MetroWest Phase 1
Preliminary (Strategic Outline) Business Case

Forecasting Report

Prepared for
North Somerset Council

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MetroWest Phase 1

Preliminary (Strategic Outline) Business Case
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North Somerset Council

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Contents

1. Introduction

1.1 Background

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 major 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 is to deliver an enhanced local rail offer for the sub-region comprising:

- Existing and disused rail corridors feeding into Bristol
- Broadly half-hourly service frequency (with some variations possible, pending business case)
- Cross-Bristol service patterns (i.e Bath to Severn Beach)
- Providing 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 purpose of this report is to document the forecasting approach for the assessment of scheme benefits for transport network users.

1.2 The Scheme

Figure 1.1 provides an overview of the MetroWest Phases 1 and 2 proposed train services.

Two main options of service specifications are proposed for Phase 1 business case assessment, which are Option 5b and Option 6b. There are two variants to each option. The service specification of each option is described as follows:

<u>Option 5b</u>

- Severn Beach to Bath Spa: 1 train per hour (tph) all day;
- Avonmouth to Portishead: 1tph all day; and
- Portishead to Bristol Temple Meads: 1tph in the morning and evening three-hour peaks only.

Stopping at: Pill, Parson Street, Bristol Temple Meads, Keynsham, Oldfield Park, St.Andrews Road, Avonmouth, Portway, Shirehampton, Sea Mills, Clifton Down, Redland, Montpelier, Stapleton Road and Lawrence Hill.

Option 5b enhanced

Same as Option 5b except:

- Portishead to Bristol Temple Meads: 1tph all day

Option 6b

- Portishead to Bath Spa: 1tph in the morning and evening three-hour peaks only;
- Portishead to Avonmouth: 1tph all day; and
- Severn Beach to Bristol Temple Meads: 1tph all day.

Off peak service pattern is as above but operating 1tph Bristol Temple Meads to Bath Spa rather than Portishead to Bath Spa.

Option 6b enhanced

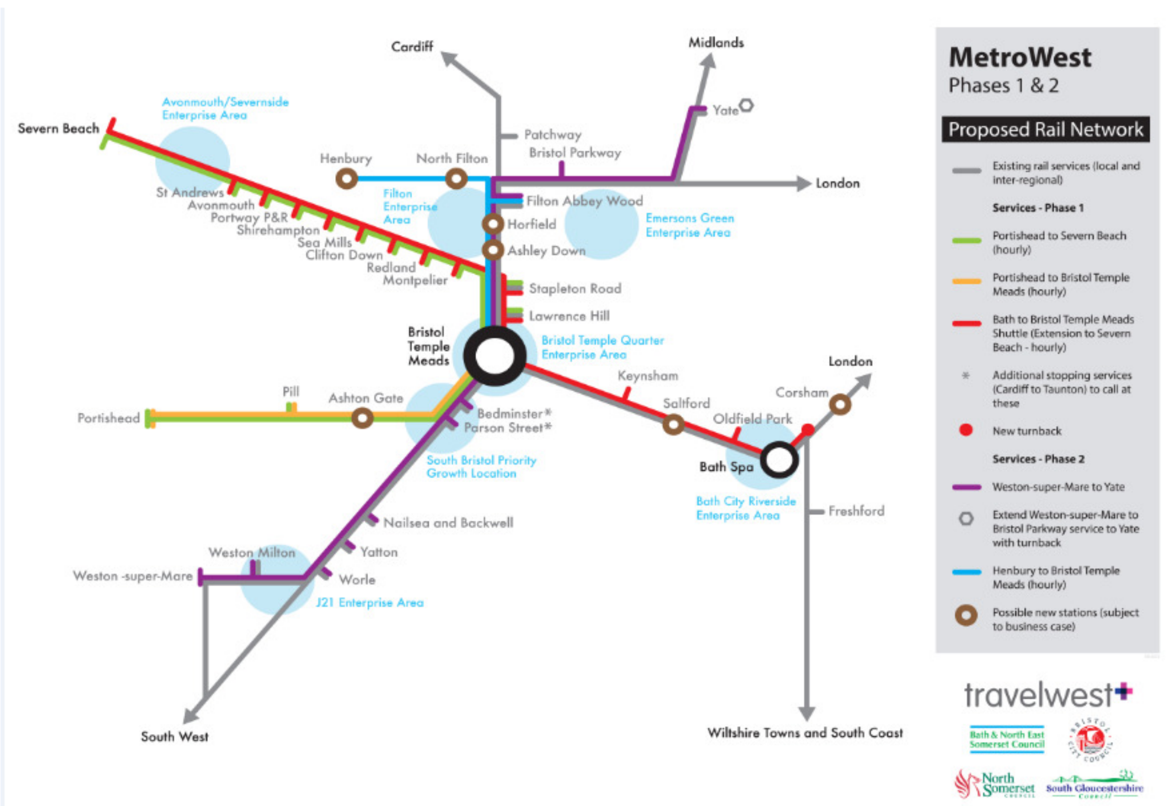
Same as Option 6b except:

- Portishead to Bath Spa operates 1tph all day, i.e. Portishead line has half hourly frequency on weekday.

Stopping at: Pill, Parson Street, Bristol Temple Meads, Keynsham, Oldfield Park, St.Andrews Road, Avonmouth, Portway, Shirehampton, Sea Mills, Clifton Down, Redland, Montpelier, Stapleton Road and Lawrence Hill.

The current MetroWest Phase 1 programme is targeting a project opening year of 2019.

Figure 1.1 MetroWest scheme



1.3 Modelling System

The key rationale of the methodology is that it makes best use of available tools. In particular, it utilises tools and approaches accepted by the rail industry and the existing GBATS multi-modal model. The methodology is in accordance with both WebTAG and Guide to Railway Investment Projects (GRIP) demand forecasting requirements. The Department for Transport's (DfT's) Transport Appraisal Guidance (WebTAG) has recently been restructured, with a major release of new and revised modules in January 2014. The methodology is consistent with the restructured guidance and revised modules.

1.4 Structure of Report

Following this introduction Chapter, the report is structured as follows:

- Chapter 2: Forecasting Approach;
- Chapter 3: New Station Demand Forecasting;
- Chapter 4: Highway Network Impacts; and
- Chapter 5: Summary.

2. Forecasting Approach

2.1 Introduction

The assessment approach makes best use of available assessment tools. In particular, it utilises tools and approaches accepted by the rail industry and the existing GBATS multi-modal model, a tool accepted by the DfT as appropriate for (ultimately successful) applications for major schemes.

The methodology used is in accordance with both WebTAG and Guide to Railway Investment Projects (GRIP) demand forecasting requirements.

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

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

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

2.2 Rail Forecasting

A combination of bespoke spreadsheet models and MOIRA are proposed to assess rail enhancements offered by MetroWest Phase 1. There are three main elements covered:

- Trips at new stations (on existing and re-opened lines);
- Diversions of existing trips to new stations; and
- Changes in demand at existing stations from new or amended services (including suppression of demand by extra station calls).

These tools combine to form a ‘rail demand model’ (RDM).

The demand forecasting approach for new stations is set out in detail in the next section.

