

# MetroWest Phase 1- EAST Appraisal

Prepared for  
**West of England**

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**CH2MHILL®**

Burderop Park  
Swindon  
SN4 0QD

+44 (0)1793 812479

+44 (0)1793 812089



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# 1 Introduction

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## 1.1 What is MetroWest?

MetroWest (formerly known as the Greater Bristol Metro) is an ambitious programme that will transform the provision of local rail services across the West of England. MetroWest comprises of a range of projects from relatively large schemes - entailing both infrastructure and service enhancement - to smaller scale projects. MetroWest is being jointly promoted and developed by the four West of England councils (Bath & North East Somerset, Bristol City, North Somerset and South Gloucestershire Councils).

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 will deliver an enhanced local rail offer for the sub-region comprising:

- Existing and disused rail corridors feeding into Bristol
- Broadly half-hourly service frequency (but some variations possible pending business case)
- Cross-Bristol service patterns for example, Bath to Severn Beach
- A Metro-type service appropriate for a city region of 1 million population.

The programme includes:

- MetroWest Phase 1 – Half-hourly local service for the Severn Beach line, Bath to Bristol line and a reopened Portishead line with stations at Portishead and Pill
- MetroWest Phase 2 - Half-hourly service for the Yate to Bristol line and an hourly service for a reopened Henbury line, with stations at Henbury, North Filton, and possibly Ashley Down and Horfield
- Further additional station openings, subject to separate business cases
- Other potential enhancements including the feasibility of extending electrification across the West of England network

The MetroWest programme is to be delivered over the next five to ten years during Network Rail Control Period (CP) 5 (CP5 is 2014-2019) and 6 (CP6 is 2019-2024). The MetroWest programme will also extend the benefits of strategic transport interventions that are either in the process of being delivered or have been delivered by the West of England councils. These include the three MetroBus schemes (Ashton Vale to Temple Meads, South Bristol Link and North Fringe to Hengrove Package), Bath Package, Weston Package and the Local Sustainable Travel Fund programme. The delivery of these projects, together with the MetroWest programme, will result in better modal integration between rail, bus and active modes, providing an important step towards seamless modal transfer at key hubs across the West of England.

The MetroWest programme has the full backing of the West of England Local Enterprise Partnership (LEP). The LEP together and the four councils' Executive Members for Transport, who collectively make up the West of England Joint Transport Board, has determined that MetroWest Phase 1 and Phase 2 are its highest priorities for devolved DfT (Department for Transport) funding.

Figure 1.1 provides an overview of the MetroWest Phase 1 proposed train services.

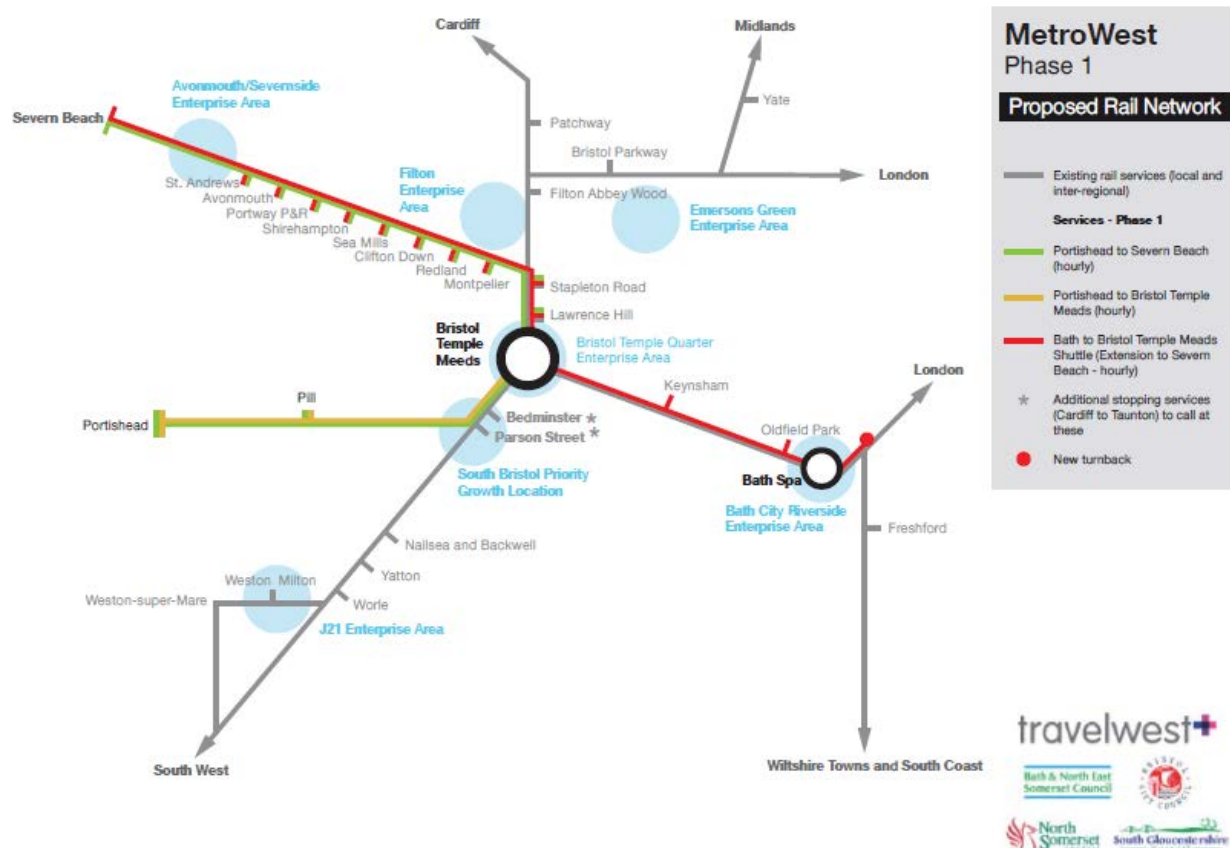


Figure 1.1: Overview of the MetroWest Phase 1 proposed train services

The West of England councils have recognised the strategic importance of the train service network to the local economy for many years. The West of England area enjoys a good network of long-distance train services. However, the local train network is underdeveloped and underutilised, in comparison with other city regions of a similar size. MetroWest fills this strategic gap and will enable the four councils and the West of England LEP to realise the strategic potential for the local rail network to play a bigger role in meeting the transport needs of the sub-region. MetroWest also complements committed investment planned by the rail industry during Control Period 5 (2014 to 2019) including electrification of the Great Western line and the Intercity Express Programme, projects which will address network bottlenecks and renewal projects.

MetroWest (formerly known as the Greater Bristol Metro) is included in the current Joint Local Transport Plan, covering the period 2011-2026 and all of the local authorities' Core Strategies.

The West of England councils and Network Rail have undertaken a considerable number of feasibility studies on MetroWest in its current and former guises. These work-streams are summarised in Figure 2.2.



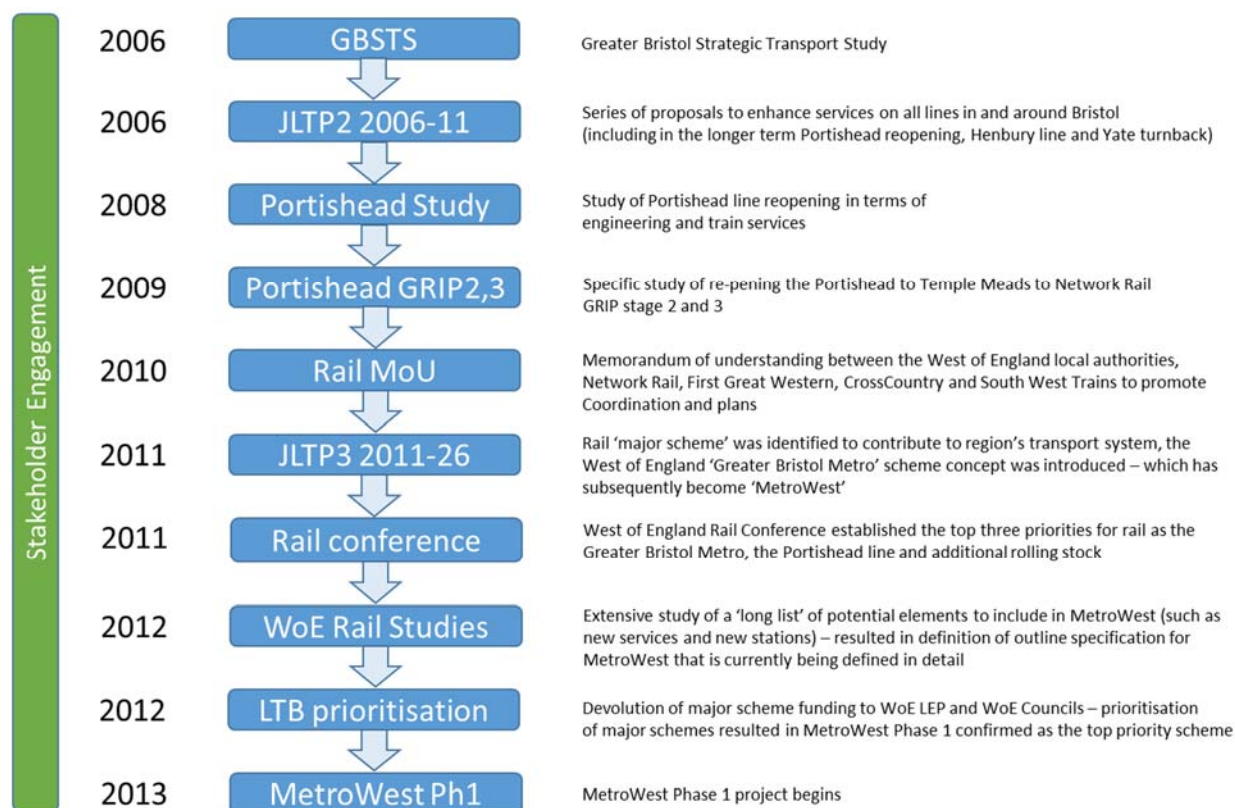


Figure 2.2: Summary of work-streams that have informed the MetroWest Phase 1 project

The outcome of this previous work is that MetroWest Phase 1 is now well-positioned to be taken forward. In summary, MetroWest Phase 1 has:

- Full backing across all four West of England authorities, including funding for project development
- A robust policy context
- A body of feasibility work and evidence
- Full backing of the rail industry to be taken forward alongside committed CP5 schemes
- An agreed output specification
- Endorsement as a priority scheme from the West of England LEP
- Endorsement by the West of England Local Transport Body Board (now the Joint Transport Board) as the top priority scheme for devolved major scheme funding, subject to business case approval

The programme has four key stages:

1. Option development (including GRIP 1-2) - Summer 2013 to Summer 2014
2. Scheme case (including GRIP 3) - Summer 2014 to Winter 2015-16
3. Planning powers and procurement (including GRIP 4-5) - Winter 2015/16 to Autumn 2017
4. Construction and opening (including GRIP 6-8) - Autumn 2017 to Spring 2019

## 1.2 Business case requirements

The Local Transport Body Board, LTBB (now the Joint Transport Board) for the West of England now has responsibility for allocating funds (which are awarded to them by the DfT) for major transport schemes. The delivery of MetroWest will, therefore, rely on funding from the LTBB.

A process to assess schemes has been set out, which includes production of business cases at key points, followed by the LTBB Independent Reviewer<sup>1</sup>'s review.

MetroWest Phase 1 is targeting a project opening date of May 2019. A series of business cases are to be prepared and submitted to the LTBB:

- Preliminary (Strategic Outline) Business Case – to be submitted to the LTBB in September 2014
- Outline Business Case – to be submitted in October 2015
- Full Business Case - to be submitted in October 2017

The assessment process is based on the DfT's WebTAG, drawing on elements of WebTAG that are relevant to the level of detail required by each of the business cases in turn. Successful submission of each business case is required to proceed to subsequent stages of development.

## 1.3 EAST assessment

The DfT's Early Assessment Sifting Tool (EAST) is a defined step in the appraisal process set out in WebTAG. It is a decision support tool that has been developed to 'quickly summarise and present evidence on options in a clear and consistent format'.

Figure 1.3 illustrates the WebTAG appraisal process. The EAST process is the sixth step in the appraisal process and hence builds on the previous five steps:

- Understanding the current situation
- Understanding the future situation
- Establishing the need for intervention
- Identifying objectives and defining geographic area of impact
- Generating options for consideration.

An overview of these five steps is set out in Sections 2 and 3 of this report.

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<sup>1</sup> Steer Davies Gleave (SDG) has been appointed the West of England LTBB's Independent Reviewer for major transport schemes.]

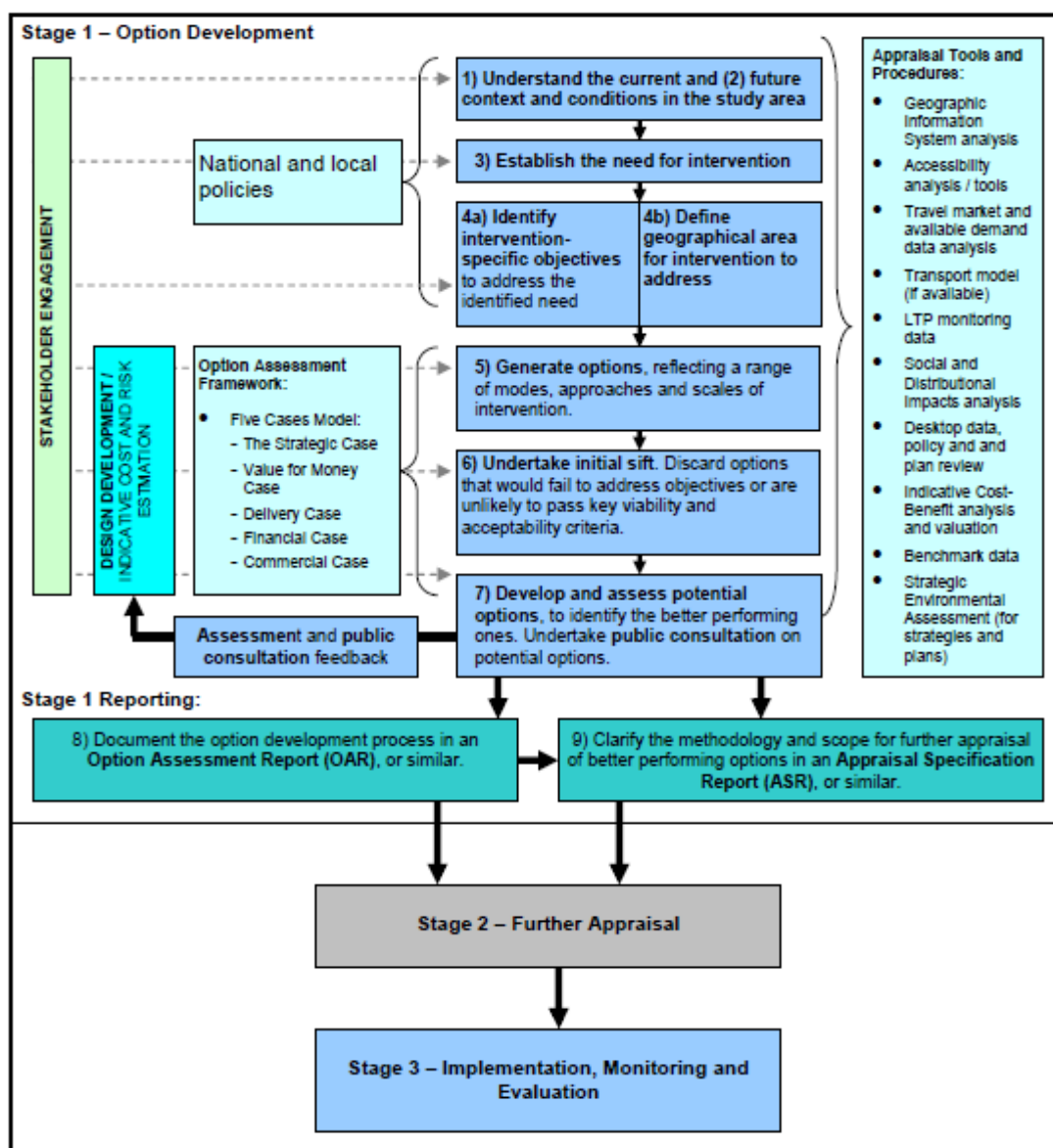


Figure 1.3: Outline of the WebTAG appraisal process

## 1.4 Purpose and structure of this report

The purpose of this report is to document work undertaken to assess MetroWest Phase 1 options EAST framework and provide information of the appraisal and assessment steps prior to the EAST assessment. This report will inform the MetroWest Phase 1 Preliminary (Strategic Outline) Business Case.

The question of the ‘need for the scheme’ has been considered at two levels:

- Macro level - the scheme is compared with other Major Schemes in the West of England (see Section 2)
- Mode-specific level - considering rail matters in more detail (see Section 3)

The EAST assessment is set out in Section 4 of this report.



## 2 The context and need for MetroWest Phase 1

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### 2.1 Introduction

This section sets out the context of the current and future situations and considers the need for the intervention. It considers transport by all modes across the West of England area. More detailed rail issues are reported in section 3.

