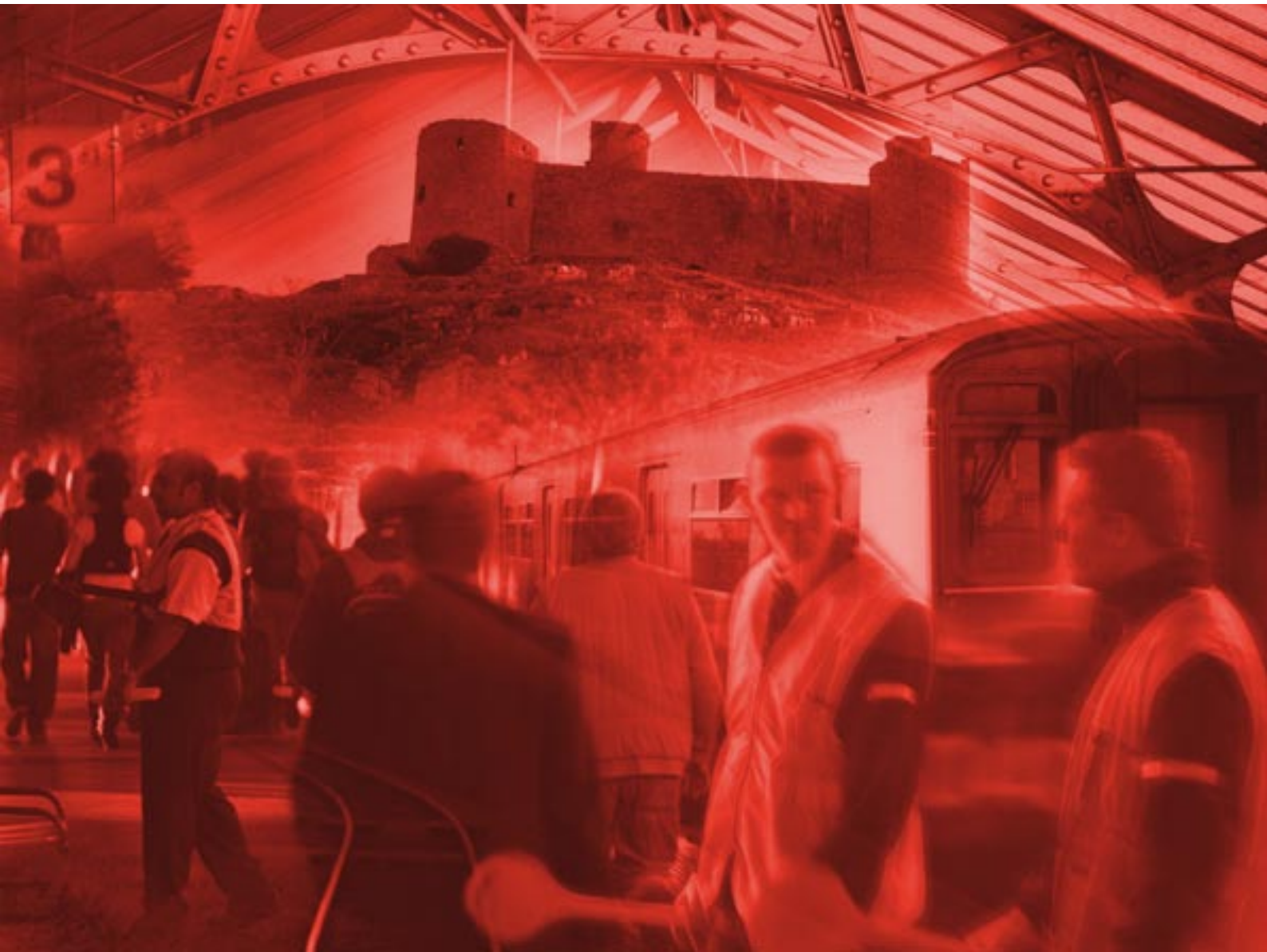
Wales

Route Utilisation Strategy

November 2008



Foreword

I am delighted to present Network Rail's Route Utilisation Strategy (RUS) for Wales. This covers the entire rail network in Wales, as well as some parts of the network in the English border counties.

This network is extensive and diverse. There are main line links from Wales into England, a long-distance line along the border connecting north and south Wales, a busy urban passenger network serving Cardiff, and branches traversing sparsely populated rural areas. Some parts of the network are subject to fluctuating demand according to the time of year, most notably on the Cambrian Coast and in the Conwy Valley.

The context in which this RUS has been produced, as has often been the case with other RUSs, is one of growing demand for rail services. It is anticipated this growth will continue, with a possible doubling of demand over the next 30 years. The extent to which existing network capacity is used varies. Across much of Wales it is low to medium, and as a result the RUS therefore focuses on those parts of the network where the use of existing capacity is high. The RUS identifies a number of gaps, many of which reflect the desire for more train services.

Principally this is in south Wales, where capacity use is at its highest. This is a result of a growth in the number of trains serving Cardiff and the building of a number of new stations. On this part of the network, in the most populous part of the country, the RUS builds on the successful past introduction of more services and the selective growth of the network.

A major programme to renew signalling equipment in the Newport and Cardiff areas will take place in the next five to seven years, and much of the work described in this strategy to enhance the network is planned in conjunction with this signalling work to increase cost-effectiveness. The High Level Output Specification (HLOS), published in July 2007, contained a specific requirement to increase seating capacity into Cardiff during the morning peak. Projects such as improving the Valley Lines corridor through central Cardiff are essential to the delivery of this objective.

This RUS was initially published as a Draft for Consultation in May 2008. A wide range of issues were raised during the consultation period and these have now influenced several aspects of the strategy. I would like to thank everyone who responded to the consultation for their contribution.

The development of this strategy has been led by Network Rail, but it has been the result of joint working across the whole rail industry. A large number of organisations have been fully involved, notably including our customers, the passenger and freight operators, and the Welsh Assembly Government. I would like to thank them all for their efforts.

Iain Coucher
Chief Executive

Executive summary

The area addressed by the Wales Route Utilisation Strategy (RUS) is large and embraces over 900 route miles of railway. The role of this extensive network is diverse and ranges from main line links between Wales and England, the long-distance line along the borders connecting north and south Wales, and a busy urban passenger network serving the capital city of Cardiff, as well as branches traversing sparsely populated rural areas. Scenic areas such as the Cambrian Coast and the Conwy Valley experience an element of seasonal fluctuation in demand. Freight carryings likewise vary from established steel industry flows and coal movements in the south, to a wide range of commodities across much of the network in Wales and the border counties.

Growing demand

There has been continued strong growth in passenger demand, particularly around the Cardiff region, and since publication of the Wales RUS Draft for Consultation the growth projections have been slightly lifted, to reflect both the expected trends for the all-day and commuting segments of the market.

For much of the network which comprises the Wales RUS area capacity utilisation is either in the low or medium categories. However in a number of instances utilisation is high and the Wales RUS has largely focused on these locations. The past growth in demand across the Wales RUS area and a general projection of future growth is the principal concern of this strategy, which builds on successful past strategies of train service frequency improvements and selective extension of the network in the most populous south-east part of the country. Many of the gaps identified and considered in this document reflect a continuing desire of stakeholders for more passenger train services. The Cambrian line in mid-Wales, between Aberystwyth and Shrewsbury, is currently undergoing upgrade to give improved performance over long stretches of single-track and passing loops, and to create an enhanced capability for more frequent services once the capacity constraints are addressed after 2009. In north Wales the pattern for long-distance and domestic services will be set by changes to the West Coast Main Line which – from 2009 onwards – will bring hourly London trains to Chester and better frequencies to Bangor and Holyhead over the existing infrastructure.

South Wales

In south Wales much of the available capacity has steadily been consumed in recent years as passenger train services radiating from Cardiff have grown in frequency and a substantial number of new stations have been built. Most recently the Ebbw Vale line with six new stations has re-opened for passenger traffic and direct trains to and from Cardiff Central have been added to the busy four-track Great Western Main Line (GWML) between Newport and Cardiff. In the medium-term major planned re-development east of Newport, at Llanwern, may prompt substantial re-organisation of local train services in order to cater for a Park & Ride station in conjunction with line-speed upgrade of the Relief Lines between Newport and Severn Tunnel Junction. To the west of Cardiff Central, where the GWML reduces to two tracks, the desire to double the frequency of passenger services between Cardiff and Maesteg has a substantial impact on capacity, and this strategy has evaluated the works necessary to cater for this at Cardiff Central, as well as the construction of other works on the Maesteg branch itself where a new passing loop near Tondu will be required.

Major renewal of signalling equipment in the Newport and Cardiff areas is due to take place in the next five to seven years, and most of the enhancements planned are expected to be implemented in conjunction with these renewals in order to carry them out in a cost-effective manner. In order to meet the objectives set out in the 2007 Government White Paper for increased passenger-carrying capability into Cardiff, the most major will be those necessary to achieve a step change in network capability on the South Wales Valleys route over the central corridor between Cardiff Queen Street station and Cogan Junction, to the south of the city. These works will be implemented during Control Period 4 (period 2009 – 2014) and will deliver the additional paths needed to permit more trains to run beyond the current maximum permissible frequency of 12 per hour on the core, city-centre section, in order to address medium and long-term expected demand.

The central corridor works will be the means by which this figure will be increased to 16 trains per hour. This infrastructure upgrade is planned to include the provision of four through platforms at Cardiff Queen Street station, and an additional Valleys platform at Cardiff Central. Bi-directionally signalled, there will be four platforms at Cardiff Central capable of use by Valleys services. The underlying strategy is to make better use of the “City” line running between Radyr and Cardiff via Ninian Park, which will be upgraded for faster running of accelerated, longer-distance services and permit more seats to be offered at stations on the established route through Llandaf. In addition to core works in Cardiff the extra capability on the Valleys route will come about as a result of additional platforms being constructed at Caerphilly, Pontypridd and Barry for turn-back of shorter-distance services.

An earlier programme of platform-lengthening works at many of the Valleys stations was due to be completed during 2008. In the short-term and medium-term much of the Valleys network will thus be able to accommodate six-car trains, on the Treherbert, Rhymney and Penarth lines. The construction of the new passing-loop at Merthyr Vale has provided the line to Merthyr Tydfil with the capability of a half-hourly service frequency, which is due to be introduced in Spring 2009. Implementation of a similar scheme at Tir Phil, north of Bargoed on the single-track section of the route to Rhymney, later in Control Period 4 (CP4) will complete the overall works necessary for all key Valleys towns to then be capable of being served by half-hourly minimum frequencies.

North-South links

A major feasibility study is underway to address journey time reductions and frequency improvements between north and south Wales. Prior to this a limited number of additional premium loco-hauled services, with catering, will operate, to accelerated schedules. Work has started on the design of a signalling enhancement scheme, in order to address the immediate known capacity pinch-point on this route, near Abergavenny, where there are capacity concerns as a consequence of the significant growth of passenger and freight volumes in recent years. Shrewsbury station is the natural “hub” of services linking north and south Wales, and mid-Wales and the West Midlands, and enhancements are planned to address the increased future demand for platform capacity to support more widespread interchange and service provision flexibility.

North Wales and north-west England

Evaluation of potentially major enhancement works in the north Wales and Merseyside region has been undertaken in this RUS, affecting services on the routes from Liverpool to Bidston and Wrexham, and to Helsby and Chester via the Halton Curve near Runcorn. Further evaluation of these two options will continue through the Merseyside RUS. In view of the comparatively high costs of extension of third-rail electrification, the alternative of 25kV overhead (and the deployment of cascaded dual-voltage rolling-stock to Merseyrail) will be evaluated, although tram-train technology is likely to be a more cost-effective means of gaining the desired through services from Deeside and the Wirral, in line with the timetable enhancements to two trains per hour (between Wrexham and Liverpool Central) identified in the Wales RUS Draft for Consultation.

Maintainability

In general the pattern of useage of the railway in the Wales RUS area is considered suitable to deliver maintenance compliance. The principal exception is the Severn Tunnel where a specific cyclical renewal programme is necessitated to maintain performance and safety, reflecting the extreme and aggressive environment, and which leads to a more intense civil engineering inspection regime. This puts additional strain on the diversionary route via Gloucester, which in part is single track.

