability impacts have been carried out. This does not distinguish between business users and commuting or other users.

2.8.3 Physical activity

There is increasing recognition of the interrelation between transport, the environment and health. Transport can affect levels of physical activity, which has an important role to play in preventing weight gain and obesity and improving mental health.

Health implications of transport proposals can be identified by assessing changes in the opportunities for increased physical activity through cycling and walking. More cycling and walking can also give benefits by improving the physical environment within communities, in turn helping to foster community spirit, with implications for health.

The proposed scheme accounts for cyclists, pedestrians and equestrians by delivering and planning for measures to minimise the interaction between these modes and motorised traffic (including trains). The measures provided for Non-Motorised Users (NMUs) that will be delivered as part of the scheme ensures that the opportunity to undertake trips through active modes will be enhanced.

The assessment has been undertaken by combining the number of active mode users affected (number of persons, based on NMU surveys in three different locations) with how much they are affected (in minutes). This is sufficient information to formulate an overall assessment score (in person 'minutes') for transport economic efficiency impacts on active mode users. This approach has involved developing a schedule, for each important route, of changes in typical journey lengths (times and distances) and likely changes in travel patterns, with an estimate of the number of people affected in each case.

Based on the work undertaken, the assessment suggests that the scheme will have an **overall slight beneficial impact** on physical activity.

2.8.4 Journey quality

TAG Unit A4.1 'Social Impact Appraisal' defines journey quality as "a measure of the real and perceived physical and social environment experienced while travelling", noting that this includes various factors related to peoples' experience on journeys such as information provision and the perception of safety. Note though that 'journey quality' considered in this assessment do not include those covered elsewhere in the appraisal (such as severance, security, accidents, journey times, journey reliability, etc).

There are three key elements to journey quality impacts:

- Traveller care – such as cleanliness, facilities, information and the general environment related to public transport
- Travellers' views – pleasantness of surroundings, such as views of both the townscape and landscape during the journey
- Traveller stress – convenience of the journey, including the ease of using the route and frustration

Journey quality is a measure of the physical and social environment that is experienced when travelling. The number of factors can be wide ranging such as the level of crowding on trains, the provision of information, perceptions of personal safety and the ease/convenience of using the route by that mode.

Journey quality can have an important influence on travel choices. Poor quality may dissuade users from using specific modes but conversely users may be willing to pay extra for certain elements of a journey. This can all impact on the overall generalised cost of journeys.

The assessment undertaken suggests that overall, the scheme has a moderate beneficial impact to journey quality. Improved frequencies on the Severn Beach line and local stations to Bath will help reduce the extent of overcrowding and lower traveller stress by improved ease and convenience. The analysis also suggests that there will be neutral impacts on other factors such as cleanliness, facilities, information and traveller's views.

With the introduction of passenger rail services to Pill and Portishead, there will be larger beneficial impacts such as new facilities at the railway stations, smoothness of ride, traveller views and integration into existing national railway information portals.

Based on the evidence, it is concluded in the AST that MetroWest Phase 1 will result in a **moderate beneficial impact** in respect of journey quality.

2.8.5 Highway Accidents

The highway accident assessment has been carried out using the DfT's Cost and Benefit to Accidents – Light Touch (COBA-LT) software, which compares the accidents and costs associated with them between the Do-Minimum (DM) and Do-Something (DS) scenarios, based on road network details (road type, speed limit etc.), forecasted traffic volume, accident rates and economical parameters, which monetise and discount the accidents' costs.

As foundation for extracting the forecast traffic volume for different scenarios, as well as road characteristics, the strategic transport model representing road traffic movement around the West of England Area (WoE) – GBATS4 – was utilised. Additionally, speed limit and accidents data (2012-2016) for the WoE region was processed and used as the remaining part of the COBA-LT input.

A full assessment of the likely impacts of the scheme was undertaken, and this suggests that as MetroWest is a rail scheme, with minimal changes on other parts of the network, it is likely to have a **neutral impact** on highway accidents in the West of England area.

2.8.6 Affordability

Relative affordability has been assessed by looking at the Index of Multiple Deprivation (IMD). The most recent measure of IMD across England was undertaken in 2015.

The analysis indicates that personal affordability is less of an issue in Portishead and Pill where MetroWest Phase 1 is likely to have its greatest impact. The assessment indicates personal affordability and deprivation are greater in areas where the Scheme will have the least impact.

The assessment against several factors indicates there will be beneficial affordability impacts from reduced fuel costs, shorter journeys and reduced congestion. However, this needs to be set against the additional costs of rail fares and car parking charges (if travelling to the stations by car).

Improved frequencies are expected to increase the numbers travelling by rail, but there may be some extraction from existing public transport provision which could impact on affordability. Based on the evidence, it is concluded in the AST that MetroWest Phase 1 will result in a **neutral impact** in respect of personal affordability.

2.8.7 Security

TAG unit A4.1 notes that changes brought about in the implementation of a transport scheme may affect the security of users. This is especially so in the case of public transport schemes, where guidelines exist in relation to bus and rail operations, especially at stops and stations.

The security assessment has been undertaken in accordance with WebTAG guidance and assesses how the Scheme will impact the level of security for transport users. The impacts on the security of road users, public transport passengers and freight has been assessed. For public transport passengers, guidelines for railway stations and public transport operators (DETR, 1998) raises key security issues and gives guidance on design and management practices. These are broad ranging and those relevant to the Scheme have been included in the security indicator list, which has formed the basis of the assessment.

The scheme elements have been designed to ensure that there are no adverse impacts upon the security of transport users. Overall, the provision of better lighting, footways, and route continuity will all help to reduce levels of transport related crime and affect a range of social groups across a vast geographical area. The investment in the existing transport network will help to enhance public perceptions of security.

The scheme will not alter the existing alignment of the line which is relatively straight with good sight lines and no ‘hidden’ sections for pedestrians or stopped vehicles. Although the addition of rail stations can enhance security of an area by providing formal and natural surveillance, these benefits are tempered by the reality that rail stations can also attract criminality regardless of the measures to prevent this.

Overall the analysis indicates that the scheme will have a **neutral impact** on security. The new rail stations will enhance the security of both locations by providing additional footfall, CCTV, emergency contact points and improved lighting. However, while there will be a general improvement in security of the area, rail stations can also attract crime. The scheme is therefore envisaged to have a ‘neutral’ impact on security.

2.8.8 Access to services

The area served by MetroWest Phase 1 covers much of the WoE, and improves services at 15 existing stations, as well as introducing two new stations to the rail network. The rail network provides linkages to key services and facilities across the WoE, including employment (in particular Bristol and Bath city centres, Temple Quarter Enterprise Zone and Avonmouth/Severnside), health facilities (notably the hospitals in central Bristol), education (several stations are located near schools, and

existing Severn Beach line trains are already well-used by scholars) and retail areas (Clifton Down, Portishead, central Bristol).

MetroWest Phase 1 will improve accessibility across the WoE area through generalised journey time improvements from enhanced services at existing stations. This has not been quantified or monetised, as the improvements are relatively small, widespread, and not specific to particular movements or journey opportunities. The opening of two new stations represents a more specific benefit to two communities, with more than 40,000 people in and around Portishead and Pill being brought into the catchment of the rail network.

In summary, MetroWest Phase 1 will generally enhance the public transport offer in area served, particularly around locations near existing stations, thus improving links to key services. There is a more substantial enhancement to the public transport offer in Portishead and Pill. Overall, MetroWest Phase 1 is assessed to have a slight beneficial on access to services.

More information on access to service assessments can be found in the MetroWest Phase 1 'Social Impact Appraisal Report', provided in Appendix 2.3 of the OBC.

2.8.9 Severance

Community severance is defined in TAG Unit A4.1 as the separation of residents from facilities and services they use within their community, caused by substantial changes in transport infrastructure or by changes in traffic flows. Severance will be an issue where either vehicle flows significantly impede pedestrian movement, or where infrastructure presents a physical barrier to movement.

The reinstatement of the disused railway between Portishead and Pill has potential to cause severance to existing farm operations and influence planning developments. Severance impacts should be mitigated during the construction phase, in such a way as to mitigate the effects during both construction and operational stages of the Scheme.

The improvement works proposed along the Portbury Freight Line between Pill and Parson Street Junction are associated with operational railways, so there will be no new severance. This is with the exception of the Barons Close crossing closure. However, some land will be required for emergency access to the tunnels, which includes agricultural land at Pill.

Overall the scheme has a **slight negative impact** on severance. Negative impacts are expected at the various at-grade crossing points affected by the Scheme. The negative impact is a result of increased journey times opposed to safety. It is expected that the overall safety of pedestrians and cyclists will be improved, particularly at Ashton Vale.

2.8.10 Option values

Option value is the willingness to pay to preserve the option of using a transport service, which is new or not currently used, over and above the expected value of any future use. In the context of this scheme, it is the additional benefit of a rail service being added to existing buses.

An assessment of option values has been undertaken as the scheme includes new rail stations and the reopening of a disused passenger rail line. This will change the availability of transport services in the West of England area, by adding a new mode (local rail) to the existing public transport offer, and supplementing existing bus services. Option values are particularly apposite in the appraisal of new services and infrastructure, especially if the scheme being appraised is introducing services where there were none before. In the context of MetroWest Phase 1, option values are relevant through the Portishead line's reopening introducing a new mode.

The option values calculations are based on WebTAG, with parameters drawn from Table A4.1.8 from the WebTAG databook (July 2017). Details of the monetised benefits of option values are in the Economic Assessment Report. In essence, the methodology follows the calculations based on

monetising the reopening of a local rail station, in a location with an existing bus service. Monetised option value calculations have taken into account the comparative levels of train and bus services.

Whilst recognising that the values assessment is very sensitive to the size of the population affected by the proposals, the calculations suggest that the nature of the change in service will have a **beneficial impact** on the population of the area.

2.8.11 Distributional impacts

The distributional impacts of the scheme has been assessed and is reported in the MetroWest Phase 1 Distributional Impact Assessment Report provided in Appendix 2.4 of the OBC.

2.9 Public Accounts

2.9.1 Broad transport budget

Table 2.9 shows the Public Accounts (PA) table for the MetroWest Phase 1 OBC scheme.

Table 2.9: MetroWest Phase 1 OBC Scheme, Public Accounts (PA)

Local Government Funding	**ALL MODES**	**Road**	**Rail**
Revenue	0	0	0
Operating Costs	-177	-177	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant/Subsidy Payments	94,369	0	94,369
NET IMPACT	**94,192**	**-177**	**94,369**
Central Government Funding: Transport	**ALL MODES**	**Road**	**Rail**
Revenue	-126,770	0	-126,770
Operating costs	126,221	0	126,221
Investment costs	0	0	0
Developer Contributions	0	0	0
Grant/Subsidy Payments	0	0	0
NET IMPACT	**-549**	**0**	**-549**
Central Government Funding: Non-Transport			
Indirect Tax Revenues	12,678	12,678	0
TOTALS			
Broad Transport Budget	93,643	-177	93,820
Wider Public Finances	12,678	12,678	0

Notes:

Costs appear as positive numbers, while revenues and developer contributions appear as negative numbers.

All entries are £'000s present values discounted to 2010, in 2010 prices

2.9.2 Indirect tax revenue

The additional rail journeys generated by MetroWest Phase 1 result in a reduction in tax costs associated with the commensurate reduction in the number of cars on the roads. These tax costs, both fuel duty and VAT, were estimated along with highway benefits, as described in the MetroWest Phase 1 OBC Forecasting Report and Economic Assessment Report, and are presented in the Public Accounts table in Table 2.9.

2.10 Performance of option variants

Sensitivity testing has been carried out to consider the socio-economic performance of MetroWest Phase 1 in the event that some of the key assumptions vary. Drawing on WebTAG unit M4, these are mostly based future year growth, and comprise:

- Sensitivity 1 – High demand growth – an increase growth profile assumptions;
- Sensitivity 2 – Low demand growth – decrease growth profile assumptions;
- Sensitivity 3 – Fare/demand growth cap at 10 years (instead of 20 years);
- Sensitivity 4 – Fare/demand growth cap at 30 years (instead of 20 years);
- Sensitivity 5 – Operating cost risk – include all risk elements identified by GWR; and
- Sensitivity 6 – Ashton Vale Road junction benefits included.

The high and low demand sensitivity tests include some changes to forecast models in order to assess highway related benefits. The other tests are directly related to assumptions that feed into the appraisal process.

Table 2.10 sets out summary socio-economic appraisal results for the six sensitivity tests, alongside the core MetroWest Phase 1 OBC scheme. The table indicates that the scheme BCR could drop to just under 2 if the worst-case sensitivity tests for growth and operating costs are achieved, though in all of these cases the adjusted BCRs (including wider economic impacts and option values) are still nearer to 3 than 2.

Table 2.10: Results of socio-economic appraisal – sensitivity tests

Scheme scenario		**Present Values**			**BCR**
capital costs	Benefits & BCR	**Costs (PVC)**	**Benefits (PVB)**	**Net Present Value (NPV)**	benefit/cost ratio
OBC scheme	main	93.64	238.90	145.25	2.55
	adjusted	93.64	338.40	244.76	3.61
Sensitivity 1	main	84.98	256.53	171.56	3.02
	adjusted	84.98	359.50	274.53	4.23
Sensitivity 2	main	104.11	222.06	117.95	2.13
	adjusted	104.11	310.55	206.44	2.98
Sensitivity 3	main	109.11	212.83	103.72	1.95
	adjusted	109.11	301.32	192.21	2.76
Sensitivity 4	main	81.35	265.67	184.32	3.27
	adjusted	81.35	368.64	287.29	4.53
Sensitivity 5	main	120.20	238.90	118.70	1.99
	adjusted	120.20	338.40	218.20	2.82
Sensitivity 6	main	93.64	247.69	154.05	2.65
	adjusted	93.64	347.20	253.55	3.71

Costs and benefits are £m; present values discounted to 2010, in 2010 prices

'adjusted' benefits and BCR includes monetised wider economic impacts and option values

2.11 Summary of impacts

2.11.1 Value for money statement

Table 2.11 sets out the Value for Money Statement for the MetroWest Phase 1 OBC scheme.

Table 2.11: MetroWest Phase 1 OBC Scheme, Value for Money Statement

Criteria	Description
Value for Money/Value for Money when Wider impacts are included	High/High
NPV	£145.25 million
Initial BCR	2.55
Adjusted BCR (With Wider Impacts)	3.61
Summary of the benefits and costs	• Rail transport user benefits (around 82% of the total benefits excluding wider impacts) • Highway transport user benefits (21% of total excluding benefits excluding wider impacts) • Wider Economic Impacts £74.0 million • Option Values £25.5m Operating costs are more significant than capital costs in the economic case, though not by much (56% operating cost versus 44% capital cost).
Significant non-monetised impacts	No significant non-monetised impacts. The most significant non-monetised impact is a moderate beneficial impact on journey quality. Other impacts are either slight beneficial (physical activity, access to services), slight adverse (historic environment, biodiversity, severance) or neutral.
Key risks, sensitivities and uncertainties underlying the appraisal	• Operating cost assumptions - potential scope for greater synergies with existing services to reduce staffing and maintenance costs • Rail demand forecasts, in particular future year growth in demand at new and existing stations • Future year fare assumptions
Significant social distributional impacts	Analysis indicates that scheme impacts are relatively evenly distributed across income, social and user groups. User benefit distributional impact is moderate beneficial, noise and air quality are minor adverse, other impacts are all neutral.

The assessment work presented in the economic case shows that there is a clear case for the MetroWest Phase 1 OBC scheme. The scheme demonstrates **high value for money**, largely due to the rail user benefits of the scheme. When wider impacts and option values are included, the scheme also offers **high value for money.**

2.11.2 Analysis of monetised costs and benefits (AMCB)

Table 2.12 shows the Analysis of Monetised Costs and Benefits (AMCB) Table for the MetroWest Phase 1 OBC scheme.

Table 2.12: MetroWest Phase 1 OBC Scheme, Analysis of Monetised Costs and Benefits (AMCB) [3]

Noise, air quality & greenhouse gases	6,286
Economic Efficiency: Consumer Users (Commuting)	144,444
Economic Efficiency: Consumer Users (Other)	54,398
Economic Efficiency: Business Users and Providers	46,447
Wider Public Finances (Indirect Taxation Revenues)	-12,678
Present Value of Benefits (PVB)	**238,897**

Broad Transport Budget	93,643
Present Value of Costs (PVC)	**93,643**

OVERALL IMPACTS	
Net Present Value (NPV)	**145,254**
Benefit to Cost Ratio (BCR)	**2.55**

Costs and benefits are £'000s, present values discounted to 2010, in 2010 prices

Table 2.13 shows the MetroWest Phase 1 OBC scheme AMCB Table including wider economic impacts and option values.

Table 2.13: MetroWest Phase 1 OBC Scheme, Analysis of Monetised Costs and Benefits (AMCB) [3]

Accidents, noise, air quality & greenhouse gases	6,286
Reliability	1,823
Wider Impacts	74,025
Option values	25,481
including Wider Impacts & Option Values	
PVB	338,403
PVC	93,643
NPV	244,760
BCR	**3.61**

Costs and benefits are £'000s, present values discounted to 2010, in 2010 prices

2.11.3 Appraisal summary table (AST)

The Appraisal Summary Table is set out in Table 2.14.

[3] The AMCB table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Table 2.14: MetroWest Phase 1 OBC Scheme, Appraisal Summary Table (AST)

Appraisal Summary Table

Name of scheme:	MetroWest Phase 1	**Date produced:**	20/12/2017	**Contact:**	
Description of scheme:	Infrastructure and passenger train operations to provide a half-hourly service for the Severn Beach Line (to Avonmouth, hourly to Severn Beach); half hourly service for local stations on the Bath Spa Line; and hourly service for a reopened Portishead Line (new stations at Portishead and Pill).			**Name**	James Willcock
				Organisation	North Somerset Council
				Role	Project Manager