### 2.2 Understanding the current transport situation

#### 2.2.1 Current transport and other policies

The Joint Local Transport Plan 3 (JLTP3) 2011-2026 is a joint plan which covers Bristol City Council, Bath & North East Somerset, North Somerset and South Gloucestershire Council areas. The principal aims and objectives are to reduce CO<sub>2</sub>, provide support to the economy, and to improve quality of life and environmental conditions. It also includes a number of associated documents on various transport topic areas such as cycling, rural transport and public transport.

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.”

#### 2.2.2 Current travel demand

The West of England city region has a population of over 1 million. Table 2.1, derived from the national and local data sources, gives an indication of how people travel. It shows that the car is by far the dominant mode and just 1.5 per cent of all journeys to work are by rail. However, there has been 44 per cent growth from 2004 to 2008 in rail demand in the West of England.

TABLE 2.1  
2013 Mode Split

Mode	Mode share
Car driver	46.6%
Walk	17.1%
Bus	6.3%
Car passenger	13.1%
Cycle	13.8%
Train	3.2%

An overview of the transport networks is shown in Figure 2.1.

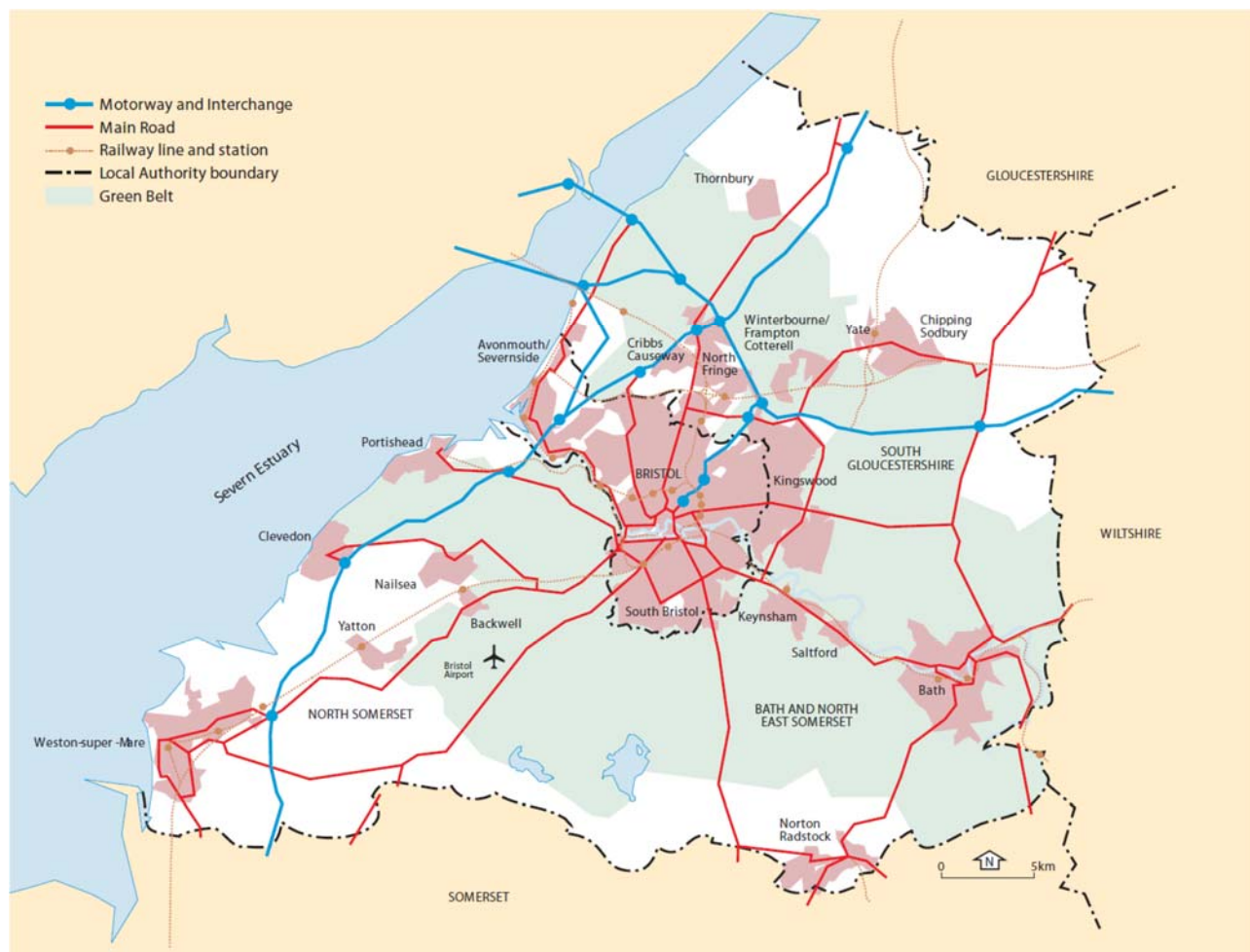


Figure 2.1 - An overview of the transport networks (source: LTP3)

### 2.2.3 Current transport opportunities and constraints

Current transport-related problems include:

- Lack of real alternatives to the car for some residents and businesses in the West of England (for example, Portishead and cross-Bristol trips).

- Areas of multiple deprivation for example, Weston-super-Mare and in north-western parts of Bristol (alongside the Severn Beach line).
- Poor transport network resilience. Incidents and accidents on the national and local highway network can ripple and cause disruption to the normal operation of the network elsewhere. Furthermore, there is a need to provide real alternatives to single occupancy car-based travel to address the long-term reliance on the car, and enable the local economy to continue to grow.
- Poor air quality in areas of Bristol and Bath.
- Congestion on West of England local and strategic road networks.

The transport problems, coupled with the need to encourage economic growth, have been considered by the West of England LTBB, to shape determining proposals to provide medium- to long-term benefits for the people, businesses and residents of the West of England. As part of this, a process of assessing and prioritising major local transport schemes was undertaken in June 2013.

## 2.3 Understanding the future situation

### 2.3.1 Future land uses and policies

Metro Phase 1 forms an important part of the West of England's economic growth agenda, led by the LEP. The West of England LEP's economic development strategy is being driven by its Strategic Economic Plan (SEP), submitted to Government in March 2014. The SEP and the City Region Deal (CRD) provide the framework for unlocking growth across the West of England. The SEP and the CRD will deliver significant growth at the following locations (see section 3.2.1 for more details):

- Bristol Temple Quarter Enterprise Zone and new arena
- Bath City Riverside Enterprise Area
- J21 Enterprise Area (Weston-super-Mare)
- Emersons Green/Science Park Enterprise Area via Bristol Parkway
- Filton Enterprise Area
- Avonmouth Severnside Enterprise Area

### 2.3.2 Changes to the West of England transport system

As part of the JTLP3 transport vision (see Figure 6.1 in the JTLP3), the MetroWest Phase 1 complements and integrates with the West of England transport programme, including:

- MetroBus (bus rapid transit) including Ashton Vale to Temple Meads, South Bristol Link and North Fringe to Hengrove Package)
- Bath package, bus network enhancements
- Weston package, multi-modal package of enhancements including J21 of the M5
- Better Bus Area fund
- Cycle City Ambition Grant
- Local sustainable transport fund
- Local pinch-point fund

### 2.3.3 Future travel demands

The Temple Quarter Enterprise Zone, centred around Bristol Temple Meads station, aims to create 17,000 new jobs with 4,000 by 2017. It is anticipated that a large proportion of employees will come to work by train.

Network Rail is assuming over 40 per cent growth in passengers at Bristol Temple Meads over the 10 years to 2020-21.

Similarly the five Enterprise Areas including Bath City Riverside (9,000 jobs), J21/Weston-super-Mare Gateway (9,000) and Avonmouth Severnside Enterprise Area (6,000 to 12,000,000), are all well located to make use of the rail network. MetroWest Phase 1 will provide a key interface for increasing access to major employment areas. For major employers, it will increase the catchment pool of the skilled workforce within a short (half an hour) journey to work.

## 2.4 The need for transport intervention

The primary highway corridors into and across Bristol, Bath and the surrounding towns are congested and continued traffic growth threatens the future economic prosperity of the sub-region. Over the last 10 years the volume of people using the rail network in the West of England had doubled. As transport demand increases, there is a need to ensure the rail network has sufficient capacity to cater for this demand as part of an integrated approach to managing the transport network. MetroWest Phase 1 will complement the rail industry's substantial programme of investment to the Western Route for Control Period 5 (2014-19).

The West of England's current share of national economic growth (GVA) is the highest of any core city region at 3.1%. The overall vision is to build on this economic growth through a range of interventions including improving access to major employment sites for the skilled workforce. The city region is also set for further population growth which is expected to exceed 1.1 million by 2026. Planning for this growth means the city region needs to make sure its transport infrastructure is not only fit-for-purpose, but has the ability to respond to increasing demand and, therefore, maximise potential for continued economic growth.

Strategic investment in transport infrastructure provides wider economic benefits. A recent West of England study found that every £1 invested in rail generates £2 benefits.

There is a public recognition of the need for intervention from a diverse range of stakeholders, including major employers and the wider business community through to community groups and local interest groups and campaigns.

### 2.4.1 Underlying causes

The underlying cause for the scheme is the excess of travel demand over available capacity which will be exacerbated with development. Without intervention, the local train network's contribution to meeting the transport needs of the sub-region will be limited. Furthermore, the local highway network is already congested in key areas. The overall impact would result in constraints to accessing employment opportunities which would restrict economic growth.

## 2.5 LTP and LEP objectives

From April 2015, the LTBB will manage major scheme funding to deliver high value for money transport schemes. These schemes will support the policies and objectives of the Joint Local Transport Plan 2011-26 and 'place' aspect of the LEP Vision.

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 Joint Local Transport Plan 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

## 2.6 Options considered for major schemes

The West of England authorities recently undertook a process of assessment and prioritisation of more than 50 potential major local transport schemes. The outcome was reported to the LTTB in June 2013.

MetroWest Phase 1 was ranked as the highest priority and is now on the Priority Programme for Devolved Major Schemes Funding.



## **3 MetroWest Phase 1 – WebTAG Appraisal Stage 1 – Steps 1 to 5**

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### **3.1 Introduction**

This section provides details of the current rail situation and optioneering relating to the MetroWest Phase 1 scheme options.

### **3.2 Understanding the current rail situation**

#### **3.2.1 Current policy framework**

The MetroWest programme of improvements has been a long-standing aspiration of all of the West of England authorities and is identified in their Core Strategies. It therefore has an established and agreed policy context and complements the overarching development plans for the local area.

The MetroWest Phase 1 is identified in the JLTP3 (referenced as Greater Bristol Metro and Portishead line) as a future priority scheme following delivery of the current three bus rapid transit schemes and the Weston and Bath package.

This policy status is underpinned by technical work including:

- The Great Western Main Line Route Utilisation Strategy, March 2010 – this tested various options for the Greater Bristol Metro
- Portishead Line Reopening – GRIP Stage 2 and 3 – 2009 and 2010

A full review of the relevant local planning policies, as well as the JLTP, is provided in the MetroWest EIA (Environmental Impact Assessment) suite of documents.

#### **3.2.2 Current rail demand and levels of service**

Figure 2.2 shows a plan of the current railway provision in Bristol and surrounding area.



Figure 2.2 A plan of the current railway provision in Bristol and the surrounding area

The local rail network across the West of England is under-developed. Many local rail routes do not have a basic half hourly frequency in the peak and some routes terminate at Bristol Temple Meads rather than operating across the city region. There are some noteworthy deficiencies in the current service patterns. For example, the Bristol/Bath line has a half hourly service to London, yet the service pattern provided for intermediate stations (Keynsham and Oldfield Park) is approximately hourly. The Severn Beach line operates every 40 minutes to Avonmouth and only two hourly to Severn Beach.

Office of Rail Regulator (ORR) station usage information is shown in Table 2.2.

TABLE 2.2  
ORR station usage information

Station Name	2012/13 Entries & Exits
<b>TOTAL (stations in study area - 3)</b>	<b>20,324,156</b>
<b>BRISTOL MAIN STATIONS</b>	
Bristol Temple Meads	9,099,368
Bristol Parkway	2,255,298
<b>TOTAL</b>	<b>11,354,666</b>
<b>SEVERN BEACH LINE STATIONS</b>	
Severn Beach	167,078
St.Andrew's Road	9,910
Avonmouth	97,880
Shirehampton	50,654
Sea Mills	58,310
Clifton Down	522,010

TABLE 2.2  
**ORR station usage information**

Station Name	2012/13 Entries & Exits
Redland	94,984
Montpelier	126,316
<i>TOTAL</i>	<i>1,127,142</i>
<b>OTHER BRISTOL URBAN STATIONS</b>	
Stapleton Road	140,390
Lawrence Hill	124,878
Bedminster	80,262
Parson Street	87,932
<i>TOTAL</i>	<i>433,462</i>
<b>BATH and NE SOMERSET URBAN STATIONS</b>	
Bath Spa	5,757,880
Keynsham	329,274
Oldfield Park	281,622
<i>TOTAL</i>	<i>6,368,776</i>
<b>SOUTH GLOUCESTERSHIRE STATIONS</b>	
Yate	307,148
Patchway	82,198
Filton Abbey Wood	852,250
<i>Pilning</i>	<i>130</i>
<i>TOTAL</i>	<i>1,241,596</i>
<b>NORTH SOMERSET STATIONS</b>	
Nailsea and Backwell	421,892
Yatton	398,530
Worle	253,590
Weston Milton	48,008
Weston-super-Mare	1,037,172
<i>TOTAL</i>	<i>2,159,192</i>

### 3.2.3 Current rail opportunities and constraints

Key factors affecting Bristol rail services include:

- Lack of a standard, 'clock-face' half hourly service pattern across the local rail network
- Bottlenecks at key junctions and sections of the track
- Lack of capacity (particularly short formation rolling stock) and connectivity across the Bristol area
- Ageing signalling equipment
- Congestion at Bristol Temple Meads station

## 3.3 Understanding the future rail situation

### 3.3.1 Future changes to the rail network and operation

Network Rail's plans for Control Period 5 (CP5), which covers the period 2014 -19, includes delivery of £7.5 billion of rail investment via the Western Programme. This will become Europe's largest construction project, covering the London Paddington, Newbury, Oxford and Bristol lines. The CP5 works include a number of rail infrastructure schemes to enhance the capacity and capability of the rail network into Bristol:

- Electrification of the Great Western main line

- Additional platform at Bristol Parkway station
- Additional infrastructure between Bristol Parkway and Bristol Temple Meads (Filton Bank)
- Bristol Temple Meads additional platform and station capacity
- Renewal of Bristol area signalling
- Line speed improvements between Bristol Temple Meads and Taunton

The rail operational challenge needs to take account of:

- The significant growth predicted by the Great Western Route Utilisation Strategy (RUS) in passenger demand around Bristol for both long distance, high speed trains, specifically commuting to London and local, commuter and leisure travel.
- Freight growth predicted for Bristol port.

Electrification of the Great Western main line (expected completion 2017-18) will introduce enhanced services between London and Bristol, with potentially four trains per hour (two via Bath and two via Bristol Parkway). Although not a specific part of current plans, the West of England authorities are investigating extension of electrification to local rail lines.

The DfT Great Western specification consultation is currently being undertaken. The consultation sets out the scope of the new franchise and feedback on the proposals is being sought. The components of MetroWest Phase 1 are listed as potential third party promoted schemes in the report:

- Bristol – Portishead
- Additional half hourly services between Bristol and Bath
- Half hourly services on the Bristol – Severn Beach line

### 3.3.2 MetroWest Phase 2

MetroWest Phase 2 is programmed for delivery within two years of the opening of MetroWest Phase 1. Phase 2 will reintroduce passenger services on the existing Henbury freight line, provide new station(s) on Filton Bank, and increase service frequencies at Yate and Weston Milton. The interaction between Phase 1 and Phase 2 services on the Severn Beach Line is reported in Section 3.6.

### 3.3.3 Future rail demand

Demand for rail travel has grown significantly in recent years. For example, there has been an almost 70 per cent increase in passenger numbers through stations in the West of England area between 2004-05 and 2011-12 (based on ORR figures). There have been even larger increases on specific routes, such as more than a doubling of patronage on the Severn Beach line. Historic growth rates at groups of West of England stations are shown in Table 3.1 and Figure 3.1. Apart from a slight levelling in 2007-08, growth has continued in spite of the economic recession, and seems likely to continue, albeit it is debatable whether rates may not be as high as recent times.