The longer-term

In 10 years' time the railway in Wales and the border counties will be carrying more traffic, particularly in south-east Wales where the capacity of the urban network will have grown.

It is increasingly becoming necessary to plan for the next decade after that considered by this RUS, a point reinforced by "One Wales: Connecting the Nation" (published by the Welsh Assembly Government in May 2008) and the 2007 Government White Paper "Delivering a Sustainable Railway". The White Paper anticipates continuing growth in passenger and freight traffic and suggests there could be an overall doubling of traffic over the next 30 years. Against this background this RUS has considered, as a scenario, what this level of growth might mean for the routes in the Wales RUS area.

Contents

1. Background

1.1 Introduction

1.1.1

Following the Rail Review in 2004 and the Railways Act 2005, the Office of Rail Regulation (ORR) modified Network Rail's network licence in June 2005 to require the establishment of Route Utilisation Strategies (RUSs) across the network. Simultaneously, the ORR published guidelines on RUSs. An RUS is defined in Condition 7 of the Network Licence as, in respect of the network or a part of the network, a strategy which will promote the route utilisation objective. The route utilisation objective is defined as:

> "the effective and efficient use and development of the capacity available, consistent with funding that is, or is reasonably likely to become, available during the period of the Route Utilisation Strategy and with the licence holder's performance of the duty".

Extract from ORR Guidelines on Route Utilisation Strategies, June 2005

1.1.2

The duty referred to in the objective is Network Rail's general duty under Licence Condition 7 in relation to the operation, maintenance, renewal and development of the network. The ORR guidelines also identify two purposes of RUSs, and state that Network Rail should balance the need for predictability with the need to enable innovation. Such strategies should:

> a) "enable Network Rail and persons providing services relating to railways better to plan their businesses, and funders better to plan their activities;" and
>
> b) "set out feasible options for network capacity, timetable outputs and network capability, and funding implications of those options for persons providing services to railways and funders."

Extract from ORR Guidelines on Route Utilisation Strategies, June 2005

1.1.3

The guidelines also set out principles for RUS development and explain how Network Rail should consider the position of the railway funding authorities, the likely changes in demand and the potential for changes in supply. Network Rail has developed a RUS manual which consists of a consultation guide and a technical guide. These explain the processes we used to comply with the Licence Condition and the guidelines. These and other documents relating to individual RUSs and the overall RUS programme are available on our website at **www.networkrail.co.uk**

1.1.4

The process is designed to be inclusive. Joint work is encouraged between industry parties, who share ownership of each RUS through its industry Stakeholder Management Group. There is also extensive informal consultation outside the rail industry by means of a Wider Stakeholder Group.

1.1.5
The ORR guidelines require options to be appraised. In Wales this is initially undertaken using the Welsh Transport Appraisal Guidance (WelTAG) developed by the Welsh Assembly Government (WAG). To support this appraisal work, RUSs seek to capture implications for all industry parties and wider societal implications in order to understand which options maximise net industry and societal benefit, rather than that of any individual organisation or affected group.

1.1.6
RUSs occupy a particular place in the planning activity for the rail industry. They utilise available input from processes such as the Wales Rail Planning Assessment, carried out jointly by WAG and Department for Transport (DfT) during 2006/07. The recommendations of an RUS and the evidence of relationships and dependencies revealed in the work to produce them in turn form an input into decisions made by industry funders and suppliers. These decisions involve issues such as franchise specifications and investment plans.

A further input arose from the High Level Output Specification (HLOS) which was published by DfT in summer 2007.

1.1.7
Network Rail will take account of the recommendations from RUSs when carrying out its activities. In particular, they will be used to help inform the allocation of capacity on the network through application of the normal Network Code processes.

1.1.8
The ORR will take account of established RUSs, and those in preparation, when exercising its functions.

1.2 The railway in Wales

1.2.1
Since 2004 the majority of train services which operate in Wales and the border counties are provided through the Wales & Borders franchise, awarded to Arriva Trains Wales for a 15-year term. The geography of the country is such that a significant part of the franchise area lies in England, and the key railway line linking north and south Wales is mostly in England between Chester and Pontrilas (just north of Abergavenny), except where it passes through Wrexham and Ruabon. WAG is the key stakeholder and, with DfT, is joint signatory to the franchise agreement.

Following devolution, legislation has been enacted which gives WAG powers to fund enhancements to the railway network within Wales, and to specify the provision of additional services in furtherance of regional policies. Similarly, for the Liverpool region adjacent to that part of Wales addressed in this RUS, Merseytravel is a key stakeholder and funding partner, and both bodies share certain cross-boundary aims.

Improved utilisation of the existing rail network and delivering the strategic outcomes outlined in the Wales transport strategy “One Wales: Connecting the Nation” (published in May 2008) is a central element of WAG policies and plans to achieve modal transfer to rail and the effective delivery of their other rail objectives. The Wales RUS therefore seeks to optimise the use currently made of available route capacity where justified, through targeted intervention, consistent with the level of funding that is likely to be available.

With the White Paper “Delivering a Sustainable Railway”, the HLOS for England and Wales was published in July 2007 and used by ORR to determine the income needed by Network Rail to fund the outputs required compared to the public funds available. Identified gaps will be closed by iterations of the specified output levels and associated funding requirements and negotiations between the parties.

1.2.2

The busiest element of the railway network in Wales is the cluster of urban routes radiating from Cardiff. In the north-east of Wales the railway also provides urban links to the Merseyside region. Much of the national network across Wales traverses rural areas and provides a facility for localised journey purposes as well as the links into the long-distance services provided between north Wales and south Wales and London. These are closely integrated with the domestic services and provide a large proportion of the overall capacity within the Wales RUS area. Another role is fulfilled by the links to the Welsh ports of Holyhead and Fishguard with their ferry links to Dublin and Rosslare in Ireland.

The trend in recent years has been towards enlargement of the network in urban south Wales, and for improved passenger train service frequencies across the whole country. Partly as a consequence there has been a steady growth in demand. The movement of freight by rail remains significant, with the greatest volumes carried being in industrial south Wales, principally in the metals and coal sectors, and with a presence in the distribution, automotive, aggregates and petroleum sectors. WAG policy has actively supported the rail-freight market through investment in terminal facilities.

The importance of the railway in developing mid-Wales and its link with the Midlands is recognised, by means of the Cambrian line from Aberystwyth and Machynlleth to Shrewsbury, and major investment for the railway in this region was confirmed during 2007.

In north Wales the strong links with the cities of Liverpool and Manchester are reflected in a number of the options tested in this RUS, in line with the emerging regional policies of the North West Regional Assembly and the Merseyside region, through its passenger transportation planning authority Merseytravel. Economic regeneration on Deeside and in south Wirral is high-profile and the railway network is seen as having a key role to play in stimulating employment opportunities in this sub-region.

1.3 Document structure

This document starts by outlining, in **Chapter 2**, the geographic scope and timescales of the RUS, and the planning context within which it has been developed. It also describes the linkage to associated workstreams and studies which relate to the RUS.

Chapter 3 describes the railway today, covering passenger and freight demand and the capability of the infrastructure to meet that demand. Gaps which already exist between demand and capacity are identified.

Chapter 4 considers anticipated changes in demand.

In **Chapter 5** the committed and uncommitted schemes proposed for the future are explained.

In **Chapter 6** gaps between forecast demand and current capability are identified. Options for bridging the gaps pinpointed in the previous chapters are listed, discussed and given an initial appraisal of their likely costs and benefits.

Chapter 7 covers the consultation process, including a summary of the responses received and how these are taken into account in the final document.

Chapter 8 deals with the strategy itself by dealing with the key recommendations for better use of resources and investment proposals for meeting growth. Our recommendations are summarised by time band using railway industry five-year control periods. The document shows how these interventions meet government targets (for the Cardiff area) for the 2009 – 2014 period.

Chapter 9 looks at a longer-term scenario of a doubling of growth over a 30-year period and considers what strategies might be deployed to meet such a challenge.

Finally, **Chapter 10** identifies the mechanisms for implementing the recommendations in the RUS.

2. Dimensions and planning context

2.1 Dimensions

2.1.1 Geography of Wales, and the English border counties

The Network Rail **Western Route** contains most of the railway network in Wales, in the south-east, south-west and mid-Wales regions, and the Network Rail **London and North Western Route** contains that in the north Wales region. The extensive border between Wales and England is crossed by three principal east to west lines of railway, as well as being traversed by a long south to north line. This falls mostly in the three border counties of Herefordshire, Shropshire and Cheshire, yet constitutes the primary link between south-west, south, mid and north Wales.

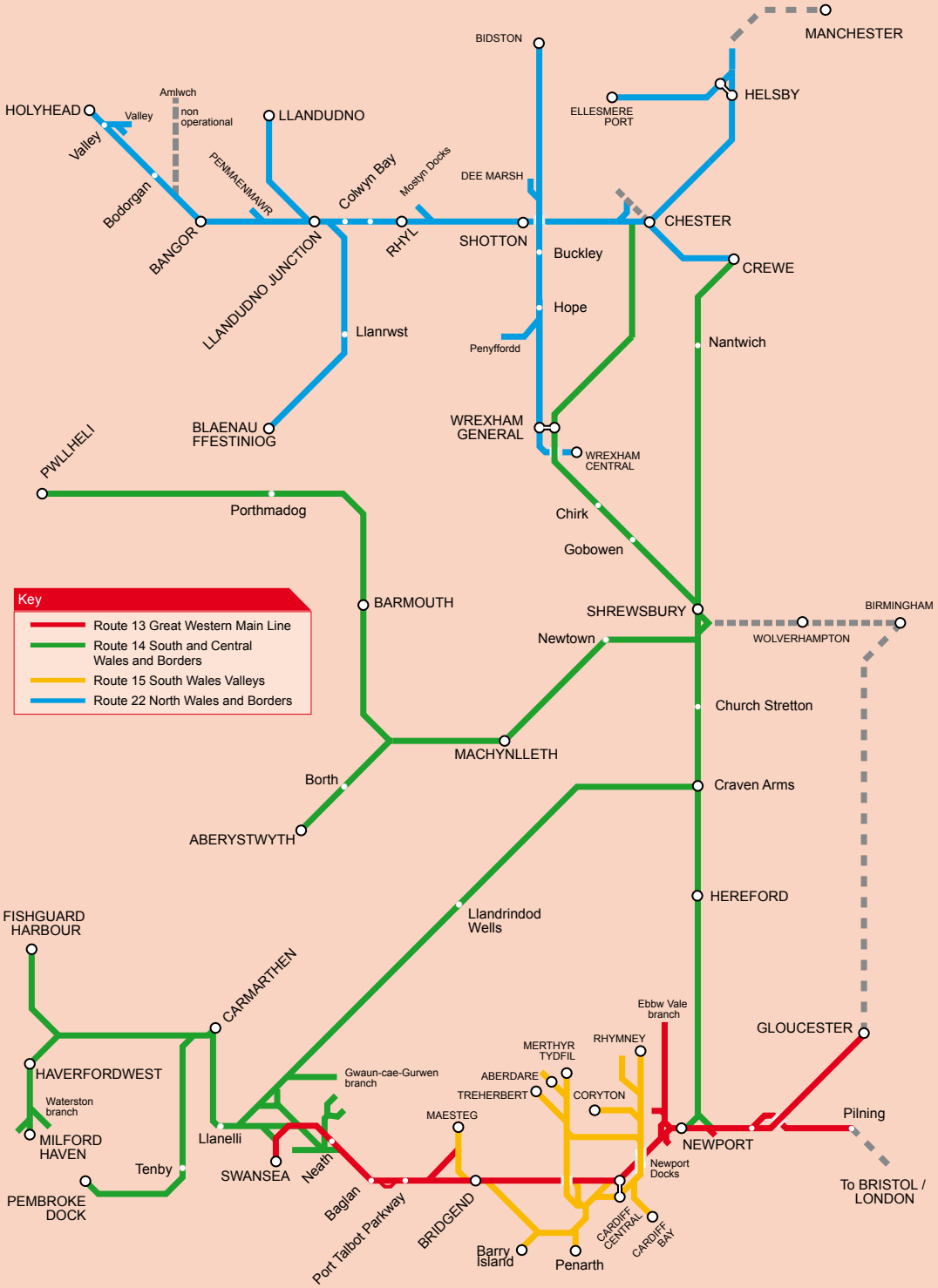
The overall railway network in the UK is divided into 26 Strategic Routes, of which four cover Wales, namely all of South & Central Wales & Borders (Route 14), the South Wales Valleys (Route 15), and North Wales & Borders (Route 22). A portion of the Great Western Main Line (Route 13) is in the Wales RUS area, from Gloucester and from the Severn Tunnel (the eastern end, at Pilning in South Gloucestershire) to Swansea. Only Route 15 lies wholly in Wales, and so the Wales RUS scope as defined herein naturally amounts to rather more than just the railway network in Wales itself (see Figure 1).