Impacts		Summary of key impacts	Assessment: Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Journey time savings are significant in geographical areas where impacts are anticipated. This covers savings for public transport users as a result of the new stations at Portishead/Pill and frequency improvement, and for highway users as a result of decongestion in the highway network where modal shift to rail occurs. (NOTE - benefit split by journey times for highway only)	**Value of journey time changes(£)** **Net journey time changes (£)** 0 to 2min: £18,545,216; 2 to 5min: £3,736,568; > 5min: £19,227	Not required	£46,438,407	Large beneficial distributional impact
	Reliability impact on Business users	Some reduction in highway traffic will result in small changes in journey time, and quantifiable reliability benefits for all users. Rail reliability has not been modelled.	NOTE - impact is highway only and total for all users	Not required	£1,823,385	
	Regeneration	The scheme links a number of regeneration and enterprise zones, and has the potential to generate new jobs, both during construction and operational stages.	1400 jobs & £57m GVA - construction stage 500 permanent jobs & £32m GVA per annum - operational	Not required	£264,781,565	
	Wider Impacts	The scheme improves productivity of local economy through improving transport provision, bringing businesses closer to each other and to the labour market.	£68.4m agglomeration benefits, £4.6m imperfect competition and £1.0m labour supply	Not required	£74,025,119	
Environmental	Noise	The increases in noise are due to the operation of the new rail service. These are not significant increases but the change in noise is sufficient to move a band in the noise worksheet. There would be a minor adverse impact at the Trinity Primary School in Portishead. Negligible impacts are expected within the Avon Gorge Woodlands SAC and SSSI and other designated areas along the route. No dwellings are expected to be eligible under the Noise Insulation Regulations. There are predicted to be no impacts are night due to the service only being operational during the day.	Households experiencing increased daytime noise in forecast year: 523 Households experiencing reduced daytime noise in forecast year: 0 Households experiencing increased night time noise in forecast year: 0 Households experiencing reduced night time noise in forecast year: 0	Not required	-£511,257	Minor adverse distributional impact
	Air Quality	The physical works for the Project cross a short section of the Bristol Air Quality Management Area (AQMA) and during operation passenger services from the scheme would extend from Portishead to Bristol passing through the AQMA from Parson Street Junction into Bristol. Air quality monitoring data suggest that AQS objectives are being met within the Project extent in North Somerset. The Project crosses one ecological designated site (Avon Gorge Woodlands SAC and SSSI) where baseline NOx levels are close to the critical level. The Project offers an alternative travel mode that promotes a Modal shift which leads to some beneficial air quality impacts in the surrounding area. These benefits are however offset by the additional diesel locomotives on the Portishead Branch Line which are expected to lead to an increase in NOx and PM10 emissions. These changes are likely to lead to adverse impacts at receptors nearest to the rail line. The Project is not predicted to result in any exceedances of the annual mean AQS objective for traffic pollutants.	**Assessment Score:** PM10: 586.09 NO2: 8,216.57 **Emissions:** PM10: +1 tonnes NOx: +936 tonnes	Not required	**AIR QUALITY VALUATION:** Value of change in PM10 concentrations: NPV: £-0.0m Value of change in NOx emissions: NPV: £-0.5m Total value of change in air quality: £-0.5m **MAIN-SENSITIVITY:** Value of change in PM10 concentrations: NPV: £-0.0m Value of change in NOx emissions: NPV: £-9.6m Total value of	Minor adverse distributional impact
	Greenhouse gases	The Project is expected to result in decrease in vehicle kilometers travelled across the road network which has the potential to result in a decrease in CO2 emissions. However, rail emissions associated with the Project are expected to contribute to an increase in CO2 emissions.	Change in non-traded carbon over 60y (CO2e): N/A Change in traded carbon over 60y (CO2e): N/A	Not required	£250,774	
	Landscape	Area north of Avon Gorge and Avon Gorge itself: **slight adverse effect** due to vegetation clearance creating more open views of construction activities and of the railway when the DCO Scheme is in operation. Area south of Avon Gorge: **neutral/slight adverse effect** due to opening up of views in the landscape, although existing landscape already has dominant transport infrastructure features and urban land cover. Overall **slight adverse effect** due to the reasons set out above. DCO Scheme will affect areas of recognised landscape quality and will impact on certain views across the area.	N/A	Slight adverse	N/A	
	Townscape	**Neutral effect** on the townscape of the Ashton Gate/Ashton Vale area due to the fact that transport infrastructure (including the existing Portbury Freight Line) is already a dominant feature in the landscape, and many views are restricted by commercial/industrial buildings so would not change significantly with the DCO Scheme. Future trends in the area are likely to include increased development and expansion outwards into the urban/rural fringe, and increased traffic volumes, so the DCO Scheme would fit this trend.	N/A	Neutral	N/A	
	Historic Environment	The DCO Scheme is assessed to have a direct **slight adverse/neutral** effect on non-designated cultural heritage assets during the enabling works and construction through the removal of known and hitherto unknown archaeological remains along the railway corridor. The adverse effects arising from these direct impacts on this resource can be adequately mitigated through preservation by record and the significance effect of the residual impact is assessed to be neutral and not significant in regards to the EIA Regulations. The effect of the DCO Scheme on the setting of the designated cultural heritage assets along the route during construction and operation is generally neutral and not significant in regards to the EIA Regulations. This results largely from the lack of inter-visibility between the DCO Scheme and heritage assets.	N/A	Slight adverse/Neutral	N/A	
	Biodiversity	The Portishead to Pill line will have **slight adverse** effects on Field east of M5 Motorway, Lodway Wildlife Site due to loss of habitat, however this impact is considered to be negligible in magnitude due to the minor loss of habitat anticipated. **Slight adverse** effects are also considered possible on protected species such as great crested newts, other amphibian species, badgers, otter and bats through the fragmentation of habitats and disturbance and death/injury from direct collision with trains. The operational maintenance of the railway corridor may also cause **slight adverse** effects on habitats such as woodland, trees and scrub due to direct loss, as well as Japanese knotweed due to the potential of facilitating the spread of this invasive species. The impact on North Somerset and Mendips Bats SAC is **to be assessed** following further bat survey in 2018. The Freight Line section of the DCO is assessed to have a **slight adverse** effect on internationally and nationally important sites/species such as the Avon Gorge and Woodlands SAC/SSSI, Leigh Woods NNR and Ancient Woodland and the notable and the important plant species these sites support, these impacts are likely to arise through the routine maintenance and clearance of the railway corridor, however they will be mitigated through the implementation of a Site Vegetation Management Statement which will be developed in consultation with Natural England. A slight adverse effect is also anticipated on the internationally important site Bath and Bradford on Avon Bats SAC, however this assessment is ongoing due to further assessment on the use and value of the tunnels to bats. A number of Local Wildlife Sites are also predicted to have potentially **slight adverse** effects due to the Freight Line section of the scheme. These include Bower Ashton BWNS, River Avon NSWS and River Avon SNCI, effects on these sites will arise due to habitat loss. A **slight adverse** effect may also occur on protected species such as badger, otters and bats through the fragmentation of habitats, disturbance and death/injury from direct collision with trains. Habitats that may be subject to a slight adverse impact includes ephemeral/short perennials which may be effected due to the routine maintenance and clearance of the railway corridor. In addition a slight adverse effect may occur due to the potential spread of invasive plant species during this routine maintenance and clearance.	N/A	Slight adverse	N/A	
	Water Environment	The water environment is typical of the locality with watercourses mostly comprising small watercourse with primarily a drainage function (some man-made) of low to medium importance discharging directly into the tidal River (Bristol) Avon which is of Very High importance. Groundwater is of Medium to High importance on a local to regional scale. The larger watercourses - Severn Estuary, River (Bristol) Avon and Easton-in-Gordano Stream are of High quality, whereas the smaller watercourses are of medium to low quality. Most are important on a local scale, with on the River (Bristol) Avon being important at a regional scale and the Severn Estuary at a national scale due to its size and ecological designations. There will be little impact upon the water environment as the scheme involves minimal additional impermeable surfaces (mostly relating to the stations and associated car parking areas) and results in little change in water quality, with some improvement in some areas through the removal of contaminated old sleepers and renewal of ballast. As the scheme involves very little change from the existing situation the magnitude of all the impacts is considered to be negligible, except for a slight adverse impact relating to the increased flood risk to the railway line from the River (Bristol) Avon, which will worsen over time. This results in a significance score of "Insignificant" for all of the impacts, apart from two exceptions for which the significance score is "Low Significance". The first exception is the flood risk to the railway from the River (Bristol)	N/A	Neutral	N/A	
Social	Commuting and Other users	Journey time savings are significant in geographical areas where impacts are anticipated. This covers savings for public transport users as a result of the new stations at Portishead/Pill and frequency improvement, and for highway users as a result of decongestion in the highway network where modal shift to rail occurs. (NOTE - benefit split by journey times for highway only)	**Value of journey time changes(£)** **Net journey time changes (£)** 0 to 2min: £23,997,886; 2 to 5min: £3,821,405; > 5min: £37,577	Not required	£198,842,893	Evenly spread across vulnerability
	Reliability impact on Commuting and Other users	Some reduction in highway traffic will result in small changes in journey time, and quantifiable reliability benefits for all users. Rail reliability has not been modelled.	NOTE - impact is highway only and total for all users	Not required	£1,823,385	
	Physical activity	The proposed scheme accounts for cyclists, pedestrians and equestrians by delivering and planning for measures to minimise the interaction between these modes and motorised traffic (including trains). The measures provided for Non-Motorised Users (NMUs) that will be delivered as part of the scheme ensures that the opportunity to undertake trips through active modes will be enhanced. Based on the work undertaken, the assessment suggests that the scheme will have an overall slight beneficial impact on physical activity.	N/A	Slight beneficial	N/A	
	Journey quality	Improved frequencies on the Severn Beach line and local stations to Bath will help reduce the extent of overcrowding and lower traveller stress by improved ease and convenience. The analysis also suggests that there will be neutral impacts on other factors such as cleanliness, facilities, information and traveller's views. With the introduction of passenger rail services to Pill and Portishead, there will be larger beneficial impacts such as new facilities at the railway stations, smoothness of ride, traveller views and integration into existing national railway information portals. Based on the evidence, it is concluded that there will be a moderate beneficial impact.	N/A	Moderate beneficial	N/A	
	Accidents	A full assessment of the likely impacts of the scheme was undertaken, and this suggests that as MetroWest is a rail scheme, with minimal changes on other parts of the network.	A saving of 130 accidents	Not required	£5,845,450	
	Security	The new rail stations will enhance the security of both locations by providing additional footfall, CCTV, emergency contact points and improved lighting. However, while there will be a general improvement in security of the area, rail stations can also attract crime. The scheme is therefore envisaged to have a neutral impact on security.	N/A	Neutral	N/A	
	Access to services	MetroWest Phase 1 will generally enhance the public transport offer in area served, thus improving links to key services. There is a more substantial enhancement to the public transport offer in Portishead and Pill. Overall, MetroWest Phase 1 is assessed to have a slight beneficial on access to services.	N/A	Slight beneficial	N/A	Evenly spread across vulnerability
	Affordability	The assessment indicates there will be beneficial affordability impacts from reduced fuel costs, shorter journeys and reduced congestion. However, this needs to be set against the additional costs of rail fares and car parking charges (if travelling to the stations by car).Improved frequencies are expected to increase the numbers travelling by rail, but there may be some extraction from existing public transport provision which could impact on affordability. Based on the evidence, it is concluded that MetroWest Phase 1 will result in a neutral impact.	N/A	Neutral	N/A	
	Severance	Negative impacts are expected at the various at-grade crossing points affected by the Scheme. The negative impact is a result of increased journey times opposed to safety. It is expected that the overall safety of pedestrians and cyclists will be improved, particularly at Ashton Vale.Overall the scheme has a slight adverse impact on severance.	N/A	Slight adverse	N/A	
	Option and non-use values	The scheme will add a rail option to a public transport offer that currently only includes bus, and a bus service that is adversely affected by traffic congestion	26,235 population within 2km of new rail station	Not required	£25,480,590	
Public Accounts	Cost to Broad Transport Budget	Public sector costs associated with investments for scheme implementation and ongoing support/maintenance, such as capital investment, operating costs and revenue income.	N/A	Not required	£93,642,672	
	Indirect Tax Revenues	The impact on tax and fuel duty loss as a result of reduction in fuel consumption.	N/A	Not required	-£12,677,961	

MetroWest

METROWEST PHASE 1
OUTLINE BUSINESS CASE

Chapter 3 Management Case

December 2017

travelwest

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

Section Page

Chapter 3: Management Case

Contents Page

Tables

Figures

Section Page

Appendices

Management Case

3.1 Introduction

This section sets out how the West of England authorities propose to deliver MetroWest Phase 1. It explains:

- The **capability and capacity** of the four authorities to deliver the scheme, drawing on evidence from other similar projects
- How plans for MetroWest Phase 1 take account of **dependencies** on other projects, decisions and deliverables
- Arrangements for project **governance**, including organisational structure and allocation of roles and decision-making powers
- The project **programme**, which has been carefully planned to ensure that it is realistic and deliverable
- The process being used to ensure that all the necessary **assurance and approvals** are obtained in a timely and efficient manner, and associated **reporting**
- The strategy for effective communication and **stakeholder management**
- The strategy and approach adopted to ensure effective **risk management**
- MetroWest is an exciting and ambitious project which will transform rail services across Bristol. The four authorities, as joint promoters of the scheme, are confident that they have the resource, capability and systems required to deliver this project successfully, to time and on budget.
- The authorities have a track record of delivering major transport schemes, and will draw on this experience for this project. They have already developed strong working relationships with external stakeholders, notably Network Rail, who can help make this project a success.

3.2 Outline Engineering Design AIP

The scheme requirements from GRIP 3 and outline Highways Design are set out below. The GRIP 3 Approval in Principle (AIP) engineering design details the outline design (option selection) for the scheme. The work undertaken at GRIP3 provides the technical information to support the option selection for re-opening the Portishead line for an hourly or hourly plus passenger service and for an enhanced (half hourly service) for the Severn Beach and Bath to Bristol lines. This has included network capability analysis (RAILSYS train path modelling) of the three lines which has informed the infrastructure requirements for the outline engineering design. The capability analysis has paid due cognisance to maintaining the existing freight path commercial rights.

Over 300 deliverables have been produced for GRIP 3 AIP by Network Rail and ARUP. This includes a GRIP 3 Option Selection Report, Construction Strategy, Ancillary Civils Drawings, Structures Assessments, Geo-Technical Assessment, Track Drainage Report, and Earthworks Reports. Attached in Appendix 3.1 is the full list of reports that had been produced. A number of engineering drawings have also been produced by CH2M showing highway and permanent compound designs. Interdisicplinary Review meetings took place throughout GRIP 3 both internally within Network Rail across their eight engineering disaplines and externally with CH2M to ensure technical interface between the Highways Design and Railway Design.

3.2.1 The Infrastructure required for the MetroWest Phase 1 Scheme

Table 3.1 Summary of Scheme Infrastructure Works

Description	Development Consent	Rail Corridor
5.45km of new permanent way and civil engineering works to the railway from Portishead to Pill, of which 4.7km is reconstruction of dis-used railway and 0.75km is new track through Pill village parallel to the operational railway and extinguishment of accommodation crossings	DCO	Portishead Line
Portishead station including platform, station building, forecourt, car parks and highway alterations	DCO	Portishead Line
A fully accessible footbridge linking to Trinity Primary School	DCO	Portishead Line
Three permanent maintenance compounds, various highway access points for the railway and temporary and permanent traffic regulation orders	DCO	Portishead Line
Minor alterations to the bridleway / National Cycle Network route 26 between Portbury and Pill including an extension north of the M5 underbridge to connect with Pill village	DCO	Portishead Line
Replacing the existing rail bridge over the Avon Road / Lodway Close pedestrian and cycle underpass in Pill with a wider bridge to support a new double track section of railway, and embankment works	DCO	Portishead Line
Pill station on the site of the existing disused southern platform, with new access ramp, passenger shelter, forecourt and car park located on Monmouth Road	DCO	Portishead Line
Double tracking works through Pill with a new railway Junction (Pill	DCO	Portishead

Junction) east of Pill Viaduct		Line
Temporary diversion of National Cycle Network Route 26 between Marsh Lane and Pill, and Route 41 between Pill and Avonmouth during construction	DCO	Portishead Line
Minor works within the Avon Gorge to upgrade the Portbury freight line for passenger services including	DCO	Portishead Line
Replacement of sections of track, sleepers, and ballast; minor works to bridges and structures; and minor	DCO	Portishead Line
Minor modifications to the vertical and horizontal alignment of the railway (Portbury freight line)	DCO	Portishead Line
New signalling and lineside equipment; and new telecommunications including a GSMR (radio communications) mast in Avon Gorge, with repeater aerials at Pill Tunnel and Portishead station	DCO	Portishead Line
Ashton Junction (Ashton Vale Road) highway level crossing will remain operational. The level crossing equipment may be replaced. No alterations will be undertaken to the level crossing itself. To reduce the highway impacts of increased use of the crossing, the left hand lane on Winterstoke Road will be extended, traffic signals optimised, and a ramp constructed to the north of the level crossing to connect pedestrians and cyclists from Ashton Vale Road to Ashton Road	DCO	Portishead Line
Ashton Containers (Barons Close) pedestrian crossing will be closed permanently, with the public right of way diverted north using a new path under construction by the MetroBus Project. This will connect to a new pedestrian and cycle ramp parallel to the railway linking Ashton Vale Road to Ashton Road	DCO	Portishead Line
Landscaping, fencing and environmental mitigation works.	DCO	Portishead Line
Liberty Lane Freight Depot – a buffer stop and trap points are required at the depot entrance	Permitted Development Rights	Portishead Line
Parson Street Junction – partial junction renewal and upgrade of some signalling equipment	Permitted Development Rights	Portishead Line
Parson Street Station – minor platform and drainage works are required to bring platform 3 back into use	Permitted Development Rights	Portishead Line
Bedminster Down Relief Line – works will include the construction of a new crossover (turnout), renewal of approximately 1 km of track on the Down Carriage Line and associated signalling to enable the regulation of freight trains before entering the branch line	Permitted Development Rights	Portishead Line

Avonmouth and Severn Beach signalling – minor signalling works are required to enable a longer layover period for passenger trains at Avonmouth and Severn Beach stations	Permitted Development Rights	Severn Beach Line
Bathampton Turnback – a new crossover between the existing Up line to London and the Down line to Bristol allowing trains terminating at Bath Spa (from Bristol) to reverse at Bathampton	Permitted Development Rights	Bath Spa to Bristol Line

Note: DCO – Development Consent Order

3.2.2 Accessibility

Both Portishead and Pill Station have been designed to the Design Standards for Accessible Railway Stations (March, 2015), which set out the standards Network Rail and train operating companies (TOCs) must comply with. Appendix 3.2 is a summary of sloped ramp / path measurements and features.

A draft Equality Impact Assement (EqIA) has been produced for the Scheme. As part of the Stage 2, Section 42 consultation EqIA organisations, those with protected characteristics e.g schools, the local councils equalities officers and the general public have been engaged / consulted with on the EqIA and scheme. Their feedback will feed into the final EqIA to be submitted with the Development Consent Order (DCO). The draft EqIA is appended at 3.3. A Network Rail Diversity Impact Assessment will be undertaken for Portishead Station, Pill Station, Trinity School Footbridge and the Ashton Vale Road ramp being constructed for the Scheme.

3.2.3 Conclusion

In conclusion the GRIP3 Approval in Principle (AIP) design and highways design has resulted in extensive deliverables that set out in detail what is required to construct and deliver the scheme. The GRIP 3 Option Selection Report sets out the technal options condsidered leading into the single option taken to AIP design. GRIP Stage 4 (Detailed Option Development) is due to begin in February 2018 and be completed by September 2018.

3.3 Evidence of Similar Projects

The West of England authorities, both individually and collectively, have a proven track record of delivering major transport infrastructure including:

- Weston Package
- Cycling City
- Greater Bristol Bus Network (GBBN)
- Local Sustainable Transport Fund (LSTF)
- Bath Package

These projects were complex and demanding and required new ways of working across the authorities and with stakeholders.

Through the Cycling City project, Bristol and South Gloucestershire Councils have delivered £11.4 million of government funding, along with £13.9 million of locally matched investment, on time and on budget. This delivery has included 102.5 miles of cycle paths and routes, either upgraded, improved or built from scratch as part of 35 different infrastructure projects.

GBBN was a £70 million project and included new bus priority measures, improved shelters, real-time information and new buses.

Weston Package was a £15million scheme to improve traffic flows around Weston-super-Mare and reduce congestion at junction 21 of the M5. As a 'package' it included, improvements to a motorway junction, duelling of a carriageway, new car park, new bus interchange and bus priority lanes. The package was delivered ahead of programme and under budget. A Ministerial launch took place in February 2014. Weston Package has provided benefits such as large reductions in congestion and queuing at Junction 21 of the M5 and across the town.

Worle Station Bus Interchange and Carpark

LSTF – WEST. The scheme included cycling and walking infrastructure improvements, public consultation, marketing of sustainable transport and engagement with businesses.

Bath Transportation Package – The scheme was completed in 2015 it included increasing Park and Ride capacity and improving waiting facilities at Bath's 3 Park and Ride sites, bus route improvements, improving transport flows and creating better pedestrian areas.

The West of England authorities are currently managing around £300 million worth of major schemes. Recent schemes relevant to the MetroWest Phase 1 scheme are:

MetroBus - South Bristol Link (SBL)- The scheme is 4.5km of new carriageway and bus infrastructure with parallel cycle and pedestrian infrastructure, including significant new roundabouts on the A370 and A38 and a new road bridge under a mainline railway. The total scheme cost was £43.3m with a

South Bristol Link

64% contribution from DfT (Major Schemes). The scheme has been delivered on time and on budget. A Ministerial opening took place in January 2017. SBL won at the CIHT Southwest Regional Awards 2017, Transport Project of the Year.

MetroBus -Ashton Vale to Temple Meads and North Fringe to Hengrove Package schemes. Both of these schemes are nearing the end of construction. The first MetroBus services will start operating in early 2018 from Long Ashton Park & Ride to Bristol Temple Meads and the city centre. A second phase of MetroBus services will launch later in 2018.

MetroBus Ashton Vale to Temple Meads

In summary, the West of England authorities have considerable experience of:

- Delivering major transport schemes on time and on budget
- Successfully obtaining consents for major infrastructure schemes
- Developing and maintaining good working relationship with key partners and stakeholders
- Internal resourcing and governance requirements for major schemes

The authorities have considerable internal knowledge, experience and capability of major transport schemes to bring the MetroWest Phase 1 project, combined with established working arrangements with its term transport consultant, CH2M Hill.

North Somerset Council is delivering the North/South Link Road, Locking Parklands – This link from the A371 to A370 West Wick Roundabout through Locking Parklands is a key part of the access strategy for the Weston Villages and will provide access to the development from either side. Planning work has progressed during 2017 and construction is expected to start in 2018/19 and is likely to last approximately 18 months

In particular North Somerset Council has a proven track record of successful major project delivery including South Bristol Link and Weston Package, which the authority lead the delivery of. Delivering projects on time and budget is core to North Somerset's success and ensuring that benefits are secured to it's communities as swiftly as possible; strong and robust governance and project / financial management; robust communication plans recognising the demands of the local communities whilst ensuring delivery is streamlined and managed effectively during construction.

3.4 Project 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 3.2. The MetroWest Phase 1 scheme programme takes account of all these dependencies. Table 3.3 sets out a number of rail schemes which MetroWest Phase 1 has an interface with but in not dependent upon.

Table 3.2 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 3.3

Table 3.3 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.

In addition to the changes to the rail network, the following committed schemes will deliver improvements to the local transport networks (highway, bus, cycle and pedestrian networks):

- MetroBus - Ashton Vale to Temple Meads, 2018
- MetroBus - South Bristol link scheme (Complete, 2017)
- MetroBus - North Fringe to Hengrove Package, 2018
- Temple Gate- Highway, Public Transport, Pedestrian/ Cycle and Public Realm improvements, 2018

3.5 Governance, Organisation Structure and Roles

MetroWest Phase 1 is one of a series of individual rail projects currently being developed as part of a broader programme of rail works by the West of England authorities. Therefore, governance arrangements are in place at both programme and project level.

3.5.1 Working With The Rail Industry

The success of the MetroWest Phase 1 scheme is dependent on successful relationships between the West of England authorities and the rail industry. The substantive current GRIP 3 workstream has involved high level technical interaction, particularly with Network Rail and the TOCs, advancing established relationships and broadening collective understanding and intelligence. Key relationships have and continue to be developed with:

- DfT Rail
- Various teams at Network Rail
- Train operating companies
- Freight operating companies

This experience has influenced the development of the project governance arrangements. Working relationships with the rail industry have been embedded into the governance arrangements, and are not simply a 'bolt on' to a local authority structure (further details are provided in Figure 3.1 and 3.2.)