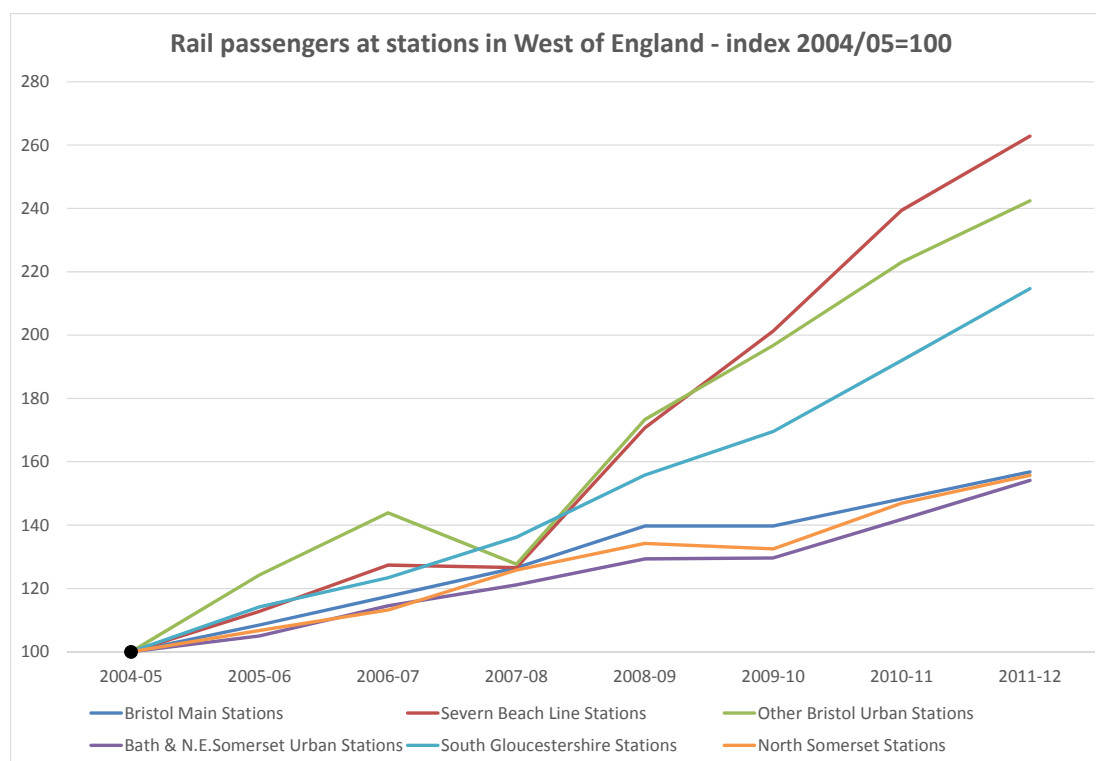
TABLE 3.1  
**ORR historic patronage growth in West of England area**  
*2004-2012 figures*

Station groupings	2010-11 to 2011-12 per annum	2009-10 to 2010-11 per annum	2004-05 to 2011-12 TOTAL	2004-05 to 2011-12 per annum
Bristol main (Temple Meads and Parkway)	5.7%	6.1%	57%	6.6%

TABLE 3.1

**ORR historic patronage growth in West of England area***2004-2012 figures*

Station groupings	2010-11 to 2011-12	2009-10 to 2010-11	2004-05 to 2011-12	2004-05 to 2011-12
	per annum	per annum	TOTAL	per annum
Severn Beach Line	9.8%	18.9%	163%	14.8%
Other Bristol urban	8.7%	13.3%	142%	13.5%
B&NES (including Keynsham)	8.7%	9.3%	54%	6.4%
South Gloucestershire(excluding Parkway)	11.8%	13.2%	115%	11.5%
North Somerset	6.0%	10.9%	56%	6.5%
OVERALL	8.7%	10.9%	69%	7.8% <sup>2</sup>

**Figure 3-1: ORR historic growth in West of England area**

Looking into the future, the Great Western Route Utilisation Strategy (RUS) (published in March 2010) forecasted that demand in the Bristol area would rise by 41 per cent at peak times between 2008 and 2019 (a rate of 3.2 per cent per annum), and 37 per cent off peak (2.9 per cent per annum), with an average growth rate of 3.0 per cent per annum.

The Long Term Planning Process (LTPP) Regional Urban Markets study (published by Network Rail in October 2013) uses a series of wider economic scenarios to frame changes in rail use, and forecasts are presented for rail use in and around key urban centres. The resulting growth rates for the Bristol area vary from 0.6 per cent per annum to 3.9 per cent per annum. More details of the LTPP growth rates are shown in Table 3.2.

<sup>2</sup> As a comparison, the West of England station survey showed a 6.5% per annum increase from 2005 to 2012

TABLE 3.2

**Network Rail LTPP: Regional Urban Markets Study – Bristol area forecast growth**  
*(October 2013)*

Economic scenario	2013-23	2013-23	2023-2043	2023-2043
	total	per annum	total	per annum
'Prosperity in isolation'	14%	1.3%	33%	1.4%
'Global stability'	47%	3.9%	44%	1.8%
'Struggling in isolation'	6%	0.6%	15%	0.7%
'Global turmoil'	35%	3.0%	21%	1.0%
AVERAGE	26%	2.3%	29%	1.3%

In spite of recorded growth in recent years, it is possible that these rates would not continue unabated in the long term. Therefore, a more robust approach is proposed for future year forecasts for West of England stations, based on a combination of decrementing historic rates, RUS and LTPP figures, as follows: <sup>3</sup>

- 2013 to 2017 – taper from recent historic growth rates at West of England stations (7.8% per annum) to RUS average of peak and off peak (3.0 per cent per annum)
- 2018 and 2019 – RUS average rate (3.0 per cent per annum)
- 2020 to 2023 – taper from RUS average rate (3.0 per cent per annum) to an LTPP average rate derived from the four economic scenarios (2.3 per cent per annum)
- 2023 to 2043 – taper from 2023 LTPP average rate (2.3 per cent per annum) to 2043 LTPP average rate (1.3 per cent per annum)

For appraisal purposes, demand would be assumed to level off after a period of growth. The point at which future growth is zero would be determined by opening year and prevailing assumptions surrounding the scenario being tested. WebTAG (revised unit A5-1) suggests 20 years' growth after opening should be assumed, with sensitivities of 10 and 30 years' growth.

### 3.4 The need for rail intervention

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 accessible and has enough capacity and resilience to continue to meet the sub-region's needs.

MetroWest Phase 1 complements planned CP5 investment through targeted investment in the West of England local rail network, to enhance the Severn Beach line, the Bath to Bristol line and reopen the Portishead to Bristol line. MetroWest Phase 1 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 play a part in removing barriers to inward investment.

The long-term trend of continued traffic growth threatens the West of England's economic prosperity; in response, the four West of England councils have developed the MetroWest programme as a key part of its integrated 'TravelWest' transport strategy. Key highway corridors into and across the city region are at or

<sup>3</sup> Given recent historic rates of growth of rail patronage, the forecast growth rates assumed can be considered comparatively conservative.



near capacity and average vehicle speeds are among the lowest for comparable city regions. The case for intervention to rebalance the transport network, through investment in the local rail network, is compelling.

### 3.5 Scheme-specific objectives and geographical area of impact

The principal business objectives of the MetroWest Phase 1 project are:

- To support economic growth, by enhancing the transport links to the Bristol Temple Quarter Enterprise Zone (TQEZ) and into and across Bristol City Centre, from the Portishead, Bath and Avonmouth/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/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 wellbeing, life opportunities and improving quality of life, across the three arterial corridors

The MetroWest Phase 1 supporting objectives are:

- To contribute to reducing traffic congestion on the Portishead, Bath and Avonmouth/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
- To contribute to reducing the overall environmental impact of the transport network

The 2012 report by Atkins 'GVA Impacts of Major Transport Schemes' states that rail schemes (including MetroWest and the new stations package) are forecast to unlock 2,550 jobs and will generate £153 million in GVA per annum by 2030. MetroWest will play an important role in bringing these major employment centres closer to the skilled workforce catchment, helping to remove barriers to inward investment. MetroWest is intended to plan for growth and make sure the city region's transport infrastructure has the ability to respond to increasing demand, to realise and maximise continued economic growth.

### 3.6 MetroWest Phase 1 option generation and descriptions

In the early stages of MetroWest Phase 1, the four Councils, Network Rail and the train operating companies held two optioneering workshops. These workshops identified the services and infrastructure required to meet a half hourly service pattern. They also considered current passenger demand characteristics and the known infrastructure constraints across the West of England rail network. This resulted in the identification of the following options:

- Option 1: Shuttles (base case)
- Option 2a and b: Portishead – Bath Spa and Severn Beach shuttle
- Option 3a and b: Portishead – Severn Beach and Bath shuttle
- Option 4a and b: Severn Beach – 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

These are described in Table 3.3.

TABLE 3.3  
Option descriptions

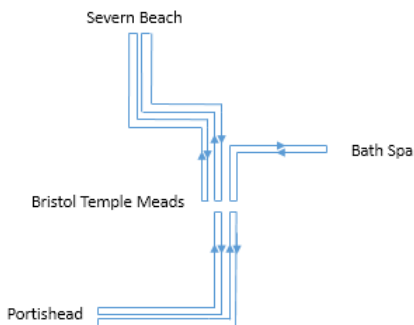
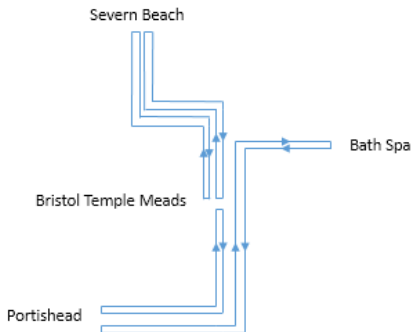
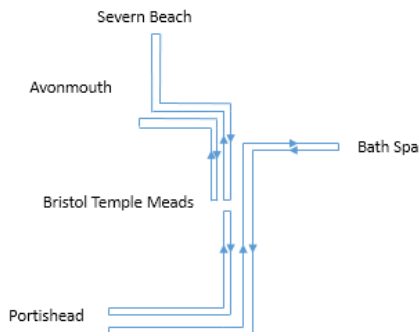
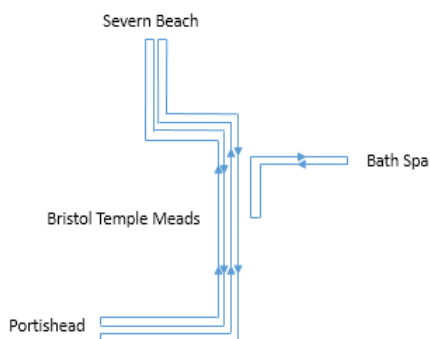
Option		Service pattern
<b>Option 1:</b> Shuttles (Base Case)		<p>Metro services operate as shuttles:</p> <ul style="list-style-type: none"> <li>2tph (trains per hour) Severn Beach – Bristol Temple Meads (BTM)</li> <li>1tph Bath Spa – BTM</li> <li>2tph Portishead – Bristol Temple Meads (BTM)</li> <li>1tph off peak</li> </ul>
<b>Option 2a:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads		<p>Link Portishead to Bath Spa:</p> <ul style="list-style-type: none"> <li>2tph Severn Beach – BTM</li> <li>1tph Bath Spa – Portishead</li> <li>1tph Portishead – BTM (off peak)</li> </ul>
<b>Option 2b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads		<p>Link Portishead to Bath Spa:</p> <ul style="list-style-type: none"> <li>1tph Severn Beach – BTM</li> <li>1tph Bath Spa – Portishead</li> <li>1tph Portishead – BTM</li> <li>1tph Avonmouth - BTM</li> </ul>
<b>Option 3a:</b> Portishead to Severn Beach and Bath shuttle		<p>Link Portishead to Severn Beach:</p> <ul style="list-style-type: none"> <li>2tph Severn Beach – Portishead (peak)</li> <li>1tph Bath Spa – BTM</li> <li>This option is presented as an all day timetable without a peak variant</li> </ul>

TABLE 3.3  
Option descriptions

Option		Service pattern
<b>Option 3b:</b> Portishead to Severn Beach and Bath shuttle		Link Portishead to Severn Beach: <ul style="list-style-type: none"> <li>• 1tph Severn Beach – Portishead</li> <li>• 1tph Bath Spa – BTM</li> <li>• 1tph Avonmouth – Portishead</li> <li>• This option is presented as an all day timetable without a peak variant</li> </ul>
<b>Option 4a:</b> Severn Beach to Bath Spa and Portishead shuttle		Link Severn Beach to Bath Spa <ul style="list-style-type: none"> <li>• 1tph Severn Beach – Bath Spa</li> <li>• 1tph Severn Beach – BTM</li> <li>• 2tph Portishead – BTM (1tph off peak)</li> </ul>
<b>Option 4b:</b> Severn Beach to Bath Spa and Portishead shuttle		Link Severn Beach to Bath Spa <ul style="list-style-type: none"> <li>• 1tph Severn Beach/Avonmouth – Bath Spa</li> <li>• 1tph Severn Beach/Avonmouth – BTM</li> <li>• (total of 1tph on Severn Beach Line)</li> <li>• 2tph Portishead – BTM</li> </ul>
<b>Option 5a:</b> (timetable proposed by Halcrow ): Severn Beach to Bath Spa and Portishead		Link Severn Beach – Bath Spa and Portishead <ul style="list-style-type: none"> <li>• 1tph Severn Beach – Bath Spa</li> <li>• 1tph Severn Beach - Portishead</li> <li>• 1tph Portishead - BTM</li> </ul>

TABLE 3.3  
Option descriptions

Option		Service pattern
<b>Option 5b:</b> Severn Beach to Bath Spa and Portishead	<p>The diagram for Option 5b shows a vertical line of stations: Severn Beach at the top, followed by Avonmouth, Bristol Temple Meads, and Portishead at the bottom. A horizontal line extends from Avonmouth to the right, connecting to Bath Spa. Blue arrows indicate the service pattern: a line of arrows points down from Severn Beach to Portishead, and another line of arrows points up from Portishead to Severn Beach. A single arrow points from Avonmouth to Bath Spa.</p>	Link Severn Beach – Bath Spa and Portishead <ul style="list-style-type: none"> <li>• 1tph Severn Beach – Bath Spa</li> <li>• 1tph Portishead - Avonmouth</li> <li>• 1tph Portishead - BTM</li> </ul>
<b>Option 6a:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	<p>The diagram for Option 6a shows a vertical line of stations: Severn Beach at the top, followed by Bristol Temple Meads, and Portishead at the bottom. A horizontal line extends from Bristol Temple Meads to the right, connecting to Bath Spa. Blue arrows indicate the service pattern: a line of arrows points down from Severn Beach to Portishead, and another line of arrows points up from Portishead to Severn Beach. A single arrow points from Bristol Temple Meads to Bath Spa.</p>	Link Portishead – Severn Beach and Bath Spa <ul style="list-style-type: none"> <li>• 1tph Portishead – Bath Spa</li> <li>• 1tph Portishead – Severn Beach</li> <li>• 1tph Severn Beach - BTM</li> </ul>
<b>Option 6b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	<p>The diagram for Option 6b shows a vertical line of stations: Severn Beach at the top, followed by Avonmouth, Bristol Temple Meads, and Portishead at the bottom. A horizontal line extends from Avonmouth to the right, connecting to Bath Spa. Blue arrows indicate the service pattern: a line of arrows points down from Severn Beach to Portishead, and another line of arrows points up from Portishead to Severn Beach. A single arrow points from Avonmouth to Bath Spa.</p>	Link Portishead – Avonmouth and Bath Spa <ul style="list-style-type: none"> <li>• 1tph Portishead – Bath Spa</li> <li>• 1tph Portishead - Avonmouth</li> <li>• 1tph Severn Beach - BTM</li> </ul>

## 4 MetroWest Phase 1 – WebTAG Appraisal Stage 1 – Steps 6 - EAST

### 4.1 Introduction

The DfT's Early Assessment Sifting Tool (EAST) is a defined step in the appraisal process set out in WebTAG. EAST is an early comparison of options and tools under consideration, prior to the more detailed appraisal which will provide recommendations for funding decisions.

DfT sets out that the EAST tool should be used to:

- Help refine options by highlighting adverse impact or unanticipated consequences
- Compare options, for example, within or across modes, geographical areas and networks
- Identify trade-offs between objectives, aiding package development
- Filter the number of options, discounting some options early to ease appraisal process and avoid resources being spent unnecessarily
- Identify key uncertainties in the analysis and areas where further appraisal efforts should focus

When undertaking an EAST appraisal, it is often at a very early stage in the scheme development work and therefore only high-level information is available. In this case, there is already a considerable amount of information for MetroWest Phase 1 (and some of its component parts, such as the reopening of the Portishead line).

Section 4 of this report sets out the results of the MetroWest Phase 1 EAST assessment for the scheme options detailed in Section 3.6, the EAST forms are set out in Appendix B.

### 4.2 Strategic Case

#### 4.2.1 Scale of Impact

Table 4.1 shows the scale of the impact of the scheme options.

TABLE 4.1

#### Scale of impact

Response options are:

- 1 Very small overall impact - Would have a very small positive impact, possibly with undesirable consequences
- 2 Minor impact - Would have a modest overall impact
- 3 Moderate impact - Expected to have a reasonably significant impact on the problem identified
- 4 Significant impact - Expected to significantly alleviate the problem
- 5 Very significant impact - Expected to alleviate the problem

Option	EAST Response	Justification
Option 1: Shuttles (base case)	3 Moderate impact	The option results in benefits for trips to/from Bristol Temple Meads station from the new and enhanced routes. However the scheme option does not include a cross-Bristol service pattern, and this option would have lower demand than the other options. There is potential for an even service pattern on each route, which will result in additional demand (compared to uneven service patterns). This option has the negative impacts of increased passenger interchange at Bristol Temple Meads, which will have a resulting impact on station capacity.