The value for money assessment of the MetroWest will be undertaken using a Discounted Cash Flow (DCF) model developed by Network Rail. The model is used for socio-economic appraisal and developed in accordance with WebTAG. It enables the quantification and monetisation of benefits and costs. The model considers a stream of costs and benefits, which are presented in 2010 present values over the appraisal period. The key outputs of the assessment is the Benefit Cost Ratio (BCR) to the Government, Transport Economic Efficiency (TEE) tables and associated Appraisal Summary Table inputs as required by DfT for enhancement schemes that require Government funding.

The DCF model was used to develop business cases that informed the development of DfT's High Level Output Statement (HLOS) and Network Rail's Business Plan for Control Period Five (CP5). The model has been audited by a number of consultants commissioned by DfT.

The DCF model incorporates the following elements:

- Investment cost (capital expenditure);
- Operating cost;
- Other government impacts (e.g. indirect taxation);
- Revenue impact;
- Rail demand;
- Benefits to rail users;
- Benefits to non-rail users; and
- Disbenefits to rail and non-rail users.

The changes in demand at existing stations and DCF assessment are documented in the Network Rail Metro West Phase One Economic Appraisal Report, July 2014, included as a separate appendix to the Preliminary Business Case.

2.3 Highway Network Impacts

Without a network model, benefits to non-users are typically calculated using the External Cost of Car Use (ECCU) model from WebTAG Unit A5-4. The ECCU shows the unit rate of removing one mile of road journey for each road type and congestion level by Government Region. This unit rate comprises of impact on road congestion, greenhouse gases and noise and air pollution. The DCF model estimates the total road mileage removed by incorporating MOIRA rail mileage output and converted to equivalent road mileage following WebTAG. The ECCU unit rate for South West region is then applied to the road mileage to calculate the non-rail user benefits.

Since a multi-modal model, including a highway assignment model, is available, this has been used as a cross check of highway benefits, in particular in assessing the benefits accrued via changes to highway trips. The principal tools used in this assessment are:

- Outputs from the RDM,
- The Greater Bristol multi-modal model (GBATS); and
- TUBA.

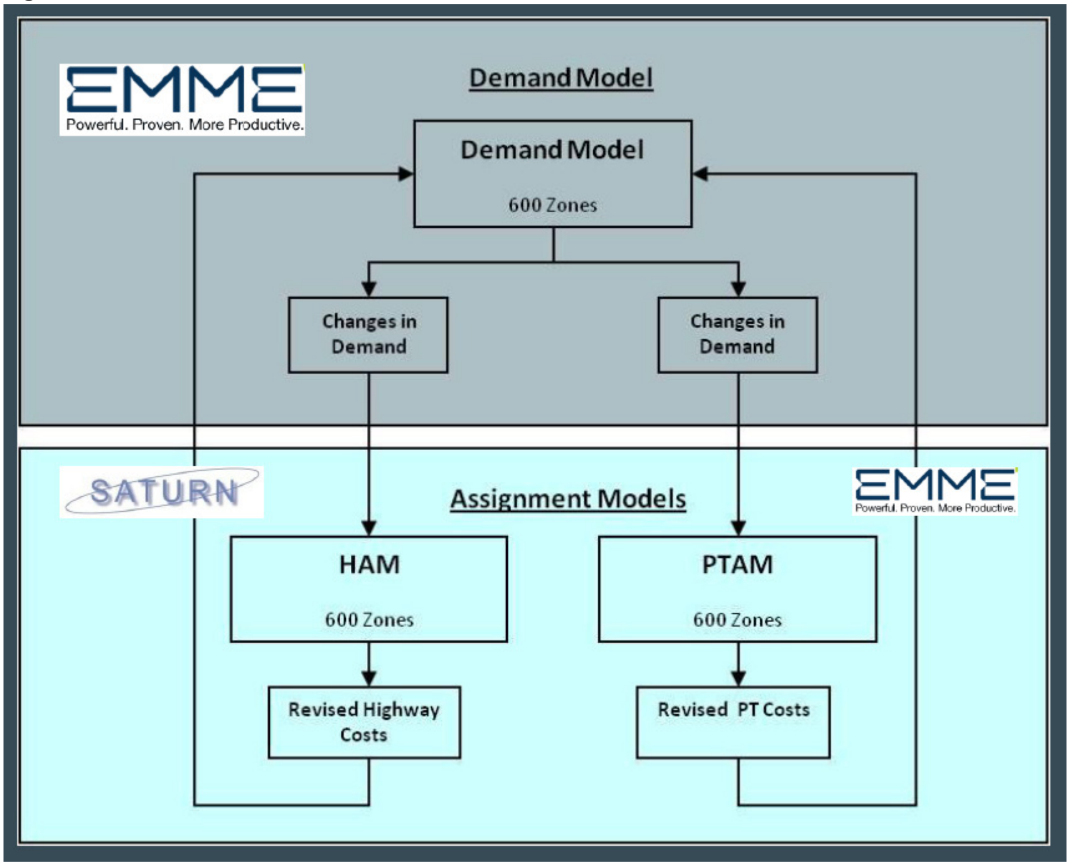
<u>GBATS</u>

GBATS is the existing multi-modal model for the greater Bristol area which has been developed to be WebTAG compliant and used to assess a number of schemes in the area that have been given funding approval by the DfT[1]. GBATS produces matrices of trips and journey data (time, cost and distance) for three time periods (AM peak, inter-peak and PM peak hours) and several modes (car, bus, rail and BRT), also sub-divided by user class (commuting, other home based trips and business journeys) and income level of travellers.

Figure 2.1 shows the structure of the model in terms of interactions between the demand and assignment models.

[1] Ashton Vale to Bristol City Centre Rapid Transit, North Fringe to Hengrove Package, South Bristol Link and Local Sustainable Transport Fund.

Figure 2.1 Demand model structure



GBATS3 has developed in recent years with several slightly different local versions being developed for particular purposes, each with an emphasis on different areas and/or transport schemes. Following discussions with officers of the West of England authorities, the 'SBL' (South Bristol Link) version of GBATS3 has been used for the Preliminary Business Case.

Further information about the GBATS3 SBL model, including further details of forecasting assumptions, can be found in the following reports which are included as supporting documents to the Preliminary Business Case:

- South Bristol Link Data Collection Report, April 2013
- South Bristol Link HAM Validation Report, April 2013
- South Bristol Link PTAM Validation Report, April 2013
- South Bristol Link Demand Model Report, April 2013
- South Bristol Link Forecasting Report, April 2013

GBATS3 has two forecast years, 2016 and 2031. As such, 2016 has been used as the proxy for the scheme opening year of 2019. This results in a conservative estimation of highway benefits.

The methodology for undertaking a cross-check of highway benefits involves taking the results from the RDM and using them to adjust the inputs to GBATS (and hence TUBA) accordingly. The steps in the methodology are shown in Figure 2.2.