The Authorities commissioned Network Rail to undertaken GRIP 3 & 4 via Development Services Agreement. For GRIP 5 -8 an Implementation Agreement will be required and early discussions on that agreement have already commenced. Furthermore the Authorities have commissioned technical support and advise from Great Western Railways (the incumbent train operator) via a Development Agreement. Further details about the commercial arrangements are set out in chapter 4 the Commercial Case.

The approach developed for the GRIP 3 workstream commenced with regular meetings, between the MetroWest Phase 1 Project Team and the NR Project Development Manager and Project Sponsor, during the scoping and authorisation process. As the GRIP 3 work stream was mobilised, the technical interface between the MetroWest project team (including the land, legal, environmental and highways consultants) and the Network Rail project team evolved, resulting in a genuinely collaborative Joint Project Team. Issues, problems, risks and constraints were shared and tackled through a combination of workshops, technical analysis and structured meetings. Such as the monthly Project Delivery Group meetings when the whole of the MetroWest Project team and Network Rail meet.

This joined up and integrated approach has not only resulted in better technical understanding for the scheme promoter, but has also advanced relationships and working processes between all parties. The positive working relations developed during GRIP 3 are reflected in the comprehensiveness of the GRIP 3 deliverables produced for the scheme.

3.5.2 Programme Level Governance

The West of England (WoE) Joint Committee brings together the Leaders/Mayors of Bath and North East Somerset, Bristol, North Somerset and South Gloucestershire Councils and the West of England Combined Authority. The LEP Board chair is a participant at this committee. This Committee replaces the previous Joint Transport Board that functioned before the West of England Combined Authority (WECA) was formed.

The WoE Joint Committee decides on the allocation of all Local Growth Fund funding and oversees the delivery of prioritised schemes. It receives and considers high-level quarterly reports and exception reports, via the Rail Programme Board (RPB) and Programme Assurance Board (PAB). The WoE Joint Committee is the ultimate decision-making body for changes escalated through the governance structure. The WoE Infrastructure Advisory Board provides strategic guidance and advice to the WoE Joint Committee.

The Programme Assurance Board (PAB) provides high-level challenge and independent assessment. It receives high-level reports on all rail schemes across the West of England. The PAB has a particular emphasis of overseeing the programme budget. The PAB is responsible for:

- Ensuring programme priorities are met and cross-scheme actions are delivered
- Providing critical review, monitoring of progress and performance, and oversight of joint actions
- Overseeing the integrated programme plan and Benefits Realisation Plan
- Ensuring strategic programme-level risks are effectively managed
- Overseeing strategic relationships with the Local Enterprise Partnership (LEP) and other key stakeholders
- Reporting high-level progress to the LEP

A Programme Senior Responsible Owner (SRO) is responsible for ensuring that the Rail Programme's objectives are met. The Programme SRO, Colin Medus, represents the West of England and is accountable to the PAB and WoE Joint Committee.

The responsibilities of the Programme SRO include:

- Stakeholder engagement in the identification of the vision, objectives, options and policies for rail.
- Ensuring the appropriate programme and project management and governance structures and milestones are in place for each of the individual projects. The Programme SRO is accountable for overall programme management.
- Problem resolution and referral from the Rail Programme Board and Project SROs. The Programme SRO is empowered by the Rail Programme Board to make decisions and approve changes and to seek authorisation from the Rail Programme Board, PAB or the WoE Joint Committee., if required.
- Monitoring and evaluating project progress and final assessment of outcomes.
- Providing guidance and direction to the individual projects' managers.

The SRO is supported by the Rail Programme Co-Ordinator, James White. The Rail Programme Co-Ordinator will:

- Provide the West of England level overview for the Rail Programme
- Ensure coordination between projects
- Support the Programme SRO
- Report updates to the Rail Programme Board
- Set up and manage the high-level steering group
- Organise and support Rail Programme board meetings

- Manage communications and stakeholder involvement
- Manage programme correspondence
- Monitor budgets for the individual projects
- Manage the programme risk register
- Provide quality assurance for the individual projects
- Organise, support and chair Core Project Team meetings

The programme organogram is shown in Figure 3.1

3.5.3 Project Level Governance

The overall rail programme is made up of a number of projects including MetroWest Phase 1. A Rail Programme Board directs, steers and oversees the direction of each project. The Rail Programme Board authorises project plans to be delivered by the project managers and authorise strategic decisions, or seeks authority for key strategic decisions from the Rail Programme Board, Programme Assurance Board or WoE Joint Committee.

Rail Programme Board meetings are linked to key milestones (at least quarterly). The board considers highlight and exception reports, changes to the project risk log and other key deliverables as defined in the project plan. It consists of authority officers with responsibility for transport who are able to act for their organisation, within the thresholds defined in the project initiation document.

The Rail Programme Board nominates an SRO who acts as the lead for individual projects representing the authorities and the Rail Programme Board. The SRO for MetroWest Phase 1 is Colin Medus from North Somerset Council. His role is to:

- Report to and receive feedback from the Rail Programme Board
- Ensure the appropriate resources, project management and technical expertise are in place for the project.
- Liaise with nominated senior officers from neighbouring authorities
- Make decisions and approve changes within agreed tolerances or seek authorisation from the board, or the WoE Joint Committee., if required
- Monitor and evaluate project progress against milestones and assess outcomes
- Provide guidance, support and direction to the project manager and project team

The MetroWest Phase 1 Project Manager, James Willcock, is also employed by North Somerset Council. His role is to:

- Lead and coordinate the project team and its work-streams
- Procure consultants and contractors
- Prepare and report project budgets
- Manage project risks and issues
- Report to and receive feedback from the SRO
- Produce periodic progress reports for the, WoE Joint Committee., Scrutiny Committee, Audit Committee, directors, the Department for Transport (DfT) and the Local Enterprise Partnership

The project team (see Figure 3.2) includes nominated representatives from the authorities, West of England office, Network Rail, the train operating companies and technical advisors from the framework consultant (CH2M Hill).

The project team is the point of contact for information and liaison with colleagues within each particular organisation. Members are responsible for communications about the project within their organisations. It is also a source of experience and expertise and connection to expertise within their organisations.

The following organisations, consultants and contractors are assisting with delivery of the project:

- Network Rail (modelling and appraisal, GRIP, procurement, delivery)
- Arup (railway design)
- Incumbent operator First Great Western (operational advice)
- CH2M Hill (modelling and appraisal, environmental assessment, highways design, technical support.)
- Womble Bond Dickinson (legal advisors and Specialist Planning/Development Consent Order team)
- Ardent (land agents)
- Mott McDonald (independent cost reviewers)

Figure 3.1 MetroWest Programme Organogram

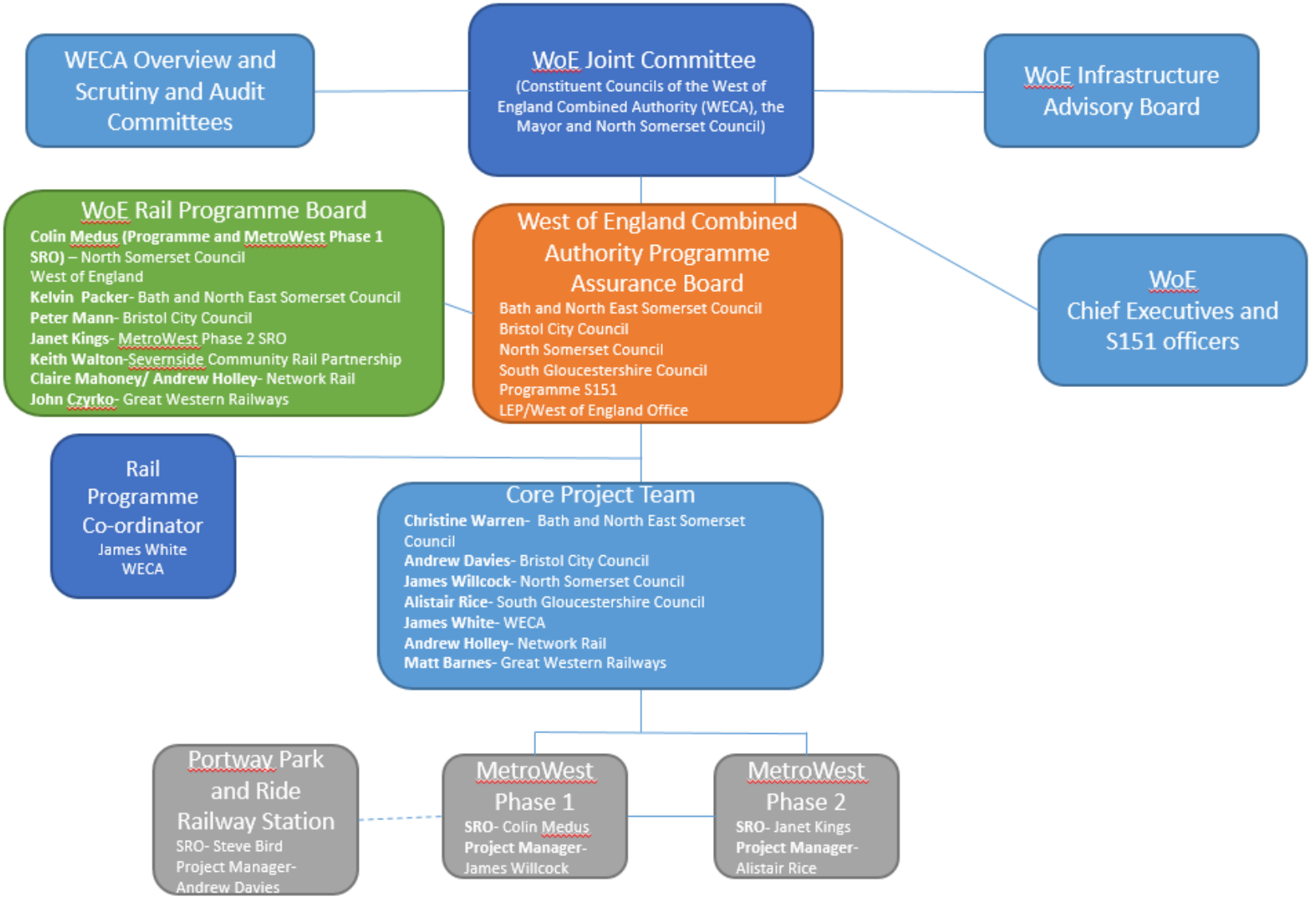
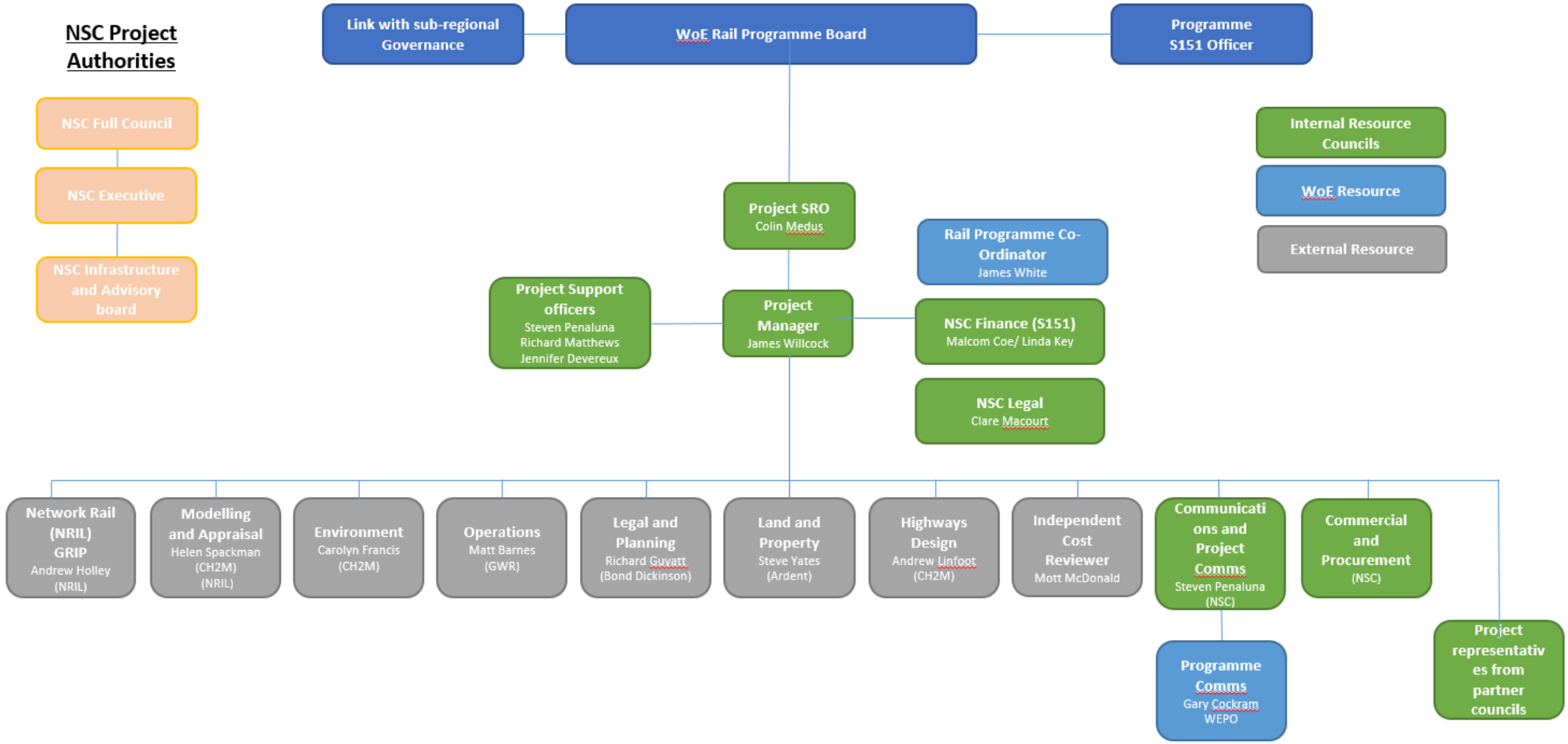


Figure 3.2 MetroWest Project Organogram



3.6 Programme/ Project Plan

Key to the organisation of the MetroWest Phase 1 project is the overarching programme/project plan. This shows activities, durations, deadlines and critical paths for all activities up to completion of works.

The key stages of the project are set out below, followed by a programme of the major milestones to be achieved. In Summary the project completed GRIP Stage 3 in December 2017. GRIP Stage 4 is due to begin in February 2018 and be completed by September 2018. GRIP Stage 5 will then begin in early 2019 and be completed in February 2020. GRIP Stage 6 will commence in May 2020 following DCO consent, Habitats Regulation Assessment approval and obtaining relevant environmental licences.

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 3.4.

Table 3.4 Project Timetable

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 Train services commencing December 2021, with the possibility of the Severn Beach Line & Bath Spa train service commencing at an earlier stage

Table 3.5 Project Milestones

Major Milestone	**Timescale**
Complete Outline Business Case	Dec 2017
DfT announce funding allocations	April /May 2018*
Submit DCO application	June/July 2018
Complete GRIP4	Sept 2018
DCO examination start	Oct 2018
DCO examination finish	Mar/April 2019
DCO Decision by Secretary of State	Nov/Dec 2019
Habitats Regulation Assessment approval	Feb 2020
Complete GRIP 5 including construction final cost	Feb 2020
Full Business Case Approval	Feb/Mar 2020
Award of construction contract	April 2020
Discharge planning conditions (DCO Requirements)	May 2020
Start of construction works GRIP6 including highway works	May 2020
Complete all construction works	Oct 2021
Commissioning & Testing	Nov 2021
Start of Train Services	**Dec 2021**

* 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.

Key tasks on the critical path include:

- Submission of the DCO
- Completion of GRIP 4 design work
- DCO hearing
- Completion of key dependent projects
- GRIP 5 detailed design and procurement of rail contractor
- Completion of enabling works
- Completion of Full business case

The full scheme programme is shown in appendix 3.4.

3.6.1 Completed Project Stages

Stage1- Feasibility

Stage 1 essentially comprised of strategic deliverables, GRIP 1-2 deliverables, highway deliverables together with the Preliminary Business Case deliverables.

Stage 2 – Option Selection

This Outline Business Case confirms the conclusions of the scheme from stage 2 – Option Selection. Stage 2 essentially comprised of strategic deliverables, GRIP 3 deliverables, highway deliverables, the Preliminary Environmental Information Report, the DCO red line boundary together with the Outline Business Case deliverables.

The Railway deliverables include:

- Portishead Station Options Appraisal (Appendix 3.5)
- The GRIP 3- deliverables include (see Appendix 3.1 for full list)
    - GRIP 3 Option Selection Report
    - Earthworks Approval in Principle's (AIP's)
    - Ancillary Civils AIP's
    - Structure's AIP's
    - Station Design AIP's
    - Track Design AIP's
    - Signalling AIP
    - Construction Strategy
    - Qualitative Cost Risk Assessment
    - Capacity Analysis (Railsys) Report
    - Environmental Assessment

The Highway deliverables include (These can be found at **website** www.metrowestphase1.org)

- Engineering Design Drawings for Portishead station/ Quays Avenue, Pill Station, Winterstoke Road, Ashton Vale Road pedestrian ramp, Compound plans, works to NCN 26 under Royal Portbury Dock Road bridge, Marsh Lane bridge and the M5 railway underbridge, Extension of the Bridlway at the M5 Avonmouth Bridge and other scheme related highway works.

Other strategic deliverables for the whole scheme include (These can be found at **website** www.metrowestphase1.org.)

- The Preliminary Environmental Information Report (essentially the draft Environmental Statement)
- DCO Red Line Boundary and land plans
- Book of Reference
- Public Rights of Way diversion plans
- Draft permanent and temporary Traffic Regulation Order plans
- Formal Section 42 (DCO) documentation and plans

3.7 Assurance, Approvals Plan and Reporting

This project is working within a number of wider processes which have their own assurance and approvals processes, as summarised in Figure 3.3

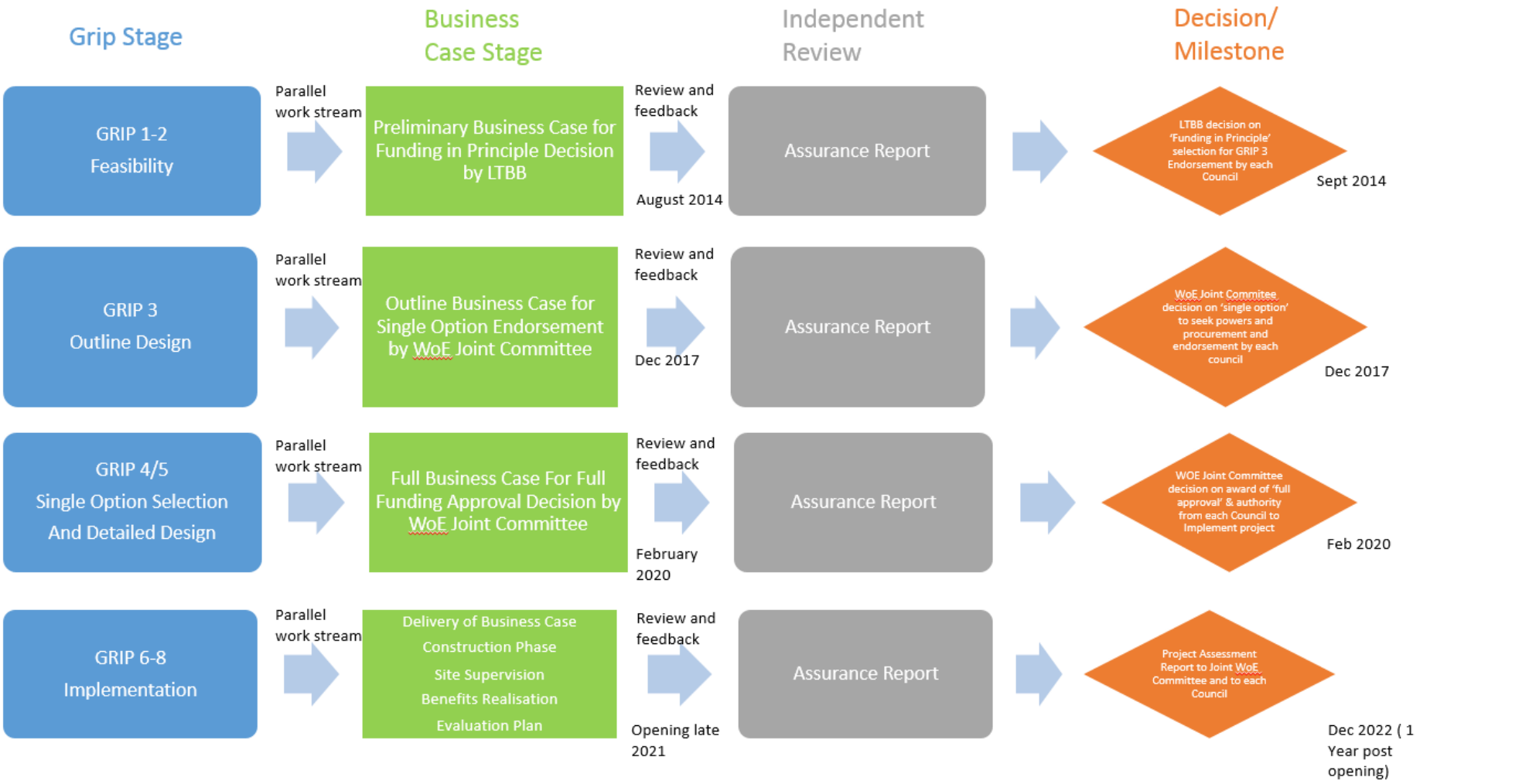
Internal and rail industry processes include:

- The West of England Joint Committee Assurance Framework - providing an independent review of the business case including the economic case and value for money
- Network Rail's GRIP process – providing technical rail operational and engineering assurance
- Project management assurance and approvals
- Independent cost reviewer- they will provide review and challenge of the scheme costs including engineering design, construction methodology, project management, industry fees and approaches to risk and inflation. Mott MacDonald were appointed based on their considerable experience undertaking similar work in the rail industry including major projects with Transport for London and Cambridgeshire County Council.