TABLE 4.1

**Scale of impact**

Response options are:

- 1 Very small overall impact - Would have a very small positive impact, possibly with undesirable consequences
- 2 Minor impact - Would have a modest overall impact
- 3 Moderate impact - Expected to have a reasonably significant impact on the problem identified
- 4 Significant impact - Expected to significantly alleviate the problem
- 5 Very significant impact - Expected to alleviate the problem

Option	EAST Response	Justification
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	4 Significant impact	This option has the potential to reduce the rolling stock inefficiencies of the shuttle option, whilst also providing direct connectivity between Portishead and Bath Spa. The option also reduces the number of crossing moves at Bristol East Junction, and therefore may be better supported by the current layout. Of the cross Bristol connections, the Portishead to Bath connection would provide the second highest additional demand from the base case.
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	4 Significant impact	This option has the potential to reduce the inefficient rolling stock usage further (compared to options 1 and 2) by linking both of the 2tph required between Severn Beach and Portishead together. The option does not introduce additional crossing moves at Bristol East Junction. Of the cross Bristol connections, the Portishead to Severn Beach connection would provide the lowest additional demand from the base case (option 1).
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	4 Significant impact	This option would improve the rolling stock inefficiencies of the Bath Spa services operating as a shuttle by linking them to Severn Beach line. The option also potentially allows for the Portishead services to operate with 2tph even shuttles in the peak with the removal of 1tph in the off peak to reduce operational expenditure. This option would potentially have uneven frequencies. This option links the key demand between stations on the route so, of the cross Bristol connections, the Severn Beach to Bath connection would provide the highest additional demand from the base case. The connections to the Portishead line would be constrained by shuttle operations (for example, need to change at BTM).
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	4 Significant impact	MetroWest Phase 1 routes linked, improving cross-Bristol connectivity. This option provides more effective use of rolling stock. Of the cross-Bristol connections, the Severn Beach to Bath connection would provide the highest additional demand from the base case, in addition to the Portishead to Severn Beach demand.
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	4 Significant impact	This option potentially offers a more efficient use of platform capacity at Bristol Temple Meads when compared to option 1, 2 or 3. It also provides additional connectivity for Phase 1 services when compared to options 1-3. The option would result in less conflicting crossings at Bristol East Junction (Bath-Spa Portishead planned to cross at BWJ). Of the cross Bristol connections, the Portishead to Bath connection would provide the second highest additional demand from the base case, in addition to the Portishead to Severn Beach demand.

## 4.2.2 Fit with wider transport and government objectives

The scheme options are all seeking to address the same problems and meet the same objectives. The MetroWest business objectives are set out in section 3.5.

Table 4.2 shows how the scheme options fit with the wider transport and government objectives.

TABLE 4.2

**Fit against wider transport and government objectives**

Option	1. To support economic growth	2. To deliver a more resilient transport offer	3. To improve accessibility	4. To improve quality of life
<b>Option 1:</b> Shuttles (base case)	3 Moderate Fit	3 Moderate Fit	5 High Fit	5 High Fit
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	5 High Fit	5 High Fit	5 High Fit	5 High Fit
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	4 Moderate/High Fit	4 Moderate/High Fit	5 High Fit	5 High Fit
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	5 High Fit	5 High Fit	5 High Fit	5 High Fit
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	5 High Fit	5 High Fit	5 High Fit	5 High Fit
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	5 High Fit	5 High Fit	5 High Fit	5 High Fit

### 4.2.3 Fit with other objectives

The MetroWest Phase 1 supporting objectives are set out in section 3.5. Table 4.3 shows the schemes fit against these objectives.

TABLE 4.3

**Fit against other objectives**

Option	5. Reducing traffic congestion	6. Enhancing the capacity of the local rail network	7. Reducing the overall environmental impact
<b>Option 1:</b> Shuttles (base case)	3 Moderate Fit	4 Moderate/5 High Fit	3 Moderate Fit
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	4 Moderate/5 High Fit	4 Moderate/5 High Fit	4 Moderate/5 High Fit
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	4 Moderate/5 High Fit	4 Moderate/5 High Fit	4 Moderate/5 High Fit
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	4 Moderate/5 High Fit	4 Moderate/5 High Fit	4 Moderate/5 High Fit
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	5 High Fit	4 Moderate/5 High Fit	4 Moderate/5 High Fit
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle-	5 High Fit	4 Moderate/5 High Fit	4 Moderate/5 High Fit

### 4.2.4 Key uncertainties

The key risks for the project are:

- Lack of sufficient devolved major scheme funding in the 4- and 10-year Comprehensive Spending Review allocations from April 2015 (identification of alternative sources of funding and/or reducing scope of the scheme and/or delaying implementation to match available funds)
- Possible lack of capacity in the base year 2019 timetables to accommodate the new MetroWest services

- Lack of sufficient resources to develop the projects through the GRIP (Guide to Rail Investment Process) requiring the identification of alternative sources of funding and/or reducing scope of the scheme and/or delaying implementation to match available funds
- Lack of public support for the preferred options (effective and ongoing public and stakeholder consultation, including sharing results of technical studies to inform all interested parties; provision of a communications officer for the rail programme), although it is noted that there is overall support for the scheme
- The potential need for additional works required at Avon Road, Portishead station and/or additional signal requirements.

Note, subsequent risk analysis has been undertaken as part of the GRIP 1 / 2. This work was not available when this EAST assessment was undertaken.

Key issues for the Business Case are:

- Deriving an acceptable timetable incorporating MetroWest Phase 1
- GRIP 1-2 construction cost estimates which are higher than anticipated
- Estimated train service subsidy – initial works shows this ranges from £400,000 to over £1.0 million per annum. Affordability is a significant issue for the councils
- Up to £44.9 million is available via DfT devolved funding up to 2021. A funding gap is likely but various options are being considered to fill a potential gap

In addition, Table 4.4 shows the option specific key uncertainties.

TABLE 4.4  
Key uncertainties

Option	Key uncertainties
<b>Option 1:</b> Shuttles (base case)	The Network Rail initial 2013 analysis focused firstly on assessing shuttle services to and from Bristol Temple Meads in order to build up a timetable in the context of the updated assumptions. This analysis demonstrated that shuttle services are not preferred because: <ul style="list-style-type: none"> <li>• They are inefficient in the use of the limited platform capacity at Bristol Temple Meads.</li> <li>• They are inefficient in terms of rolling stock unit numbers.</li> <li>• It proves difficult to deliver an even pattern for the MetroWest Phase 1 services.</li> </ul>
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	It may prove difficult to achieve even service intervals on the Portishead and Bath Spa routes of MetroWest.
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	There are challenges to achieving an even service interval on the Severn Beach and Portishead routes. Significant performance risk is also inherent in linking these two routes with single lines.
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	This option increases the likelihood of requiring enhancements to Bristol East Junction, and presents performance risk because of additional crossing moves between the Bath Spa route and the Severn Beach route. It may also result in uneven intervals on the Severn Beach Line, limiting the level of service provision on the Severn Beach Line.
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Increased performance risk to services via Bath Spa if not using Bathampton turn-back (otherwise increases in operational expenditure).
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	This option may result in uneven frequencies across all three routes potentially constraining the Severn Beach line's ability to achieve 2tph to Severn Beach. Also with all three routes linked together the potential impact on performance may be worse than Options 1-3. Option 6b has been developed to reduce the potential impact on performance and the operational costs.



More detailed construction issues are set out in section 4.4.5.

## 4.2.5 Degree of consensus over outcomes

Table 4.5 shows the degree of consensus about the scheme options.

TABLE 4.5

### Degree of consensus over outcomes

Response options are:

- 1 Little or no consultation has taken place yet, or consultation has revealed a high level of disagreement about the scheme's ability to deliver the stated outcomes.
- 2 Little consultation and/or strong reasons to suggest the outcomes are controversial.
- 3 Some consultation has taken place with some agreement.
- 4 Wide consultation and broad agreement on the outcomes, with a possibility that one or two areas of disagreement remain.
- 5 Extensive consultation has taken place with a high degree of consensus on the outcomes.

Option	EAST Response	Justification
<b>Option 1:</b> Shuttles (base case)	3 Some agreement	Known support for rail schemes. The scale impact of this scheme option would mean it is likely to receive less support than other options. Limited connectivity.
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	4 Broad agreement of outcomes	Known support for rail schemes
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	4 Broad agreement of outcomes	Known support for rail schemes
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	4 Broad agreement of outcomes	Known support for rail schemes
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	4 Broad agreement of outcomes	Known support for rail schemes
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	4 Broad agreement of outcomes	Known support for rail schemes

## 4.2.6 Summary of strategic case

In summary, all scheme options are supported by a robust case for change that fits with wider public policy objectives. Thus all options have a 'strategic case'.

## 4.3 Economic Case

### 4.3.1 Economic growth

The West of England has a substantial economic growth agenda which is being developed through the Strategic Economic Plan. The SEP states that the region's current share of national economic growth (GVA) is the highest of any core city region at 3.1%. The overall vision is to build on this economic growth through a range of interventions including improving access to major employment sites for the skilled workforce catchment. The SEP notes that the population is expected to exceed 1.1 million by 2026.

Planning for this growth means the city region needs to make sure its transport infrastructure is not only fit for purpose, but has the ability to respond to increasing demand, and therefore maximise potential for continued economic growth. The modal share for journey to work within the Temple Quay Enterprise Zone is increasing rapidly; the recent TQEZ Transport Report (June 2012, Halcrow/CH2M HILL) forecasts that 15 per cent of trips to the Enterprise Zone will be by rail).

The Enterprise Areas are now becoming established and expected to be major trip generators. Rail will play a significant part in meeting this demand (see Table 4.6).

TABLE 4.6

**Enterprise Zone and Enterprise Areas**

Enterprise Zone/Area	Jobs	Rail Schemes
Bristol Temple Quarter Enterprise Zone and new arena	17,000	MetroWest Phase 1 and 2 New stations package Portway platform
Bath City Riverside Enterprise Area	9,000	MetroWest Phase 1 New stations package
J21 Enterprise Area (Weston-super-Mare)	9,000	MetroWest Phase 1 and 2
Emersons Green/Science Park Enterprise Area via Bristol Parkway	4,000 to 7,000	MetroWest Phase 2
Filton Enterprise Area	7,000 to 12,000	MetroWest Phase 2
Avonmouth Severnside Enterprise Area	6,000 to 12,000	MetroWest Phase 1 and 2
South Bristol priority growth location	10,400	MetroWest Phase 1

Source: West of England Response to the Great Western Franchise, updated using info from the SEP

As Table 4.7 shows, a considerable number of new homes and jobs are planned in the West of England area to 2029. Table 4.8 indicates those major housing areas directly served or with potential for rail links.

TABLE 4.7

**Planned housing and employment growth in the West of England**

Council	Homes	Jobs	Core Strategy Period
Bath & North East Somerset*	13,000	10,300	2011- 2029
Bristol City	32,800	21,900	2011- 2026
North Somerset*	17,130	14,000**	2006- 2026
South Gloucestershire	28,355	18,600-21,870	2006 - 2027
All	91,285	68,070	

Source: West of England Response to the Great Western Franchise, updated using info from the SEP

\*Proposed figures and subject to local plan examinations ongoing 2014.

\*\* Homes updated February 2014 but job figures to be revised.

TABLE 4.8

**Major new housing areas served by rail schemes**

Housing Area	Homes	Rail Schemes
Cribbs Patchway New Neighbourhood	5,700 50 ha employment land	MetroWest Phase 2 (Henbury Line)
North Yate	3,000	MetroWest Phase 2
Somerdale (former Cadbury site at Keynsham)	700	MetroWest Phase 1
Weston-super-Mare	11,000	MetroWest Phase 1 and 2

**Source: Core Strategies. Housing area figures are included in the Core Strategies.**

The Atkins report 'Unlocking Our Potential: The Economic Benefits of Transport Investment in the West of England' November 2012 found that MetroWest would deliver some 2,500 jobs. MetroWest, therefore, has significant benefits in bringing forward private sector investment.

## SECTION 4

TABLE 4.9  
Economic growth

Option	Impact to end-to-end journey time (JT)	Impact to cost of travel (time and money)	Impact to transport reliability and resilience	Impact to accidents	Impact to new housing/employment development	Wider economic impacts	Accessibility changes	Improved connectivity to central business districts	Overall RAG (red-amber-green)
<b>Option 1:</b> Shuttles (base case)	New rail journey opportunities associated with new stations at Pill/Portishead. Removal of car trips will result in overall JT savings on highway network.	Reduction	Improvement	Reduction, as reduction in highway trips	Scheme supports housing growth	Slight positive impact	New accessibility options provided by enhancing the West of England public transport network	Yes	Amber/Green
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	Same as Option 1 plus JT savings between Portishead and Bath Spa	Significant reduction	Significant improvement						Green
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	Same as Option 1 plus JT savings between Portishead and Severn Beach	Significant reduction	Significant improvement						Green
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	Same as Option 1 plus JT savings between Severn Beach and Bath Spa	Significant reduction	Significant improvement						Green
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Same as Option 3 + Option 4	Significant reduction	Significant improvement						Green
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	Same as Option 2 + Option 4	Significant reduction	Significant improvement						Green

## SECTION 4

### 4.3.2 Carbon emissions

Scheme options will have an impact on carbon emissions but, until detailed transport assessment work is undertaken, it is not possible to fully differentiate between option. The impacts of the scheme options are:

- Reduction in the volume of non-public transport trips, due to mode switch from car to rail
- Increase in public transport services resulting in a reduction in car mileage
- Decongestion benefits
- Shift from low to high occupancy vehicles
- Construction works
- No impact associated with the use of lower carbon fuel
- No impact associated with a change in fuel efficiency, however scheme makes passive provision for electrification
- Reduction in overall emissions, due to an overall reduction in fuel consumption.

The RAG assessment for carbon is Amber/Green- for Option 1 and green for Option 2,3,4,5 and 6.

### 4.3.3 Socio-distributional and regional impacts

Table 4.10 shows the schemes socio-distributional and regional impacts. Information about the social composition of the area is provided in:



- Figure 4.1: Population aged under 16
- Figure 4.2: Population aged 16-25
- Figure 4.3: Population aged 70 and over
- Figure 4.4: Population claiming Disability Living Allowance (DLA)
- Figure 4.5: Population claiming Jobseeker's Allowance (JSA)
- Figure 4.6: Black and minority ethnic (BME) population
- Figure 4.7: Households with no car
- Figure 4.8: Indices of Deprivation – Income
- Figure 4.9: Indices of Deprivation

Data is displayed at Super Output Areas (SOA) level and identifies the top 20 per cent SOAs in the West of England for that data theme.

Figures 4.1-4.8 have been considered in determining the socio-distributional impacts of the scheme options.

TABLE 4.10

**Socio-distributional and regional impacts**

Option	Social distributional impact	Regeneration	Regional imbalance	Overall RAG
<b>option 1:</b> Shuttles (base case)	Potential benefits on the Severn Beach line for those on JSA, and young people in Bath, and older people in Portishead	The scheme links into the Temple Quarter Enterprise Zone. The scheme will increase the catchment of skilled labour in a commutable distance	Not relevant	Green/amber
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	Same as option 1, but greater benefits to Portishead corridor.			Green/amber
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	Similar to option 1			Green/amber
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	Same as Option 1, but greater benefits to Severn Beach corridor.			Green/amber
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Similar to Option 4			Green/amber
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle-	Similar to Option 2			Green/amber
<b>Option 6b:</b> Portishead – Avonmouth and Bath Spa	Similar to Option 2			Green/amber