Figure 2.2: Highway benefits cross-check – methodology

Identify core scenario development and infrastructure assumptions for 2016 and 2031, in line with WebTAG unit M4

↓

Develop a core scenario 'Do Minimum' model in GBATS, incorporating the assumptions identified

↓

Code MetroWest (Phase 1) scheme and run a multi-modal assignment in GBATS

↓

Develop correspondence table between MetroWest stations and GBATS zones

↓

Adjust GBATS scheme forecast rail matrices to generate station totals in GBATS that match rail demand forecast from the RDM

↓

Make corresponding adjustments to car matrices retaining relative shift from alternative modes to rail in line with GBATS forecast changes

↓

Re-assign highway matrices to highway networks in GBATS as fixed matrix assignments to derive final travel costs for highway trips

↓

Run TUBA using highway demand and cost matrices generated above

2.4 Modelling Responsibilities

The modelling approach has been carried out jointly by CH2M HILL and Network Rail, with the lead taken on individual elements as appropriate. This is summarised as follows (and illustrated in Table 2.1):

- CH2M HILL lead on developing the new stations model and diversions model, building on models previously developed for the West of England Rail Studies.
- Network Rail take the results of this modelling, incorporating them into the overall demand forecasts the constitute outputs from the RDM.
- Network Rail prepare the socio-economic appraisal (value for money assessment and benefit cost ratio), including the impact on non-user benefits (e.g. carbon and environment) estimated using the external costs of car use assumptions from WebTAG, using the DCF.
- CH2M HILL responsible for the highway benefits cross check, taking outputs from the RDM and utilising GBATS and TUBA to calculate benefits.
- Network Rail finalise the socio-economic assessment prepared using the DCF with GBATS/TUBA results from the highway benefits cross check.

Table 2.1 MetroWest modelling lead for each key element

Models	**CH2M HILL**	**Network Rail**
RDM		
New stations model	✓	
Diversions model	✓	
MOIRA		✓
Future year		✓
Socio-Economic Analysis		
DCF		✓
GBATS	✓	
TUBA	✓	

3. New Station Demand Forecasting

3.1 Methodology

Forecasts of demand for the new stations proposed as part of MetroWest Phase 1 have been carried out using a methodology derived from that used for recent studies associated with the original development of MetroWest Phase 1, as well as MetroWest Phase 2 and the 'new stations package'. The methodology makes use of rail industry data and derived techniques to forecast demand at new stations broadly based on relationships at existing stations elsewhere. No data has been specifically collected, forecasts have therefore employed existing data sources.

Note that demand forecasts described and presented in this section of the report are for scheme appraisal purposes, and relate solely to new stations in MetroWest Phase 1. As such, they do not include effects elsewhere on the MetroWest network. Furthermore, sensitivity testing and risk assessments, such as into the likelihood of achieving the demand postulated, has not been carried out. This should be considered in using the forecasts for financial assessments.

3.1.1 Main data sources

National Rail Travel Survey (NRTS)

The National Rail Travel Survey (NRTS) estimates the number of rail trips at stations on a typical day and includes origins and destinations of trips using the rail network, both the rail journeys themselves (first, intermediate and last stations used) and the 'true' origin and destination of trips (including the locations where the overall journey started and finished, such as home, work or other location and the mode of station access/egress). Other journey characteristics derived from NRTS data includes ticket types, journey purposes and journey frequency. NRTS data is key to developing the model for new stations.

Office of Rail Regulation (ORR) statistics

Passenger boardings and alightings at stations. The latest ORR station statistics were published in February 2014 covering the annual period 2012-13. ORR station totals are used in conjunction with NRTS and other data to update figures as required.

West of England annual station survey

Passenger counts at stations. The latest West of England station survey was carried out in November 2013. The survey results are used in conjunction with ORR station statistics where appropriate.

MOIRA

MOIRA is used by the rail industry to forecast the impact of timetables on passenger revenue, including analysing the effect of changes such as stopping patterns, infrastructure and rolling stock on the passenger numbers carried and the revenue impact. MOIRA1 has been used to assess the impacts of MetroWest Phase 1 on the wider rail network.[2] In addition, generalised journey time, demand and revenue figures have been extracted from MOIRA1 for stations in the MetroWest area to use in the forecasts of the new stations.

Passenger Demand Forecasting Handbook (PDFH)

The PDFH summarises knowledge of the effects of changes to services, fares and other factors on rail passenger demand, and provides guidance on applying this to forecasts. Values in the PDFH can be used to assess demand responses to timetabling and operating decisions. Various PDFH relationships have been employed to adjust forecasts where the source data is based on different circumstances (for instance, scaling demand from a station with a better frequency of train service).

[2] MetroWest Phase 1 demand at existing stations has been assessed by Network Rail using MOIRA1

3.1.2 New station demand forecasts

A series of approaches have been used to assess different aspects of new stations. These consider three main elements that together enable the net total benefit to the railway to be established, and include:

- Total trips generated by the new station;
- Existing rail trips diverted from existing trips to the new station; and
- Suppression of demand at existing stations by an extra station call by passing services.

Total station demand

This has employed a simple regression and gravity model technique, which takes into account the relationship between journeys and catchments at a number of similar stations. Regression has been used to identify a series of demand/catchment relationships for several types of movements, including journeys made using full price tickets, reduced price tickets and season tickets, and between 'independent' stations (such as Keynsham), 'regional' stations (such as Bristol Parkway), 'urban' stations (such as Stapleton Road) and London stations, as the characteristics of such trips can differ.

Stations used in the regressions are drawn from the local West of England area locations as much as possible. The specific regression models used to forecast demand at the MetroWest Phase stations have been calibrated using demand quantum and access modes at a combination of Nailsea & Backwell, Bridgwater and Keynsham stations, as these are considered the most reasonable demographic fit as similar 'independent' characteristic stations to the catchments for Portishead and Pill.

Distribution of trips

Total new station demand has been derived from the regression model. This is distributed to determine the destinations of trips from the new stations using a synthetic gravity model. A gravity model has been set up that makes use of the full catchment of destination stations for rail users in the MetroWest area (derived from local stations to Portishead). Generalised journey times have been derived for each potential movement from MOIRA data, and population catchments extracted from Census data.

Gravity model powers were broadly calibrated with reference to Nailsea & Backwell station's trip distribution, to build in inherent local tendencies to make long or short distance trips. This process doesn't manifestly change the total demand, adjusting it slightly to accentuate or reduce the new stations' propensity for longer trips compared to Nailsea & Backwell (basically reducing, as Nailsea & Backwell is served by direct trains to/from London Paddington). It does though facilitate calculation of revenue based on the mix of short, medium and longer distance trips in the distribution.

Diversions of existing trips to new station

An estimate of how many trips are new to the railway or transferring from other stations has been made using a station choice logit model, with generalised costs calculated for whole journeys from origin (home in many cases) to destination (for example, work) via the existing station used, compared with a similar trip using the new station. NRTS data identifies true origin and destination of rail users.

This model calculates propensity to change stations based initially on a simple logit approach for trips at stations in the MetroWest area. The difference between the distance from origin to original station and origin to new station is used to calculate a competing generalised journey time for an existing trip, to use the new station instead of the one it actually uses. The initial 'mode shift' calculated in this manner derives the theoretical mode share based purely on generalised cost, which if un adjusted could result in higher transfers than would be realistic. As such, this has been calibrated using behaviour at existing stations, with a broad catchment defined for each new station and the main principle being that unrealistic transfers are eliminated. For example, it is considered highly unlikely that trips using Severn Beach line stations, which are the closest existing stations to both Pill and Portishead (but which are also basically local stations and not railheads), would transfer to either Pill or Portishead. Also, care has been taken to consider longer distance railhead movements from the Pill/Portishead catchment that use major stations such as Bristol Temple Meads.