External statutory processes:

- The DCO process - providing planning consents and consultation assurance
- Other consents- Habitats Regulation Assessment, General Permitted Development prior approval, Environmental Consents including Environment Agency and Natural England Licences

Figure 3.3 Interfaces of assurance processes



3.7.1 WoE Joint Committee Assurance Framework/DfT Business Case Process

The four authorities are working in accordance with the principles of the LEP Assurance Framework (October 2017) which sets out how schemes funded through the Local Growth Fund are identified, developed and approved. This requires schemes to go through the following approvals' process:

- Initial priority status. MetroWest Phase 1 was approved by the Joint Transport Board (the forerunner of the WoE Joint Committee) as the priority scheme for the devolved funding allocation at its meeting on 14 June 2013.
- Preliminary Business Case – this was approved at the JTB in 2014.
- Outline business case sufficient to support statutory processes.
- Final approval to secure release of funds supported by a full business case.

This process incorporates as series of processes and procedures for quality assurance, approvals and reporting as shown in Figure 3.4.

Figure 3.4 DFT Business Case Process

In line with guidance for transport schemes <£5m, at each stage of the business case process, the WoE Joint committee will require an independent review of documentation. Business Cases will be developed in accordance with DfT's WebTAG.

3.7.2 The GRIP Process

The MetroWest Phase 1 project is being undertaken in accordance with Network Rail's Governance for Rail Investment Projects (GRIP) process with its built-in process of checking and assurance, including sign-offs and gateway reviews. The GRIP process is based on best practice within industries that undertake major infrastructure projects and practice recommended by the major professional bodies.

These include the Office of Government Commerce (OGC), the Association of Project Management (APM) and the Chartered Institute of Building (CIOB). GRIP divides a project into eight distinct stages. The overall approach is product rather than process driven and, within each stage, an agreed set of products are delivered:

GRIP 1. Output definition

GRIP 2. Feasibility

GRIP 3. Option selection

GRIP 4. Single option development

GRIP 5. Detailed design

GRIP 6. Construction test and commission

GRIP 7. Scheme hand back

GRIP 8. Project close-out

Formal stage gate reviews are held at varying points within the GRIP lifecycle. The stage gate review process examines a project at critical stages in its lifecycle to provide assurance that it can successfully progress to the next stage.

The various stages of the GRIP process are aligned with development of the business case, see Figure 3.3. This figure also shows key decision points, aligned with the WoE Joint committee process of review and approval.

GRIP 3 (Option Selection) has been completed with GRIP Stage 4 (Detailed Option Development) due to begin in February 2018 and be completed by September 2018.

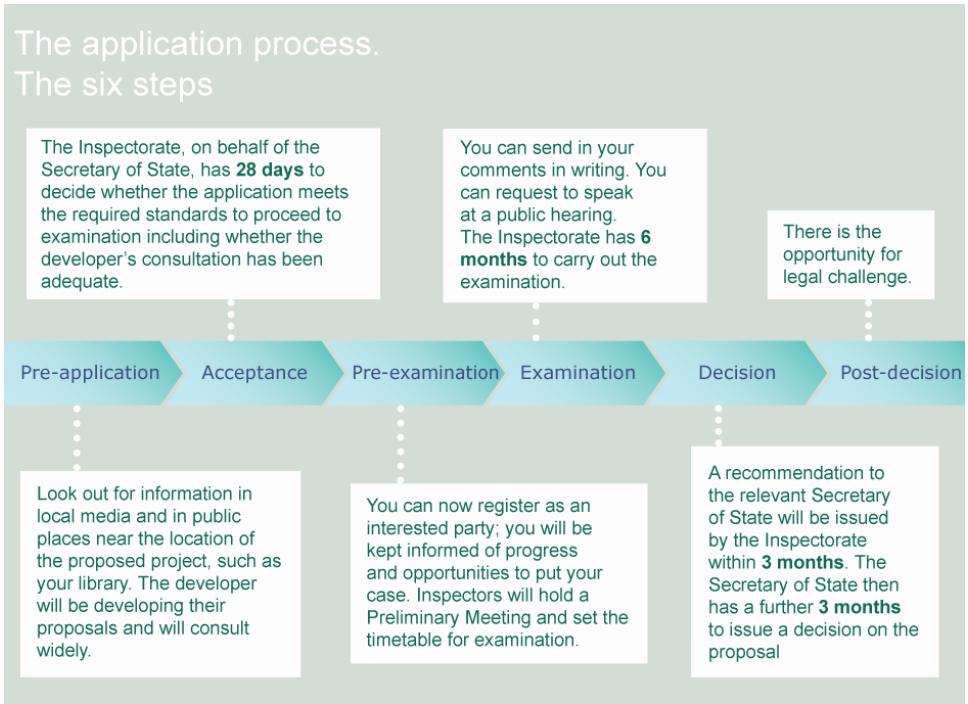
3.7.3 The Development Consent Order Process

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 government has delegated responsibility for overseeing the DCO process to the Planning Inspectorate (PINS). The DCO process is a six-stage process entailing:

- Pre-application
- Acceptance
- Pre-examination
- Examination
- Decision
- Post-decision

An integral part of the process is the engagement of public and stakeholders throughout the process, as illustrated in Figure 3.5. More information undertaken on the consultation required for the DCO can be found in section 3.8.

Figure 3.5 DCO Application Process



3.7.4 The Habitats Regulations Assessment (HRA) Process

A HRA will be submitted with the DCO application to assess the likely impacts of the project on European Sites. 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. The HRA is process is determined by Natural England. It is anticipated that the Avon Gorge Woodlands SAC and the North Somerset and Mendip Bat SAC will require to go Stage 2 of the HRA process (Appropriate assessment). The HRA process is set out below in figure 3.6.

Figure 3.6 HRA Stages

Stage 1:	Screening	The process to identify the likely impacts of a project upon a European site, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.
Stage 2:	Appropriate assessment	The consideration of the impacts on the integrity of the European site[10], either alone on in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects then development consent can only be given if stages 3 and 4 are followed.
Stage 3:	Assessment of alternative solutions	Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on European sites.
Stage 4:	IROPI	This is the assessment where no alternative solution exists and where adverse impacts remain. The process to assess whether the development is necessary for IROPI and, if so, the potential compensatory measures needed to maintain the overall coherence of the site or integrity of the European site network.

3.7.5 Project/ Programme Level Approvals and Assurance

At the project level, quality assurance is the responsibility of the SRO. Quality assurance will be managed through the following processes:

- Peer group reviews and benchmarking - the purpose of the group is to provide an internal 'challenge' role to support the Rail Programme Board when considering highlight and exception reports from the project manager. The group will not undertake any audits or reviews at this level but rather raise formal issues via the nominated Rail Programme Board member if concerns are identified.
- Independent Cost Reviewer- Independent cost reviewer- they will provide review and challenge of the scheme costs including engineering design, construction methodology, project management, industry fees and approaches to risk and inflation. The findings will be reported to the Project Manager and SRO.
- External quality reviews, where appropriate - including those required by the GRIP process will be undertaken at the relevant points in the programme throughout its duration. The approval for such a review will include a detailed proposal for: the reasons (linked to issues/risks, peer review reports or change controls); scope; timescale; and budgetary

requirements for the review. All quality reviews will include the following minimum requirements:

- Establishing a review team
- Agreed scope and timescale
- Agreed list of documentation for the Programme SRO to provide in advance
- Formal report following conclusion of the review with, if necessary, an exception report for the Rail Programme Board to consider.

- At the programme level, quality assurance is the responsibility of the Programme Assurance Board. The PAB provide high level challenge and independent assessment to the Rail Programme Board and Project SROs, with particular emphasis of overseeing the programme budget. Notwithstanding the ultimate political decision making process provided by the WoE Joint Committee, the chair of the PAB will have overall accountability for the delivery of the programme.

3.7.6 Reporting

The process for reporting is closely aligned with the process for approvals and assurances.

The levels of reporting required are:

- Reporting to the Rail Programme Board and WoE Joint Committee , the business case deliverables including:
- Preliminary business case
- Outline business case
- Full business case
- Regular highlight reports

Each business case stage will report the relevant technical stage the project has reached in respect of project design, GRIP, powers and consents, and procurement.

Reporting to the Rail Programme Board and West of England Joint Committee progress and sign off of Network Rail, GRIP stages:

- GRIP 1-2 Output definition/feasibility
- GRIP 3 Option selection
- GRIP 4 Single option development
- GRIP 5 Detailed design
- GRIP products developed and reported through the process include:
  - Estimating management
  - Risk and value management

- Stakeholder management plan
- Stage gate checklist
- Consents and approvals
- Environmental management
- Project management plan
- Project requirements' specification
- Health and safety management
- Contracts and procurement
- Safety verification process
- Change management
- Delivering work within possessions

Reporting to the Rail Programme Board and WoE Joint Committee progress and status related to the DCO process including:

- Application form
- Plans/drawings/sections
- Draft development consent order
- Compulsory acquisition information (including 'statement of reasons', 'red line', 'funding statement' and 'book of reference')
- Consultation report
- Environmental impact assessment
- Transport assessment (and supporting modelling information)
- Flood risk assessment report
- Environmental protection information
- Details of other consents and licences
- Reporting to the Rail Programme Board and the WoE Joint Committee the overall management of the project/programme.
- Highlights reports
- Exception reporting
- Project risk register
- Issue log

3.8 Communications and Stakeholders

3.8.1 Engagement to Date

The MetroWest Phase 1 scheme has been included in sub-regional and local transport policy for many years. Therefore it has been subject to a series of strategic engagements and consultations including:

1. West of England Joint Transport Study (JTS) and Joint Spatial Plan (JSP) consultation
2. Local authority planning including Core Strategies; Local Plans; Sites and Policies Plans; Supplementary Planning documents; and Neighbourhood Development Plans
3. Joint Local Transport Plan 3 (JLTP3) consultation
4. Strategic Economic Plan (SEP) consultation
5. West of England Multi-Area Agreement, Local Economic Assessment, LEP Business Plan
6. MetroWest Stakeholder meetings (including engagement with rail interest groups)

Each of these have been reported to or approved through the appropriate governance channels, including:

- West of England Joint Committee
- West of England Combined Authority Board
- Local Authority Executive/Full Council meetings
- West of England Joint Transport Board comprising the Joint Transport Body Board and the Joint Transport Executive Committee
- Rail Programme Board
- Scrutiny Panels

Project specific consultations have also been undertaken, and have informed the design and technical development of the scheme. To date the following public consultations have taken place:

- Portishead station location consultation - June 2014
- Formal Stage 1 Scheme Consultation - June 2015
- Pill Station Consultation - February 2016
- Ashton Vale Road Consultation Round 1 - February 2016
- Ashton Vale Road Consultation Round 2 - November 2016
- Formal Stage 2 Scheme Consultation - October to December 2017

Further information about the Formal Stage 2 Scheme Consultation is set out in chapter 1 the Strategic Case. In parallel with the above, we are engaging with internal and external stakeholders including land/property owners, statutory bodies, government agencies, local interest groups, train and freight operating companies and wider stakeholders. This process of engagement and consultation has informed the evolution of the scheme which is managed as detailed below. This is set out in a communications strategy which is reported on and reviewed with the project and management teams on a regular basis.

3.8.2 Management of Internal Stakeholders

The Project Manager has overall responsibility for ensuring internal stakeholders are appropriately engaged and informed. This is managed through the team's reporting structure and primarily dealt with by the engagement lead from the project team reporting directly to the Project Manager. In accordance, formal, minuted meetings with set agenda and actions have been undertaken with all internal stakeholders.

3.8.3 Management of External Stakeholders

The Project Manager has overall responsibility for external engagement, however there are two specific engagement leads – land agents Ardent have been appointed to engage with land owners and utility companies; and an engagement lead from the project team is appointed to co-ordinate all other engagement. The Project Manager is kept informed through regular meetings and telephone conferences. The project's legal advisors Womble Bond Dickinson co-ordinate the list of statutory consultees and work closely with the project team's engagement lead.

The external stakeholders identified are summarised below:

- Unitary and Combined Authorities, Wards, Parishes and Neighbourhood Partnerships
- Political Stakeholders
- Statutory Stakeholders
- Representative organisations (businesses, local and national campaign/equalities groups, freight and train operating companies, motorists, public transport users)
- West of England transport stakeholder meetings
- Local interest forums including cycling and walking

3.8.4 Information Sharing, Co-ordination and Co-operation Arrangements

The majority of information is shared through the governance structure as important project decisions and commitments are discussed and agreed in public meetings. However we also actively ensure that relevant information is made available through stakeholder meetings, consultation events and online channels. These are well publicised through social and traditional media. As well as a project specific website (www.metrowestphase1.org) which hosts all project documentation published to date, we also have a programme specific website (www.travelwest.info/metrowest) which contains wider information for context.

Internal cloud-based file sharing is also an important tool and the project team host all material on a private server (SourceDocs) which requires individual login details to access. Logins have been provided to all partners including Network Rail, Womble Bond Dickinson, Ardent, CH2M and local authorities.

The West of England Councils have worked together under a number of different arrangements which have evolved from the first Joint Transport Executive Committee to the current Joint Committee. This streamlines decision making and ensures co-operation between all authorities. Memorandums of Understanding (MoU) with partners including Network Rail, train operators, and local authorities have also been signed to promote effective co-ordination and co-operation between the organisations. An action plan for the specific rail MoU was developed in 2010 to define a set of deliverables outcomes based on the short, medium and long term.

3.9 Risk management strategy

3.9.1 Programme-Level Risk

Risks and mitigation measures are dealt with at the Rail Programme Board level because of the close inter-relationship between the rail projects. Programme and project SROs and managers regularly review the risk register and report to the Rail Programme Board. The most significant risks are reviewed at each board meeting, via the highlight report. A risk owner is identified who will be the person best able to manage the risk.

The Rail Programme Co-Ordinator is responsible for tracking and monitoring programme level-risks. This will include both risks which are common across the rail programme and those which are scheme-specific but could have a significant impact on the whole programme. The Programme SRO is responsible for approving actions to mitigate risks at the programme level. The key project level and the programme risks are reviwed at each Rail Programme Board meeting.

The top three risks are reported to the quarterly meetings of the Rail Programme Board, PAB and WoE Joint Committee. This process enables these strategic risks to be considered appropriately through the corporate risk management processes of the authorities.

3.9.2 Project-Level Risk

A full Quantified Cost Risk Assessment (QCRA) was undertaken in March 2017 to assess risk exposure and inform the cost estimate, see appendix 3.6. As a third party scheme, the risks modelled were divided into the following categories:

1. NR Project Risks – risks associated with Network Rail's execution of the project
2. NR Integration Risks – risks on the integration (and timely completion) of other NR programmes
3. Client Risks – risks owned by the promoting authorities

The majority of risks that are programme level in nature, excluding the integration risks are held by the Authorities. The GRIP3 cost estimate was completed in March 2017 (based on the 2 trains per hour option) and this included the QCRA modelling with a P80 output of £24.8M combined total. The GRIP3 cost estimate including all client costs totalled £160M, which was considerably higher than the previous GRIP2 cost estimate. This presented major affordability issues for the Authorities and in discussion with the rail industry, the Authorities decided in March 2017 to proceed with a lower cost option for the Portishead Line (one train per hour instead of two trains per hour).

This resulted in a considerable amount of railway infrastructure being removed from the scheme, through value engineering informed by further train pathing modelling (Railsys), refer to the strategic Case chapter 1 for further details. The value engineering exercise was completed in June 2017 and included revisions to the QCRA, see appendix 5.1. Between June and December 17 revisions to the GRIP3 AIP design were undertaken based on the revised value engineering scope. The QCRA was further updated in December 2017 and resulted in a P80 output of £20.2M. The £20.2M risk provision equates to 28% of the total preparation and construction costs.

The top five risks are:

1. Design work results in additional infrastructure outside DCO red line boundary, resulting in redrawing red line boundary. Implication is to increase the scope of the EIA/ES and identification of additional s42 consultees, resulting in additional work and time
2. Unexpected findings on site including protected species, mines, archaeology, ground conditions, noxious weeds, utilities, asbestos etc.
3. GRIP 3-5 design work, Network Rails network change process identifies additional works items
4. Network Rail CP5 schemes that MetroWest Phase 1 is dependent on (incl. Filton Bank 4 Tracking, BASRE) must be constructed prior to ensure network capacity is adequate.
5. Railway construction programme over-run due to contractor performance issues, contractor dispute with NR or other rail industry players etc, causing a knock on delay to the rest of the construction programme and possible cost escalation.

Risks at the project level are reported to the Rail Programme Board. Risk review meetings take place every month with Network Rail and more regularly leading into major deliverables. Network Rail have recently increased the level of internal rigor and review for its approach to risk management, in light of cost escalation problems experienced on some of its major schemes, such as electrificartion of the Great Western Main Line. While cost escalation remains an issue for the industry, MetroWest Phase 1 is drawing on the collective experience of Network Rail and industry partners to ensure a robust approach is taken to the identification, assessment and management of risk.

Furthermore the cost estimate and QCRA has been subject to independent review via Mott MacDonald appointed by the Authorities as its 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.

Further information about our approach to risk is set out in chapter 4 the Commercial Case.

3.10 Evaluation and Benefits Realisation Plan

MetroWest Phase 1's evaluation and benefits realisation plan will cover the monitoring of impacts and the approach to determining the projected benefits, impacts and objectives.

The evaluation and benefits realisation plan is appended at 3.7

3.11 Project Management

The West of England councils have a considerable wealth of experience in delivering major transport schemes, as set out in Section 3.3. Each major scheme brings specific technical and organisational challenges and requires honed and adaptable project management and leadership skills for successful delivery. MetroWest Phase 1 is being led by North Somerset Council on behalf of the West of England Authorities. North Somerset Council have a proven track record of scheme delivery and established and proven project management protocols which are aligned with PRINCE2 principles.

Project management is the process of planning, delegating, monitoring and controlling a project or scheme. At the heart of this process, project management entails the management of costs, timescales, quality, scope, risk and benefits. The following project management principals provide a framework for successful project management:

- Continue business justification
- Learn from experience
- Defined roles and responsibilities
- Manage by stages
- Manage by exception
- Focus on products
- Tailor to suit the project environment

In summary the councils have deployed proven project management principals and have the capability and capacity to successfully deliver MetroWest Phase 1.

The Authorities and Network Rail have recently agreed to set up a joint Programme Management Organisation (PMO), initially informally but possibly formally at a later stage. The driving purpose of the PMO is to achieve cost reduction, achieve cost certainty for the scheme and establish a better balance of risk between the client (the Authorities) and Network Rail. A PMO charter is being scoped and will set out the critical success factors along with a range of specific targets focused on cost reduction. The PMO when in place in early 2018 will report to an Integrated Executive Steering Team comprising Executive sponsors and Executive representatives from the partner organisations. The establishment of the PMO also forms part of a strategy to capture wider opportunities and benefits through a wider alliancing approach for contractualising the delivery arrangements for GRIP 4, GRIP5 and the construction phase at GRIP6 to scheme completion. Further information about the PMO is set out in chapter 4 the Commercial Case.

3.12 Summary of Management Case

In summary:

- the GRIP3 Approval in Principle (AIP) design and highways design has resulted in extensive deliverables that set out in detail what is required to construct and deliver the scheme.
- the West of England authorities, both individually and collectively, have a proven track record of delivering major transport infrastructure
- North Somerset Council led the delivery of the MetroBus - South Bristol Link (SBL). A 4.5km highway scheme with a total scheme cost of £43.3m, delivered on specification, on time and on budget.
- the scheme depeancies are fully understood, which includes the delivery of three major Network Rail schemes. Two of the three schemes are currently in build, and the third scheme, Bristol East Junction Enhanced Renewal is in the later stage of design, with delivery to follow in late CP5 into early CP6.
- the Authorities have clear lines of reporting and Governance in place and wider Governance arrangements with industry partners.
- the shceme programme entails four clearly defined scheme stages, with satge one and two now complete. Detailed programming through to GRIP Stage 8 has been undertaken. Subject to the timely decision making on funding, a scheme opening date of December 2021 is achievable.
- extensive stakeholder engagement and consultation has been undertaken throughout the development of the scheme since 2013. Formal Stage 2 Development Consent Order consultation was completed in early December 2017.
- there is an unprecideted high level of support for the delivery of the scheme.
- a robust approach is taken to the identification, assessment and management of risk and an Independent Cost Estimation Reviewer has been appointed.
- the Authorities along with industry partners have the capability and capacity to deliver the MetroWest Phase 1 scheme.