4-11

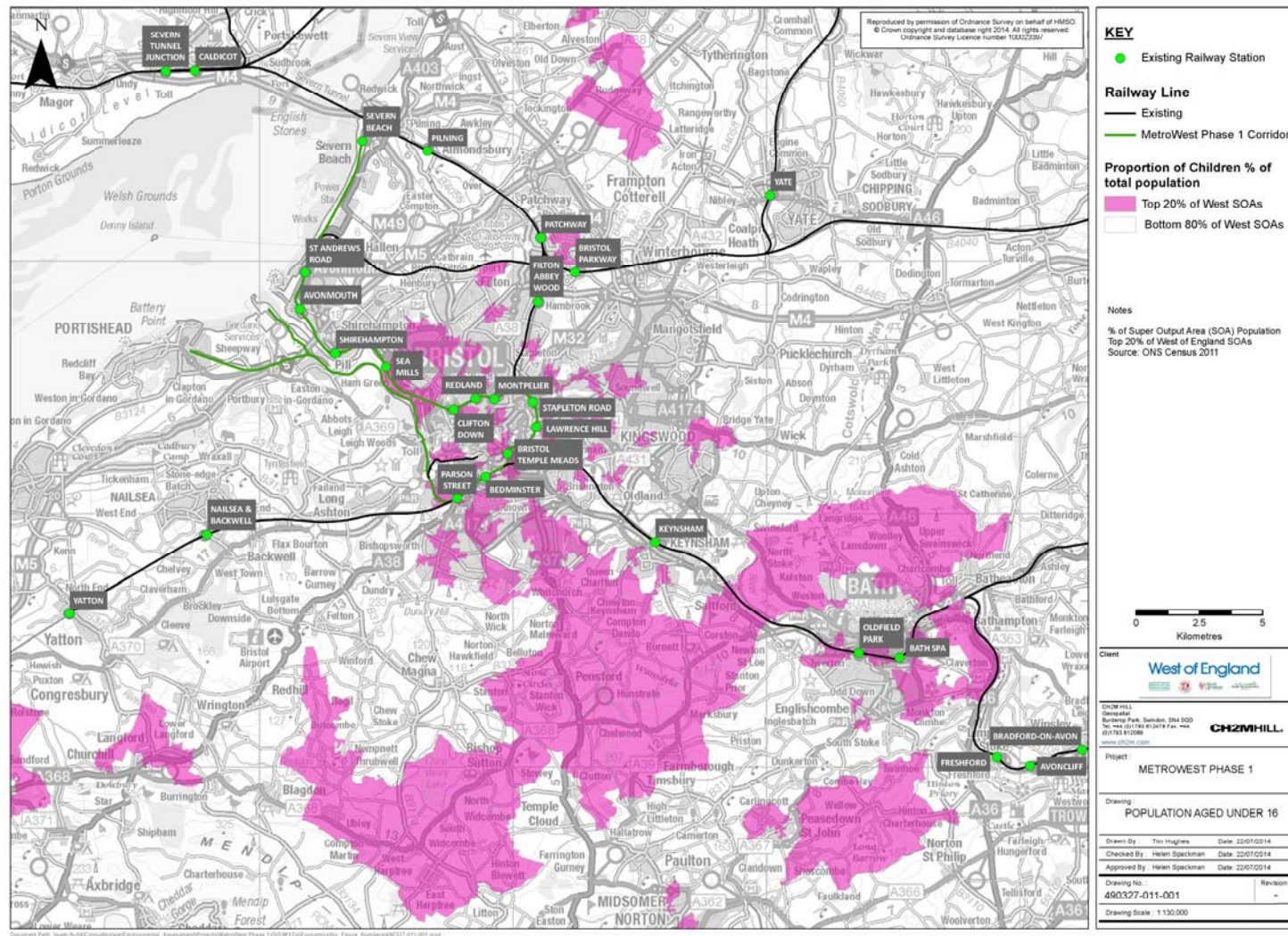




Figure 4.2: Socio-demographics: population aged 16-25

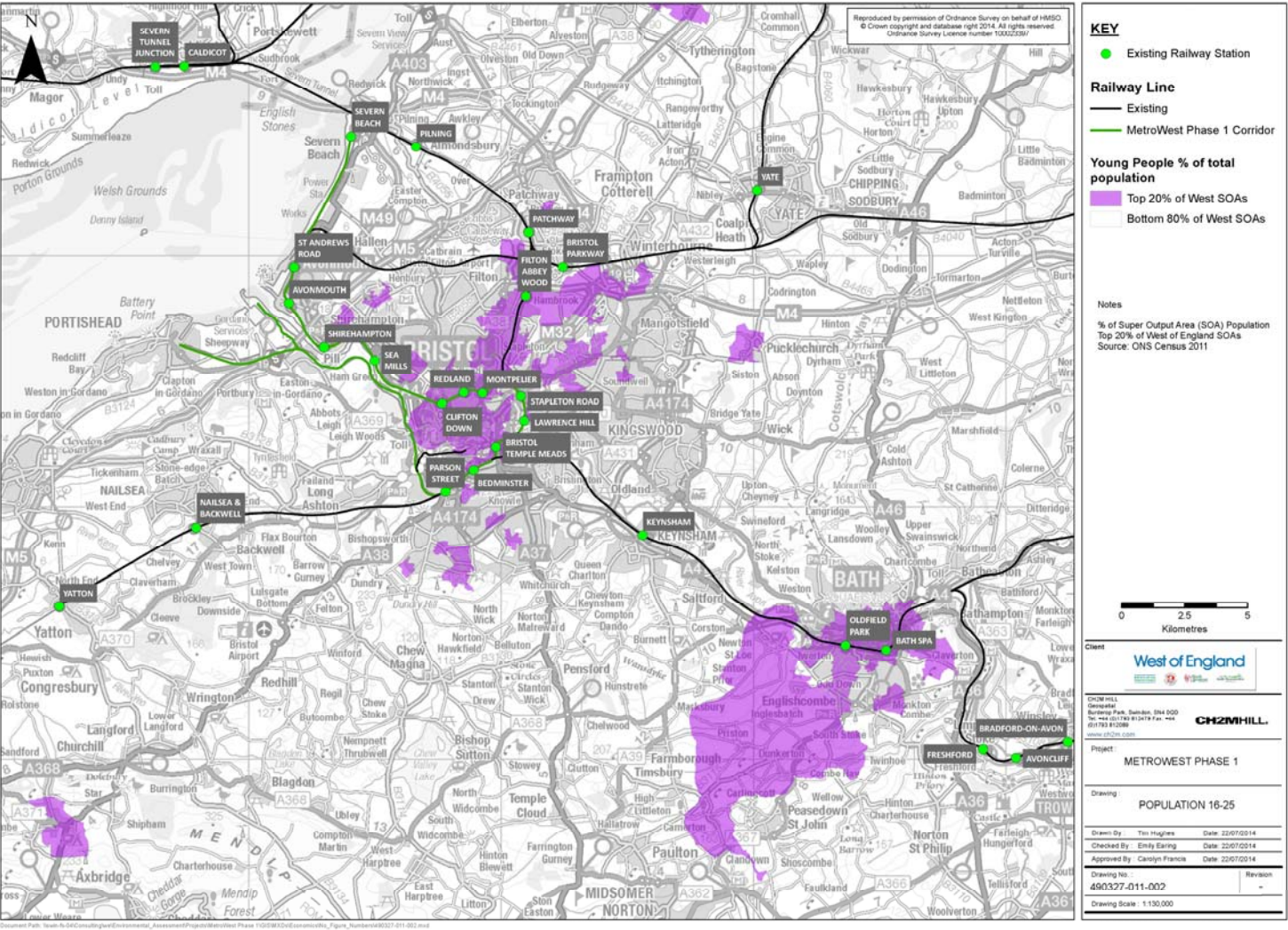




Figure 4.3: Socio-demographics: population over 70

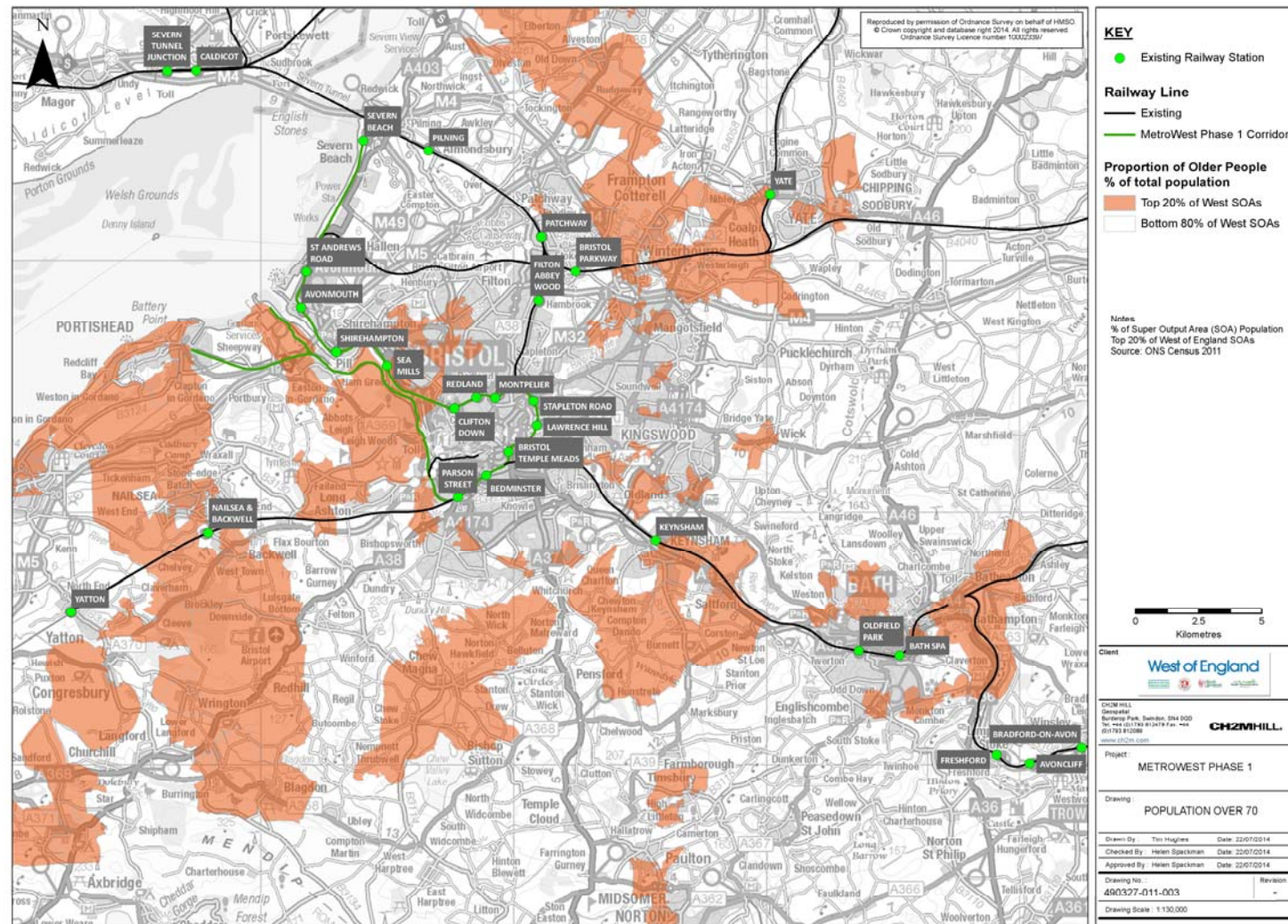


Figure 4.4: Socio-demographics: Disability Living Allowance claimants

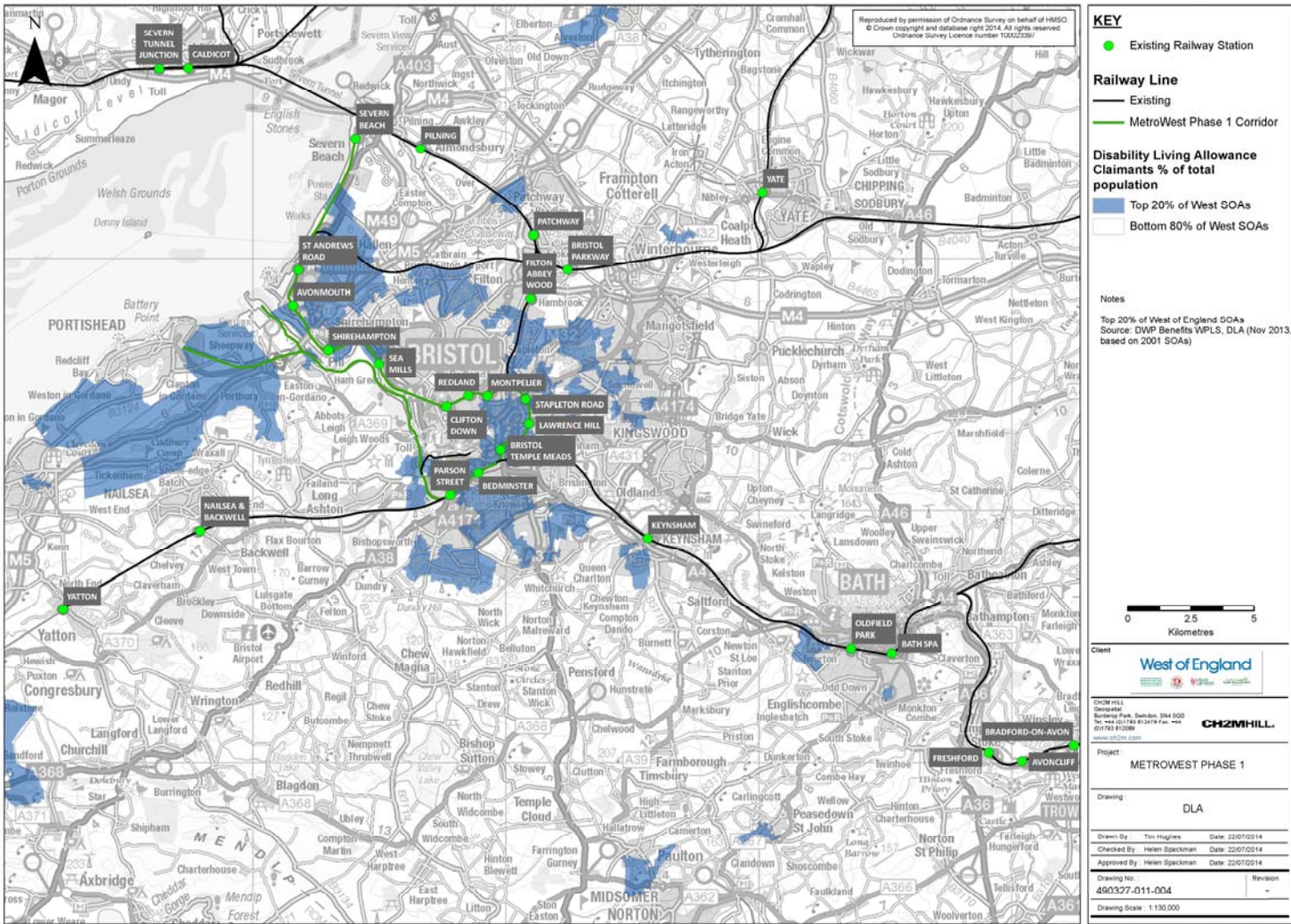




Figure 4.5: Socio-demographics: Job Seeker's Allowance claimants

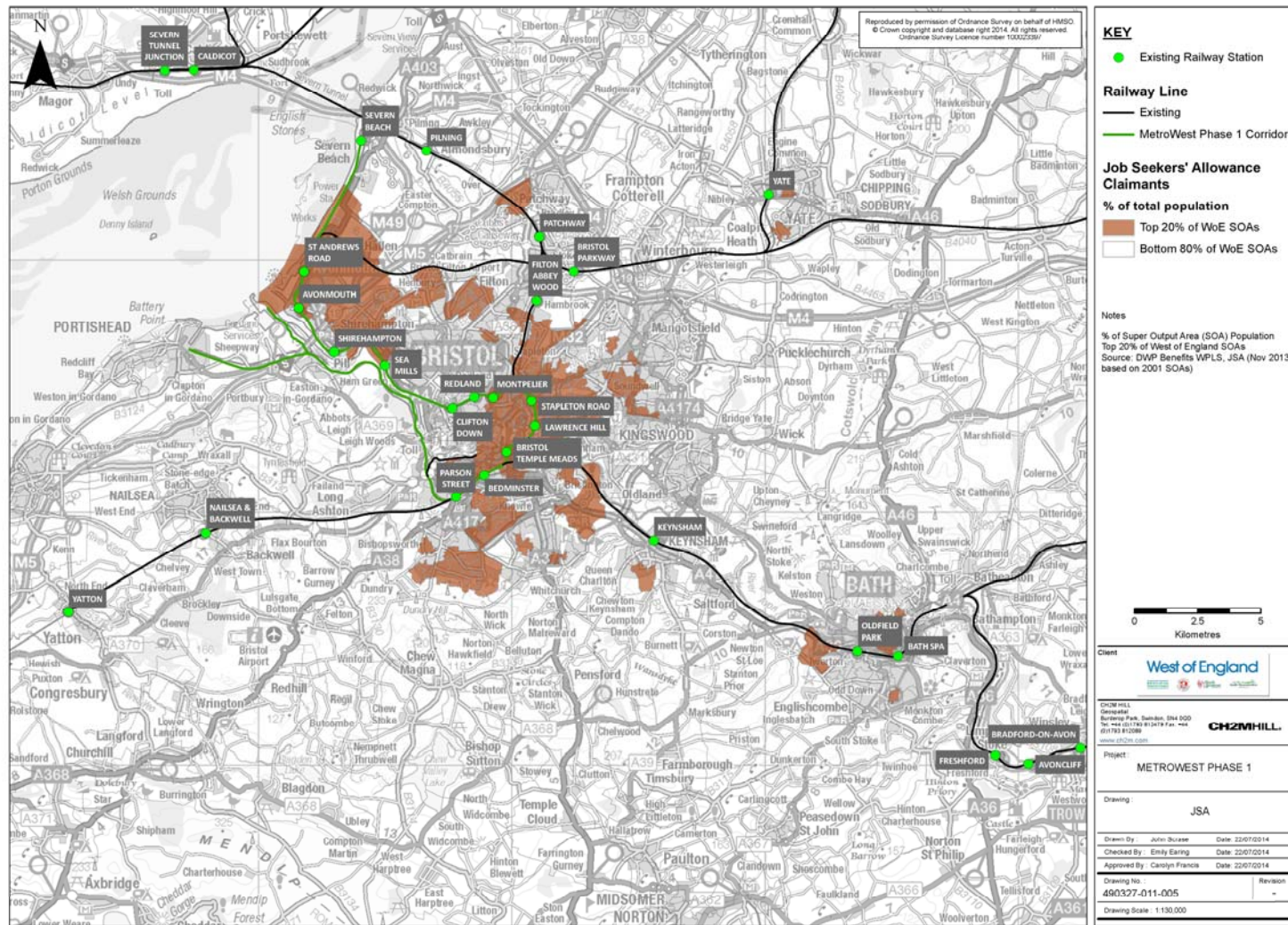


Figure 4.6: Socio-demographics: black and minority ethnic population

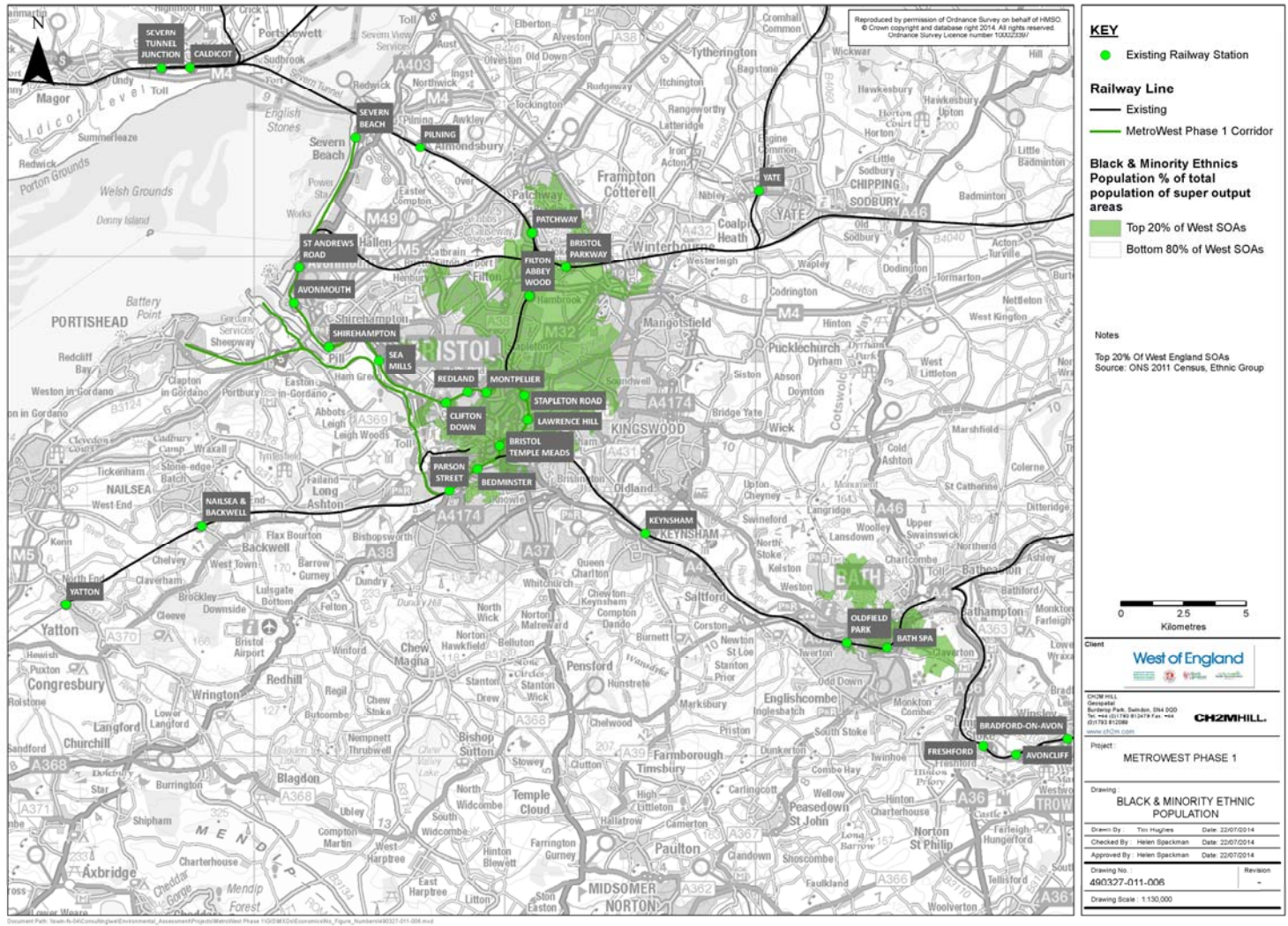