The scope of this RUS is therefore that of the entire railway network in Wales, as well as those lines physically in England but whose purpose is an integral part of serving Welsh and border counties needs. In this way the geography covered broadly mirrors the area served by the Wales and Borders franchise area created in December 2004. Overall, the Wales RUS addresses some 912 route miles of railway owned and managed by Network Rail, and which comprise the passenger network.

NB: The numerous privately owned railways, both standard-gauge and narrow-gauge, throughout Wales are excluded from this RUS.

Route	Wales (miles)	England (miles)	Combined
13, GWML	100	31	131
14, South & Central	341	148	489
15, Valleys	110	0	110
22, North Wales	127	55	182
Totals	**678**	**234**	**912**

Figure 1 – Geographic scope



Within this large network is a considerable diversity of types of route, ranging between the densely trafficked main line along the south Wales coastal belt, the TENS-status route along the north Wales coast to Holyhead for Ireland, and lightly used rural lines such as that from Craven Arms to Llanelli, the “Heart of Wales” line, across the most sparsely populated mid-Wales region. In addition the South Wales Valleys routes radiating from Cardiff form the busiest urban network in Britain outside the Passenger Transport Executive areas.

2.1.2 Stations in the Wales RUS area

The situation for stations in Wales and the English border counties in the RUS area is similarly diverse, embracing a small number of substantial stations (with a wide-range of facilities, and multiple platforms) and greater numbers of medium-size stations, through to many unstaffed minor stations and halts, in some cases served on a request basis.

Network Rail own and maintain all the stations in Wales (with the exception of Fishguard Harbour which is owned and operated by Stena Line) and all are leased to Arriva Trains Wales, the holder of the Wales & Borders franchise. The franchisee is also the lessee of those stations in England where these are served wholly or mainly by the Wales & Borders franchised train services. The split of stations between Wales and England is in broadly the same proportions as for the passenger network route-miles split, thus:

Stations by route	Wales	England	Combined
13, GWML	23	2	25
14, South & Central	85	16	101
15, Valleys	74	0	74
22, North Wales	39	9	48
Totals	**221**	**27**	**248**

Note: The above figures include Llanharan (on GWML, between Pontyclun and Pencoed), which opened in December 2007, plus the six opened on the Ebbw Vale line during 2008.

2.1.3 Borders

Principal east to west border points.

South Wales. The GWML (Route 13) between London Paddington and Swansea enters Wales through the Severn Tunnel, underneath the Bristol Channel, emerging in Monmouthshire, at Severn Tunnel Junction station. (The westwards continuation of the GWML beyond Swansea to Milford Haven and Fishguard Harbour is within Route 14.)

Mid-Wales. The Cambrian Main Line (a component of Route 14) between the west Midlands and Aberystwyth (and linked with the Cambrian Coast section from Dyfi Junction to Pwlhelli), enters Wales near Middletown in Shropshire, approximately mid-way between Shrewsbury and Welshpool, in Powys.

North Wales. The north Wales coastal main line (a component of Route 22) from Crewe to Holyhead enters Wales near Saltney Junction in Cheshire, between Chester and Shotton, in Flintshire. It can be regarded as a major branch of the West Coast Main Line (Route 18) from London Euston to the north-west and Scotland.

Other portions of route-sections cross the border as well, see below.

South to north border points. The majority of Route 14 from Newport to Crewe lies in England, entering Herefordshire near Pontrilas (north of Abergavenny) and proceeding through Shropshire and Cheshire. Likewise most of the Shrewsbury to Chester route is in England, except that portion between Chirk and Rossett/Pulford which runs through the Wrexham unitary authority area.

The whole route from Wrexham Central to Bidston (part of Route 22) is included in this RUS although a substantial portion northwards from Hawarden Bridge lies in Cheshire and in the metropolitan county of Merseyside.

Similarly the route from Gloucester to Severn Tunnel (Route 13) is included in this RUS although between Gloucester and Chepstow most lies in Gloucestershire.

In the above three cases train services are provided wholly or principally by the Wales & Borders franchise.

2.1.4 Other sections of the network included in this RUS

East of Chester this RUS includes the portion of Route 22 as far as Acton Grange Junction (between Frodsham and Warrington Bank Quay, on the West Coast Main Line WCML), on which section train services are provided almost entirely by the Wales & Borders franchise, as part of the service group which links north Wales with Manchester.

(Warrington to Manchester was dealt with by the North Western RPA/RUS.)

Attached to this section is the “Halton Curve”, between Frodsham and Halton Junction (near Runcorn) on the section of the WCML (Route 18) between Crewe and Liverpool. Except from a summer Saturdays only train, this section is unserved by regular franchised passenger trains. Also adjoining the Chester to Warrington and Manchester section is the short stretch of route between Ellesmere Port and Helsby.

Neither of these sections are served by the all-Wales franchise, but they were not dealt with by the North Western RPA/RUS, and are logically included herein.

2.1.5 Sections excluded from this RUS

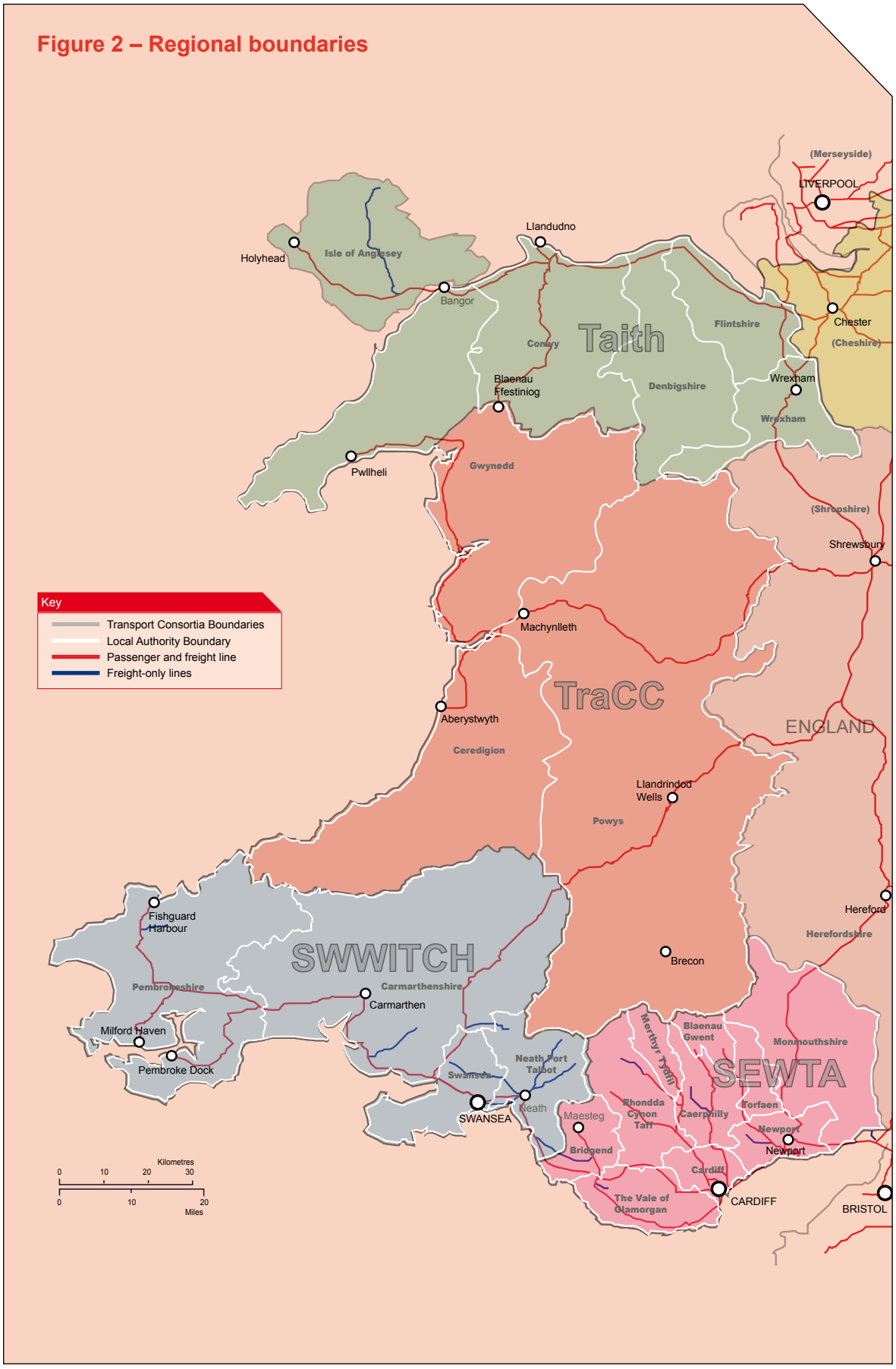
The electrified Merseyrail network (Route 21) radiating from Liverpool runs via Birkenhead to Hooton and to Chester, where it is accommodated by one electrified platform, but can be regarded as self-contained from Wales & Borders franchised services at Chester itself. The section from Hooton to Ellesmere Port likewise abuts the Wales & Borders RUS area, at Ellesmere Port station.

(The Merseyrail network will be dealt with by a separate RUS.)

Two sections of the West Midlands network (Route 17), from Birmingham to Shrewsbury, and from Birmingham to Hereford, abut the Wales RUS area at those locations, at Abbey Foregate Junction and at Shelwick Junction respectively.

(These were dealt with by the West Midlands RUS, published by the former SRA, and the West Midlands Regional Planning Assessment, published by DfT in July 2006. A new West Midlands and Chiltern RUS is in process of formulation.)

Figure 2 – Regional boundaries



2.2 Planning context

2.2.1 Wales regions

The Welsh Assembly Government at Cardiff exercises overall planning responsibility for Wales, which at local level is administered by 22 local/unitary authorities, and the Wales railway network is spread across these and four English shire counties, with peripheral elements spreading into South Gloucestershire and Merseyside as well. For transportation planning purposes the Welsh Assembly Government (WAG) has legislated that Wales will be divided into four regions, each of which will produce a Regional Transport Plan (RTP) during 2008/09. Rail strategy in Wales is the responsibility of WAG centrally, and this has been reflected in the initial RTP submissions made in January 2007, with plan development to follow after consultations in 2007/08.
Much of the structure of this RUS reflects the new regional grouping, (see Figure 2) the constituent authorities of which are as follows:

South-east Wales Sewta
Monmouthshire, Newport, Blaenau-Gwent, Torfaen, Caerphilly, Cardiff, Rhondda-Cynon-Taff, Merthyr, Vale of Glamorgan, Bridgend

South-west Wales Swwitch
Neath-Port Talbot, Swansea, Carmarthenshire, Pembrokeshire

Mid-Wales TraCC
Powys, Ceredigion, Gwynedd (Meirionydd district)

North Wales Taith
Wrexham, Flintshire, Denbighshire, Conwy, Gwynedd, Ynys Mon/Anglesey

Three of the four regions are of broadly comparable physical dimensions, the south-eastern region being by far the most populous and correspondingly the most densely rail-served. The largest region, mid-Wales, is the least densely populated but is well served by rural-designated lines.

Region	Area (ha)	Proportion of Wales land mass	Proportion of Wales population
Sewta	288,744	14%	48%
Swwitch	494,487	23%	22%
TraCC	959,244	45%	11%
Taith	372,907	18%	19%
Totals	**2,115,382**	**100%**	**100%**

Passenger rail routes in Wales do not correspond exactly with the four designated regions, and ensuing RUS data is presented by whole route section without any artificial division to reflect the RTP areas.