MetroWest

METROWEST PHASE 1

OUTLINE BUSINESS CASE

Chapter 4 Commercial Case

travelwest

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

December 2017

Chapter 4: Commercial Case

Contents Page

Tables

Figures

Appendices

CHAPTER 4

Commercial Case

4.1 Introduction

MetroWest Phase 1 is a third party local rail scheme promoted by the West of England Authorities, led by North Somerset Council. The scheme estimated capital out-turn cost is £106M. The scheme forms part of the MetroWest Programme which 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

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.

The current MetroWest Programme is planned to be delivered by 2021, 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.

The scope of MetroWest Phase 1 has been managed carefully by the Authorities and while the original scope included two trains per hour across the three rail corridors, due to cost increases for the works to the Portishead Line, the scope has been revised to deliver one train per hour for the Portishead Line. Passive provision has been allowed for to add in additional stations at a later stage, eg Ashton Gate station subject to a separate business case and funding approval. Train path modelling has confirmed that three additional train sets are required to operate the MetroWest Phase 1 train service. A Rail Demand Model has produced forecast passenger demand (see chapter 2 Economic Case) output and this has informed the scheme operational revenue profile (see chapter 5 Finance Case). The revenue performance of the scheme is very positive, with a forecast revenue surplus from year 6, increasing year on year. The timescales for delivering the scheme are set out in chapter 3 Management Case.

The wider context informing the scheme Commercial Case is the experience and lessons from the delivery of current Network Rail schemes across the Western Route, in Control Period 5. The Western Route has seen the largest investment to modernise the route since it was built 175 years ago. There have been many delivery successes with schemes delivered on time, on specification and on budget. There has also been challenges with particular schemes, most notably the electrification of the Great Western Main Line in respect of cost escalation. Cost escalation has become a wider issue in the rail

industry and this is something that MetroWest Phase 1 needs to address in this Commercial Strategy / Case as a third party rail scheme.

Therefore the primary driver of this Commercial Strategy / Case is to achieve cost certainty, within the affordability envelope of the Authorities. In other words cost certainty is very important to the Authorities but achieving certainty should not be at the expense of increasing the total cost of the scheme. For example one way of achieving greater cost certainty would be to load up the risk budget above the QCRA P80 output, however clearly such an approach would be a departure from first principles and would invite inherent inefficiency in the delivery of the scheme. It would also raise value for money issues for the Authorities. Therefore the focus of the Authorities in achieving cost certainty is to examine opportunities for organisational and delivery efficiency and to identify the most appropriate mechanisms for contractualising these delivery arrangements.

The Hansford Review which reported in July 2017, recognised a need for Network Rail to change its approach to working with third party promoters to fully achieve an 'open for business' mind-set and facilitate more third party investment in the network. It makes a number of recommendations with the most relevant relating to appropriate risk sharing. The Network Rail response to the Hansford Report States: *"One of the deterrents to investment in the railway is the degree of risk that can be realistically borne by a third party. We will clarify what risks can be excluded by a third party and assess where Network Rail alone is in a position to bear certain risks. We also expect certain risks can in future be transferred to the insurance markets rather than being ultimately borne by Network Rail or the third party and already have products in place to support this."*

MetroWest Phase 1 has just completed GRIP 3 AIP with GRIP 4 programmed to be completed by summer 2018. The GRIP 5 invitation to tender is programmed to be issued in autumn 2018 with the GRIP 5 contractor appointed in spring 2019. This Commercial Case sets out two principle options for packaging the construction works and sub-options for contractualising these packages. In parallel with this discussions are taking place at director level between the Authorities and Network Rail regarding the potential to achieve better integration between the two organisations in the context of delivering the current MetroWest Programme and potentially moving to a rolling medium term investment programme. These discussions include agreement to set up a joint Programme Management Organisation (PMO), initially informally but possibly formally at a later stage. This forms part of a strategy to capture wider opportunities and benefits through an alliancing approach for contractualising the delivery arrangements for GRIP 4, GRIP 5 and the construction phase at GRIP6 to scheme completion.

4.2 Procurement / Contractual Strategy

The scheme procurement essentially comprises of three main elements:

a) Procurement / delivery of professional services pre-construction
b) Procurement / delivery of the Train Operator and service
c) Procurement / delivery of construction works

4.2.1 Procurement / Delivery of Professional Services Pre-construction

The arrangements for the procurement / delivery of professional services pre-construction comprise of a mixture of specific competitively tendered OJEU contracts, the use of competitively tendered OJEU framework contracts and the direct commissioning of Network Rail for GRIP 1-4 as the system operator. Commissioning of Network Rail has been undertake via an exemption from Council Contract Standing Orders, on the basis that Network Rail are the system operator and need to have oversight of the work and furthermore that Network Rail are subject to competitive tendering as a publically owned and operated organisation.

As set out in 4.1 above, the Authorities and Network Rail have agreed to set up a joint Programme Management Organisation (PMO), initially informally but possibly formally at a later stage. This forms part of a strategy to capture wider opportunities and benefits through an alliancing approach for contractualising the delivery arrangements for GRIP 4, GRIP 5 and the construction phase at GRIP 6 to scheme completion.

4.2.2 Procurement / Delivery of the Train Operator and Service

The arrangements for the procurement / delivery of the train operator & service are set out in chapter 5 Financial Case. The DfT Rail Executive has set out the key priorities for the Great Western Franchise in the Great Western Rail Franchise - Public Consultation, Nov 2017 document. In chapter 4, 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."

The MetroWest Phase 1 train service is forecast to generate significant revenue surpluses, refer to section 5.1.3 of the Financial Case. The forecast revenue surplus generated by the scheme's train service demonstrates that should the service be included in the Great Western Franchise it would result in a net positive financial impact for the franchise. However, this net positive financial impact only arises from the delivery of the scheme infrastructure which is being delivered by the Authorities who are taking all the delivery risk as a third party promoter. Therefore the authorities wish to explore further with the DfT Rail Executive the most appropriate delivery arrangement for the procurement and contractualisation of the train service.

4.2.3 Procurement / Delivery of Construction Works

The arrangements for the procurement / delivery of construction works form the main focus of this Commercial Case. Before considering the commercial and contractual delivery options, the scheme context firstly needs to be understood. The scheme essentially comprises of three main elements of works (three self-defined packages):

- the highway works
- the dis-used rail line (civil engineering works)
- the operational railway (across the three rail corridors)

4.2.3.1 The Highway Works

The highway works are relatively modest works and are the type of works that the Authorities deliver across the local highway network on a routine basis. Some of the highway works will need to be delivered early in the construction phase, such as the realignment of Quays Avenue in Portishead, as this provides essential access for installation of Trinity School footbridge and construction of Portishead rail station. This key programme interface is a key consideration for the commercial and contractual approach for delivering these highway works. The highway works also include construction of the station car parks, comprising of two car parks for Portishead station and one car park for Pill station.

4.2.3.2 The Dis-used Railway (civil engineering works)

The works to dis-used railway are predominately civil engineering works, followed by a relatively small amount of specific railway infrastructure/systems works, in order to re-open the line. The civil engineering works in summary entails:

- creation of construction compounds/permanent maintenance compounds and construction haul route
- removing the 4.7km of old track formation
- digging out the railway ditches and old ballast
- replacing culverts
- repairs to road overbridges and other structures
- works to pedestrian & cycle paths and bridleways
- installation of a footbridge
- construction of a rail station platform and building
- minor utility diversion and drainage works
- installing geo-tech material and laying 4.7 km of new ballast
- environmental mitigation works

The dis-used line has good highway access and because it's disused there are no line possession access constraints. Network Rail have advised that these works would lend themselves to be undertaken by tier three contractors and could in fact be undertaken by non-railway civil engineering contractors (the works are effectively a high street contractor environment). These civil engineering works would deliver a re-built 4.7 km railway alignment up to top ballast level along with a new Portishead rail station, comprising platform and building. These works would be inspected by and then handed over to Network Rail, who would take responsibility to deliver:

- 4.7km of new track formation (sleepers and track) via use of a High Output Train (HOT)
- Install the GSMR communications and electrical equipment at Portishead rail station

Note there is no signalling equipment or systems to be installed on the 4.7km alignment to Portishead, the nearest signalling interface is at Pill station and Pill Junction on the existing operational railway.

4.2.3.3 The Operational Railway (across the three rail corridors)

The works to the operational railway entail a combination of civil engineering and railway infrastructure and systems in the context of an operational railway. The vast majority of the works are works to the existing Portbury Freight Line (which forms part of the Portishead Line), with minor works at Parson Street Junction, Parson Street station, Bedminster, Avonmouth/Severn Beach and Bathhampton.

Access to the Portbury Freight Line is constrained by the current freight train operations, and the relatively poor highway access. There are also significant environmental constraints where the line passes through Avon Gorge. Network Rail have advised that the works to the operational railway will need to be undertaken by tier two (or tier one) rail contractors, and managed by them (Network Rail).

4.3 Procurement Options/ Packages

4.3.1 Design & Construction Delivery Route

The Preliminary Business Case, identified the high level design and construction delivery route as follows:

- Scheme feasibility (GRIP 1 & 2) through direct procurement of Network Rail via a Basic Services Agreement with the Authorities
- Approval in Principle (AIP) design (GRIP 3 & 4) through direct procurement of Network Rail via a Development Services Agreement with the Authorities
- Design & Build contract (GRIP 5 - 8) split into two parts, to be tendered and awarded by Network Rail, via an Implementation Agreement with the Authorities:
    - Part A) Detail Design GRIP5 only with an option to extend to GRIP 6 - 8
    - Part B) Construction, Testing Commissioning, Scheme Handback, Project Close GRIP 6 -8 (award of Part B is subject receipt of powers to build and operate and Full Business Case approval)

The Implementation Agreement will be either a 'Fixed Price' or an 'Emerging Cost' agreement. Early discussion on the Implementation Agreement have commenced with Network Rail. A key aspect of this is agreement on the balance of risk between the promoter (the Authorities) and Network Rail. While a 'Fixed Price' agreement, entails a premium above an 'Emerging Cost' agreement, the Authorities preference is to achieve cost certainty and this suggested opting for the 'Fixed Price'.

Design & build is usually packaged as either GRIP 5 to 8, or GRIP 4 to 8, and remains standard practice in the rail industry. The main advantage is that this approach brings a construction contractor on-board with the scheme at an early enough stage to have some influence on the Detailed Design and drive construction efficiencies. A construction contractor, will often be able to identify alternative construction methodologies and also where appropriate challenge Network Rail standards, to aid the efficient delivery of the scheme. This approach also has the advantage of the contractor taking the contractual responsibility for the Detailed Design.

4.3.2 Contract Packages

The Preliminary Business Case set out two main options for the Design & Build approach either one single contract for the entire scheme or two contracts; one for the operational railway procurement and managed by Network Rail and one contract for the dis-used railway procured and managed by the Authorities. These two options and sub-options are considered further in this Commercial Case.

As set out in section 4.2 the scheme essentially comprises of three main elements of works (three self-defined packages):

- the highway works
- the dis-used railway (civil engineering works)
- the operational railway (across the three rail corridors)

The organisation of these three packages and the contracting / commercial arrangements give rise to two main procurement options which are shown in Figure 4.1.

4.3.3 Procurement Opportunities & Options

Figure 4.1 - Main Procurement Options

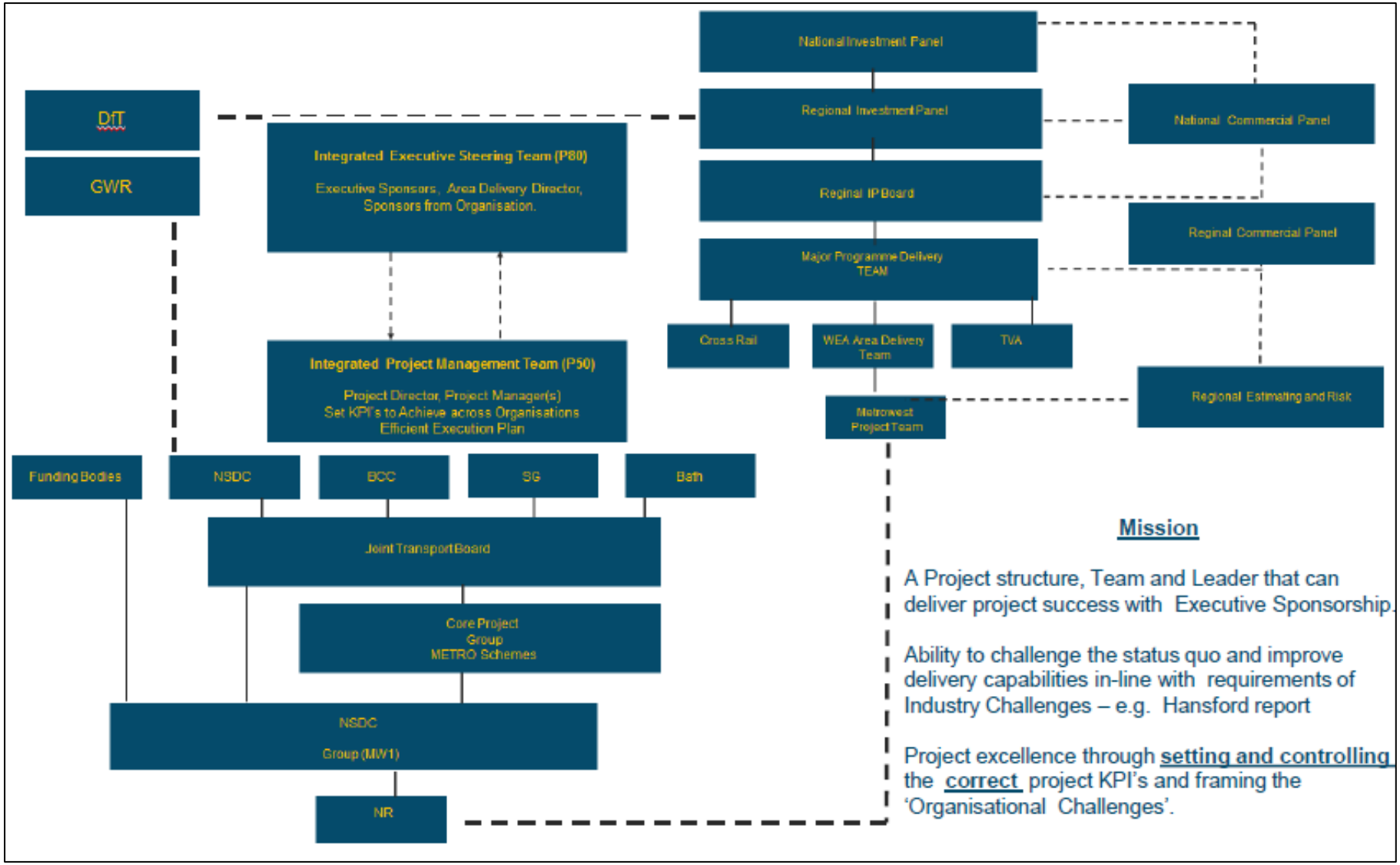
[1] Except delivering the new track formation and install the GSMR communications and electrical equipment at Portishead rail station

[2] Including delivering the new track formation and install the GSMR communications and electrical equipment at Portishead rail station

4.3.4 Programme Management Organisation (PMO)

As set out in 4.1, the Authorities and Network Rail have agreed to set up a joint Programme Management Organisation (PMO), initially informally but possibly formally at a later stage. The PMO is being set up irrespective of which of the two procurement options is taken forward. The driving purpose of the PMO is to achieve cost reduction, achieve cost certainty for the scheme and establish a better balance of risk between the client (the Authorities) and Network Rail. A PMO charter is being scoped and will set out the critical success factors along with a range of specific targets focused on cost reduction. The PMO when in place in early 2018 will report to an Integrated Executive Steering Team comprising Executive sponsors and Executive representatives from the partner organisations. Figure 4.1 shows how the PMO will fit into the existing governance structure, improving influence and efficiency. The establishment of the PMO also forms part of a strategy to capture wider opportunities and benefits through a wider alliancing approach for contractualising the delivery arrangements for GRIP 4, GRIP5 and the construction phase at GRIP6 to scheme completion.

Figure 4.2 - Proposed PMO Governance Structure



4.3.5 Alliancing

Alliancing has been successful in reducing delivery hurdles and costs within the rail industry most notably between Network Rail and the TfGM MetroLink and the TfL enhancements to the London Overground network, to deliver infrastructure enhancements. Network Rail has also entered into various successful alliances with train operators where the focus has been to bring the operation of the trains and the track closer together to yield service performance and other benefits for the end users, rail customers. Network Rail's policy statement on alliancing is attached in appendix 4.1.

Alliancing is most effective where the parties to it have a medium to long term relationship, whereby they are motivated to effect internal change in return for a medium to long term gain. While MetroWest Phase 1 is not a medium term investment on its own, the MetroWest Programme together with additional MetroWest schemes that will emerge in response to the West of England housing and employment growth agenda, will create a medium term investment based relationship. This medium term investment together with the wider devolution agenda, will increase the focus on alliancing based delivery models.

Procurement option 2 set out in Figure 4.1 represents a first step towards an alliancing based approach. A more radical option that has been considered would be to set up a horizontal and vertical alliancing delivery model including close working between the Authorities, Network Rail and a contractor/s, in the context of delivering a third party scheme. This approach may be feasible in the future as experience of alliancing is gained by the industry, however it would not be suitable for MetroWest Phase 1 because there isn't sufficient time available within the scheme programme, furthermore the untested nature of this approach would potentially increase risk in the short term.

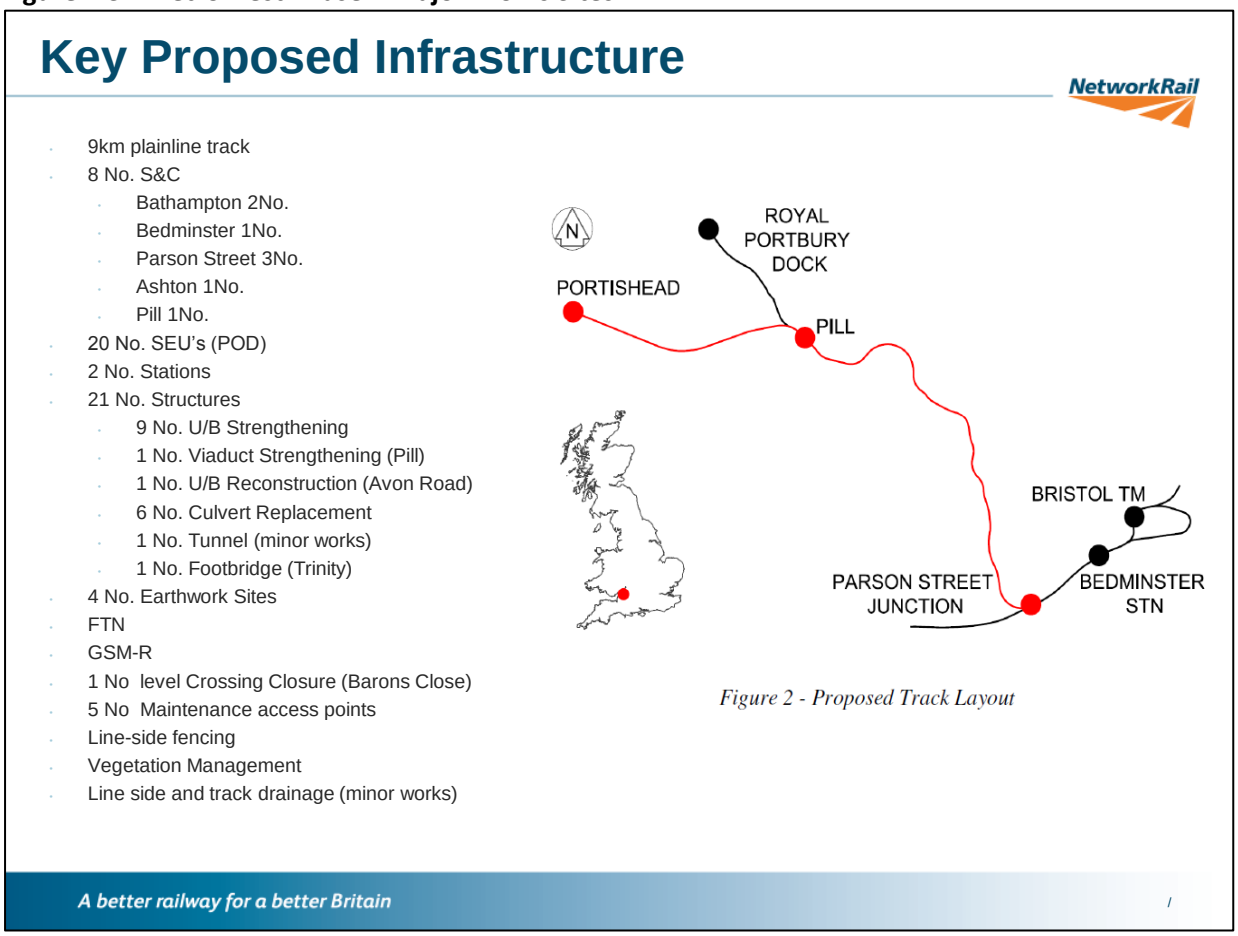
4.3.6 Hub & Spoke Contracting Option

Network Rail are increasingly utilising the hub and spoke contractual option in favour of a using a principle contractor. The principle contractor route can create management issues for Network Rail where the principle contractor sub-contracts multiple parts of the works. In the context of a busy operational railway this can create issues for Network Rail such that it effectively has to step in and manage the sub-contractors but without having a direct contractual relationship. In this situation it is also not cost efficient as the main contractor's overheads and profit margin add to costs that otherwise would not be incurred.