Figure 4.7: Socio-demographics: households with no car

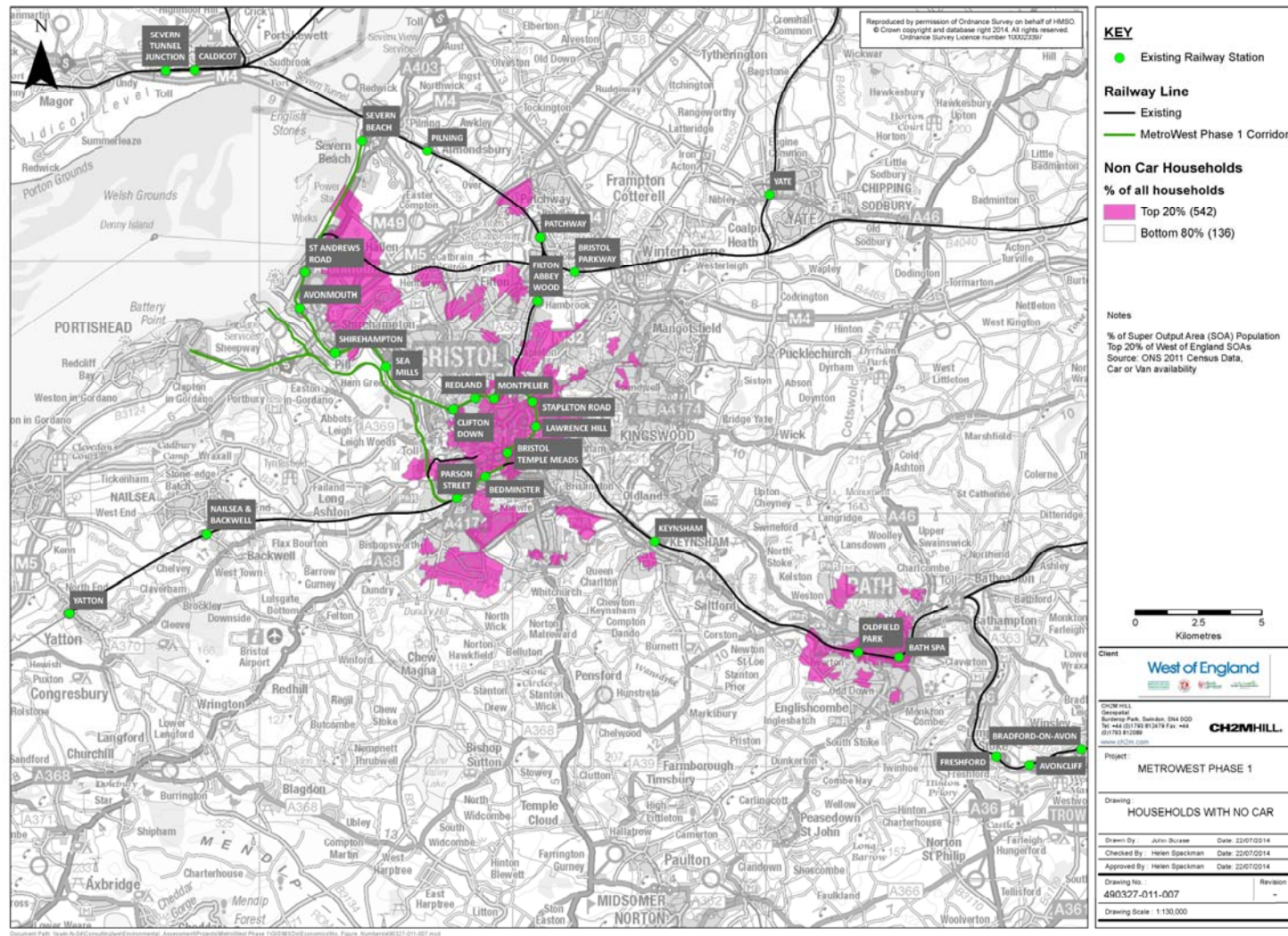


Figure 4.8: Socio-demographics: Income deprivation

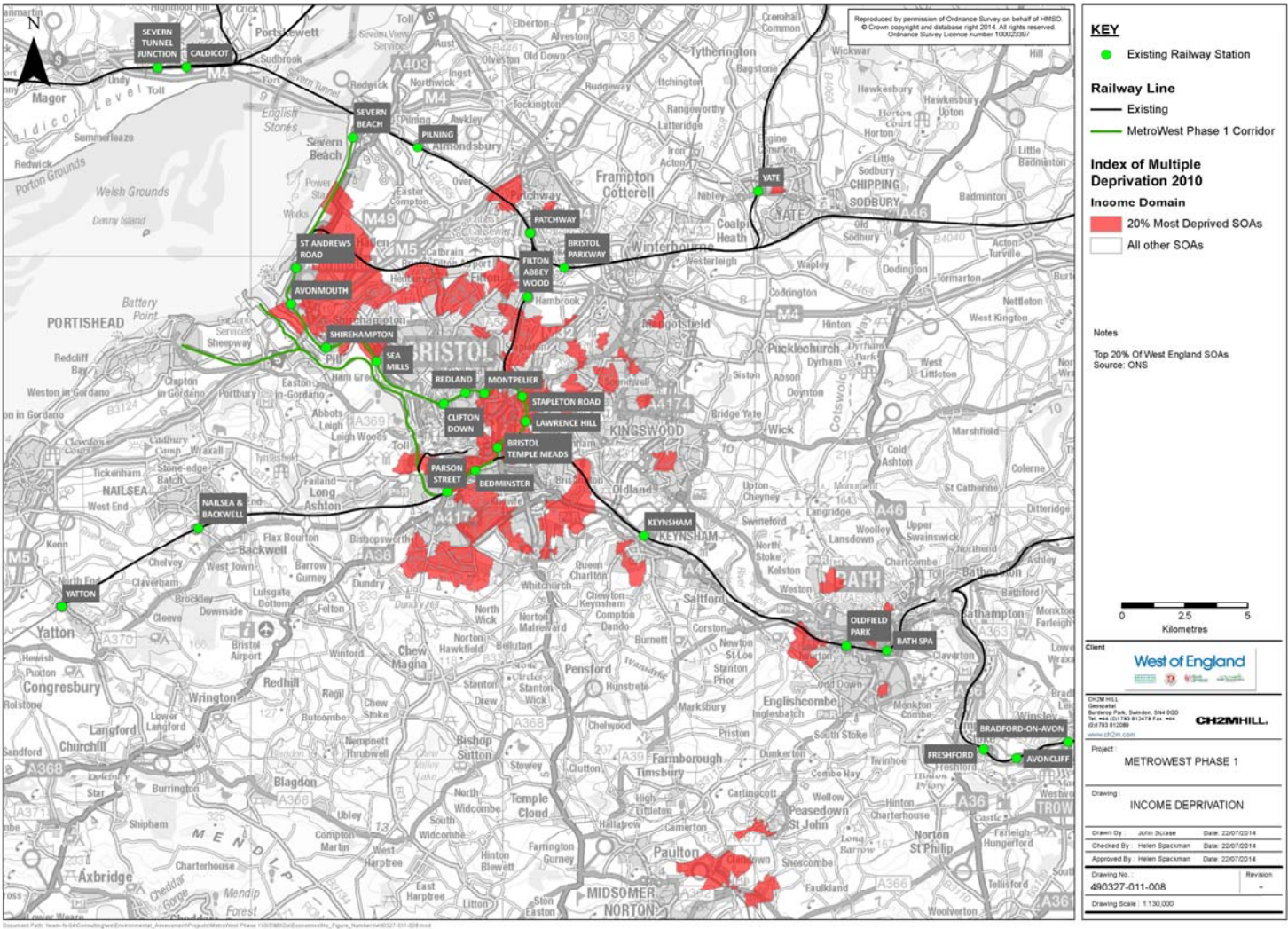
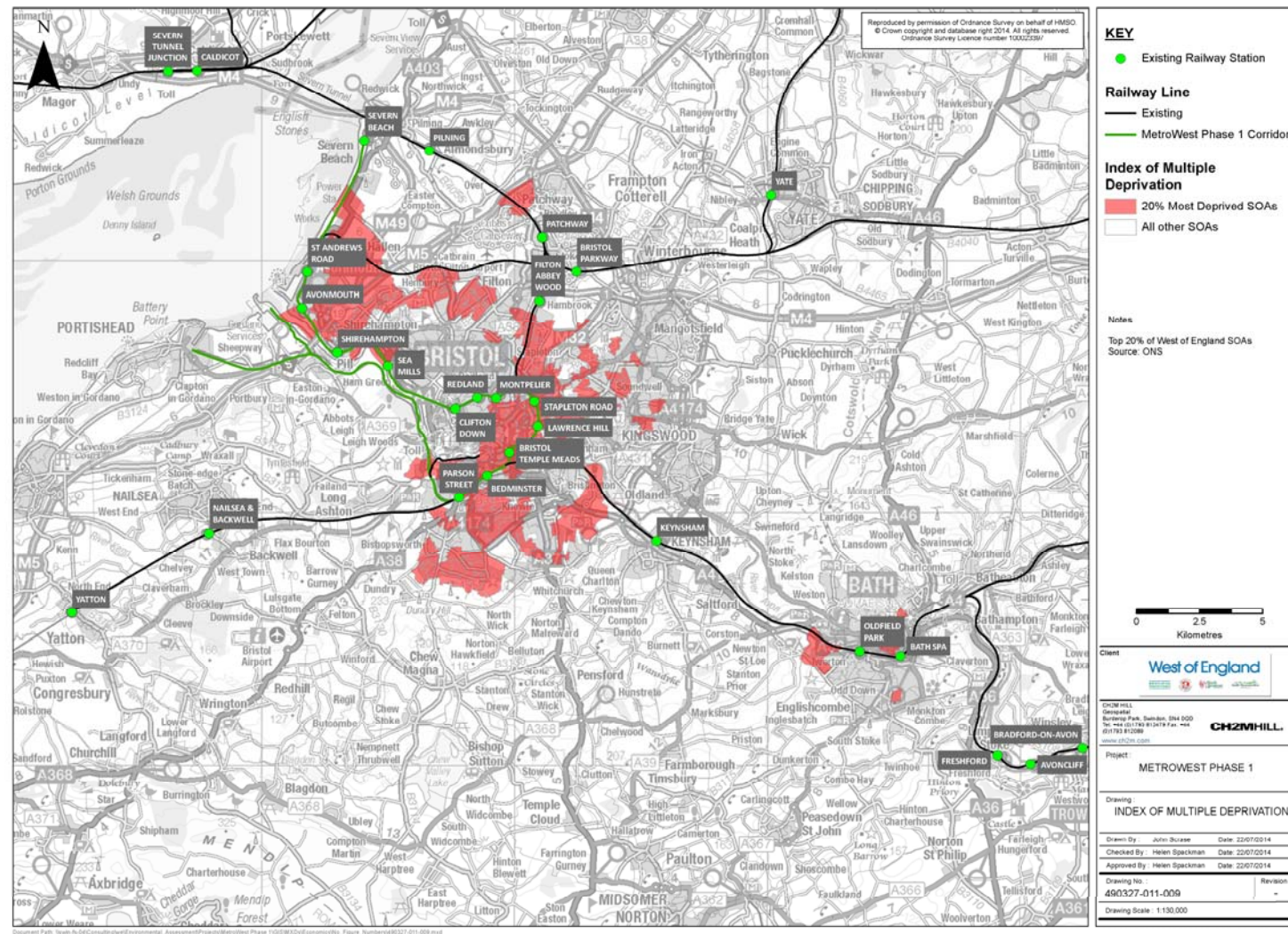




Figure 4.9: Socio-demographics: index of multiple deprivation



## SECTION 4

### 4.3.4 Local environment

Table 4.11 shows the schemes' impact on the local environment. The environmental impacts of the scheme options are broadly similar. More detailed transport modelling would indicate differences in changes in vehicle traffic, with associated variations in noise and air quality impacts.