Suppression of demand

Overlaying the demand of a new station is potential loss of existing rail passengers, where there is potential to affect demand on services passing through (and stopping) at the new station, and lengthening journey times. This could have a significant effect on revenue if the services are fast and/or long distance, where the journey time penalty is greater and/or fares paid are higher than more local journeys. The new stations at Portishead and Pill are not located on an existing passenger rail line, and no existing services would be delayed to stop at them. As such, suppression of demand at existing stations does not explicitly apply to these new stations.

Station parking charges

The demand forecasts implicitly assume that a Portishead station car park would be a pay facility, in the first instance because key stations in the area that have been used to calibrate forecasts have car parks that levy charges. However, the specific level of charge has not been considered at this stage, other than assuming it would be similar to the costs at nearby stations, in particular Nailsea & Backwell (which is currently £1.50 per day for peak users) and Yatton (£2.30 per day). A charging regime will be considered along with car park access and capacity considerations as MetroWest Phase 1 development proceeds.

3.1.3 Future demand

Demand for rail travel has grown significantly in recent years, with, for example, an almost 70% increase in passenger numbers being recorded through stations in the West of England between 2004/05 and 2011/12 (ORR figures). This includes larger increases on specific routes, such as more than 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 levelling in 2007/08, growth has continued in spite of the recession. It is likely to continue, albeit debatable whether rates will be as high as in recent times.

Looking to the future, the Great Western RUS (published in March 2010) forecast that demand in the Bristol area would rise by 41% at peak times between 2008 and 2019 (a rate of 3.2% per annum), and 37% off peak (2.9% per annum), with an average growth rate of 3.0% per annum. The Network Rail Long Term Planning Process (LTPP) Regional Urban Markets study (published October 2013) uses a series of wider economic scenarios to frame changes in rail use, and forecasts are presented for rail use in/around key urban centres. The resulting growth rates for the Bristol area vary from 0.6% per annum to 3.9% per annum. More details of the LTPP growth rates are shown in Table 3.2.

In spite of recorded growth in recent years, it is possible that these rates would not continue unabated. As such, future year forecasts for West of England stations have been produced using a combination of decrementing historic rates, RUS and LTPP figures, as follows: [3]

- 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 annum);
- 2018 & 2019 – RUS average rate (3.0% per annum);
- 2020 to 2023 – taper from RUS average rate (3.0% per annum) to an LTPP average rate derived from the four economic scenarios (2.3% per annum); and
- 2023 to 2043 – taper from 2023 LTPP average rate (2.3% per annum) to 2043 LTPP average rate (1.3% per annum). Note that for appraisal, growth is capped to 0% per annum after 2034.

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 & Parkway)	5.7%	6.1%	57%	6.6%

[3] Given recent historic rates of growth of rail patronage, the forecast growth rates assumed can be considered comparatively conservative.

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
Severn Beach Line	9.8%	18.9%	163%	14.8%
Other Bristol urban	8.7%	13.3%	142%	13.5%
B&NES (incl. Keynsham)	8.7%	9.3%	54%	6.4%
South Gloucestershire (excl. 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% [1]

Note 1: As a comparison, the West of England station survey showed a 6.5% per annum increase from 2005 to 2012

Figure 3.1: ORR historic growth in West of England area

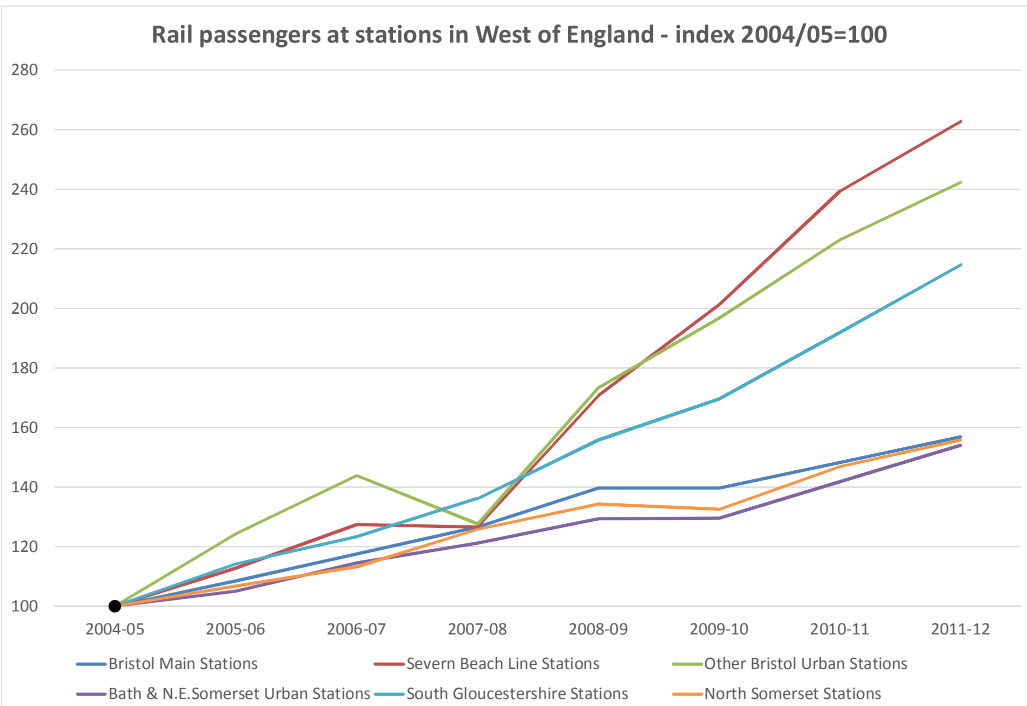


TABLE 3.2
Network Rail LTPP: Regional Urban Markets Study – Bristol area forecast growth
October 2013

Economic scenario	2013-23 total	2013-23 per annum	2023-2043 total	2023-2043 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%

3.2 Results of forecasts

3.2.1 Demand and revenue

There are two basic train service operating options for the stations on the Portishead line, both with enhanced versions. This results in four overall options as briefly described as follows:

- 5B – 1 train per hour all day Severn Beach-Bath, 1 train per hour all day Avonmouth-Portishead and 1 train per hour peak only Portishead-Bristol Temple Meads;
- 5B enhanced – same basic train service as 5B, but with 1 train per hour all day operating Portishead-Bristol Temple Meads;
- 6B – 1 train per hour peak only Portishead-Bath, 1 train per hour all day Avonmouth-Portishead and 1 train per hour all day Severn Beach-Bristol Temple Meads; and
- 6B enhanced – same train service as 6B, but with 1 train per hour all day Portishead-Bath.

The variations shown above only apply to weekday services, and weekend services would be hourly at both stations in all options. Note also that the level of service is the same in train service options 5B and 6B (2 trains per hour in the peaks, 1 train per hour off peak), as well as in options 5B enhanced and 6B enhanced (2 trains per hour all day). Hence, whether option 5B or 6B is considered does not alter demand forecasts for the new stations, as the methodology does not explicitly take into account the benefits (or otherwise) of specific service routeings that are the differences between 5B and 6B options. The respective 'baseline' and 'enhanced' service patterns are only different in the inter-peak period, which is reflected in the demand being slightly lower for 'baseline' options.