The hub and spoke approach separates the works into smaller packages that are typically more attractive to tier three contractors and this in turn stimulates competition in the market and leads to more competitive contract prices. It can also result in a wider pool of smaller contractors, effectively increasing contractor capacity by enabling multiple work sites concurrently where this is needed. While it requires management of multiple contractors by Network Rail this has not generally been an issue because as the system operator Network Rail has to manage multiple contractors on a daily basis.

For the operational railway package of works, a further consideration is the scheme major works sites comprise of a number of separate sites several kilometres apart which reduces contractor to contractor interface issues and provides more opportunity to award smaller contracts geographically. For the dis-used line package of works a hub and spoke contracting approach may not be the best approach because the works are essentially 4.7km of continuous works which doesn't lend itself to being separated into sub-packages very easily, while also creating some contractor to contractor interfaces issues. The scheme proposed infrastructure is shown in Figure 4.3 below. Note for simplicity Bathampton turnback and Avonmouth/Severn Beach signalling is not shown on the plan but the infrastructure is included in the list on the left of the plan.

Figure 4.3 - MetroWest Phase 1 Major Works Sites



4.3.7 Procurement / Contract Options for the Dis-used Railway Works & Operational Railway Works

The main procurement and contract options are set out in the Table 4.1.

Table 4.1 - Main Procurement & Contract Options for the Dis-used Railway & Operational Railway

Agreement	Client	Delivery Organisation	Contracting Organisation
Asset Protection Agreement	Local Authority remains overall scheme client and delivery client for works it tenders: • dis-used railway only	LA supported by the PMO	OJEU Procured Contractors - principle contractor
			Local Authority Framework Contractors – principle contractor
Implementation Agreement either 'Fixed Price' or 'Emerging Cost'	Network Rail Western Route becomes delivery client for works it tenders: • operational railway only or • dis-used railway and operational railway	Network Rail Infrastructure Projects (NRIP) – Hub and Spoke Delivery	Network Rail Framework Contractors – Hub and Spoke Model
			OJEU Procured Contractors – Hub and Spoke Model
		OJEU Procured Alliance (Network Rail / Contractor vertical alliance)	

4.3.8 Procurement Decision Making

MetroWest Phase 1 has just completed GRIP 3 AIP with GRIP 4 programmed to be completed by summer 2018. The GRIP 5 invitation to tender is programmed to be issued in autumn 2018 with the GRIP 5 contractor appointed in spring 2019. A decision on which of the two main procurement options is to be taken forward, will need to be made by spring 2018. This timescale aligns with both the GRIP process and also the Development Consent Order application (for powers to build and operate the scheme). While taking a decision now (December 2017) would be premature, the Authorities recognise that they will need conclude their position and make a decision in the coming months, no later than spring 2018. Table 4.2 sets out the main advantages and dis-advantages of the two procurement options.

Table 4.2 – Advantages and Dis-advantages of the Procurement Options

Procurement Approach	Advantages	Dis-advantages
Option 1 Single combined GRIP 5-8 design & build contract procured by Network Rail, via an Implementation Agreement with the Authorities and a separate minor build only contract for the Highway Works, procured by NSC	Integrated approach, providing a simplified programme management interface. Greater certainty that the as built assets will be accepted by Network Rail into the national rail network. Low delivery risk with procurement and construction led by Network Rail, which is their core business as the system operator Simplified arrangements for dis-charging planning conditions Simplified interfaces for contractor insurance arrangements, Health & Safety / CDM	Possibility of Network Rail over specifying the engineering design and construction requirements, leading to higher costs, driven by desire to minimise future infrastructure maintenance cost. However, this issue will need to be managed regardless of the procurement approach because Network Rail technical approval is required for GRIP 5 to 8 sign off. The Authorities have very little control over the final cost of the scheme, but all the risk lies with the Authorities. The Network Rail Industry & Fee Fund will apply to the whole scheme, increasing the cost of the scheme by £M's
Option 2 Two separate GRIP 5-8 design & build contracts: i) the dis-used railway and highway works, and ii) the operational railway where i) is procured directly by the Authorities (supported by the PMO) and ii) is procured by Network Rail via an Implementation Agreement with the Authorities	Potential to use lower cost tier three contractors for the civil engineering works for the dis-used line and potentially more competitive tender prices. Potential for reduced construction cost through contactor innovation, due to direct engagement between the Authorities and the contractor for the dis-used line works. Potential to reduce the total sum paid to the Network Rail Industry & Fee Fund. Potential for better cost control and risk management for the Authorities, as they would be managing contractors directly for the works to the dis-used line.	Use of multiple contractors could increase programme risks. More complex contractor management arrangements required. Greater potential for accountability issues and contractual dis-agreement. Potential for additional costs to be imposed on the Authorities at GRIP stage 7 Handback, if there are issues with the acceptance of assets by Network Rail i.e. quality of the contractor workmanship.

4.4 Summary of Commercial Case

In summary:

- the scope of the scheme works are clearly defined based on a GRIP3 Approval in Principle design
- the scheme procurement requirements are properly understood and have been clearly defined comprising of three key procurement elements
- a joint programme management organisation is being set up by the Authorities and Network Rail
- there is a genuine desire for more collaborative working between the partner organisations, learning lessons from other schemes, utilising best industry practices and making use of new opportunities such as taking an alliancing approach to delivery
- the arrangements for procurement of professional services for the pre-construction phase are sound
- the options for the procurement of the train operator/service are being considered by the DfT Rail Executive in light of the significant forecast revenue surpluses generated by the scheme.
- the procurement of the construction works entail three self-selecting packages; highway works, dis-used railway works and operational railway works
- there are two main procurement options for the organisation and contratualisation of these packages
- the advantages and dis-advantages of the two options are currently being considered in detail, and
- a clear path for procurement decision making has been identified

MetroWest

METROWEST PHASE 1

OUTLINE BUSINESS CASE

Chapter 5 Financial Case

travelwest

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

December 2017

Chapter 5: Financial Case

Contents Page

Tables

Figures

Appendices

CHAPTER 5

Financial Case

5.1 Introduction

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. 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.

In respect of scheme operational costs negotiations between the Authorities and the DfT Rail Executive are on-going and there are both operational options being considered by DfT and commercial /contractual options. The base position is that the DfT's three year rule would apply whereby the Authorities would have to fund all the operational costs during the first years of operation. However, the proposed train services are forecast to generate a revenue surplus by the end of year six and that by year 10 the surplus is approx £1M per annum, consequently the three year rule may not be the most appropriate option.

5.2 Scheme Costs

The delivery and operation of the scheme entails a four stage cost lifecycle, as follows:

1. Preparation costs up to submission of Outline Business Case (Sunken Costs)
2. Preparation costs from Outline Business Case to Full Business Case Approval and Construction Costs (Scheme Out-turn Cost)
3. Operational costs (train service, railway and highway maintenance costs)
4. Long term asset renewal costs eg track renewal costs, train replacement costs

Item 1 - Preparation costs up to submission of Outline Business Case are sunken costs and have been met by the Authorities.

Items 2 - Preparation Costs and Construction Costs are capital costs (except costs for Part 1 claims and monitoring and evaluation costs) and will be met by a combination of funding budgeted by the Authorities and funding to be secured through the DfT Large Local Major Scheme Fund or other funding mechanism. For further details see section 5.3 and Table 5.1.

Item 3 - Operational costs include train service costs, railway and highway maintenance costs. These costs are examined in detail in section 5.4 and Table 5.2.

Item 4 - Long term asset renewal costs includes long term industry costs of renewing track and infrastructure (in year 20, 30 & 40) and train replacement costs (year 30). Both of these costs will fall upon the public sector, via Network Rail in respect of track renewal and DfT (directly or indirectly) in respect of train replacement costs. These costs have been estimated for the economic appraisal and included in calculating the net present costs.

5.3 Capital Costs

The scheme estimated 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. Therefore the total estimated scheme out-turn cost to be borne by the Authorities including cost of work to date, Part 1 claims and monitoring and evaluations is £116,462,715.

Table 5.1 and Figure 5.1 shows the capital out-turn cost by cost heading. The cost estimate is based on GRIP stage 3 Option Selection Approval in Principle (AIP) design. The GRIP 3 AIP deign is built around a 3d model and includes the Network Rail engineering disciplines: Track formation, Geo-technical & drainage, Structures, Signalling and Electrical & Plant, Communications (GSMR), Overhead Line Equipment (for Bathampton Turnback only), Buildings & Property and Maintenance.

The GRIP 3 AIP deliverables are extensive and comprise of over 300 reports and drawings. All the mandatory deliverables required at GRIP Stage 3 have been undertaken and have achieved Route Asset Manager (RAM) technical approval. Above and beyond this additional deliverables that are normally undertaken GRIP 5 were undertaken during GRIP3, including extensive ground investigation works and track telemetry modelling, to reduce risks particularly in respect of informing the scheme red line boundary and construction strategy. Further information about the scheme engineering design and technical work is set out in chapter 3, the Management Case.

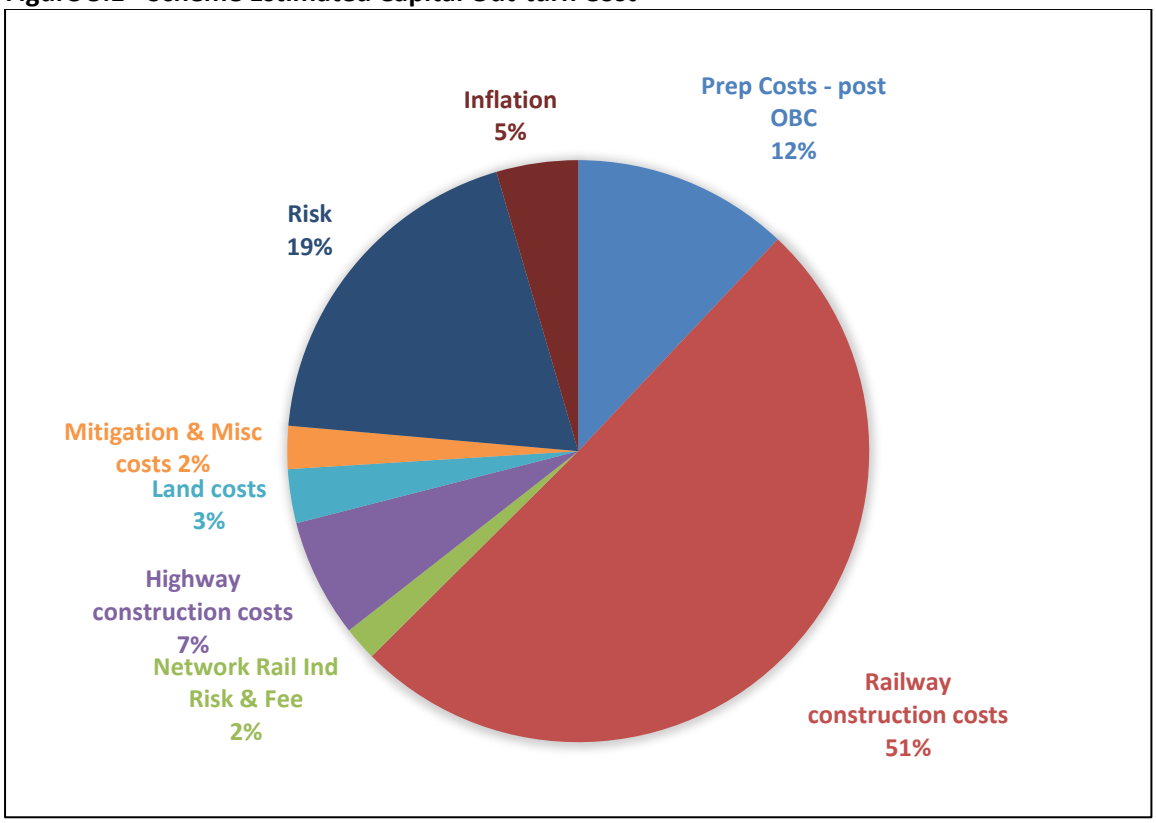
Table 5.1 – Scheme Estimated Capital Out-turn Cost by Cost Heading

Cost Heading	Scheme Delivery Costs*
Preparation Costs - Outline Business Case to Full Business Case	£12,751,887
Railway construction costs (2017 prices excl risk & inf)	£53,600,000
Network Rail Ind Risk & Fee Fund for railway construction	£2,000,000
Highway construction costs (2017 prices excl risk & Inf)	£6,975,497
Land costs	£3,179,054
Mitigation works & Misc costs	£2,529,525
Sub-total	**£81,035,963**
Risk	£20,221,425
Inflation	£4,814,271
Total including all Costs	**£106,071,658**

* excluding preparation costs to date, provision for potential Part1 claims and scheme monitoring and evaluation costs.

The 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 appointed by the Authorities as its 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.

Figure 5.1 - Scheme Estimated Capital Out-turn Cost



Risk

A full Quantified Cost Risk Assessment (QCRA) was undertaken in March 2017 to assess risk exposure and inform the cost estimate and is attached to chapter 3 Management Case as appendix 3.6. As a third party scheme, the risks modelled were divided into the following categories:

1. NR Project Risks – risks associated with Network Rail's execution of the project
2. NR Integration Risks – risks on the integration (and timely completion) of other NR programmes
3. Client Risks – risks owned by the promoting authorities

The majority of risks that are programme level in nature, excluding the integration risks are held by the Authorities. The GRIP3 cost estimate was completed in March 2017 (based on the 2 trains per hour option) and this included the QCRA modelling with a P80 output of £24.8M combined total. The GRIP3 cost estimate including all client costs totalled £160M, which was considerably higher than the previous GRIP2 cost estimate. This presented major affordability issues for the Authorities and in discussion with the rail industry, the Authorities decided in March 2017 to proceed with a lower cost option for the Portishead Line (one train per hour instead of two trains per hour).

This resulted in a considerable amount of railway infrastructure being removed from the scheme, through value engineering informed by further train pathing modelling (Railsys), refer to the strategic Case chapter 1 for further details. The value engineering exercise was completed in June 2017 and included revisions to the QCRA, see appendix 5.1. Between June and December 17 revisions to the GRIP3 AIP design were undertaken based on the revised value engineering scope. The QCRA was further updated in December 2017 and resulted in a P80 output of £20.2M. The £20.2M risk provision equates to 28% of the total preparation and construction costs.

Inflation

The Building Cost Information Service (BCIS) central forecast to 2021 Q2 has been used for inflation estimation. The forecast is based on the BCIS Price Adjustment Formulae Indices, developed and managed by the Royal Institute of Chartered Surveyors (RICS). This indices has been used in preference to Retail Prices Index (RPI) because using RPI would result in a risk of insufficient provision for inflation. The BCIS Price Adjustment Formulae Indices is based on a data set of underlying construction and materials costs which are regularly updated inline which fluctuations in markets, industry practises and industry buoyancy. The total provision for risk is £4,814,271, which equates to a total uplift of 8% on 2017 Q3 estimated construction costs.

Commenting on BCIS Price Adjustment Formulae Indices, Robert Stockwell Crossrail Ltd (CRL) said *"At Crossrail we have administered NEC3 Contracts with Secondary Option X1 clauses using the BCIS Price Adjustment Formulae Indices (PAFI). By using the BCIS Indices we have been able to procure contracts where inflation is identified as an Employers' risk which could otherwise have been priced by our Tier 1 Contractors at a potentially high risk premium. The biggest benefit of using the BCIS Price Adjustment Formulae Indices is that it promotes a collaborative commercial arrangement between the project manager and contractor by setting out in the contract tender process exactly how the impact of inflation will be measured and how the Contractor will recover costs through the administration of a periodic Price Adjustment".* Source: BCIS Inflation Adjustment Clauses - May 2016.

5.4 Operational Costs

The scheme operational costs comprise of four main elements:

I. Train operator costs (pre-opening mobilisation costs) leading up to the start of the train services

II. Train operator costs (post opening train service) during the first three years of operation

III. Network Rail infrastructure maintenance costs, from opening to the start of the next control period

IV. Highway maintenance and car park operating costs

Train Operator Costs - pre-opening mobilisation Costs

Prior to scheme opening there will be some train operator costs (pre-opening mobilisation costs) comprising of recruitment and training of train drivers and train managers, training of additional staff (depot pool) operational commissioning and testing cost (new rail infrastructure, stations, ticketing etc). A total of 18 addition train drivers will be required and 13.5 train conductors to operate the MetroWest Phase 1 train services (further information on this is set out in the following paragraphs). The initial estimate for these mobilisation costs is £1.74M, with costs commencing T-18 months to T-0 scheme opening.

Although the Authorities do not take issue that these costs will need to be borne, the largest proportion of these costs relate to the cost of recruiting and training new train drivers and conductors. Training a new train driver takes 18 months and the investment produces a medium to long term asset for the rail industry. While MetroWest Phase 1 should pay its fair share of operational costs it should not be expected to meet what are essentially medium to long term rail industry costs.

Train Operator Costs - post opening train service costs

The scheme will augment the existing Severn Beach Line service, which is currently operated using two train sets and augment the existing Bath Spa to Bristol local train service, which is operated as part of a regional route. The enhancement of the Severn Beach Line service and the Bath Spa to Bristol service requires two additional train sets (based on Railsys modelling to date). The reopening of the Portishead Line with an hourly service requires one train set. For the hourly plus option (hourly with peak enhancement) an additional train set is required for the peak. Each train set will operate in a three car formation, therefore a total of nine train units will be required to operate the base MetroWest Phase 1 service (with an hourly service for the Portishead Line).

Table 5.2 sets out a summary of the composition of train operator costs, provided by Great Western Railway.

There are number of constraints in resourcing additional train crew:

- Shifts for members of train crew including rest periods and booking on and off may only last eight hours. Therefore, to cover an eighteen hour service, three shifts are typically required.
- Opportunities may present themselves to create efficient diagrams by integrating with existing diagrams. However these may already be as efficient as possible and additional interworking creates inherent performance risks (train and crew not necessarily being in the same place at the same time).

- Each member of train crew only works four days in seven. So allowing for leave and sickness two heads are required to cover each driver turn and 1.5 to cover each conductor turn. Across a large train crew pool there may be minor efficiencies available but these will be limited.
- Therefore it can be assumed that the likely net additional train crew requirement is effectively 18 train drivers (3 trains x 3 shifts x 2 heads) and 13.5 conductors (3 trains x 3 shifts x 1.5 heads).

There are also constraints in respect of rolling stock:

- The train path modelling (Railsys) indicates that MetroWest Phase 1 requires three additional train sets in three car formations (nine train units in total), however the large number of enhancement and renewal schemes currently being delivered in a relatively short period in late control period 5 and early control period 6, is causing a degree of uncertainty in the modelling undertaken to date. This will be clarified by further Railsys modelling based on the final December 2018 timetable, which is expected to be available around Easter 2018.
- The commercial rolling stock market via the rolling stock operating companies (ROSCOs) can fluctuate in accordance with demand, therefore the costs set out in Table 5.2 are indicative.

Table 5.2 also shows the costs estimated for the 2014 Preliminary Business Case option 5B (previous central case), for comparative purposes.

Table 5.2 - Indicative Train Operator Costs (Post Opening Train Service Costs)

Operational Cost	**Operational Cost Detail**	**OBC Central Case** **Severn Beach and Bath corridors 2 TPH, Portishead corridor 1TPH** **9 x Class 165/6**	***PBC 2014 (Option 5B)*** ***All three corridors 2TPH*** ***12 x Class 165/6***
Base Estimate	Mileage Costs	£1.129	*£1.218*
	Lease Costs	£1.482	*£1.976*
	Staff Costs	£1.548	*£2.064*
	Station Costs	£0.271	*£0.271*
Base Estimate Total		**£4.430**	***£5.529***
Operational Risk	Fuel price +50%	£0.319	*£0.427*
	Spare Train Unit (Maintenance)	- - - -	*£0.494*
	More Train Managers per turn	£0.162	*£0.216*
	Station Staff at Portishead	- - - -	*£0.241*
	Depot Staff	£0.379	- - - -
	Sub-total	**£0.860**	***£1.378***
Risk Adjusted Total	**(all numbers £M)**	**£5.290**	***£6.907***

Network Rail Infrastructure Maintenance Costs

The maintenance costs incurred by Network Rail in the early years after scheme opening are likely to be very modest, because the key railway assets will either be new or in a renewed condition.

Network Rail have informed the Authorities informally that it is unlikely that it would levy any maintenance costs onto the Authorities to cover any maintenance costs from midpoint in the control period to the end of the control period, subject to internal approval. Towards the end of control period 6, post scheme opening Network Rail will seek to include the new MetroWest Phase 1 assets into the regulatory asset base (RAB) in negotiation with the Office of Rail & Road leading into the next control period. For the economic appraisal undertaken to the Economic Case chapter 2, theoretical maintenance costs were included in the detailed appraisal calculations.