TABLE 4.11

**Local environmental impacts**

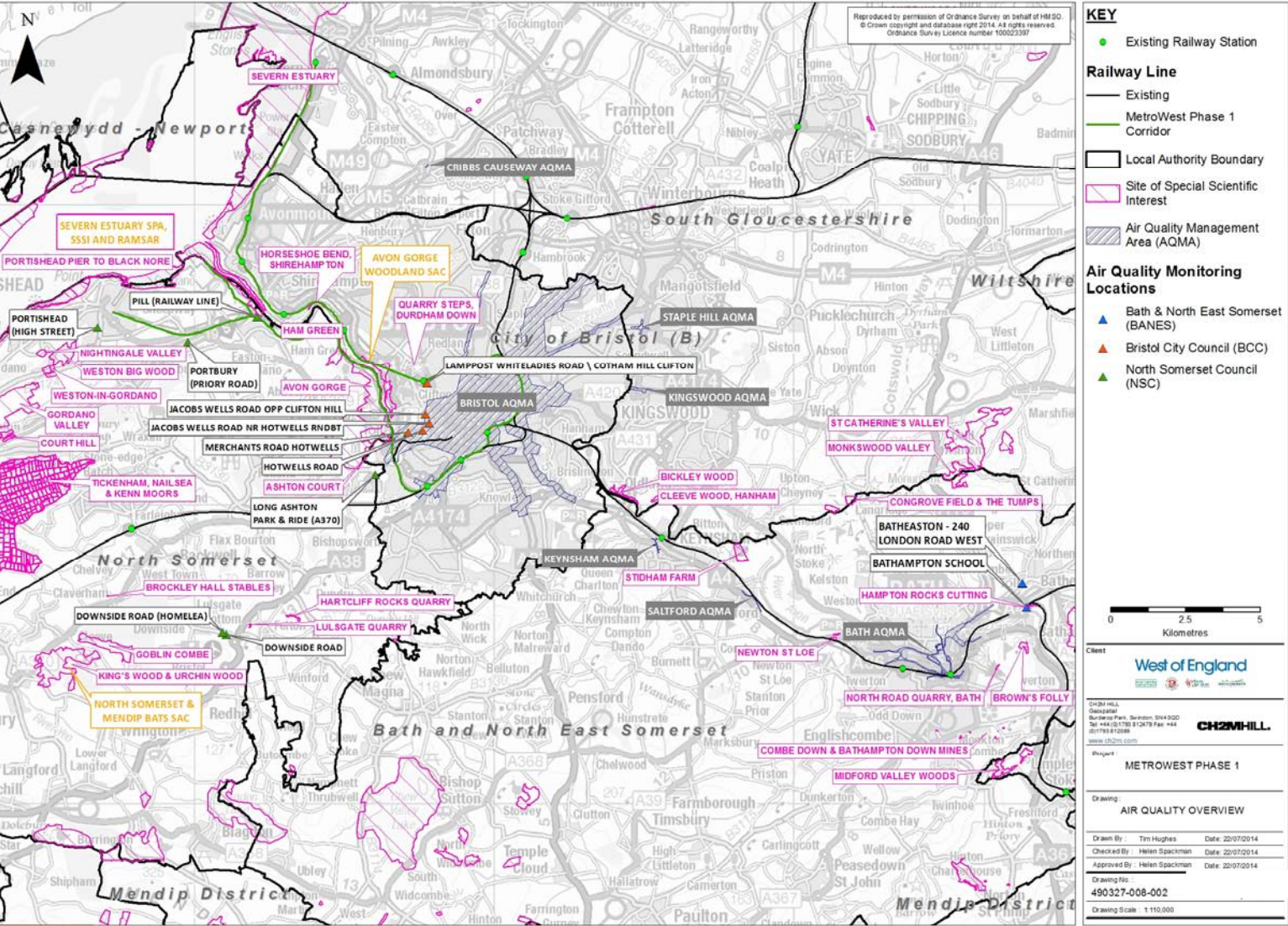
Impact	Comment
Impact on air quality	Adverse local impact, but general reduction in traffic resulting in wider benefits. Work will be required to rebuild the track formation - this could generate dust if undertaken during a dry spell.
Impact on existing AQMA*	No adverse impacts, could remove car trips from Bristol and Bath centres, see Figure 4.1.
Will scheme create an AQMA?	No
Impact on noise	Adverse local impact, but general reduction in traffic resulting in wider benefits.
Impact on natural and urban environment	<p>Some vegetation clearance required including areas sensitive to reptiles (including great crested newts and badgers). The scheme will have a lighting impact in areas near the new stations and it is likely that this cannot be fully mitigated. The scheme will have a visual impact at the new stations and where new structures are built. It will also enhance the street screen and built environments. Some of the Portishead station location options are close to residential properties.</p> <p>The Avon Gorge and Ham Green Sites of Special Scientific Interest (SSSI) may be affected.</p>
Value of land effected	Not relevant as alignment is former railway alignment
Overall RAG	Amber

\* AQMA - Air Quality Management Area



# SECTION 4

Figure 4.10: Air Quality Management Areas (AQMA) and Sites of Special Scientific Interest (SSIs)



## SECTION 4

### 4.3.5 Wellbeing

Table 4.12 shows the schemes' impact on the wellbeing of local residents. The consequences are broadly similar for each option.

TABLE 4.12

#### Wellbeing

Impact	Comment
Severance	Severance impacts associated with reopening the railway line are being mitigated where viable, but may not all be fully mitigated.
Physical activity level	Walking and cycling to/from station will increase physical activity.
Changes in accidents	Possible reduction in road accidents, due to reduced car traffic.
Impact on crime/ fear of crime	Good design and use of natural surveillance, lighting and CCTV will minimise impacts.
Access to goods, services, people and places	Positive impacts. Active rights of way not impacted
Terrorism	Not relevant so not assessed
Overall RAG	Amber/green

### 4.3.6 Value for money

The Greater Bristol Metro - Bristol Area Rail Study – Final Report, for West of England Partnership, February 2013 reported that the Benefit to Cost Ratio (BCR) for Option 5 (for the sensitivity test including 10 per cent increase in optional costs) was 2.38. The BCRs for the other options costs have been estimated by considering the relative difference in costs and benefits reported in this EAST appraisal.

Table 4.13 shows the likely value for money levels of the scheme options.

TABLE 4.13

#### Value for money

Option	Expected value for money	Comments
<b>Option 1:</b> Shuttles (base case)	Medium, BCR 1.5-2	
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	Medium, BCR 1.5-2	The Network Rail Interim Report states that Option 2a has a 13,000 passenger demand incremental increase per annum compared to Option 1. The incremental increase per annum compared to Option 1 in revenue and value of time is £170,000.
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	Medium, BCR 1.5-2	The Network Rail Interim Report states that 3a has a 2,000 demand incremental increase per annum compared to Option 1. The incremental increase per annum compared to Option 1 in revenue and value of time is £20,000.
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	Medium, BCR 1.5-2	The Network Rail Interim Report states that Option 4a has a 30,000 demand incremental increase per annum compared to Option 1. The incremental increase per annum compared to Option 1 in revenue and value of time is £400,000.
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	High, BCR 2-4	The 2013 Halcrow study analysis indicated a BCR of 2.38. PVB = £349,537,000, PVC = £138,993,000, NPV = £210,544,000. Values discounted to 2010.

TABLE 4.13

**Value for money**

Option	Expected value for money	Comments
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	Option a – Medium, BCR 1.5-2 Option b - High, BCR 2-4	

Current appraisal work indicates that the option BCRs are particularly sensitive to additional train resources.

### 4.3.7 Summary of economic case

In summary all scheme options demonstrate value for money and thus all have an 'economic case'.

## 4.4 Managerial case

### 4.4.1 Implementation timetable

All scheme options have the same proposed implementation timetables as follows:

- Stage 1 option development (including GRIP1-2) - Summer 2013 - Summer 2014.
- Stage 2 scheme case (including GRIP 3) - completion Summer 2014 - Winter 2015/16.
- Stage 3 planning powers and procurement (including GRIP 4-5) - Winter 2015/16 - Autumn 2017.
- Stage 4 construction and opening (including GRIP 6-8) - Autumn 2017 to Spring 2019. Project opening is currently scheduled for December 2018.

### 4.4.2 Public acceptability

In general terms, the MetroWest scheme has a good level of public support. Indeed, the West of England Rail Conference on 4 November 2011 established the top three priorities for rail as the Greater Bristol Metro, Portishead line and additional rolling stock. In addition, the TravelWest website has galvanised stakeholder support for MetroWest with over 34,000 hits since its launch in February 2012.

Consultation has not been undertaken on the specific scheme options considered in this EAST assessment. It has been assumed that scheme options would have similar levels of support, but that scheme option 1 would be less supported than other options, as it does not offer the cross-Bristol movements. Assumed public acceptability has been assessment on a scale from '1 - low level of public acceptability' to '5 - high level of public acceptability', as shown in Table 4.14.

TABLE 4.14

**Public acceptability**

Option	Level of public acceptability
<b>Option 1:</b> Shuttles (base case)	3 Moderate level
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	5 High level
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath Shuttle	5 High level
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead Shuttle	5 High level
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	5 High level
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	5 High level

TABLE 4.14

**Public acceptability**

Option	Level of public acceptability
--------	-------------------------------

Overall, all scheme options are at a very comparable level of development and have similar quality of supporting evidence.

Aspirations for rail are high and there is a clear need to explain what is happening, promote understanding and encourage support for proposals across the programme. The Communications Framework for MetroWest is co-ordinated at the Rail Programme level.

The Communications Framework for MetroWest is based on the following principles:

- Specific communication activities are focussed at the right level for particular consultees and stakeholders. Different types of consultees and stakeholders will have different concerns and require either a different level of information or have different interests in the project.
- Projects seek an appropriate level of feedback from consultees and stakeholders to be incorporated into the development of the Metro.
- Concerns of potential objectors are addressed as far as possible.
- The core project team will be responsible for ensuring statutory consultation meets the requirements for the appropriate process.

Key business/industry stakeholders include, but are not limited to:

- DfT
- Office of Rail Regulation (ORR)
- Network Rail
- Train operating companies (existing and potential)
- Freight operating companies
- Bus operators
- Bristol Port Company

Consultees and stakeholders include, but are not limited to:

- Local Members
- West of England Local Enterprise Partnership
- Joint Scrutiny
- Business West and other business organisations
- Local MPs
- Neighbouring authorities
- Parish and town councils affected by the schemes
- Resident and community groups affected by the schemes
- Public transport users and non-users

- Local rail and transport campaign groups

Meetings with local stakeholders and consultees will be held to share technical work where possible; this will help inform a more technical rather than aspirations-based approach and enable better understanding of the projects. The frequency of meetings will depend on the level of involvement needed by different stakeholders and consultees in the project.

It is envisaged that potential objections would be associated with local environmental impacts in Portishead and Pill.

### **4.4.3 Practical feasibility**

#### **4.4.3.1 Local endorsement**

The scheme is endorsed, as follows:

- Joint Transport Executive Committee (JTEC) 7 March 2012 Phase 1 and 2 agreed for franchise consultation
- JTEC 12 December 2012 development costs Phase 1 and 2 agreed
- LTTB 14 June 2013 prioritised Phase 1 for post-2015 major transport scheme funding
- The Councils have identified funding for project development

#### **4.4.3.2 Operational issues**

The scheme options have the same physical feasibility issues, as the options only differ by service pattern.

Network Rail owns and maintains the infrastructure and coordinates track access. The Councils are working with Network Rail on a range of technical and legal matters.

There are some challenges adding MetroWest Phase 1 train services into the existing network due to significant bottlenecks in parts of the network. The large programme of investment led by NR (CP5), including both enhancements and renewals, and four-tracking of Filton Bank will help relieve these.

Network Rails 2012 timetabling analysis indicates that scheme options 1, 2, 3, 4 and 6 would require seven-car units and option 5 would require six-car units. The number of car units has a direct impact on revenue costs.

#### **4.4.3.3 Construction issues**

The scheme alignment has been subject to local planning policies for many years to protect encroachment of development that would prevent the line from being reopened. The only location where development has created an obstacle to the reopening of the line is at Quays Avenue, a new road crossing over the railway alignment. At the time of the master planning of the Portishead Vale development, the design standards for road easements across railway branch lines allowed for level crossings. However, the rail industry design standards have since changed and level crossings are no longer acceptable to the ORR.

In light of this, the project team undertook public consultation on three options for the location of Portishead station in June/July 2014. The consultation feedback is being considered and a decision on the preferred options for the station is anticipated by early 2015.

The disused and down relief lines are free-standing construction sites away from operational railway. Works at Bathampton and Avonmouth stations will require possessions but these are considered achievable. Works on the freight line will require a detailed possession strategy.

#### **4.4.3.4 Summary of practical feasibility**

Other practical feasibility issues include:

- Need for an acceptable timetable solution

- Development consent order is required for some work (other works fall under Network Rail’s permitted development rights)
- The new asset is to be transferred to Network Rail and associated negotiation is required
- Governance is agreed and agreements are in place

For these reasons, all the scheme options have been scored between 3 and 5, on a scale of ‘1 - low level of practical feasibility’ to ‘5 - high level of practical feasibility’, see Table 4.15.

TABLE 4.15

**Practical acceptability**

Option	Level of public acceptability
<b>Option 1:</b> Shuttles (base case)	3 Moderate level
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	3 Moderate level
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath Shuttle	3 Moderate level
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead Shuttle	3 Moderate level
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Option a - 3 Moderate level Option b - 5 High level
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	Option a - 3 Moderate level Option b - 5 High level

#### 4.4.4 Quality of supporting evidence

All scheme options have been developed to a relatively high level for this EAST level of assessment. This has been due to a number of studies that have been undertaken in recent years about MetroWest or its components parts. The consideration of the scheme options to date is shown in Table 4.16

TABLE 4.16

**Consideration of scheme options in previous work**

Option	Portishead GRIP 1-3 report	Greater Bristol Metro Bristol Area Rail Study – Final Report	Network Rail – Analysis and Forecasting MetroWest Interim Report
<b>Option 1:</b> Shuttles (base case)	Report of relevance to scheme option		Study considers scheme option as base case
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	Report of relevance to scheme option		Study considers scheme option
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath Shuttle	Report of relevance to scheme option		Study considers scheme option
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead Shuttle	Report of relevance to scheme option		Study considers scheme option
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Report of relevance to scheme option	Study considers scheme option	Study considers scheme option
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	Report of relevance to scheme option		Study considers scheme option

TABLE 4.16

**Consideration of scheme options in previous work**

Option	Portishead GRIP 1-3 report	Greater Bristol Metro Bristol Area Rail Study – Final Report	Network Rail – Analysis and Forecasting MetroWest Interim Report
--------	----------------------------	--	--

Overall, all scheme options are at a very similar level of development and have a comparable quality of supporting evidence. Thus all the scheme options have been scored as 4, on a scale of '1 - low quality of supporting evidence' to '5 - high quality of supporting evidence'.

#### 4.4.5 Key risks

General project and operational uncertainties are set out in Section 4.2.4 of this report. This section provides details of the construction-related risks.

As part of the Portishead GRIP 3 work, the following risks were identified:

- Signalling cost estimate uncertainty
- Generic GRIP 4/5 design risks, such as changes resulting from approvals process
- Generic GRIP 6 construction risks, such as late possession, finding contaminated land
- Renewals' funding
- Delays caused by implementation agreement
- Delays and changes caused by planning requirements
- Environmental risks
- Network changes
- Access issues on six-mile freight section between Parson Street and Pill
- Interface with construction at Baron's Close and construction of Bus Rapid Transit (BRT)
- Signal sighting issues
- Cable from Parson Street to Bristol panel not suitable to use

#### 4.4.6 Summary of management case

In summary, scheme options 5b and 6b are achievable and thus have a 'management case'. However, scheme options 1, 2a/b, 3a/b, 4a/b, 5a and 6a are not considered achievable because of the operational issues associated with finding an acceptable timetable solution.

### 4.5 Financial Case

#### 4.5.1 Affordability

The scheme capital and revenue costs for the schemes are detailed in section 4.5.2 and 4.5.3. Table 4.17 sets out the scheme affordability, where "5" indicates the scheme is affordable and "1" indicates the scheme is unaffordable. An initial joint promotion agreement is in place to ensure that the shortfall between available major scheme funding and scheme costs can be funded locally.

TABLE 4.17

**Affordability**

Option	Affordability	Justification
<b>Option 1:</b> Shuttles (base case)	3	Revenue funding implications, due to ineffective operations

TABLE 4.17

**Affordability**

Option	Affordability	Justification
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	3	Revenue funding implications, due to ineffective operations
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	3	Revenue funding implications, due to ineffective operations
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	3.	Revenue funding implications, due to ineffective operations
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Option a – 3 Option b - 5 Affordable	Revenue funding implications, due to ineffective operations for Option a
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	Option a – 3 Option b - 5 Affordable	Revenue funding implications, due to ineffective operations for Option a

## 4.5.2 Capital Cost (£m)

For the purpose of this EAST appraisal, the scheme cost estimates have been taken from the Greater Bristol Metro - Bristol Area Rail Study – Final Report, for West of England Partnership, February 2013, allowing consideration of consistent costs and benefits. The capital costs were reported at £42 million.

Table 4.18 presents the capital cost (£m) for the scheme options.

TABLE 4.18

**Capital Cost (£m)**

Option	Capital Cost (£m)	Justification (comments provided from 2013 Network Rail report)
<b>Option 1:</b> Shuttles (base case)	25-50	Likely to require enhancement to BEJ. Likely to require Platforms 0, 1 and 2 at BTM. High capital expenditure/infrastructure requirements.
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	25-50	Likely to require Platforms 0 or 2 at BTM. Moderate Capital Expenditure/ Infrastructure Requirements.
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	25-50	May require Platform 0 at BTM.
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	25-50	Platform 2 and 0 BTM may be required. High capital expenditure/ infrastructure requirements.
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	25-50	Requires platform 1 and 0 at BTM. May also require BEJ enhancements. High capital expenditure/infrastructure requirements.
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach Shuttle	25-50	Platform 0 BTM may be required.

## 4.5.3 Revenue Costs (£m)

Table 4.19 presents the approximate discounted Revenue Cost (£m) for the scheme options, for the 60-year appraisal. The Option 5 cost has been derived from information in Greater Bristol Metro - Bristol Area Rail Study – Final Report, for West of England Partnership, February 2013. The options' costs have been estimated by considering the relative difference in operational cost sets out in the Network Rail – Analysis & Forecasting, MetroWest Interim Report 2013.