Headline results of demand forecasts for Portishead and Pill, are shown in the tables for 'baseline' and 'enhanced' service options.[4] Table 3.3 has current year 2013 equivalent demand figures for train service options '5B' & '6B', with 2020 figures in Table 3.4 (which represents the first full year after commencement of MetroWest Phase 1, assuming that MetroWest Phase 2 opens in 2019). Table 3.5 shows equivalent figures for Pill in 2013 for scenarios '5B enhanced' & '6B enhanced', with 2020 figures in Table 3.86.

TABLE 3.3
Demand forecasts – MetroWest Phase 1 new stations
2013 figures equivalent (Scenarios 5B & 6B – 2 trains per hour peaks, 1 train per hour off peak)

Demand/revenue	Portishead	Pill
Annual demand	329,526	149,525
Daily demand (average)	1,046	475
Annual revenue (£)	£1,564,152	£354,492

TABLE 3.4
Demand forecasts – MetroWest Phase 1 new stations
2020 figures (Scenarios 5B & 6B – 2 trains per hour peaks, 1 train per hour off peak)

Demand/revenue	Portishead	Pill
Annual demand	465,124	211,053
Daily demand (average)	1,477	670
Annual revenue (£)	£2,207,790	£500,363

TABLE 3.5
Demand forecasts – MetroWest Phase 1 new stations
2013 equivalent figures (Scenarios 5B enhanced & 6B enhanced – 2 trains per hour all day)

Demand/revenue	Portishead	Pill
Annual demand	339,287	153,576
Daily demand (average)	1,077	488

[4] Revenues are based on the mileage of distributed trips, assuming an overall £0.20 per mile average fare.

TABLE 3.5
Demand forecasts – MetroWest Phase 1 new stations
2013 equivalent figures (Scenarios 5B enhanced & 6B enhanced – 2 trains per hour all day)

Demand/revenue	Portishead	Pill
Annual revenue (£)	£1,610,487	£364,096

TABLE 3.6
Demand forecasts – MetroWest Phase 1 new stations
2020 figures (Scenarios 5B enhanced & 6B enhanced – 2 trains per hour all day)

Demand/revenue	Portishead	Pill
Annual demand	478,902	216,771
Daily demand (average)	1,520	688
Annual revenue (£)	£2,273,190	£513,919

It should be noted that the daily forecasts represent an ‘average day’, based on a new stations annualisation factor of 315 (in turn based on analysis of data extracted from MOIRA2) and do not take into account daily or weekly fluctuations in demand from, for example, seasonal variation, and incorporate future growth assumptions described earlier.

The majority of trips are forecast to be new to the railway, although 11.2% of demand at Portishead (53,697 journeys in 2020) is derived from existing rail users transferring stations, principally from Nailsea & Backwell (74% of transfers, 39,959 journeys) with the remainder from Yatton (13,738 journeys in 2020). The proportion from Pill is similar, with 12.2% of demand (26,481 journeys) being forecast as station transfer by existing rail users, though reflecting Pill’s status as a more local station than Portishead, all are from Nailsea & Backwell.

Table 3.9 shows future year forecasts from opening in 2019 to 2034, including annual and daily (average day) demand and revenue. Growth assumptions are conservative when compared with recent actual growth in rail use, but still indicate that demand could increase substantially as time passes, in effect increasing by over 40% by 2043. Also shown are year 2013-2018 equivalent demand figures.

3.2.2 Catchment and access modes

The total demand forecasts have been further analysed to understand the locations that potential users of the potential new stations could come from, as well as the modes of transport they may use to reach the stations. NRTS data has been used to determine potential patterns of trip distance and mode of access, as this provides an indication of the true origin of trips through a station, as well as the mode of transport used to get there. This has been based on a combination of information from Nailsea & Backwell, Bridgwater and Keynsham stations, with adjustments related to possible availability of access facilities, such as car parking and bus services.

Table 3.7 shows indicative assessment of the potential catchment distance and mode of access for Portishead station, based on the 2020 demand forecasts. In the first instance, almost half of all one-way trips are likely to be outward and return portions of returns, many of which will be day returns, thus suggesting some 763 individuals arrive at the station in order to make 1,520 trips. Table 3.8 shows a similar indicative assessment for the station at Pill (based on 345 individuals arriving at the station, to make 688 trips).

TABLE 3.7

Rail users accessing Portishead – by origin catchment and access mode

2020 figures (Scenarios 5B enhanced & 6B enhanced – 2 trains per hour all day)

Catchment	Walk	Bus	Car parked	Car drop off	Bicycle	Taxi	ALL
Less than 1 km	150	2	29	9	10	1	200
from 1 to 2 km	209	4	87	47	12	10	369
from 2 to 3 km	10	-	25	16	3	9	62
from 3 to 4 km	-	6	29	14	3	-	52
from 4 to 5 km	-	2	10	12	2	-	25
from 5 to 10 km	-	-	36	7	1	-	44
More than 10 km	-	-	10	1	-	-	11
TOTAL	368	14	225	106	31	19	763

numbers may not add up exactly to totals due to rounding

TABLE 3.8

Rail users accessing site near Pill – by origin catchment and access mode

2020 figures (Scenarios 5B enhanced & 6B enhanced – 2 trains per hour all day)

Catchment	Walk	Bus	Car parked	Car drop off	Bicycle	Taxi	ALL
Less than 1 km	170	3	-	8	14	1	195
from 1 to 2 km	24	3	11	16	6	13	72
from 2 to 3 km	1	-	7	16	3	8	35
from 3 to 4 km	-	8	6	4	2	-	20
from 4 to 5 km	-	2	1	2	2	-	8
from 5 to 10 km	-	-	7	5	1	-	13
More than 10 km	-	-	3	0	-	-	3
TOTAL	194	16	34	51	28	22	345

numbers may not add up exactly to totals due to rounding

Catchments for users of both stations are considered relatively local, more so for Pill than Portishead, and the rail services are likely to be mostly used for local journeys. However, given the availability of connections at Bristol Temple Meads, this will provide opportunities for some longer journeys on the wider rail network that previously required a trip to another railhead, if made at all. Forecasts indicate that almost 75% of journeys at Portishead are likely to be between Portishead and other stations in the MetroWest area, with almost 50% being to/from central Bristol (mostly Bristol Temple Meads, but also including Stapleton Road, Lawrence Hill, Bedminster and Parson Street). Over 90% of journeys through Pill station are between Pill and other MetroWest stations, with almost 80% to/from central Bristol stations.

Portishead is likely to generate some demand for car parking for both local rail trips (into Bristol) and those further afield. There are, for instance, already journeys recorded for Nailsea & Backwell station that originate from the Portishead and Clevedon areas that could have some benefit in transferring to a Portishead station (as identified in the assessment of transfer demand). As such, while Portishead is not anticipated to become a major railhead, assessment of the distribution of destinations for Portishead station users reflects its greater role as a railhead than Pill, with more journeys to places further afield (than at Pill).