Highway Maintenance Cost

Most of the highway works are to be delivered within North Somerset Council's area, with the remainder of works delivered in Bristol City Council's area. A section 278 agreement (under the Highways Act 1980) will be entered into with each of the highway authorities. Furthermore each Council has agreed to own and maintain the new highway assets delivered in its area. The scheme highway works are of a relatively minor nature, the biggest item entails the re-alignment of the northern end of Quays Avenue, Portishead. Quays Avenue is already maintained by North Somerset Council as part of the adopted highway and the realignment of the northern end of the road will not result in any additional highway maintenance costs. The four road over bridges on the dis-used section of railway between Portishead and Pill are already maintained by North Somerset Council as part of the adopted highway. While some defect rectification works will be undertaken to the bridges as part of the scheme works, the scheme will not result in any additional ongoing maintenance requirements for the bridges.

Other highway maintenance costs include maintenance costs of new toucan crossing at Quays Avenue, various other informal pedestrian crossing points, a 150m extension of a bridleway east of the M5, a new 300 metre pedestrian & cycle boulevard on Harbour Road, a new footbridge next to Trinity Primary school and landscaping / ecology maintenance costs. These maintenance costs will be borne by North Somerset Council's Highways & Transport Service and total approximately £0.08M per annum. At Ashton Gate, Bristol a new pedestrian and cycle ramp is to be delivered along with a 100 m extension to a left turn only lane and an upgrade to a set of high traffic signals. The maintenance costs of these assets are very modest. Note the sections of National Cycle Route 26 that run under three highway bridges are already maintained by Sustrans and will continue to be maintained by them.

Car Park Operating Costs

The scheme entails delivery of three new car parks, two for Portishead station and one for Pill station. The operating costs of the car parks include rates, electricity, operational staffing and asset maintenance. The total estimated operating cost of the two Portishead station car parks is £0.03M per annum and £0.008M per annum for Pill station car park. All three car parks will be operated by North Somerset Council's Highway & Transport Service with a charging tariff. The exact tariff is yet to be decided however the working assumption is a charge of £2 to £3 per day for Portishead and slightly lower for Pill. Using the forecast passenger demand profiled by mode of transport arrivals at the stations (see Forecasting Report appended to the Economic Case chapter 2), the forecast total revenue for all three car parks is £0.145M in the opening year, giving a forecast revenue surplus of £0.107M.

Given, the forecast revenue surplus from the car parks is substantially greater than the highway maintenance costs, these costs are being treated as cost neutral by North Somerset Council's Highway & Transport Service. In other words the Council will offset the highway maintenance costs from the car parking revenue surplus.

5.5 Budgets & Funding Position

As set out in section 5.2 the delivery and operation of the scheme entails a four stage cost lifecycle, as follows:

1. Preparation costs up to submission of Outline Business Case
2. Preparation costs from Outline Business Case to Full Business Case Approval and Construction Costs (Scheme Out-turn Cost)
3. Operational costs (train service, railway and highway maintenance costs)
4. Long term asset renewal costs eg track renewal costs, train replacement costs

5.5.1 Funding of Preparation Costs up to the submission of the OBC

The MetroWest Phase 1 scheme was launched in 2013. The total of preparation costs from May 2013 up to the submission of this Outline Business Case in December 2017 is £10,116,057. The costs have been met by the Authorities and are treated as sunken costs. Table 5.3 sets out the funding sources for the sunken costs.

Table 5.3 - Scheme Sunken Costs

Funding Source		**Sub-total**
Local Contribution - Prior to OBC up to December 17	Cash contributions by the Councils	£2,214,921
	Local Growth Funding by WoE LEP	£7,901,136
	Sub-total	**£10,116,057**

5.5.2 Funding of Preparation Costs (OBC to FBC) and Construction Costs

The estimated preparation cost from the Outline Business Case to the Full Business Case is £12,751,887. In order to achieve the Full Business Case the scheme must meet rail industry GRIP costs (GRIP 4 & 5) and also substantial costs to achieve powers to build and operate the scheme, including Development Consent Order costs and Habitat Regulations Assessment costs. The preparation cost to Full Business Case are to be met by the Authorities (using combination of cash resources and Local Growth Funding).

The estimated scheme capital out-turn cost is £106,071,658 excluding preparation costs up to the submission of this Outline Business Case, (which are set out in Table 5.3), excluding provision for potential Part1 claims and excluding scheme monitoring and evaluation costs. These three cost areas in total amount to £10,391,057. 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.

With a scheme budget of £57,813,000 this left a total funding gap of £58,649,715 leading up to the submission of this Outline Business Case. The initial task for the Authorities was to examine all possible sources of local funding within the West of England including Local Growth Funding (LGF) and Economic Development Funding (EDF), West of England Combined Authority Funding and Council reserves. The outcome of the examination was that all LGF and EDF was already fully committed to high priority schemes. While an allocation of West of England Combined Authority Funding was identified as a potential option, there are issues and constraints with this funding

source. The lead Authority for MetroWest Phase 1 North Somerset Council (within which most of the scheme infrastructure is to be delivered) is not part of the West of England Combined Authority (WECA). WECA comprises of the Bath & North East Somerset, Bristol City and South Gloucestershire Council areas. MetroWest Phase 1 is a cross boundary scheme, and the proportion of the scheme (on a mileage basis) within WECA is relatively modest.

In respect of Council reserves these are very limited due in part to the sustained period of reduction in central Government revenue funding for local Government since 2010. Given the outlook of further reduction in local Government revenue support, no funds are available from Council reserves. Another possible funding source identified was borrowing on the back of Portishead station car park and this could contribute circa £1M. Note this has subsequently been built into North Somerset Councils additional contribution of £5.86M, as set out below.

Having established at an early stage (summer 2017) that it would not be feasible for the Authorities to meet the total funding gap, the Authorities engaged in discussions with the DfT on how the scheme could be funded. The DfT advised that one potential funding mechanism is the Large Local Major Scheme Fund. This fund requires the promoter to provide a local contribution, although the amount is not prescribed, the fund entails a competitive bidding process with a strong focus of decision making on value for money in terms of both the BCR and the limiting the net amount of funding sought from the DfT by the promoters.

In early December 2017 the Authorities increased the local contribution by a further £11,720,000 to £69,533,000 to support a Large Local Major Scheme Fund bid to the DfT. £10,116,057 of the Authorities £69,533,000 budget has been spent on preparation costs prior to the submission of this Outline Business Case, leaving £59,141,943. With the additional £11,720,000 allocated by the Authorities this leaves a net funding gap of £46,929,715 which is being sought from the DfT through a Large Local Major Scheme bid.

This equates to a local contribution of 56% with the remaining 44% being sought from the DfT. Both the scheme cost and indeed the total local contribution is above the DfT's threshold of £59M minimum scheme cost for the WoE (as set out in DfT Guidance) for consideration of Large Local Major Scheme Funding, for schemes which otherwise are too large to be funded locally. The funding sources for the scheme estimated out-turn are shown in Table 5.4. The spend profile for the scheme estimated out-turn is shown in Table 5.5.

Table 5.4 - Scheme Funding Sources

Funding Source		**Sub-total**	**%**
Local Contribution - Post OBC	Cash contributions by the Councils [1]	£1,923,079	-
	Local Growth Funding by WoE LEP	£45,498,864	-
	North Somerset Council - further cash [2]	£5,860,000	-
	West of England Combined Authority - cash [2]	£5,860,000	-
	Sub-total	**£59,141,943**	**56%**
Large Local Major Funding Sought		**£46,929,715**	**44%**
Total Scheme Budget		**£106,071,658**	**100%**

[1] a further sum has been allocated by the Councils for Part 1 Claims and Evaluation & Monitoring Costs
[2] this funding has been allocated to support the Large Local Majors Funding Bid

Table 5.5 - Scheme Spend Profile

Funding Source	2017/18 Q4 Estimated Spend	2018/19 Estimated Spend	2019/20 Estimated Spend	2020/21 Estimated Spend	2021/22 Estimated Spend	Total
Prep Costs - LGF funding	£ 945,434	£ 4,019,034	£ 5,864,340	£ -	£ -	**£ 10,828,808**
Prep Costs - Authority funding:						
Bath & North East Somerset	£ -	£ 120,450	£ 168,012	£ -	£ -	**£ 288,462**
Bristol City	£ -	£ 240,900	£ 336,024	£ -	£ -	**£ 576,924**
North Somerset	£ -	£ 401,500	£ 560,040	£ -	£ -	**£ 961,540**
South Gloucestershire	£ -	£ 40,150	£ 56,004	£ -	£ -	**£ 96,154**
Sub-total Prep Costs - Authority funding	**£ -**	**£ 803,000**	**£ 1,120,079**	**£ -**	**£ -**	**£ 1,923,079**
Construction Costs - LGF funding	£ -	£ -	£ 6,453,695	£ 28,216,361	£ -	**£ 34,670,056**
Construction Costs - Authority funding:						
North Somerset	£ -	£ -	£ -	£ -	£ 5,860,000	£ 5,860,000
West of England Combined Authority	£ -	£ -	£ -	£ -	£ 5,860,000	£ 5,860,000
Sub-total Construction Costs - Authority funding	**£ -**	**£ -**	**£ -**	**£ -**	**£ 11,720,000**	**£ 11,720,000**
Construction Costs - DfT Large Local Major	£ -	£ -	£ -	£ 20,043,239	£ 26,886,476	**£ 46,929,715**
Total	**£ 945,434**	**£ 4,822,034**	**£ 13,438,114**	**£ 48,259,600**	**£ 38,606,476**	**£ 106,071,658**

Note the above spend profile is subject to agreement by the WoE LEP (through approval by the West of England Joint Committee) to amend the profile of LGF funding between years, from the current approved profile. The revised spend profile includes moving of £9.883M of LGF funding from construction to preparation costs, in light of the revised scheme programme. This re-profiling of LGF funding does not change the total spend of £53.4M of LGF by March 2021.

5.5.3 Funding of Operational Costs

The estimated operating costs in the opening year of the scheme total £5,372,299 (see section 5.4 for the detail cost breakdown). The opening year operating costs includes a 19% risk uplift on the base cost estimate provided by Great Western Railways, based on a P50 risk output (see table 5.2). These operating costs in the opening year are largely off-set by forecast farebox revenue of £4,385,000, leaving a net subsidy requirement of £987,099. After the opening year the forecast revenue increases each year such that the train service breaks even in year six. By the end of year 10 the train service is forecast to generate a net surplus of just under £1M per annum, see table 5.6.

Table 5.6 - Estimated Operating Costs and Forecast Revenue

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Scheme Estimated Operating Costs	5,372,299	5,521,040	5,681,070	5,853,201	6,038,333	6,229,970	6,428,363	6,633,772	6,846,466	7,066,728
Scheme Forecast Revenue	£4,385,200	£4,830,408	£5,289,775	£5,627,691	£5,981,376	£6,354,164	£6,746,866	£7,160,311	£7,595,351	£8,052,854
Scheme Net Revenue Position	-£987,099	-£690,632	-£391,295	-£225,510	-£56,956	£124,194	£318,503	£526,540	£748,885	£986,126

The forecast revenue growth arises from growth in forecast passenger demand during the first ten years and into the medium term. This growth in passenger demand is driven by three main factors:

- Ramp up - the forecast passenger trips produced by the Rail Demand Model, refer to the Economic Case chapter 2 for more details, have been manually adjusted (reduced) to take account of the fact that demand for a new train service does not switch on 100% from day one. There is an initial period of typically two or three months for people to adjust to the new service. The financial profiling shown in Table 5.6 has included a ramp up factor based on 90% of the forecast demand in year 1 increasing to 95% in year 2, with year 3 based on 100% of demand.
- Latent demand and personal strategic decision making - the absence of a rail offer on the Portishead corridor has the effect of suppressing total travel on the corridor for all modes,

because of the inherent unreliable journey times by car and by bus into and out of Bristol, this results in latent demand (demand above what would normally be expected from modelling existing trip flows/patterns). This effect can be augmented further by personal strategic decision making after an initial period of operation. For example, a commuter who tries out the new train service in the first few months, switching between a few days a week traveling by train and a few days a week by car, may decide after a few months to sell a car (typically second household car) thereby limiting his/her access to a car and opt for the train every day of the week.

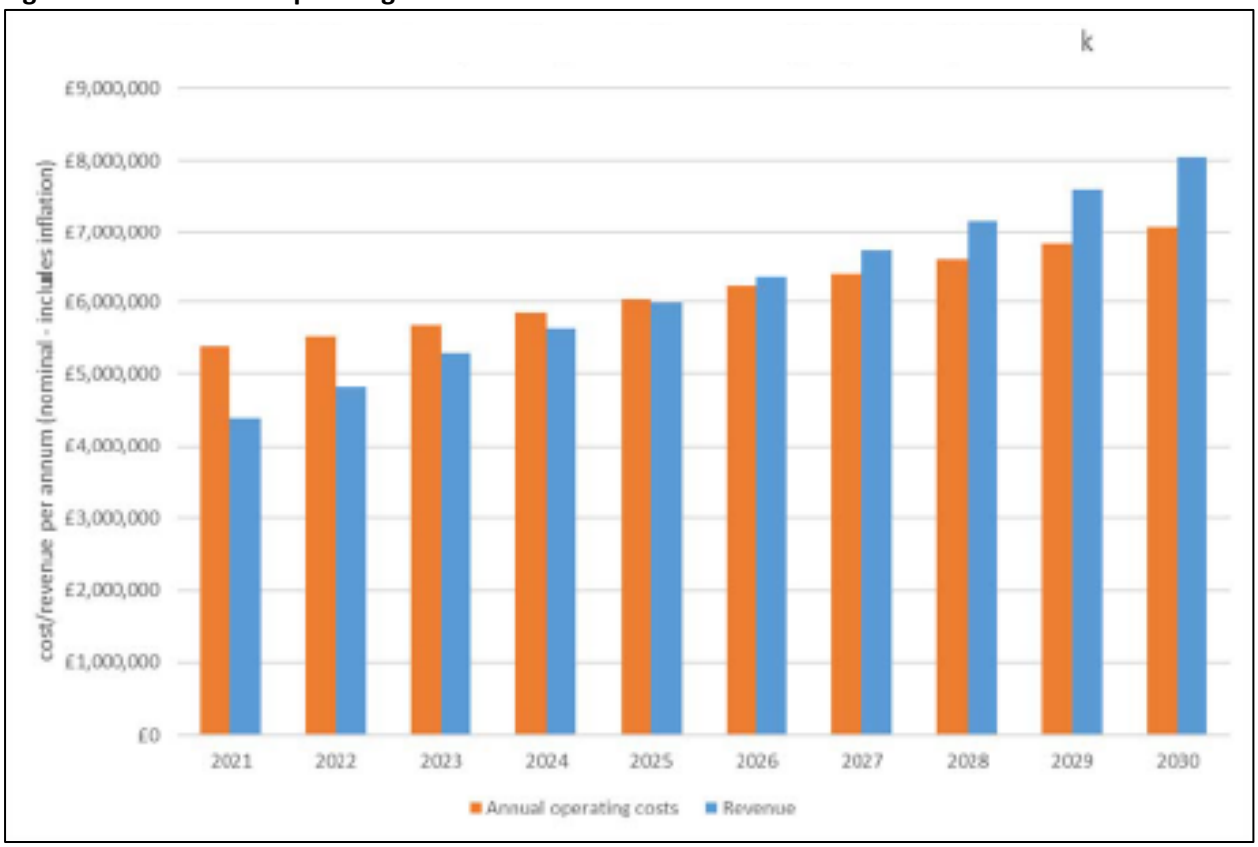
- Underlying growth in rail passenger demand - as set out in the Strategic Case Chapter 1, ORR data shows the ten year growth from 2006/7 to 2015/16 was 63%, averaging 5.6% per annum for all stations in the West of England. This is the main driver of the increase in forecast farebox revenue during the first ten years and into the medium term. Note inflation has been assumed to apply to both fares and operating costs in future years in the financial profile.

Detailed information about the assumptions used for calculation of farebox revenue is set out in the Forecasting Report which is appended to chapter 2 the Economic Case. The fare tariff has been calculated based on a basket of fares which takes into account purchase of season tickets, use of rail cards etc to produce a rate of 26½ pence per mile. Furthermore a number of sensitivity tests have also been undertaken on the scheme revenue profile.

Figure 5.2 illustrates how forecast growth in passenger demand out strips estimated operating costs during the first ten years. The forecast revenue surplus generated by the scheme's train service demonstrates that should the service be included in the Great Western Franchise it would result in a substantial positive financial impact for the franchise. However, this net positive financial impact only arises from the delivery of the scheme infrastructure which is being delivered by the Authorities who are taking all the delivery risk as a third party promoter. Therefore the authorities wish to explore further with the DfT Rail Executive the most appropriate delivery arrangement for the procurement and contractualisation of the train service.

To illustrate this point under the DfT three year rule the Authorities would have to meet the train subsidy costs for the first three years which amounts to an estimated £2.069M. The DfT would then meet the subsidy costs there on. However, this is only needed for two further years and amounts to an estimated £0.282M, after which the scheme generates an annual surplus. By year 10 the revenue surplus amounts to an estimated £1M per annum, rising to £3.9M per annum by year 20 and £7.7M per annum by year 30. Clearly it would not be equitable for the Authorities to have to meet the £2.069M subsidy for the first three years and then forgo a stake in the long term revenue surpluses generated by the scheme.

Figure 5.2 - Estimated Operating Costs and Forecast Revenue



Service Capacity

The operating cost estimate provided by Great Western Railway is based on Class 165/6 trains operating in three car formations. Each three car train has approximately 270 seats and standing capacity for approximately a further 130 people. Figure 5.3 and 5.4 below shows that full standing capacity is not reached within the first ten years of service, however taking account of passenger comfort, an upgrade to 5 car train formations would be likely around year 10.

Note both new stations at Portishead and Pill are to be delivered with 5 car length platforms from the outset, furthermore all the existing station on the Portishead line (Parson Street, Bedminster and Bristol Temple Meads) have 5 car length platforms. The local stations on the Bath Spa to Bristol Line (Keynsham and Oldfield Park) also already have 5 car length platforms. The stations on the Severn Beach Line has a mixture of platform lengths.

Figure 5.3 - Portishead to Bristol TM – Maximum Passengers Per Train 08:00-09:00

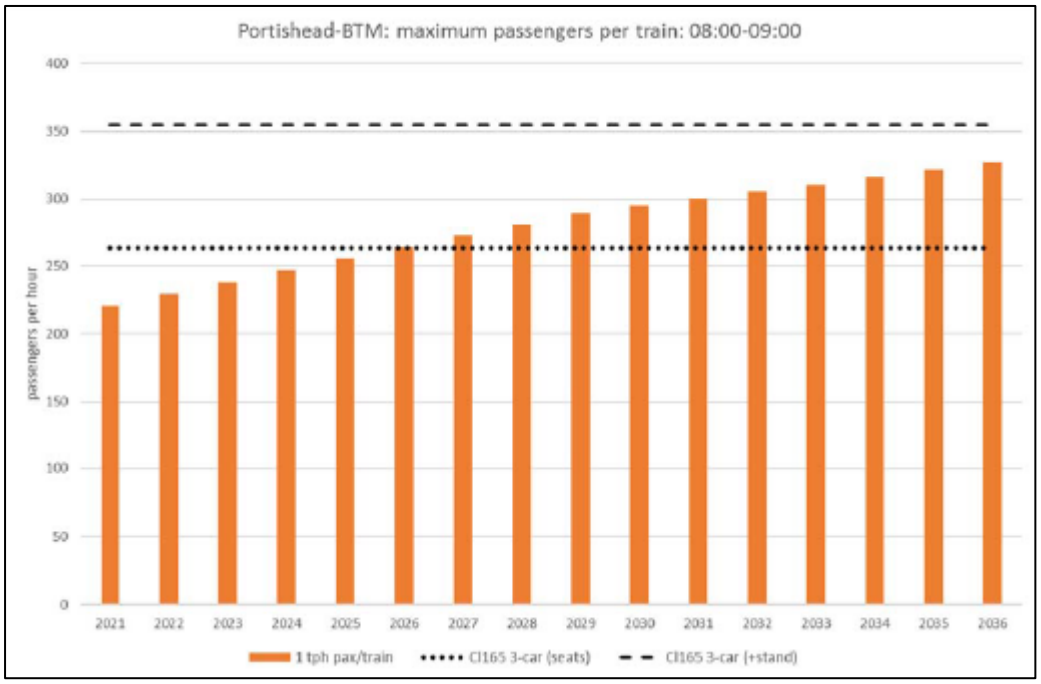
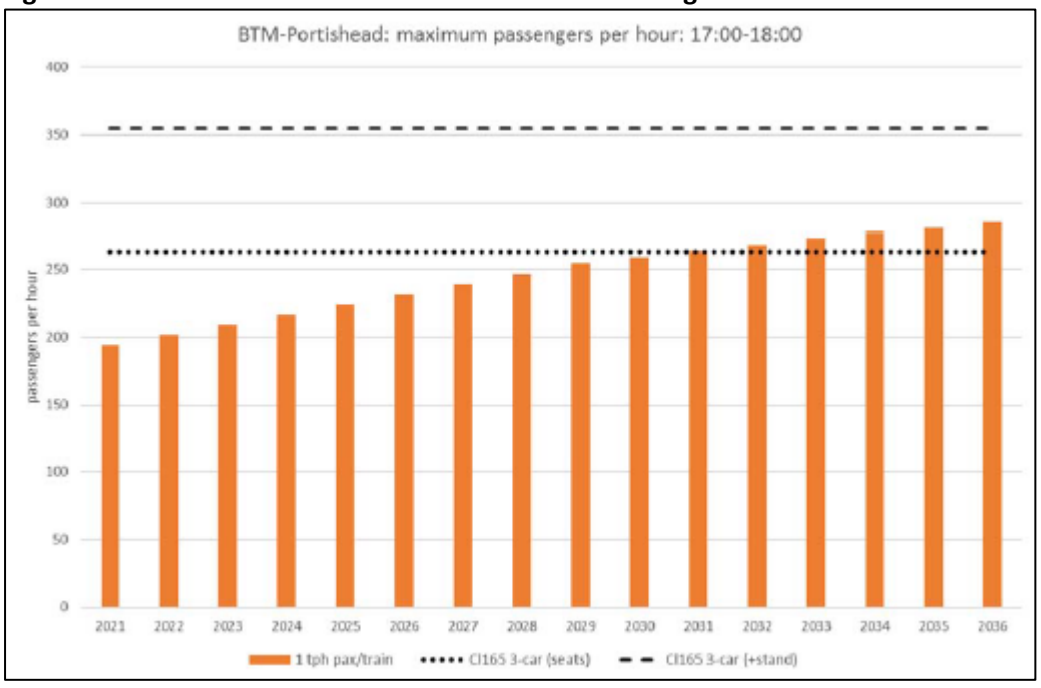