The revenue costs quoted below are for the resultant revenue costs. Revenue gained has been estimated and included in the net revenue costs.

TABLE 4.19  
**Revenue Cost (£m)**

Option	Revenue Cost (£m)	Justification
<b>Option 1:</b> Shuttles (base case)	50-100	2013 Network Rail analysis states this option is likely to result in high operational costs due to the inefficient use of rolling stock required to operate a MetroWest Phase 1 service. Option is likely to require several units to operate. High operational expenditure.
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	50-100	A high-level assessment of demand of this option (against the base option) was undertaken. Demand increases as this option provides an opportunity to travel across Bristol without the need to interchange. In this case, the connection between Portishead and Bath Spa provides a medium increase in revenue and value of time improvements, significantly more than Option 3, but less than half of Option 4. Each route would require multiple units to operate, a potential unit reduction from option 1. High operational expenditure. Option 2b (Portishead – Bath Spa 1tph, Portishead shuttle 1tph, Severn Beach shuttle, 1tph Avonmouth shuttle 1tph) may result in some reduction of unit requirements when compared to 2a, thus operational expenditure could be moderate.
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	50-100	A high-level analysis shows that the demand for travel between Portishead and Severn Beach is low and therefore the value of time improvement and revenue impact is significantly less when compared to other connectivity options. Likely to require several units to operate each route, potential unit reduction from option 1. High operational expenditure.
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	50-100	Option 4 provides the largest incremental increase in passenger demand and revenue due to better connections, and is over double that offered by Option 2. Demand increases as this option provides an opportunity to travel across Bristol without the need to interchange and connecting large catchment areas (eg Clifton Down) with the major employment centres (eg Bath and Bristol). Historic demand data shows that a large number of passengers (72,000 in 2012) travel from Clifton Down to Bath Spa. Likely to require several units to operate each route, potential unit reduction from option 1. High operational expenditure. Option 4b: (Severn Beach/Avonmouth – Bath Spa 1tph, Severn Beach/Avonmouth – BTM 1tph, Portishead Shuttle 2tph). This could include potential reduction in unit requirements using Avonmouth to turn-back services, resulting in moderate operational expenditure. Potential reduction in unit requirements (moderate if using Bathampton turn-back).
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Option a - 50-100 Option b - 25-50	Potential reduction in unit requirements (moderate if using Bathampton turn-back). Low operational expenditure.
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	Option a - 50-100 Option b - 25-50	Likely to require several units to operate each route. High operational expenditure.

Emerging timetabling analysis indicates that option 5 is the only option available, requiring six trains, and 6b is the best-performing option, requiring 7 units.

It is assumed that the responsibility for revenue subsidy for the first three years will rest with the West of England councils but, thereafter, this would be transferred to DfT, subject to a detailed funding agreement.

#### 4.5.4 Cost Profile

The capital costs for all scheme options are the same and hence there are no inconsistency issues. The capital cost estimate includes a risk allowance. The revenue costs for the scheme options have all been considered by Network Rail at a high level.

#### 4.5.5 Overall cost risk and other costs

The scheme costs are all affected by the following risks:

- Construction costs are at a GRIP1-2 (feasibility) level and subsequent engineering design work could result in cost increases.
- Revenue costs are to be fully derived following completion of timetabling analysis.
- Parking strategies will affect the station parking charges at Portishead and Pill.
- Funds are to be secured from LTBB, following acceptance of full business case.
- Funding split between the four promoting authorities is to be agreed.

In addition to the risks above, Table 4.20 presents the overall cost risk and other costs for the scheme options.

TABLE 4.20

##### Overall cost risk and other costs

Option	Overall cost risk	Other costs
<b>Option 1:</b> Shuttles (base case)	2. Moderate/High risk	Revenue costs could be unaffordable
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	2. Moderate/High risk	Revenue costs could be unaffordable
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	2. Moderate/High risk	Revenue costs could be unaffordable
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	2. Moderate/High risk	Revenue costs could be unaffordable
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	Option a - 2. Moderate/high risk Option b - 3. Moderate risk	
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	Option a - 2. Moderate/high risk Option b - 3. Moderate risk	

The cost risk assessment is on a scale of '1 high risk' to '5 low risk'.

#### 4.5.6 Summary of financial case

In summary, scheme options 5b and 6b are financially affordable and thus have a 'financial case'. However, scheme options 1, 2, 3, 4, 5a and 6a are not considered affordable because they are likely to require an unaffordable amount of revenue support.

## 4.6 Commercial Case

### 4.6.1 Flexibility of option

All schemes contain the same infrastructure package and a large component of the capital costs is the reopening of Portishead Line between Pill and Portishead. Hence, there is little scope to change the scale of the scheme options. However, there would be opportunities to consider alternative service patterns. There would be potential for medium- to long-term commercial development by the train operator.

Overall, flexibility of the options have been scored as 4, on a scale of ‘1 – Dynamic’ to ‘5 - Static’.

### 4.6.2 Funding sources

In addition to the West of England Local Transport Body – Developed Major Scheme Funding, other potential funding sources include:

- City Region Deal
- Funding associated with the Strategic Economic Plan
- Any new government funding competition
- Developer contributions
- New Homes Bonus (where not already allocated)

These funding sources would be applicable for all scheme options.

### 4.6.3 Income generation

The scheme options will generate revenue via:

- Ticket sales
- Car park charges
- Track access charges.

The approximate scheme income generation values have been incorporated into the revenue totals presented in Section 4.5.3, and currently are not disaggregated.

### 4.6.4 Summary of commercial case

In summary all scheme options are considered commercially viable, thus have a ‘commercial case’.

## 4.7 Summary and EAST forms

Appendix B contains EAST forms, summarising the information in this section.

In summary, the key strengths for the Business Case are:

- Substantial latent passenger demand for a Portishead to Bristol train service. Portishead’s population is approximately 27,000 (2012 estimate) and up to 1600 people live within 1 km of the station (the catchment size is dependent on the station location).
- Continued passenger demand supports the enhancement to the Severn Beach and Bath lines, driven by economic and population growth.
- Enhancing access for the skilled workforce to major employment markets, helping business to expand and deliver economic growth.
- Substantial support from the community and stakeholders for the project.

- Majority of capital funding identified.
- Provides a sound foundation for taking forward the rest of the MetroWest programme and potential for medium-/long-term commercial expansion.

Table 4.21 shows a summary of how the scheme options meet the five cases. The EAST analysis shows that option 5 and 6B are the preferred options to take forward to the Preliminary Business Case.

TABLE 4.21

**Summary of how the scheme options meet the five cases**

Option	Strategic case	Economic case	Management case	Financial case	Commercial case
<b>Option 1:</b> Shuttles (base case)	✓	✓	✓	✓	✓
<b>Option 2a/b:</b> Portishead to Bath Spa and Severn Beach to Bristol Temple Meads	✓	✓	✓	✓	✓
<b>Option 3a/b:</b> Portishead to Severn Beach and Bath shuttle	✓	✓	✓	✓	✓
<b>Option 4a/b:</b> Severn Beach to Bath Spa and Portishead shuttle	✓	✓	✓	✓	✓
<b>Option 5a/b:</b> Severn Beach to Bath Spa and Portishead	✓	✓	Option a ✗ Option b ✓	Option a ✗ Option b ✓	✓
<b>Option 6a/b:</b> Portishead to Severn Beach and Bath Spa and Severn Beach shuttle	✓	✓	Option a ✗ Option b ✓	Option a ✗ Option b ✓	✓

## Appendix A

### LTB Prioritisation

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The West of England Local Transport Body undertook a process of assessment and prioritisation of major local transport schemes in June 2013. The prioritisation process is summarised in Figure A.1.

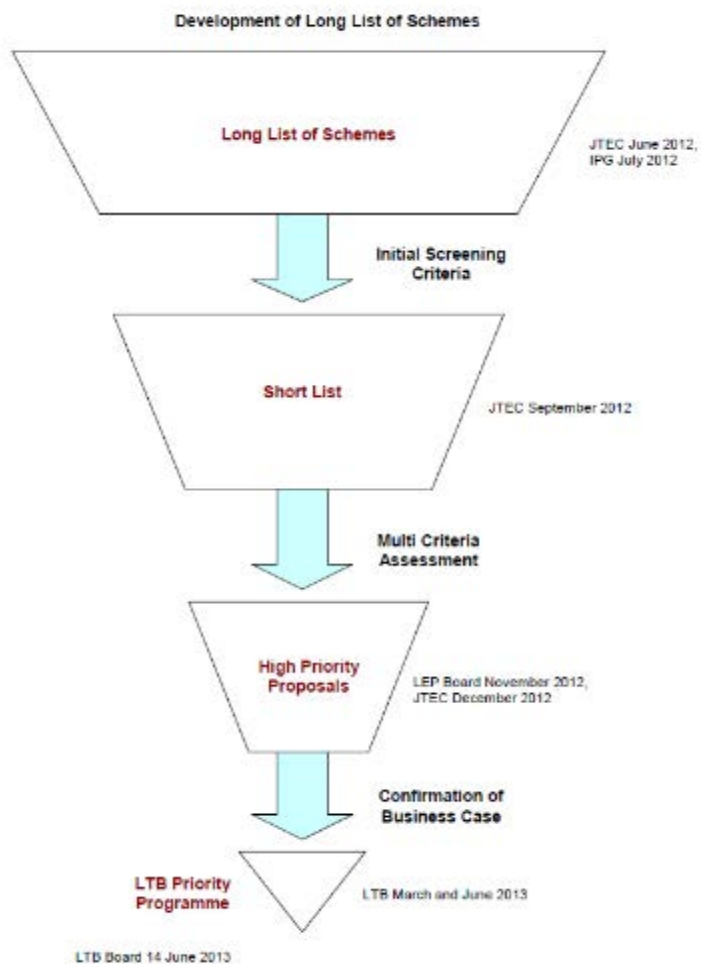


Figure A.1: Overview of prioritisation process

The initial long list of schemes was derived by reviewing the Joint Local Transport Plan 2011-26 (JLTP3), the authorities' Core Strategies and other more detailed infrastructure plans, including those for the Enterprise Zone or Areas. The long list included a comprehensive set of schemes including those expected, or with the potential, to be funded by others, together with those outside of the immediate cost or delivery constraints.

### **The long list**

The long list of schemes was reviewed by officers across the authorities to seek to identify those which fit less well in terms of deliverability or affordability within the likely allocation through the devolved major schemes' funding approach. This process involved the application of three initial screening criteria:

- 1) **Affordability** – schemes which cannot be funded within the likely allocation for the CSR period. Based on guidance at the time, this was expected to be some £38 million in the period 2015/16 to 2018/19, if population based, up to £50 million if using GVA. The criterion was applied, based on the higher GVA-based allocation and assuming a 10 per cent local contribution (schemes over £55 million at 2015/16 prices will be considered unaffordable through the devolved major schemes process).

- 2) Minimum cost threshold – given the requirement for assurance and appraisal, including evidencing value for money, and the associated resource implications, a minimum cost threshold of £2 million was applied.
- 3) Deliverability – schemes must be sufficiently well defined to have the realistic potential to progress through design, consultation and statutory processes to be substantially complete within the review period.

Schemes were excluded from the shortlist where they were:

- Already funded through other sources
- Unable to be delivered through the developed major scheme funding allocation due to:
  - Timescale
  - Affordability
- Below the minimum threshold for developed funding

### **The emerging shortlist**

The short list of schemes, considered affordable and deliverable through the initial assessment process, were subject to a multi-criteria assessment with the aim of identifying a set of high priority proposals for devolved funding. A set of weighted assessment criteria were developed, based on strategic fit, deliverability and outputs. These were refined, scored and weighted, as shown in Figure A.2.

The shortlist assessment was undertaken by a panel of officers from across the West of England authorities. These officers reviewed technical information about each of the schemes - provided through individual summaries prepared by the promoting authority(ies)- and then allocated a score for each criterion. Scores were then averaged and weightings applied to provide an overall score.



Figure A.2: Scoring and Weighting Criteria for Short List Assessment

Criteria	Scoring (1 - 5, Five Highest)	Weighting (Highest 3)
<b>Strategic fit</b>		
Core Strategies	Identified priority scheme = 5 Identified scheme = 4 Part of identified programme = 3 Accords with wider framework = 1	3
Joint Local Transport Plan	Identified priority scheme = 5 Identified scheme = 4 Part of identified programme = 3 Accords with wider framework = 1	3
Enterprise Zone and Area	Strong Links = 5, through to Limited Support = 1	3
Links with wider programmes	eg links with existing major schemes, rail franchise, other funding programmes.	1
Identification in previous technical studies programmes	eg GBSTs, other studies, TIF, RGF, DIIP	1
<b>Deliverability</b>		
Stakeholder Support	Strong and tested support = 5 Likely strong support = 3 Mixed support = 1	2
Construction Start (Note: To have regard to number of statutory powers and consents required)	2015/16 = 5 2016/17 = 4 2017/18 = 3 2018/19 = 2 2019/20+ = 1	3
Reliance on Third Parties eg NR, HA	No reliance = 5 Reliance but strong support = 3 Reliance support uncertain = 1	1
Current State of Development	Outline business case = 5, through to Initial Identification = 1	2
<b>Outputs &amp; Value for Money</b>		
Ability to draw on other funding	Significant local funding (30%+) = 5 20-30% = 4 15-20% = 3 10-15% = 2 Minimal local funding (<10%) = 1	2
Assist in delivery of job growth	Significant Jobs = 5, through to Minimal = 1	3
Assist in delivery of homes	Significant homes = 5, through to Minimal = 1	3
Contribution to congestion reduction	Significant = 5, through to Minimal = 1	2
Contribution to carbon reduction	Significant = 5, through to Minimal = 1	2
Other significant wider benefit: - Noise/Air Quality, Accidents, Natural Resources, Landscape/Townscape, Heritage, Social/Distributional/Equalities	Significant Impact = 5, through to Minimal = 1	2



## Appendix B EAST forms

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## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	1
Date	20/05/2014
Description	Option 1: Shuttles (Base Case)

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	3	No cross Bristol service pattern
Fit with wider transport and government objectives	3	
Fit with other objectives	3	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	3	

### Economic

Economic growth	4. Amber/green	
Carbon emissions	4. Amber/green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VfM Category	3. Medium 1.5-2	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	3	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs      Revenue costs could be unaffordable

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	2
Date	20/05/2014
Description	Option 2a/b: Portishead to Bath Spa and Severn Beach to Bristol Temple Meads

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VfM Category	3. Medium 1.5-2	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs Revenue costs could be unaffordable

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	3
Date	20/05/2014
Description	Option 3a/b: Portishead to Severn Beach and Bath Shuttle

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	4	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VfM Category	3. Medium 1.5-2	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs      Revenue costs could be unaffordable

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	4
Date	20/05/2014
Description	Option 4a/b: Severn Beach to Bath Spa and Portishead Shuttle

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VfM Category	3. Medium 1.5-2	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs Revenue costs could be unaffordable

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	5a
Date	11/06/2014
Description	Option 5a: Severn Beach to Bath Spa & Portishead

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VFM Category	2. High 2-4	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know



## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	5b
Date	11/06/2014
Description	Option 5a: Severn Beach to Bath Spa & Portishead

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected Vfm Category	2. High 2-4	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	5. High	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	5. Affordable	
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	05. 25-50	
Cost profile		
Overall cost risk	3	Other costs

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	6a
Date	20/05/2014
Description	Option 6a: Portishead to Severn Beach & Bath Spa and Severn Beach Shuttle

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected VfM Category	3. Medium 1.5-2	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	3	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	3	Possible revenue funding issues
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	06. 50-100	
Cost profile		
Overall cost risk	2	Other costs      Revenue costs could be unaffordable

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know

## Early Assessment and Sifting Tool - *Saved Option*

Option name/no.	6b
Date	20/05/2014
Description	Option 6b: Portishead to Severn Beach & Bath Spa and Severn Beach Shuttle

### Strategic

Identified problems and objectives	To support economic growth, to deliver a more resilient transport offer, to improve accessibility, to improve quality of life.	
Scale of Impact	4	
Fit with wider transport and government objectives	5. High	
Fit with other objectives	4	
Key uncertainties	Funding, timetable capacity, resources, lack of support, may need additional works	
Degree of consensus over	4	

### Economic

Economic growth	5. Green	
Carbon emissions	5. Green	
Socio-distributional impacts and the regions	4. Amber/green	
Local environment	3. Amber	
Well being	4. Amber/green	
Expected Vfm Category	2. High 2-4	

### Managerial

Implementation timetable	5. 2-5 years	Scheme opening planned for Dec 2018
Public acceptability	5. High	
Practical feasibility	5. High	
What is the quality of the supporting evidence?	4	
Key risks	GRIP 1/2 level of design, consents required	

### Financial

Affordability	5. Affordable	
Capital Cost (£m)	05. 25-50	
Revenue Costs (£m)	05. 25-50	
Cost profile		
Overall cost risk	3	Other costs

### Commercial

Flexibility of option	4	
Where is funding coming from?	City Region Deal, SEP, funding competitions, development contributions	
Any income generated (£m)	Yes	Don't know