The 221 stations in Wales fall into the four regions as follows:

Sewta, 92, Swwitch, 42, TraCC, 45, Taith 42

NB: The western extremity of the Cambrian Coast section of Route 14, between Porthmadog and Pwlheli, is treated in the RUS as being in the mid-Wales region (ie. the TraCC area) with the remainder of the Cambrian Lines, but is regarded for RTP purposes as being in the Taith area.

Likewise, on the Blaenau Ffestiniog branch, the whole section is treated in the RUS as being in the north Wales region (ie. the Taith area) although Blaenau Ffestiniog station is regarded for RTP purposes as being in the TraCC area.

Similarly, the whole of the "Heart of Wales" section of Route 14 within Wales, between Knighton and Bynea stations inclusive, is treated in the RUS as being in the mid-Wales region (ie. the TraCC area) whereas for RTP purposes the northernmost portion (Knighton to Sugar Loaf Halt inclusive) is regarded as being in the TraCC area, but the remainder (Llandovery to Bynea inclusive) is regarded as being in the Swwitch area .

England

For the Wales RUS area, three English shire counties have an interest in the 125 mile-long route between Crewe and Newport which links the north-west of England and north Wales to the south. In regional government terms Cheshire is within the North West Region, whilst Shropshire and Herefordshire are within the West Midlands Region, and Gloucestershire the South West Region.

The easternmost portion of the Wales RUS area covering the Great Western Main Line to a point to the east of the English entrance portal of the Severn Tunnel, and which includes Pilning station, is in South Gloucestershire, also falling within the Government Office for the South West region.

Although only a small proportion of the Wrexham – Bidston route lies within Merseyside, traffic patterns are closely tied to the wider Merseyrail franchise services operated on the Liverpool electrified network where connection is made at Bidston with frequent services between Liverpool Central and West Kirby. The RUS has taken account of Merseytravel policies and plans which will naturally impact upon north-east Wales, for employment and commuting purposes, as well as the policies and plans of the Halton authority and Cheshire for the area to the east and north of Chester.

2.2.2 DfT policy, the Wales Rail Planning Assessment

The Wales Rail Planning Assessment (RPA) was published jointly by the Department for Transport and the Welsh Assembly Government in July 2007, in parallel with the High Level Output Statement (HLOS) and the White Paper "Delivering a Sustainable Railway".

The area addressed by the Wales RPA was broadly that covered by this RUS, except for the addition (to the Wales RUS) of the lines in Wirral and in north-west Cheshire mentioned above. The Wales RPA looked ahead over a twenty-year period.

It set out at high level a number of options for development of rail services in Wales, including some referring to infrastructure issues specifically, addressing the whole country and the relevant parts of the English border counties. The options were defined by time period as covering the period up to 2014 (short-term), up to 2019 (medium-term) and beyond 2019 (long-term).

Particular emphasis was placed on the continued development of the Cardiff urban network, and the options set out in the Wales RPA for this and the three other Welsh regions are developed further in this RUS. Further reference to the Cardiff city region was also made in the HLOS, and is addressed fully in Chapter 6.

2.2.3 Welsh Assembly Government Spatial Plan: "People, Places, Future"

The Wales Spatial Plan was published in November 2004, and considers transportation issues at a strategic level based on six defined regions of Wales, namely:

- north-west Wales – Eryri a Mon
- north-east Wales – Border & Coast
- central Wales
- south-east Wales: the Capital network
- Swansea Bay – Waterfront and Western Valleys
- Pembrokeshire – The Haven.

The Wales Spatial Plan served as one of a number of inputs to the preparation of the Wales RPA. Two of the main themes of the Spatial Plan which are reflected in the Wales RPA and in this RUS concern the importance of north-south Wales links, and the further development of integrated public transport within the urban networks in three of the spatial plan areas, namely those in the north-east of Wales, the south-east, and around Swansea Bay.

The Wales Spatial Plan was updated in July 2008 following a consultation update in January 2008.

2.2.4 Welsh Assembly Government transportation policy

Welsh Assembly Government transportation policy is set out in the following documents:

"One Wales: Connecting the Nation", which was published by WAG in May 2008.

Four Regional Transport Plans for Wales – in preparation in 2007 – 09.

Wales Freight Strategy published May 2008.

2.2.5 Linkages with other Route Utilisation Strategies

GWML RUS – (published by Strategic Rail Authority June 2005)

West Midlands RUS – (published by Strategic Rail Authority July 2005)

Freight RUS – (published March 2007)

North West RUS – (published May 2007)

Merseyside RUS (Draft for Consultation to be published Autumn 2008)

In preparation:

Network RUS

West Midlands and Chilterns RUS

Great Western RUS

3. Current capacity, demand and delivery

3.1 Franchised train operators

Introduction: creation of the Wales & Borders franchise

Most passenger train services in the Wales RUS area are now provided by the holder of the Wales & Borders franchise, however four other train operating companies (TOCs) also have a presence. A wide range of types of train are operated across Wales, ranging between long-distance "Inter-City" services deploying eight-coach IC125 units with around 500 seats through to single "Regional" vehicles used on rural branch lines with around 70 seats.

The creation of the Wales & Borders franchise in December 2004 was a conscious move towards forming a single TOC for Wales which mirrored devolution legislation and the establishment of the Welsh Assembly Government. It brought together within one franchise the domestic services in south Wales, mid-Wales, north Wales and the English border counties which had hitherto been provided by two separate TOCs. These were the previous Wales & Borders TOC (which embraced the Cambrian Line and Shrewsbury – Chester services) run by the National Express Group, and the First North Western TOC (which had operated in north Wales and the north-west of England). The latter was split so that its north Wales element could be combined with the Wales & Borders south and mid-Wales operations to create the new, bigger franchise area, enabling more coherent Wales-wide planning with a single marketing focus.

3.1.1 Arriva Trains Wales (ATW)

Train services operated by Arriva Train Wales throughout the Wales RUS area are typically formed of three-car and two-car 100mph class 175 "Coradia" units on longer distance services, and two-car class 158 (90mph) units on most others. Urban commuter services are generally provided by two-car class 142/143 "Pacer" or class 150 "Sprinter" 75mph units, and some rural services by single-vehicle 75mph class 153 units. The main resource base of ATW is at Cardiff (Canton), with secondary depots at Chester and Machynlleth.

In addition to providing most rail journey opportunities within Wales the ATW franchise incorporates relatively long-distance inter-urban style services which fulfil a significant role in providing capacity in England. These are the services between north Wales and Manchester via Warrington, between mid-Wales and Birmingham via Wolverhampton, and between south Wales and Manchester via Hereford and Crewe. The franchise also includes the provision of boat-train connections for the ferry service between Fishguard Harbour and Rosslare in Ireland. All ATW trains are standard class only. The Arriva group was awarded the Wales & Borders franchise in 2004, for a 15-year term.

The number of trains operated daily by ATW is 880 (December 2006 baseline).

England – Wales long-distance through services.

A key component of the overall train service now operating within Wales is provided by two long-distance TOCs, which operate between London (Paddington) and south Wales and London (Euston) and Chester and north Wales.

3.1.2 First Great Western (FGW)

FGW holds a 10-year franchise running from December 2006. This includes London – south Wales services, at half-hourly intervals over the Great Western Main Line (GWML) between Paddington and Cardiff and at hourly intervals thence to Swansea. One train is extended to/

from Carmarthen on weekdays, and one train is extended on summer Saturdays to Pembroke Dock. These are usually operated by eight-coach FGW InterCity125 units with first and standard class facilities, and which provide much of the capacity within Wales along the busy South Wales Main Line between Newport, Cardiff and Swansea serving only the principal stations. These services are coordinated with ATW workings of shorter trains which serve the other intermediate stations.

From December 2006 (following the abolition of the Wessex Trains TOC) FGW are also wholly responsible for Cardiff to Bristol services. Most Bristol services from Cardiff proceed beyond, to Weston-super-Mare and to Bath, Westbury and Portsmouth. The principal resource bases of FGW for their Welsh services are at Swansea (Landore) and Bristol (St. Philips Marsh).

The number of trains operated daily by FGW in the Wales RUS area is 128.

3.1.3 Virgin Trains (West Coast)

The Virgin Trains West Coast franchise primarily serves the west Midlands, the north-west of England and south-west Scotland, running over the electrified West Coast Main Line (WCML) from London Euston. The original franchise was awarded for a 15-year period from 1997 to 2012. This was subsequently superseded by a management contract arrangement which was reviewed on an annual basis. In December 2006 the DfT announced that it had reinstated the franchise agreement with the Virgin Rail Group to operate services on the WCML. The franchise agreement is effective from December 2006 until March 2012. It includes the provision of through services between London (Euston) and Chester and north Wales.

Until the December 2008 timetable change, some of these were operated by “Pendolino” nine-coach electric sets, which were diesel-hauled over the non-electrified North Wales Main Line (NWML) beyond Crewe, where diesel locomotives were attached or detached. The Chester and Bangor/Holyhead workings will be formed by Virgin Voyager five-coach diesel sets which work “under the wires” between London and Crewe. All Virgin Trains rolling stock provides first and standard class facilities.

When the December 2008 timetable change is introduced there will be a significant increase in services operated by Virgin West Coast. This will include what amounts to a new hourly through service between London (Euston) and Chester, of which a number will proceed beyond into north Wales, to Bangor and Holyhead. This will have an impact on “domestic services” within Wales (and is addressed in Chapter 6).

The number of trains operated daily by Virgin West Coast in the Wales RUS area is 12.

3.1.4 CrossCountry Trains

CrossCountry Trains (a part of the Arriva group) took over (from November 2007, from the former Central Trains TOC) the operation of the semi-fast hourly service between Nottingham, Birmingham and Cardiff via Gloucester and Chepstow. This service is resourced from the west Midlands and deploys 100mph-capable class 17x “Turbostar” two-car and three-car units. These have standard class facilities only but, under the terms of the new franchise, first class facilities will be introduced during 2008. Between Newport and Cardiff CrossCountry Trains complement the frequent services provided by ATW and FGW.

CrossCountry Trains also operate long-distance services between the south of England and the north of England and Scotland. As part of the half-hourly frequency all-day pattern between Bristol and Birmingham within this national structure, one train per day in either direction is extended from/to Cardiff. This service runs in FGW "slots" between Cardiff and Bristol.

The number of trains operated daily by Cross Country in the Wales RUS area is 30.

3.1.5 Northern Trains

The Northern Trains franchise covers a large area of northern Britain on either side of the Pennines, and includes the provision of local trains in the Manchester area as well as local trains in the Liverpool area outwith the electrified Merseyrail network. A very restricted service is provided by Northern Trains between Ellesmere Port and Helsby, some of which run through to Warrington (Bank Quay) and Liverpool.

The number of trains operated daily by Northern Trains in the Wales RUS area is eight.

Standard hour service patterns

The following five spider diagrams (Figures 3 – 7) depict a "standard hour" service provision in each of these five named areas, showing which TOC operates on which route.

- south Wales (east)
- south Wales (west)
- mid-Wales
- north Wales & Wirral
- south Wales Valleys

In a number of cases services operate at less than hourly frequencies, and the diagrams thus show a busiest hour. Actual services are listed in the appendix "Service Groups", at the December 2006 baseline.