Figure 5.4 - Bristol TM to Portishead – Maximum Passengers Per Train 17:00-18:00

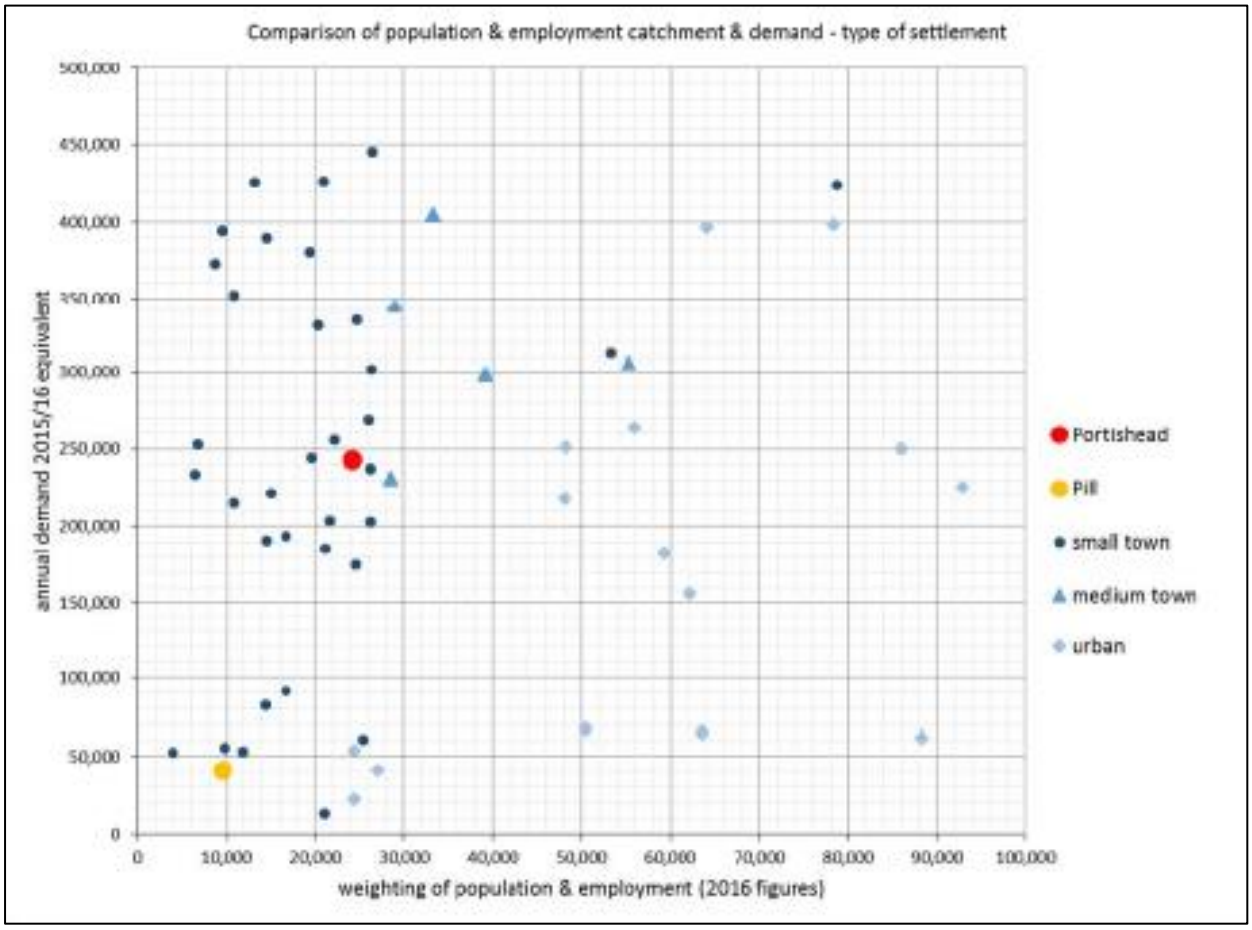


Robustness of the Passenger Demand Forecast

The passenger demand forecast is based on a Rail Demand Model which encompasses three main elements; the Network Rail MORIA model to changes in demand to existing stations, a CH2M gravity demand model for the two new stations and the sub-regional GBATS4 multi-modal model which is being used as a cross check for Network Rail and CH2M model and used to calculate the scheme non-user benefits. Further detail about the Rail Demand Model is set out in the Economic Case chapter 2.

Having built, validated and operated the Rail Demand Model, the model output has been put through a further check to benchmark the results against similar existing stations and their respective passenger volumes. This additional benchmarking provides an extra level of assurance for the Authorities in the robustness of the passenger demand forecasting. The results of the benchmarking illustrated in Figure 5.5 show that the forecast demand for each of the new stations is very comparable with existing peer group stations.

Figure 5.5 - One Train Per Hour Comparator Stations by Location Type



5.5.4 Funding of Long Term Asset Renewal Costs

The scheme infrastructure assets will be transferred to Network Rail at GRIP stage 7. As set out in section 5.4 Network Rail will seek to include the assets within its Regulatory Asset Base (RAB) as part of its periodic (Control Period 7) funding settlement. Aside from on-going maintenance operating costs, there will be a need to renew key assets approximately every 30 years, which typically include track formation and signalling. At part of the RAB these renewal costs will be met by Network Rail.

In respect of the train service, there will be a need for heavy maintenance work to rolling stock every 10-15 years and major rebuild or renew every 30 years. These costs are built into the rolling stock leasing costs which contains both a 'Base Capital' element and a 'Non Base Capital Reserve' element.

5.5.5 Alternative Scheme Funding Approach

Section 5.1.3 demonstrates the MetroWest Phase 1 train service yields a strong financial performance, generating a revenue surplus from year 6 onwards, based on a conservative

operational cost and forecast revenue methodology. Table 5.6 shows that by year 10 the train service is forecast to generate a net surplus of just under £1M per annum. The paragraphs following Table 5.6 explains the context of how forecast growth in passenger demand out strips estimated operating costs during the first ten years.

Financial profiles have been undertaken over a 30 and 60 year period, using a range of assumptions and sensitivity tests. The profiles in Table 5.7 are based on a more conservative approach to operating costs that assumes all the quantified operational cost risks arise all together. In other words the combined total of the operational cost risks (which is £1.72M) has been applied to the base operational cost estimated provided by GWR (of £4.430M), giving a total (risk adjusted) estimated operating cost in the opening year of £5.290M. This more cautious approach has be taken to provide a higher level of certainty for decision makers. It can be seen from Table 5.7 that the trend of growth in passenger demand outstripping operating costs, continues into the medium to long term. By year 20 the revenue surplus is £3.9M per annum and by year 30 the revenue surplus is £7.7M per annum.

Given the considerable revenue generated by the scheme, it may be feasible to establish a funding mechanism where the Authorities borrow against these future revenues to fund the cost of delivering the scheme. This approach was used to fund Worcester Parkway station and was deemed a successful approach for potential replication for other third party rail schemes. The approach is however dependent upon the borrower having certainty over the whole borrowing period of a dependable income stream. For Worcester Parkway station scheme the approach used by the DfT Rail Executive entailed setting up a station access payment to Worcestershire County Council (the promoter) that guaranteed an annual payment in return for delivering the new station and operating the new station over a 30 year period. The farebox revenue collected for trips to and from the station was then fed back to the DfT Rail Executive.

Such an arrangement needs to be commercially attractive to the promoter who is taking all the risk for delivering the scheme, while also giving value for money to the DfT Rail Executive. Our initial calculations indicate that the scheme revenue surpluses could make a contribution towards the scheme capital funding gap, via a borrowing arrangement.

Table 5.7 - Scheme Indicative Revenue Profile Over 60 Years (based on Full Operating Cost Risks)

		INITIAL PROFILE			NO real terms increases in fares			NO real terms increases in wages		
60 min PHD		Demand growth:	main profile		Demand growth:	main profile		Demand growth:	main profile	
100% RISK		Ticket price policy:	real terms incr.		Ticket price policy:	NO increases		Ticket price policy:	real terms incr.	
		Inflation assumption:	WebTAG		Inflation assumption:	WebTAG		Inflation assumption:	WebTAG	
		Real earnings:	real terms incr.		Real earnings:	real terms incr.		Real earnings:	NO increases	
		Revenue	Operating costs	NET (rev - op)	Revenue	Operating costs	NET (rev - op)	Revenue	Operating costs	NET (rev - op)
	TOTAL	£1,645,541,018	£1,037,485,429	£608,055,589	£1,118,997,661	£1,037,485,429	£81,512,232	£1,645,541,018	£710,033,672	£935,507,346
	total inc. mobilisation	£1,645,541,018	£1,039,828,661	£605,712,357	£1,118,997,661	£1,039,828,661	£79,169,000	£1,645,541,018	£712,329,802	£933,211,216
	Year	Revenue	Operating costs	NET (rev - op)	Revenue	Operating costs	NET (rev - op)	Revenue	Operating costs	NET (rev - op)
mobilisation	2017	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
mobilisation	2018	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
mobilisation	2019	£ -	£440,383	-£440,383	£ -	£440,383	-£440,383	£ -	£431,244	-£431,244
mobilisation	2020	£ -	£1,902,849	-£1,902,849	£ -	£1,902,849	-£1,902,849	£ -	£1,864,886	-£1,864,886
1	2021	£4,447,009	£5,770,907	-£1,323,898	£4,447,009	£5,770,907	-£1,323,898	£4,447,009	£5,657,526	-£1,210,517
2	2022	£4,900,844	£5,921,763	-£1,020,919	£4,853,811	£5,921,763	-£1,067,952	£4,900,844	£5,766,018	-£865,174
3	2023	£5,369,486	£6,084,110	-£714,623	£5,266,895	£6,084,110	-£817,214	£5,369,486	£5,882,102	-£512,616
4	2024	£5,715,240	£6,258,704	-£543,464	£5,552,191	£6,258,704	-£706,513	£5,715,240	£6,006,145	-£290,905
5	2025	£6,077,348	£6,446,376	-£369,028	£5,847,226	£6,446,376	-£599,150	£6,077,348	£6,138,546	-£61,198
6	2026	£6,456,117	£6,648,035	-£191,917	£6,151,926	£6,648,035	-£496,109	£6,456,117	£6,279,732	£176,385
7	2027	£6,855,120	£6,856,603	-£1,484	£6,469,320	£6,856,603	-£387,284	£6,855,120	£6,424,166	£430,954
8	2028	£7,275,199	£7,072,338	£202,862	£6,799,740	£7,072,338	-£272,597	£7,275,199	£6,571,922	£703,277
9	2029	£7,717,219	£7,295,503	£421,716	£7,143,518	£7,295,503	-£151,985	£7,717,219	£6,723,076	£994,143
10	2030	£8,182,063	£7,526,376	£655,687	£7,500,980	£7,526,376	-£25,396	£8,182,063	£6,877,707	£1,304,356
11	2031	£8,670,630	£7,765,242	£905,388	£7,872,447	£7,765,242	£107,205	£8,670,630	£7,035,894	£1,634,736
12	2032	£9,183,840	£8,012,401	£1,171,439	£8,258,236	£8,012,401	£245,835	£9,183,840	£7,197,720	£1,986,120
13	2033	£9,722,628	£8,268,161	£1,454,466	£8,658,657	£8,268,161	£390,495	£9,722,628	£7,363,267	£2,359,360
14	2034	£10,287,944	£8,532,846	£1,755,098	£9,074,012	£8,532,846	£541,166	£10,287,944	£7,532,623	£2,755,321
15	2035	£10,880,754	£8,806,788	£2,073,965	£9,504,595	£8,806,788	£697,807	£10,880,754	£7,705,873	£3,174,881
16	2036	£11,502,037	£9,090,337	£2,411,699	£9,950,692	£9,090,337	£860,354	£11,502,037	£7,883,108	£3,618,929
17	2037	£12,152,784	£9,383,854	£2,768,930	£10,412,576	£9,383,854	£1,028,722	£12,152,784	£8,064,419	£4,088,365
18	2038	£12,833,998	£9,687,715	£3,146,283	£10,890,511	£9,687,715	£1,202,797	£12,833,998	£8,249,901	£4,584,097
19	2039	£13,546,691	£10,002,310	£3,544,381	£11,384,747	£10,002,310	£1,382,437	£13,546,691	£8,439,649	£5,107,042
20	2040	£14,291,882	£10,328,046	£3,963,835	£11,895,521	£10,328,046	£1,567,475	£14,291,882	£8,633,761	£5,658,121
21	2041	£15,070,596	£10,665,346	£4,405,251	£12,423,055	£10,665,346	£1,757,709	£15,070,596	£8,832,337	£6,238,259
22	2042	£15,883,866	£11,014,647	£4,869,218	£12,967,553	£11,014,647	£1,952,906	£15,883,866	£9,035,481	£6,848,385
23	2043	£16,732,722	£11,376,408	£5,356,313	£13,529,206	£11,376,408	£2,152,798	£16,732,722	£9,243,297	£7,489,425
24	2044	£17,402,031	£11,751,103	£5,650,927	£13,935,082	£11,751,103	£2,183,979	£17,402,031	£9,455,893	£7,946,138
25	2045	£18,098,112	£12,139,226	£5,958,886	£14,353,135	£12,139,226	£2,213,909	£18,098,112	£9,673,378	£8,424,734
26	2046	£18,822,036	£12,541,290	£6,280,746	£14,783,729	£12,541,290	£2,242,439	£18,822,036	£9,895,866	£8,926,170
27	2047	£19,574,918	£12,957,830	£6,617,088	£15,227,241	£12,957,830	£2,269,411	£19,574,918	£10,123,471	£9,451,447
28	2048	£20,357,915	£13,389,400	£6,968,515	£15,684,058	£13,389,400	£2,294,658	£20,357,915	£10,356,311	£10,001,604
29	2049	£21,172,231	£13,836,578	£7,335,653	£16,154,580	£13,836,578	£2,318,002	£21,172,231	£10,594,506	£10,577,725
30	2050	£22,019,120	£14,299,965	£7,719,155	£16,639,217	£14,299,965	£2,339,252	£22,019,120	£10,838,180	£11,180,941
31	2051	£22,899,885	£14,780,186	£8,119,699	£17,138,394	£14,780,186	£2,358,207	£22,899,885	£11,087,458	£11,812,427
32	2052	£23,815,881	£15,277,891	£8,537,989	£17,652,545	£15,277,891	£2,374,654	£23,815,881	£11,342,469	£12,473,411
33	2053	£24,768,516	£15,793,757	£8,974,759	£18,182,122	£15,793,757	£2,388,365	£24,768,516	£11,603,346	£13,165,170
34	2054	£25,759,257	£16,328,485	£9,430,772	£18,727,585	£16,328,485	£2,399,100	£25,759,257	£11,870,223	£13,889,033
35	2055	£26,789,627	£16,882,808	£9,906,818	£19,289,413	£16,882,808	£2,406,605	£26,789,627	£12,143,238	£14,646,389
36	2056	£27,861,212	£17,457,488	£10,403,724	£19,868,095	£17,457,488	£2,410,607	£27,861,212	£12,422,533	£15,438,679
37	2057	£28,975,660	£18,053,315	£10,922,345	£20,464,138	£18,053,315	£2,410,823	£28,975,660	£12,708,251	£16,267,409
38	2058	£30,134,687	£18,671,114	£11,463,572	£21,078,062	£18,671,114	£2,406,948	£30,134,687	£13,000,541	£17,134,146
39	2059	£31,340,074	£19,311,743	£12,028,332	£21,710,404	£19,311,743	£2,398,662	£31,340,074	£13,299,553	£18,040,521
40	2060	£32,593,677	£19,976,091	£12,617,586	£22,361,716	£19,976,091	£2,385,625	£32,593,677	£13,605,443	£18,988,234
41	2061	£33,897,424	£20,665,089	£13,232,335	£23,032,568	£20,665,089	£2,367,479	£33,897,424	£13,918,368	£19,979,056
42	2062	£35,253,321	£21,379,701	£13,873,620	£23,723,545	£21,379,701	£2,343,844	£35,253,321	£14,238,491	£21,014,831
43	2063	£36,663,454	£22,120,932	£14,542,522	£24,435,251	£22,120,932	£2,314,319	£36,663,454	£14,565,976	£22,097,478
44	2064	£38,129,992	£22,889,827	£15,240,165	£25,168,309	£22,889,827	£2,278,482	£38,129,992	£14,900,993	£23,228,999
45	2065	£39,655,192	£23,687,475	£15,967,717	£25,923,358	£23,687,475	£2,235,883	£39,655,192	£15,243,716	£24,411,476
46	2066	£41,241,400	£24,515,008	£16,726,392	£26,701,059	£24,515,008	£2,186,051	£41,241,400	£15,594,322	£25,647,078
47	2067	£42,891,056	£25,373,603	£17,517,452	£27,502,090	£25,373,603	£2,128,487	£42,891,056	£15,952,991	£26,938,065
48	2068	£44,606,698	£26,264,489	£18,342,209	£28,327,153	£26,264,489	£2,062,664	£44,606,698	£16,319,910	£28,286,788
49	2069	£46,390,966	£27,188,940	£19,202,026	£29,176,968	£27,188,940	£1,988,028	£46,390,966	£16,695,268	£29,695,698
50	2070	£48,246,604	£28,148,285	£20,098,320	£30,052,277	£28,148,285	£1,903,992	£48,246,604	£17,079,259	£31,167,346
51	2071	£50,176,469	£29,143,907	£21,032,562	£30,953,845	£29,143,907	£1,809,938	£50,176,469	£17,472,082	£32,704,387
52	2072	£52,183,527	£30,177,244	£22,006,283	£31,882,460	£30,177,244	£1,705,216	£52,183,527	£17,873,940	£34,309,588
53	2073	£54,270,868	£31,249,796	£23,021,073	£32,838,934	£31,249,796	£1,589,139	£54,270,868	£18,285,040	£35,985,828
54	2074	£56,441,703	£32,363,120	£24,078,583	£33,824,102	£32,363,120	£1,460,982	£56,441,703	£18,705,596	£37,736,107
55	2075	£58,699,371	£33,518,840	£25,180,531	£34,838,825	£33,518,840	£1,319,985	£58,699,371	£19,135,825	£39,563,546
56	2076	£61,047,346	£34,718,646	£26,328,700	£35,883,990	£34,718,646	£1,165,344	£61,047,346	£19,575,949	£41,471,397
57	2077	£63,489,240	£35,964,296	£27,524,944	£36,960,510	£35,964,296	£996,214	£63,489,240	£20,026,196	£43,463,044
58	2078	£66,028,810	£37,257,621	£28,771,189	£38,069,325	£37,257,621	£811,704	£66,028,810	£20,486,798	£45,542,011
59	2079	£68,669,962	£38,600,527	£30,069,435	£39,211,405	£38,600,527	£610,878	£68,669,962	£20,957,995	£47,711,967
60	2080	£71,416,760	£39,994,999	£31,421,762	£40,387,747	£39,994,999	£392,748	£71,416,760	£21,440,028	£49,976,732

5.6 Summary of Financial Case

In summary:

- a robust approach has been taken to understanding and estimating the costs of the scheme
- a QCRA has been undertaken based on the GRIP3 AIP design with a P80 output which has informed the GRIP 3 estimated capital out-turn cost
- the estimated capital out-turn cost has been subject to an independent cost estimation review
- the scheme operating costs have been informed by input from Great Western Railways and Network Rail
- the Authorities have already increased their contribution to the scheme delivery costs to £69.5M, including the cost of work to date of £10.1M, leaving a net capital funding gap of £46.9M
- the MetroWest Phase 1 train service yields a strong financial performance, generating a revenue surplus from year 6 onwards, based on a conservative operational cost and forecast revenue methodology.
- by year 10 the train service is forecast to generate a net surplus of just under £1M per annum.
- a robust approach has been taken to forecast passenger demand including bench marking to check how the forecast output compares against similar existing peer group stations
- the forecast scheme revenue profile shows the scheme would result in a substantial positive financial impact for the Great Western franchise and this would continue into the long term over a 60 year period.
- there are options for the DfT Rail Executive to consider in respect of the contractualisation of the MetroWest Phase 1 train service, taking into account that the forecast scheme revenue only arises from the delivery of the scheme infrastructure for which the Authorities are taking all the delivery risk.