Parking is therefore important at Portishead station. Note though that figures in Table 3.7 are an initial indication of potential car access to the station, and do not specifically represent car park occupancy forecasts. Station access will be further assessed and refined as plans for MetroWest Phase 1 are developed. Pill station is not due to have a station car park, and the figures in Table 3.8 reflect this. As such, less demand for access by car is anticipated for Pill than Portishead. It is likely though there will be some limited demand for on-street parking near Pill station. Although, as for Portishead, this should not be taken as a definitive forecast of parking demand at this stage, and will be refined as development of MetroWest progresses.

Table 3.9: New station forecasts – demand and revenue by year

	Portishead 5B/6B (2 thp peak, 1 tph other)			**Portishead** 5B/6B enhanced (2 tph all day)			**Pill** 5B/6B (2 thp peak, 1 tph other)			**Pill** 5B/6B enhanced (2 tph all day)			
Year	**Demand (2013 pop)**		**Revenue**	**Demand (2013 pop)**		**Revenue**	**Demand**		**Revenue**	**Demand**		**Revenue**	
	annual	daily	annual	annual	daily	annual	annual	daily	annual	annual	daily	annual	
2013	329,526	1,046	£1,564,152	339,287	1,077	£1,610,487	149,525	475	£354,492	153,576	488	£364,096	
2014	355,084	1,127	£1,685,469	365,603	1,161	£1,735,397	161,122	511	£381,987	165,487	525	£392,335	
2015	379,275	1,204	£1,800,294	390,510	1,240	£1,853,623	172,099	546	£408,010	176,761	561	£419,064	
2016	401,535	1,275	£1,905,957	413,430	1,312	£1,962,417	182,200	578	£431,957	187,136	594	£443,660	<< electrification PARTIAL
2017	421,314	1,338	£1,999,840	433,795	1,377	£2,059,081	191,175	607	£453,235	196,354	623	£465,513	<< electrification COMPLETE
2018	438,092	1,391	£2,079,481	451,070	1,432	£2,141,081	198,788	631	£471,284	204,173	648	£484,052	
2019	451,406	1,433	£2,142,675	464,778	1,475	£2,206,147	204,829	650	£485,606	210,378	668	£498,762	<< Metro PHASE 1 (assumed)
2020	465,124	1,477	£2,207,790	478,902	1,520	£2,273,190	211,053	670	£500,363	216,771	688	£513,919	
2021	478,396	1,519	£2,270,790	492,567	1,564	£2,338,057	217,076	689	£514,641	222,957	708	£528,584	<< Metro PHASE 2 (assumed)
2022	491,160	1,559	£2,331,378	505,710	1,605	£2,400,439	222,868	708	£528,373	228,906	727	£542,687	
2023	503,355	1,598	£2,389,260	518,265	1,645	£2,460,036	228,401	725	£541,491	234,589	745	£556,161	
2024	514,918	1,635	£2,444,149	530,172	1,683	£2,516,551	233,648	742	£553,931	239,978	762	£568,937	
2025	526,489	1,671	£2,499,072	542,085	1,721	£2,573,101	238,899	758	£566,378	245,371	779	£581,722	
2026	538,055	1,708	£2,553,973	553,994	1,759	£2,629,628	244,147	775	£578,821	250,761	796	£594,502	
2027	549,605	1,745	£2,608,797	565,886	1,796	£2,686,076	249,388	792	£591,246	256,144	813	£607,263	
2028	561,127	1,781	£2,663,487	577,749	1,834	£2,742,386	254,616	808	£603,640	261,514	830	£619,994	
2029	572,608	1,818	£2,717,985	589,571	1,872	£2,798,499	259,825	825	£615,992	266,865	847	£632,680	
2030	584,037	1,854	£2,772,233	601,338	1,909	£2,854,353	265,011	841	£628,286	272,191	864	£645,307	
2031	595,400	1,890	£2,826,170	613,038	1,946	£2,909,888	270,167	858	£640,510	277,487	881	£657,862	
2032	606,685	1,926	£2,879,737	624,657	1,983	£2,965,042	275,288	874	£652,650	282,746	898	£670,331	
2033	617,880	1,962	£2,932,872	636,183	2,020	£3,019,751	280,368	890	£664,693	287,963	914	£682,700	
2034	628,970	1,997	£2,985,514	647,602	2,056	£3,073,953	285,400	906	£676,623	293,132	931	£694,954	

4. Highway Network Impacts

4.1 Introduction

The West of England highway networks are reaching capacity and congestion is particularly notable at:

- Bristol city centre and approaches to Bristol Temple Meads
- The M5 Junction 19
- The A369 between the M5 and Portishead
- The A4 between Bath and Bristol
- Corridors into Bristol city.

The Portishead to Bristol corridor (A369) suffers congestion and journey time reliability problems. This not only causes delays and lost productivity for car drivers and goods vehicle operators but also presents a major hurdle for an attractive public transport mode along the corridor. The problems and context of the A369 corridor are summarised as:

- The A369 is the only transport corridor directly linking Portishead with Bristol which is just 10 miles to the east.
- The capacity constraints on the A369 are exacerbated by the fact that it crosses junction 19 of the M5. This is one of the busiest parts of the M5 with the Avonmouth Bridge immediately to the north.
- The A369 continually suffers from the knock-on effects of incidents on the M5 with high volumes of traffic using a constrained local road corridor with few alternative route options.

The West of England trend for high rates of private car ownership is magnified in Portishead where only 12% of households (2011 Census) do not have access to a private vehicle. This emphasises the town's over-reliance on private car ownership. These patterns are reflected in the high proportion of residents who travel to work using private vehicles (as car/motorcycle drivers or passengers). At 81 per cent, the proportion of commuters travelling by private vehicle is considerably above both the West of England (69 per cent) and nationwide averages (66 per cent).

Table 4.1 shows free flow vs peak hour journey times on the key corridors served by MetroWest Phase 1. This shows peak hour journey times can be more than twice the corresponding free flow times.

Table 4.1 Free flow vs AM Peak journey times on key routes

Route	Observed AM Peak (Oct 2013)	
	Free Flow JT (mins)	Peak Hour JT (mins)
A4 (Keynsham to Bath Bridge)	11.4	29.5
A4 Portway (Avonmouth to Hotwells)	10.6	21.4
A369 (Portishead to Ashton Gate)	11.8	22.7

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

Observed = Strategis data

4.2 Without-Intervention Case

Do Minimum infrastructure assumptions

MetroWest represents a major transport scheme development in the West of England area. In modelling its effects, other key infrastructure developments need to be included in the 'Do Minimum' assumptions prior to MetroWest interventions being included. It is proposed that the Do Minimum should include:

- South Bristol Link (SBL) and other committed schemes identified in the SBL assessment;
- Ashton Vale to Temple Meads (AVTM);
- North Fringe to Hengrove Package (NFHP); and
- Cribbs Patchway New Neighbourhood (CPNN) Off-site Works Package.

The LSTF schemes and 20mph speed limits are also being implemented across the wider Bristol area and a residents parking permit scheme implemented in central Bristol. However it is not proposed to include these schemes in the Preliminary (Strategic Outline) Business Case GBATS modelling since they are area-wide and not expected to favour one MetroWest option over another.

The proposed new station at Portway Park & Ride site has not been included in the Do Minimum situation. It is not specifically a part of MetroWest, and is envisaged as complementary to any of the options. However, its implementation timescales are not yet confirmed.