Figure 3 – South Wales Main Line (East)

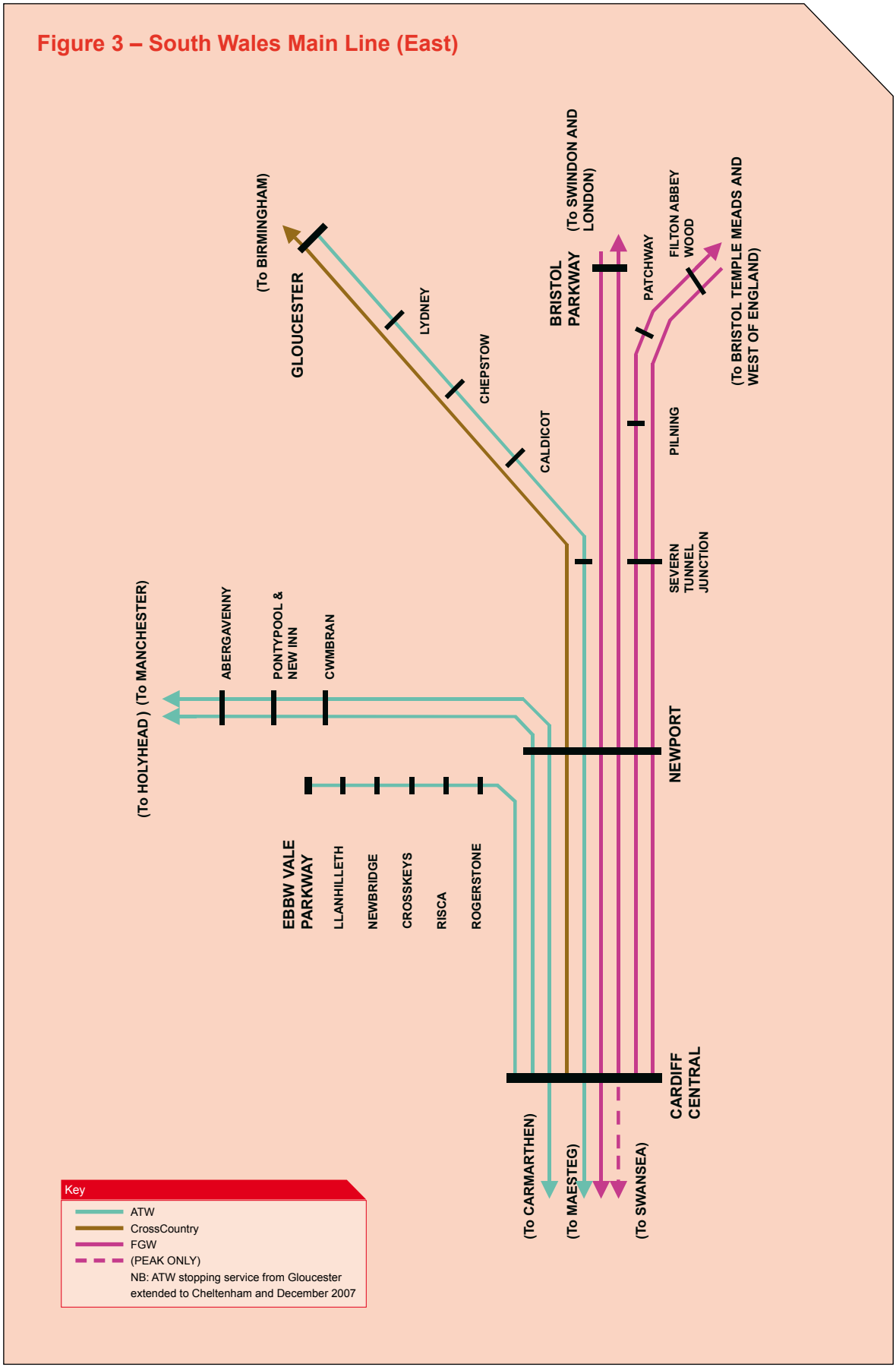


Figure 4 – South Wales Main Line (West)

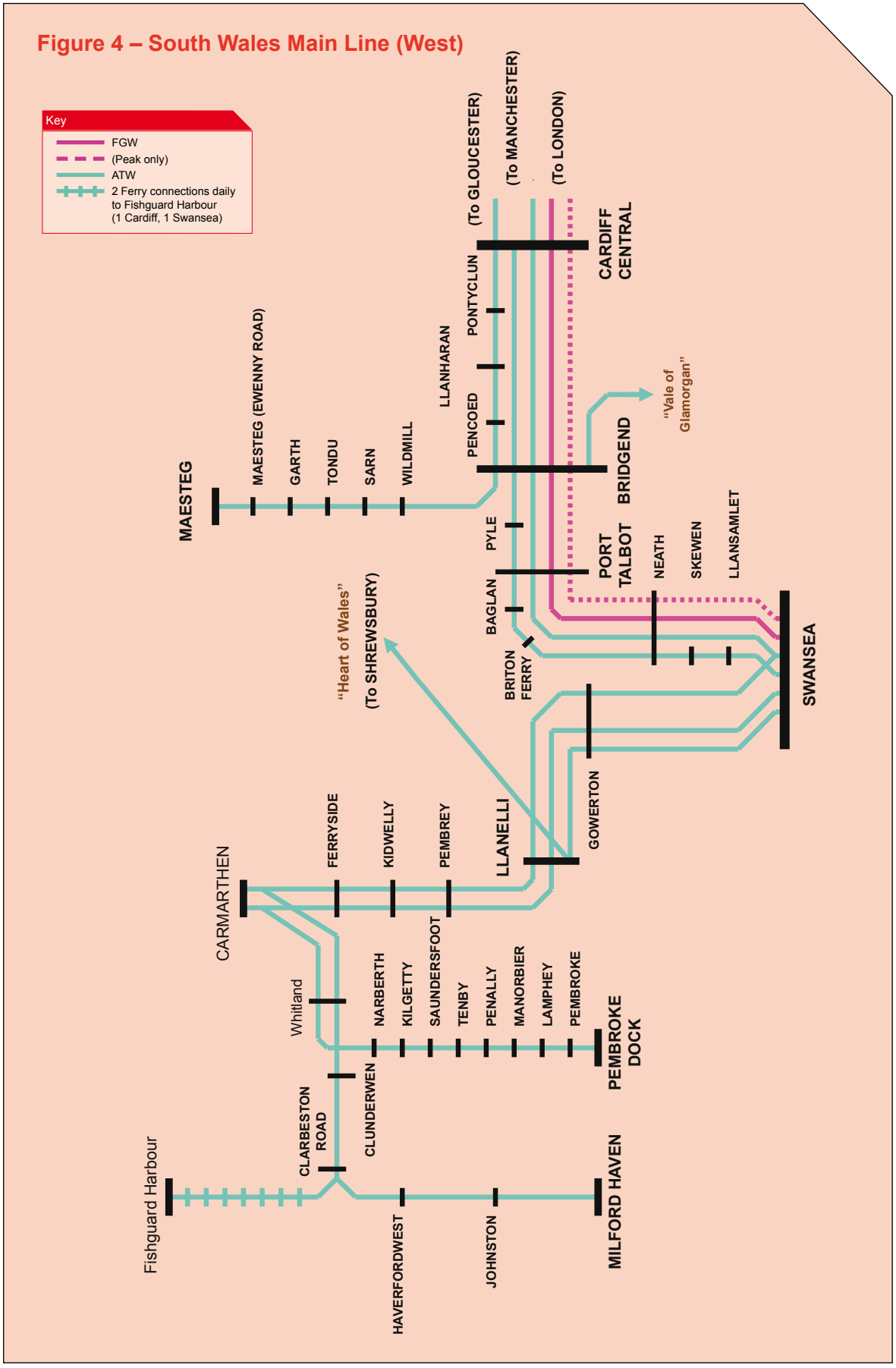


Figure 5 – Mid-Wales, borders

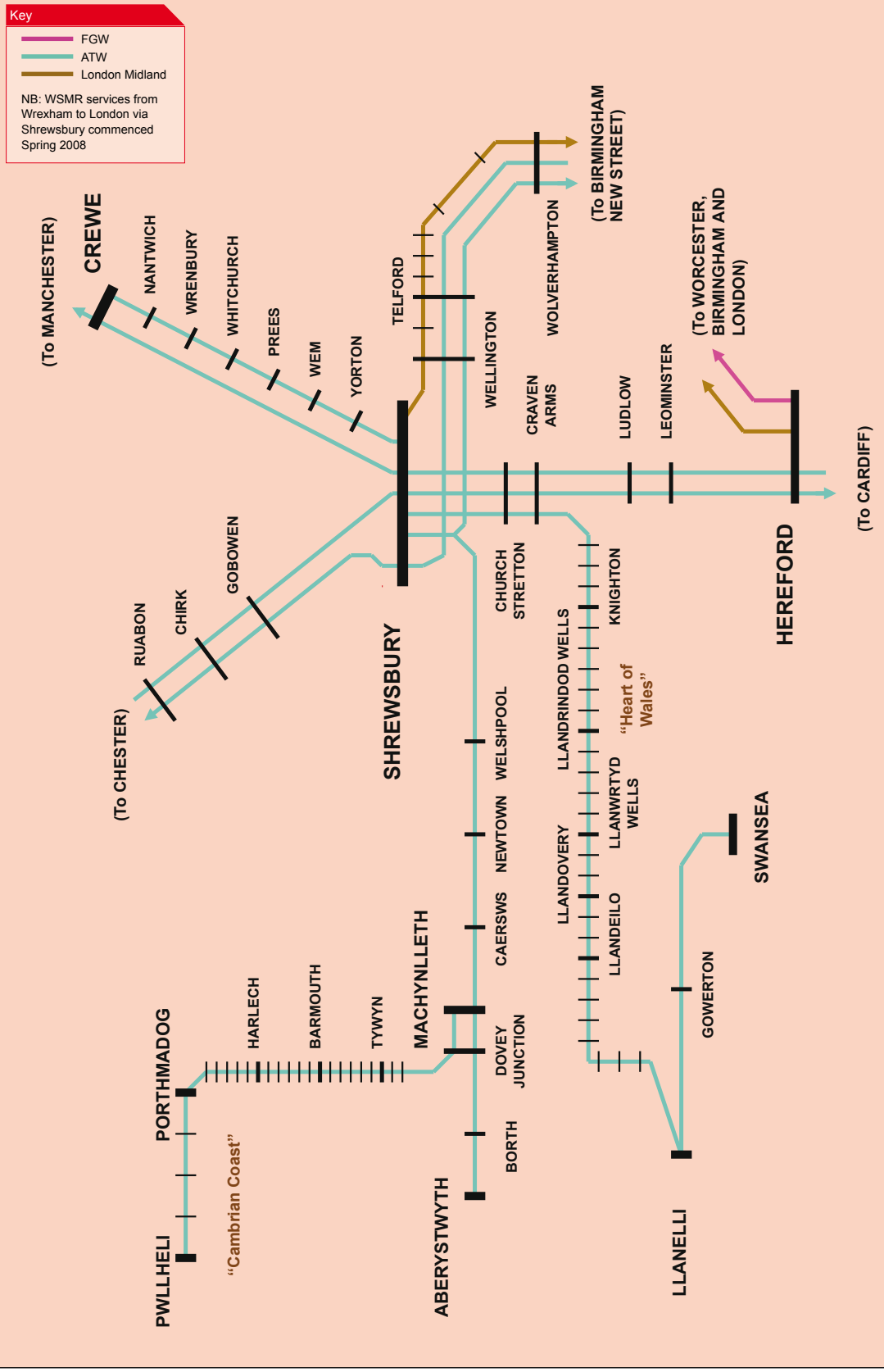


Figure 6 – North Wales

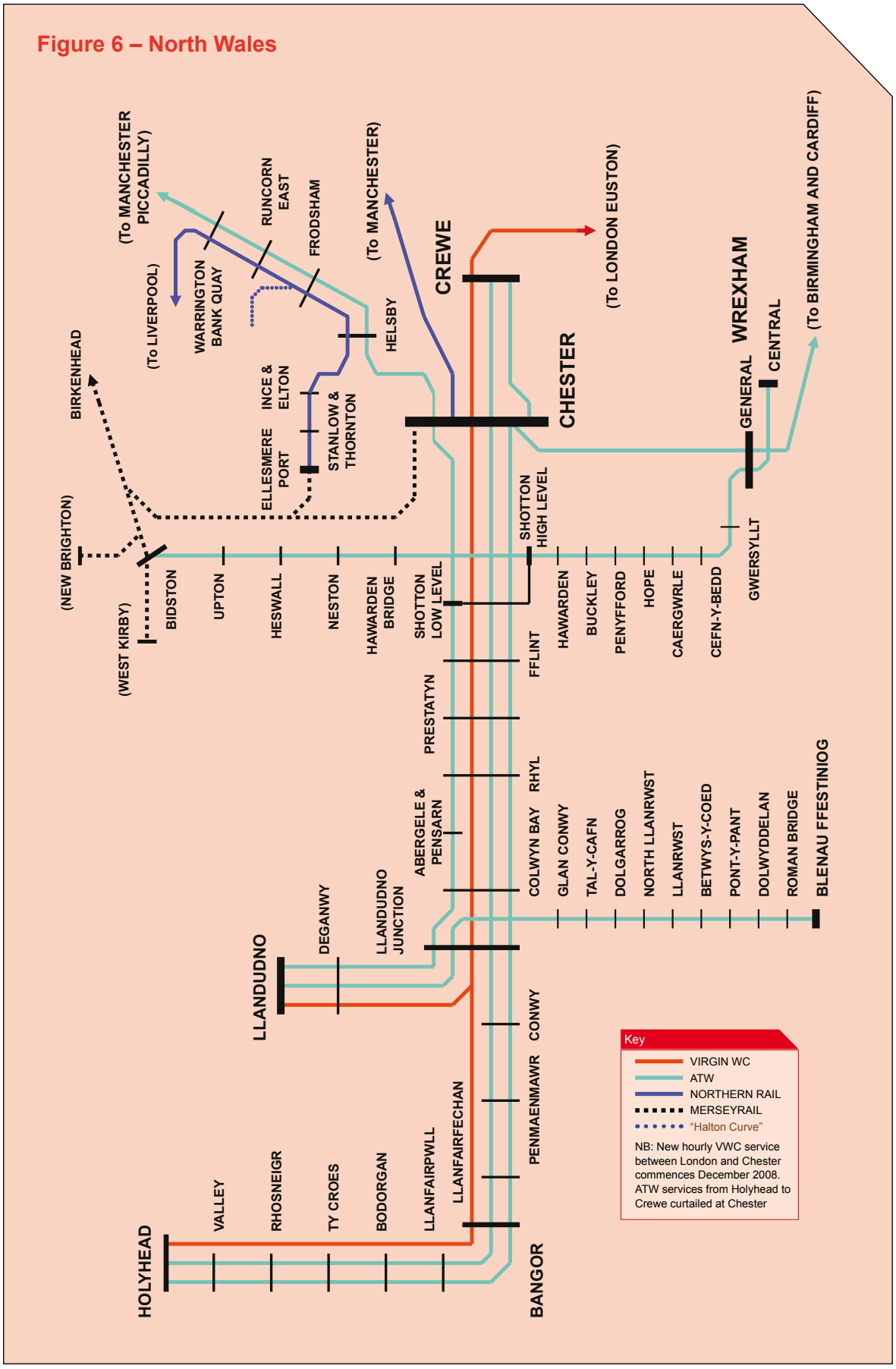
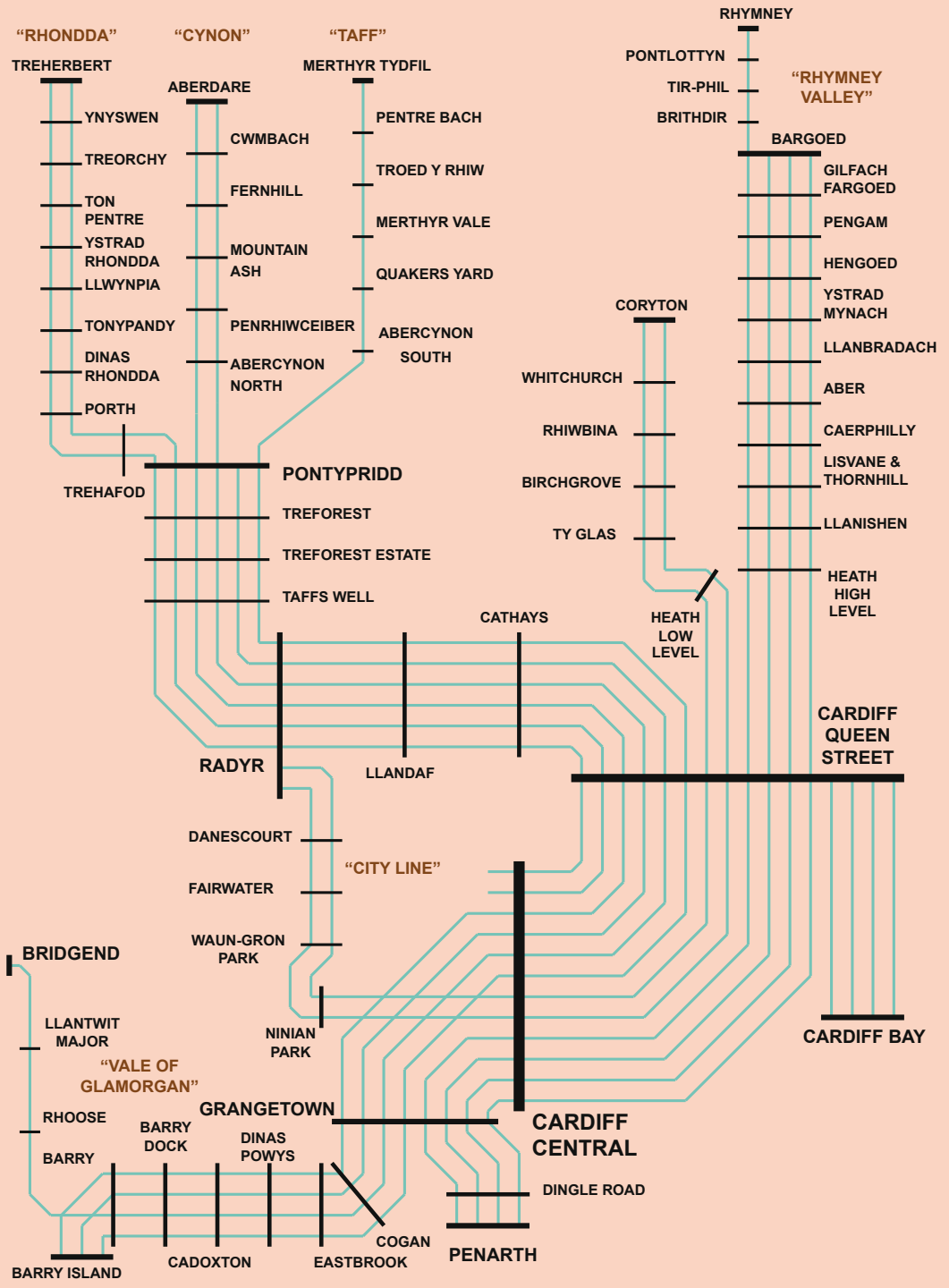


Figure 7 – South Wales valleys



NB: Abercynon stations merged Spring 2008

3.2 Freight operators

Various freight operators provide services at freight terminals throughout the Wales RUS area. EWS Railway is the dominant Freight Operating Company (FOC) in Wales, with a major operational base strategically located at Margam, near Port Talbot, in south Wales. EWS Railway also has a substantial presence at Newport, mostly at Alexandra Dock Junction yard, and also at East Usk yard. EWS Railway mainly operates bulk traffic in south Wales and in north Wales, as well as wagonload and intermodal traffic.

Freightliner Limited operates intermodal traffic linking Wentloog (east of Cardiff) with deep-sea ports, and between Wentloog and a number of English and Scottish destinations. Freightliner Heavy Haul operates a number of bulk flows, notably for aggregates in south Wales, and with a significant presence in north Wales.

Direct Rail Services Limited operates in north Wales to service the nuclear power installation on Anglesey.

3.3 Other operators

There are a number of other operators which operate on Network Rail infrastructure, which include:

3.3.1 Wrexham, Shropshire & Marylebone Railway (WSMR)

WSMR was formed in 2006/07 with the aim of operating a new, Open Access service between Wrexham and London Marylebone via the Chiltern Line through High Wycombe. Regulatory approval was granted in September 2007 for up to five journeys per day to serve stations between Wrexham and Shrewsbury, plus Tame Bridge Parkway (and not calling at Birmingham New Street station). Services commenced in April 2008.

3.3.2 West Coast Railway Company (WCR)

WCR has been a licenced Train Operating Company (TOC) since 1998, when it became the first privately owned non-franchised company to obtain a licence, allowing the company to coordinate and run its own trains without Third Partyparty involvement. During the summer of 2007, WCR operated a daily steam-hauled service on the Cambrian Coast line, between Machynlleth and Porthmadog. In 2008 the service again operated, extended to Pwllheli.

3.4 Community Rail Partnerships

A number of Community Rail Partnerships provide marketing and promotional support to much of the railway network throughout the Wales RUS area, mostly in the rural areas. Those which are members of the Association of Community Rail Partnerships (ACORP) are listed below:

Partnership	Route
Borderlands Line Rail Partnership	Wrexham Central to Bidston
Conwy Valley Rail Initiative	Llandudno to Blaenau Ffestiniog
North Cheshire Rail Users Group	Chester to Warrington
Cambrian Rail Partnership	Aberystwyth/Pwllheli to Shrewsbury
Shrewsbury – Chester Rail Partnership	Shrewsbury to Wrexham and Chester
Heart of Wales Line Forum	Swansea to Shrewsbury
South West Wales CRP	Swansea to Pembroke Dock, Milford Haven and Fishguard Harbour

3.5 Current passenger market profile

3.5.1 Current demand

The area covered by the RUS has a population of around four million, of which three million live in Wales and one million in the English counties. There is a concentration of people in south Wales, particularly in Cardiff and in the north-western part of the RUS area in North West England.

The key features of passenger journey demand reflect the concentrations of population, and land use. In 2006/7 there were approximately 31 million passenger journeys, within, to and from the Wales RUS area (this description is referred to hereafter as 'Wales RUS journeys'). 16.6 million (54 percent) of these journeys were entirely within the RUS area and 14.4 million journeys between the RUS area and other parts of the United Kingdom.

To understand the volume of journeys in the RUS area, station to station journeys have been aggregated into zones, which are comparable to the zoning used in the Wales RPA. These journeys are shown in Figure 8. 9.6 million journeys (31 percent of the total Wales RUS journeys) are within the Cardiff conurbation. The majority of commuting journeys take place in this area. This conurbation has been divided into two demand zones; Cardiff and the Valleys. The Cardiff Zone includes all stations to Coryton; stations on the Rhymney and Bargoed branches to Lisvane and Thornhill and all stations on the Valley of Glamorgan to Barry and Barry Island, and all stations on the inner ring to Radyr. The remainder are in the Valley zone.

The Wales RUS zones are further aggregated into three areas, the Southern RUS area, the Mid-Wales RUS area and Northern RUS area, so that flows between the three main areas can be described. Three figures (9 to 11) show the main flows in the Wales RUS area.

The largest volume of passenger journeys is in the Southern RUS area. 19.3 million (62 percent) of all journeys in the Wales RUS area start or end here. The Severn Tunnel is used for 15 percent of all Wales RUS journeys (approximately 4.7 million) to or from South West England, London and the South East. Journeys to or from the Southern RUS area include journeys to or from South West Wales along the South Wales Main Line to Cardiff, the Valleys, South East Wales and to the Wales RUS towns in South West England.

The Mid-Wales RUS area comprises flows to or from the Heart of Wales, the Cambrian Line, the Marches, and the RUS towns in the West Midlands. This area includes 1.3 million journeys to and from the Wales RUS West Midlands towns of Shrewsbury and its environs, to and from the main West Midlands area.

The Northern RUS area comprises journeys to and from North West Wales, and the RUS towns in North West England. From this area the largest volume of journeys are to and from Crewe and Chester and other North West England stations within the RUS area, with 3.4 million journeys to and from the rest of North West England.

The lowest volume of passenger journeys in the Wales RUS area is those to and from stations on the Heart of Wales line, with 110,000 journeys.

In the Wales RUS area there are robust growth trends, above 15 percent in journeys along the south Wales coast from Swansea towards Newport and along the Marches line to Chester and Crewe. West Wales and the north Wales coast are showing volume growth annually of 5 to 10 percent in the last year. These trends illustrate the overall attraction of rail travel and reflect the benefits of the Standrard Pattern Timetable as well as improved performance. The RUS will need to monitor these trends.