Development assumptions

Table 4.2 shows a considerable number of new homes and jobs are planned in the West of England area to 2029.

Table 4.2 West of England Planned Growth

Council	Homes	Jobs	Core Strategy Period
Bath & North East Somerset*	13000	10300	2011- 2029
Bristol City	32800	21900	2011- 2026
North Somerset*	17130	14,000**	2006- 2026
South Gloucestershire	28355	18,600-21,870	2006 - 2027
All	**91285**	**68070**	

Source: Core Strategies and supporting evidence documents

* Proposed figures subject to local plan examinations

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

Table 4.3 underlines this with major housing areas directly served or capable of being served by MetroWest rail.

Table 4.3 Development sites served by MetroWest

Housing Area	Homes	Rail Schemes
Cribbs Patchway New Neighbourhood	5700 50 ha employment	MetroWest Phase 2 (Henbury Line)
North Yate	3000	MetroWest Phase 2
Somerdale (former Cadbury site at Keynsham)	700	MetroWest Phase 1
Weston-super-Mare	11000	MetroWest Phase 1 and 2

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

A significant number of jobs are planned to delivered through Enterprise Zones / Areas that will benefit from MetroWest Phase 1, including Bristol Temple Quarter Enterprise Zone, Bath City Riverside Enterprise Area and and Avonmouth Severnside Enterprise Area.

Further details of modelled development assumptions are provided in South Bristol Link Forecasting Report, April 2013.

Network operation

Table 4.4 shows highway network operation for the 2012 model base year and the forecast years for the Do Minimum scenario. This shows a considerable worsening of network operation in future years resulting in marked increases in queues, associated travel times and reductions in average speed relative to the current levels of congestion.

Table 4.4 Do Minimum highway network operation

	2012 Base year			2016			2031		
	AM	IP	PM	AM	IP	PM	AM	IP	PM
Queues (PCU. HR./HR)	6768	3906	6801	8513	4791	8583	14193	7010	14141
Total travel time (PCU. HRS/HR)	22690	15743	22176	26503	18217	25984	35702	23924	34928
Travel distance (PCU. KMS/HR)	1030834	783188	1006413	1117977	858587	1095510	1333785	1078829	1310820
Overall average speed (KPH)	45	50	45	42	47	42	37	45	38
Total trips loaded (PCUS/HR	120133	97165	112211	128165	105367	120346	151692	129160	142075
				2016 vs 2012			2031 vs 2012		
				AM	IP	PM	AM	IP	PM
Queues (PCU. HR./HR)				26%	23%	26%	110%	79%	108%
Total travel time (PCU. HRS/HR)				17%	16%	17%	57%	52%	58%
Travel distance (PCU. KMS/HR)				8%	10%	9%	29%	38%	30%
Overall average speed (KPH)				-7%	-5%	-7%	-18%	-9%	-17%
Total trips loaded (PCUS/HR				7%	8%	7%	26%	33%	27%

4.3 With-Intervention Case

The highway network operation has been assessed in the With Intervention ‘Do Something’ scenario using the methodology set out in section 2.

The change in rail and highway trips are shown in Table 4.5, which take into account increased rail demand at both new and existing stations. The proportion of additional rail trips that are forecast to switch from highway have been identified from the GBATS multi-modal assessment results, which vary by time period.

Tables 4.6 and 4.7 show the highway network operation for scenarios 4 (Option 6b) and 5 (Option 5b Enhanced) for 2016 and 2031 respectively. These options are presented as the worst and best performing options respectively.

The highway assignment results indicate improvements in network operating conditions as a result of the MetroWest scheme. Whilst there are highway benefits the results indicate the differences between options are limited in terms of highway network impacts.

Table 4.5 Change in rail and highway trips

Change in rail / car demand (from do minimum)		2016 Annual	2016 Average day AM	2016 Average day IP	2016 Average day PM	2031 Annual	2031 Average day AM	2031 Average day IP	2031 Average day PM
5B baseline	Existing stations	466,023	226	71	181	691,023	335	105	269
	Portishead	401,535	147	67	148	595,400	217	99	219
	Pill	182,200	86	29	68	270,167	128	43	101
	TOTAL	1,049,758	459	167	397	1,556,591	680	248	589
	reduction in car trips		160	81	91		213	114	114
5B enhanced	Existing stations	475,809	230	72	185	705,534	342	107	274
	Portishead	413,430	151	69	152	613,038	224	102	226
	Pill	187,136	89	30	70	277,487	131	44	103
	TOTAL	1,076,375	470	171	407	1,596,058	697	254	603
	reduction in car trips		164	83	93		218	117	117
6B baseline	Existing stations	349,027	166	55	132	517,540	247	81	196
	Portishead	401,535	147	67	148	595,400	217	99	219
	Pill	182,200	86	29	68	270,167	128	43	101
	TOTAL	932,762	399	151	348	1,383,107	592	224	516
	reduction in car trips		138	73	79		184	102	99
6B enhanced	Existing stations	356,356	170	56	135	528,408	252	83	200
	Portishead	413,430	151	69	152	613,038	224	102	226
	Pill	187,136	89	30	70	277,487	131	44	103
	TOTAL	956,922	409	155	357	1,418,932	607	230	529
	reduction in car trips		142	75	81		188	105	101

Table 4.6 2016 MetroWest highway network operation

	Do Minimum			Scenario 4 (Option 6b)			Scenario 5 (Option 5b Enhanced)		
2016	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**
Queues (PCU. HR./HR)	8513	4791	8583	8494	4778	8565	8490	4788	8559
Total travel time (PCU. HRS/HR)	26503	18217	25984	26459	18195	25953	26455	18199	25945
Travel distance (PCU. KMS/HR)	1117977	858587	1095510	1116526	858083	1094681	1116584	857613	1094541
Overall average speed (KPH)	42	47	42	42	47	42	42	47	42
Total trips loaded (PCUS/HR	128165	105367	120346	128061	105315	120285	128046	105310	120277
				AM	**IP**	**PM**	**AM**	**IP**	**PM**
Queues (PCU. HR./HR)				-0.2%	-0.3%	-0.2%	-0.3%	-0.1%	-0.3%
Total travel time (PCU. HRS/HR)				-0.2%	-0.1%	-0.1%	-0.2%	-0.1%	-0.1%
Travel distance (PCU. KMS/HR)				-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Overall average speed (KPH)				0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Total trips loaded (PCUS/HR				-0.1%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%

Table 4.7 2031 MetroWest highway network operation

	Do Minimum			Scenario 4 (Option 6b)			Scenario 5 (Option 5b Enhanced)		
2031	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**
Queues (PCU. HR./HR)	14193	7010	14141	14071	6990	14124	14070	7001	14107
Total travel time (PCU. HRS/HR)	35702	23924	34928	35545	23894	34894	35543	23894	34875
Travel distance (PCU. KMS/HR)	1333785	1078829	1310820	1331978	1078308	1309747	1331786	1077492	1309658
Overall average speed (KPH)	37	45	38	38	45	38	38	45	38
Total trips loaded (PCUS/HR	151692	129160	142075	151556	129088	141999	151536	129080	141988
				AM	**IP**	**PM**	**AM**	**IP**	**PM**
Queues (PCU. HR./HR)				-0.9%	-0.3%	-0.1%	-0.9%	-0.1%	-0.2%
Total travel time (PCU. HRS/HR)				-0.4%	-0.1%	-0.1%	-0.4%	-0.1%	-0.2%
Travel distance (PCU. KMS/HR)				-0.1%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%
Overall average speed (KPH)				0.3%	0.0%	0.0%	0.3%	0.0%	0.3%
Total trips loaded (PCUS/HR				-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%

4.4 Highway Benefits Analysis

Highway benefits have been identified through TUBA based on results of the highway modelling reported above. TUBA version 1.9.3 has been used.