The features of this area are described in more detail in the Wales RPA published in July 2007. This document uses 2004/5 journey data, which show similar patterns to the 2006/7 data presented here. This document is available from **www.dft.gov.uk** and from **www.wales.gov.uk**

3.5.2 Most and least used stations

The most used and the least used stations in the Wales RUS area are shown below:

Most used	Annual journeys (000s)
Cardiff Central	7,634
Cardiff Queen St	4,668
Chester	2,862
Crewe	2,411
Newport	2,552
Swansea	1,652
Shrewsbury	1,524
Hereford	1,454
Bidston	1,454
Gloucester	1,211
Brigend	1,193
Pontypridd	794
Trefforest	745
Barry	784

Source: MOIRA Extract of LENNON data. Note: These are total passenger journeys made to and from these stations, not solely journeys within the RUS area.

Least used	Annual Journeys
Sugar Loaf Halt	<100
Roman Bridge	<1000
North Llanrwst	<1000
Hopton Heath	<1000
Llangynllo	<1000
Bynea	<1000
Cilmeri	<1000
Pen-y-bont	<1000
Llangennech	<1000
Tygwyn	<1000
Pilning	<1000
Garth Powys	1,000
Abererch	1,100
Tonfanau	1,100
Pont-y-pant	1,200
Dolau	1,300

Source: MOIRA Extract of LENNON data. Note: These are total passenger journeys made to and from these stations, not solely journeys within the RUS area.

3.5.3 Connectivity inside and outside the RUS area

As indicated in Figures 3 – 7 passengers can interchange between train services at many of the major stations in the Wales RUS area. Interchange to and from the Wales RUS area also occurs outside the area. The volume of interchange inside and outside the Wales RUS area is shown below.

Table summarising interchanges for the 20 busiest interchange stations within the Wales RUS area in 2006/07.

Station	Percentages of interchanges to/from and within RUS area %	Interchanges to/from and within Wales RUS area (000s)	Total interchange per station in 2006/07 (000s)
Crewe	64	625	1,112
Cardiff Central	100	558	667
Newport	96	569	633
Chester	93	386	430
Cardiff Queen St	100	295	295
Shrewsbury	95	155	181
Trefforest	100	111	111
Grangetown	100	97	97
Swansea	100	76	80
Bidston	100	73	73
Llandudno Junction	100	44	44
Machynlleth	100	36	37
Gloucester	86	25	29
Hereford	93	23	25
Cathays	100	25	25
Radyr	100	23	24
Bridgend	100	22	23
Carmarthen	100	22	23
Shotton	100	20	20
Pontypridd	100	16	16
Total Interchanges	**88**	**3,201**	**3,945**

Source: MOIRA extract of LENNON data. Notes: This represents 98 percent of all journey interchanges at stations within the Wales RUS area. The table shows interchange proportions for the top 1,000 flows at each station.

Table summarising interchanges made at a few sample interchange stations outside the Wales RUS area in 2006/07.

Station	Percentages of interchanges to/from RUS area %	Interchanges to/from Wales RUS area (000s)	Total interchanges per Station in 2006/07 (000s)
Birmingham New Street	15	465	3,612
Bristol Parkway	56	318	582
Reading	9	231	2,581
London Paddington	8	216	2,719
Bristol Temple Meads	22	178	833
Manchester Piccadilly	13	152	1,288
Manchester Oxford Road	20	106	526
Warrington Bank Quay	43	105	250
Cheltenham Spa	71	43	107
Total	**16**	**1,814**	**12,498**

Source: MOIRA extract of LENNON data. NB The table shows total interchanges for top 1,000 flows at each station.

3.5.4 Train loads

The level of rail demand in the RUS area varies considerably by time of day, journey purpose and route. Demand is greatest when commuters travel and thus the RUS has focused on the train loading in the morning and evening peaks.

Evidence from autumn 2006 counts indicates that passengers may stand on some trains to and from Cardiff in the am peak period (07:00 – 09:59) and in the pm peak period (16:00 – 18:59). These diagrams show levels of standing within the rolling stock capacity as defined in the Arriva Train Wales and First Great Western franchises, and where standing is greater than this level. Typical crowding on Valleys services into Cardiff's central stations in the am peak period are shown on Figure 12A and in the pm on Figure 13A. West of Cardiff on the South Wales Main Line, the evidence base of autumn 2007 has been used as from December 2006 the timetable in the pm peak period altered. Figure 12B and 13B indicate typical crowding on services entering or leaving Cardiff from the west. Since the timetable change in December 2006, standing within train capacity, occurs on the 17:21 Cardiff to Maesteg train in particular. As part of the December 2008 timetable change the rolling stock on the Maesteg services will be adjusted to provide additional train capacity.

Standing above train capacity may occur on morning trains between Cadoxton and Cardiff Central, Treforest and Cardiff Queen Street and between Aber and Cardiff Queen Street. In the afternoon, the extent of standing above capacity appears to be less severe. Standing on trains at levels greater than capacity may occur between Cathays and Llandaff, between Cardiff Queen Street and Caerphilly, between Grangetown and Dinas Powys on the Vale of Glamorgan branch and on trains services west of Cardiff. Indicative crowding on the Valley services is shown on Figure 14 and Figure 15 for the am peak hour of 08:00 – 08:59 and pm peak hour of 17:00 – 17:59.

Apart from these Valleys services, there is generally sufficient train capacity on all routes except on occasional trains in peak periods and in the coastal areas during the summer. There is standing on some weekday peak morning trains on the Gloucester to Cardiff services between Newport and Cardiff; with people standing on some evening peak services between Newport and Cwmbran on the Manchester trains and standing on Friday evening services between Newport and Gloucester. Away from Cardiff, crowding occurs on sunny summer days on the Cambrian Coast line and in south west Wales around Carmarthen, if the trains are not lengthened from their general two car formation.

There is also standing on trains outside the Wales RUS area. Examples include standing in the peak periods between London and Reading, or on selected Aberystwyth trains between Wolverhampton to Telford. These issues will be addressed in relevant Route Utilisation Strategies.

Figure 8 – Journey zones

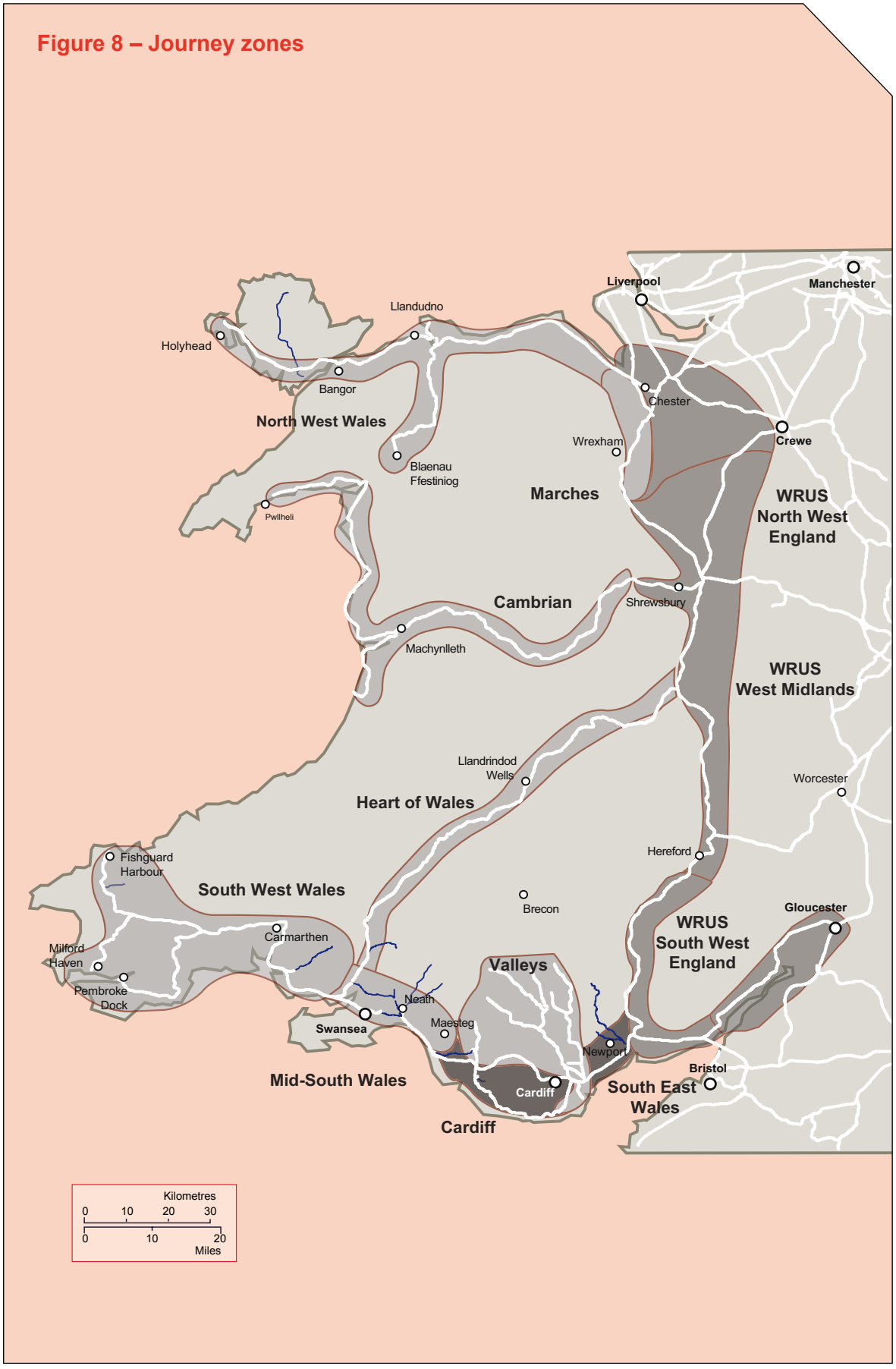


Figure 9 – Significant passenger journeys within the Southern RUS area in 2006/07

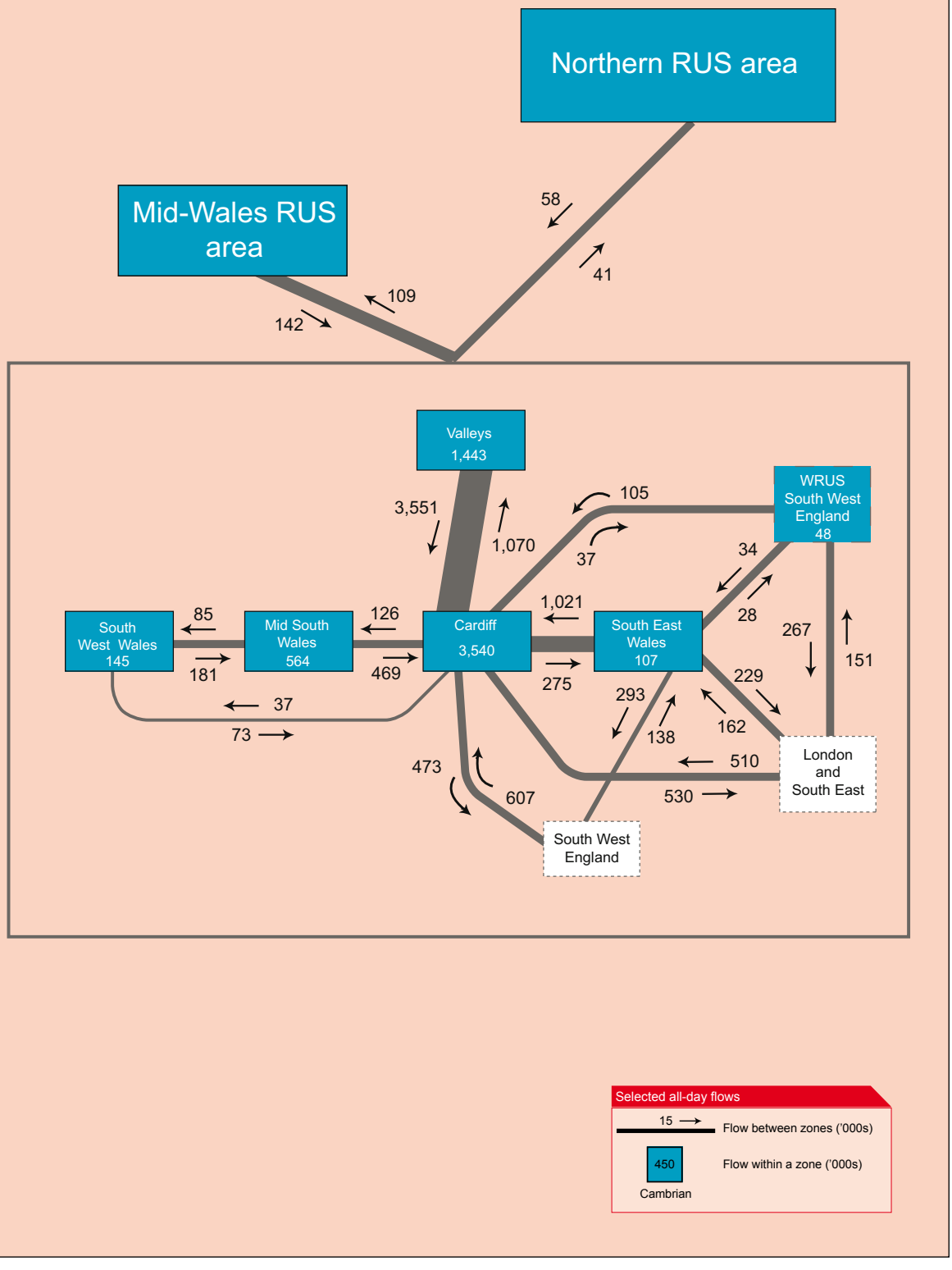


Figure 10 – Significant passenger journeys within the Mid-Wales RUS area in 2006/07