Table 4.8 shows annualisation factors employed, which take into account relative congestion levels in peak and 'shoulder' hours rather than purely on traffic counts. These are set out in the NFHP DfT Engagement Annualisation Factors Review, August 2011 supplementary document. This document is available upon request.

Table 4.8 TUBA annualisation factors

Time Period	Modelled Hour to Period Conversion Factor	Number of Occurrences per Year	Annualisation Factors	Comments
AM	2.55	253	645.15	Conversion based on AM peak hour
IP	6	253	1518	Conversion based on IP average hour
PM	2.56	253	647.68	Conversion based on PM peak hour
OP	0.69	253	174.57	Conversion based on IP average hour
WE	6.07	56	339.92	Conversion based on IP average hour

Given the similar level of highway impacts between the options relative to the total level of demand across the model area, average results are presented which are considered representative of the magnitude of benefits for all options.

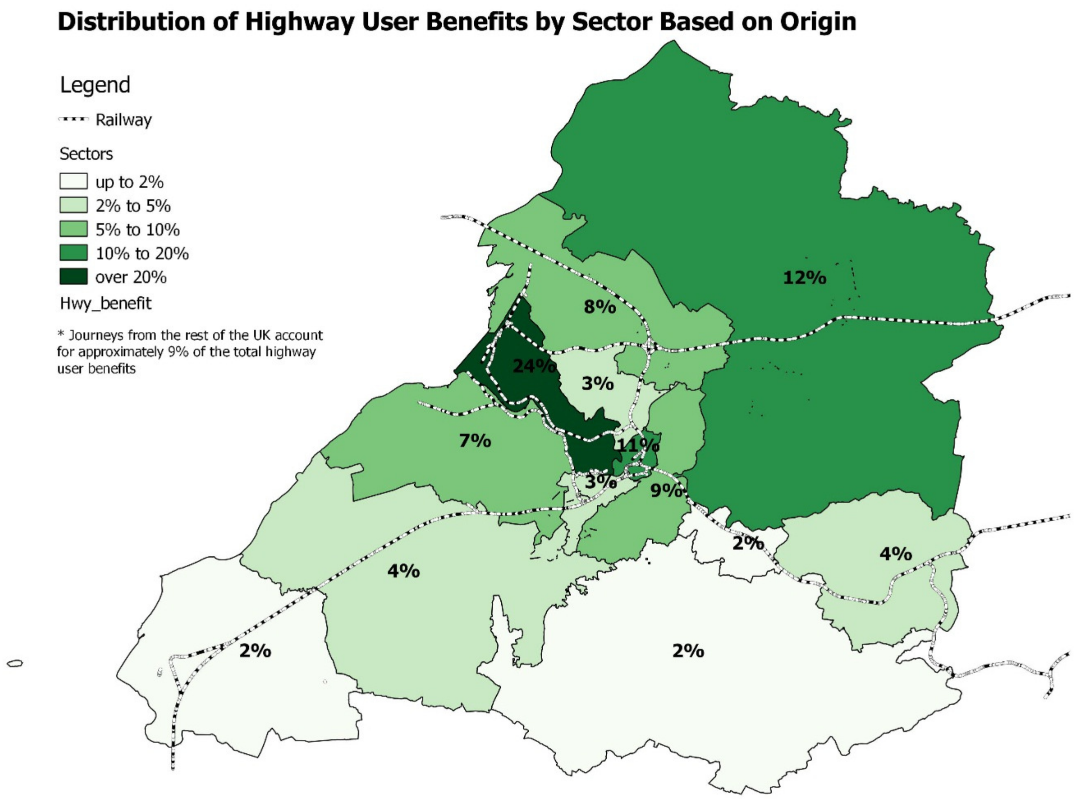
Table 4.9 gives the TUBA highway benefits identified. Appendix A presents the decongestion-related inputs in TEE format.

Table 4.9 TUBA highway benefits

Item	Highway Benefits (£'000)
Commuting / Other User Benefit	15,263
Business User Benefit	8,331
Wider Public Finances (Indirect Taxation Revenues)	-4,215
Greenhouse Gases	1,454

Figure 4.1 presents the spatial distribution of highway benefits from the scheme based on trip origins. This shows the spatial distribution of benefits is consistent with the areas expected to benefit from the MetroWest Phase 1 scheme.

Figure 4.1 Spatial distribution of benefits



5. Summary

5.1 Summary

A methodology has been employed that makes best use of approaches accepted by the rail industry, in the form of a rail demand model, and the GBATS multi-modal model. The methodology is in accordance with both WebTAG and Guide to Railway Investment Projects (GRIP) demand forecasting requirements.

This report has presented:

- rail demand forecasts for new stations;
- highway network impacts; and
- highway user benefits.

The new station forecasts indicate passenger numbers in excess of 450,000 for Portishead and 200,000 for Pill in the opening year.

Highway network impacts show a net present value of highway user benefits of around £23.6 million. A net reduction in tax revenues of around £4.2 million is expected due to reduced fuel consumption and reduced greenhouse gases giving benefits of around £1.5 million.

The rail forecasts for existing stations and rail user benefits are presented in the Network Rail Metro West Phase One Economic Appraisal Report, July 2014.

The final combined economic appraisal results are presented in the Preliminary Business Case Report.

Appendix A
TEE Table TUBA Highway Benefits

Economic Efficiency of the Transport System (TEE) £'000 (Highway only)

Non-business: Commuting	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	8,776		8,776					
Vehicle operating costs	6,509		6,509					
User charges	-22		-21.75					
During Construction & Maintenance	0		0					
NET NON-BUSINESS BENEFITS: COMMUTING	**15,263**	*(1a)*	15,263					
Non-business: Other	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	0		0					
Vehicle operating costs	0		0					
User charges	0		0					
During Construction & Maintenance	0		0					
NET NON-BUSINESS BENEFITS: OTHER	**0**	*(1b)*						
Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	7,922		3,852	4,071				
Vehicle operating costs	420		200	220				
User charges	-12		-2	-11				
During Construction & Maintenance	0		0	0				
Subtotal	**8,330**	*(2)*	4,050	4,280	0			
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	0							
Operating costs	0							
Investment costs	0							
Grant/subsidy	0							
Subtotal	0	*(3)*						
Other business impacts								
Developer contributions	0	*(4)*						
NET BUSINESS IMPACT	8,330	*(5) = (2) + (3) + (4)*						
TOTAL								
Present Value of Transport Economic Efficiency Benefits (TEE)	23,593	*(6) = (1a) + (1b) + (5)*						

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values