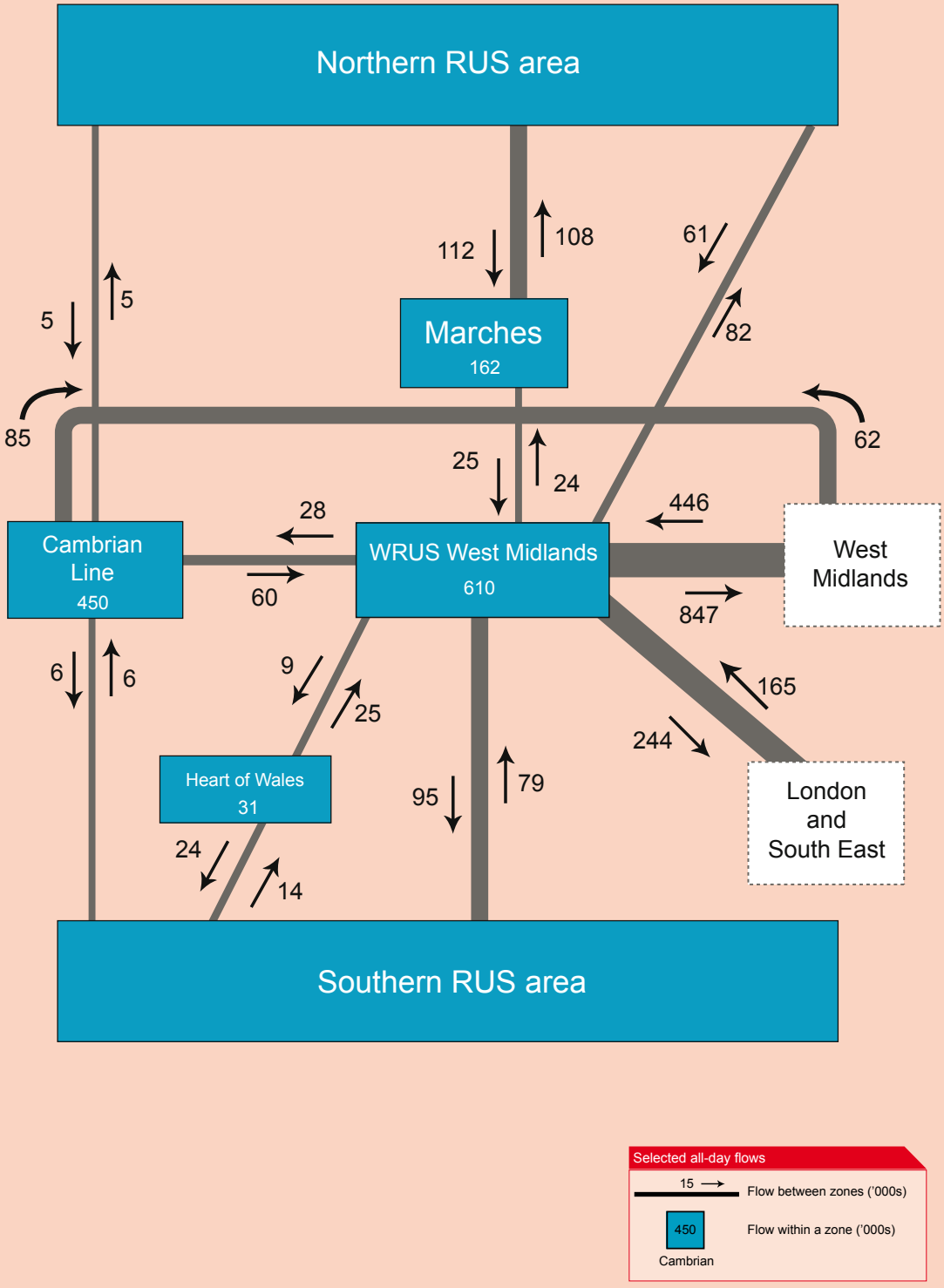


Figure 11 – Significant passenger journeys within the Northern RUS area in 2006/07

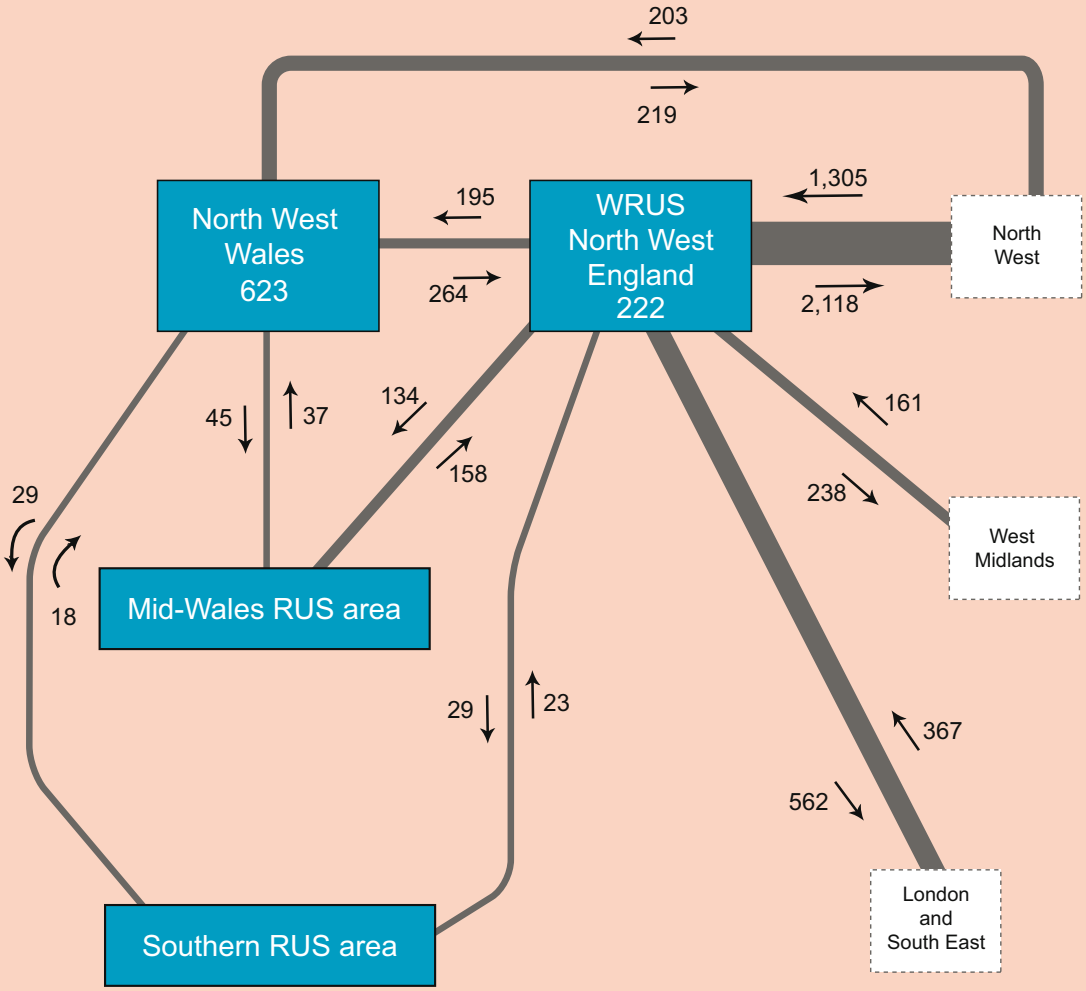


Figure 12A – Loading on Valley services arriving at Cardiff between 07:00 – 09:59 (from September 2006 train counts)

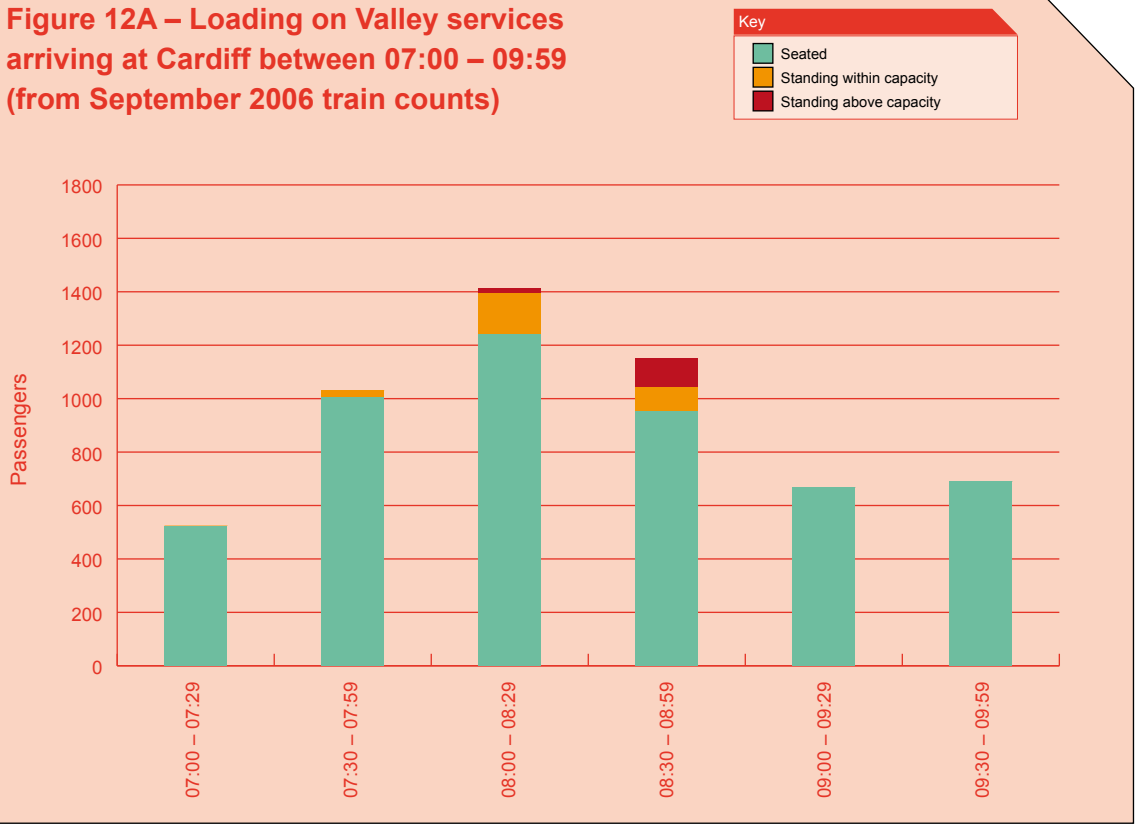


Figure 12B – Loading on west of Cardiff (South Wales Main Line) services arriving at Cardiff between 07:00 – 09:59 (from Autumn 2007 train counts)

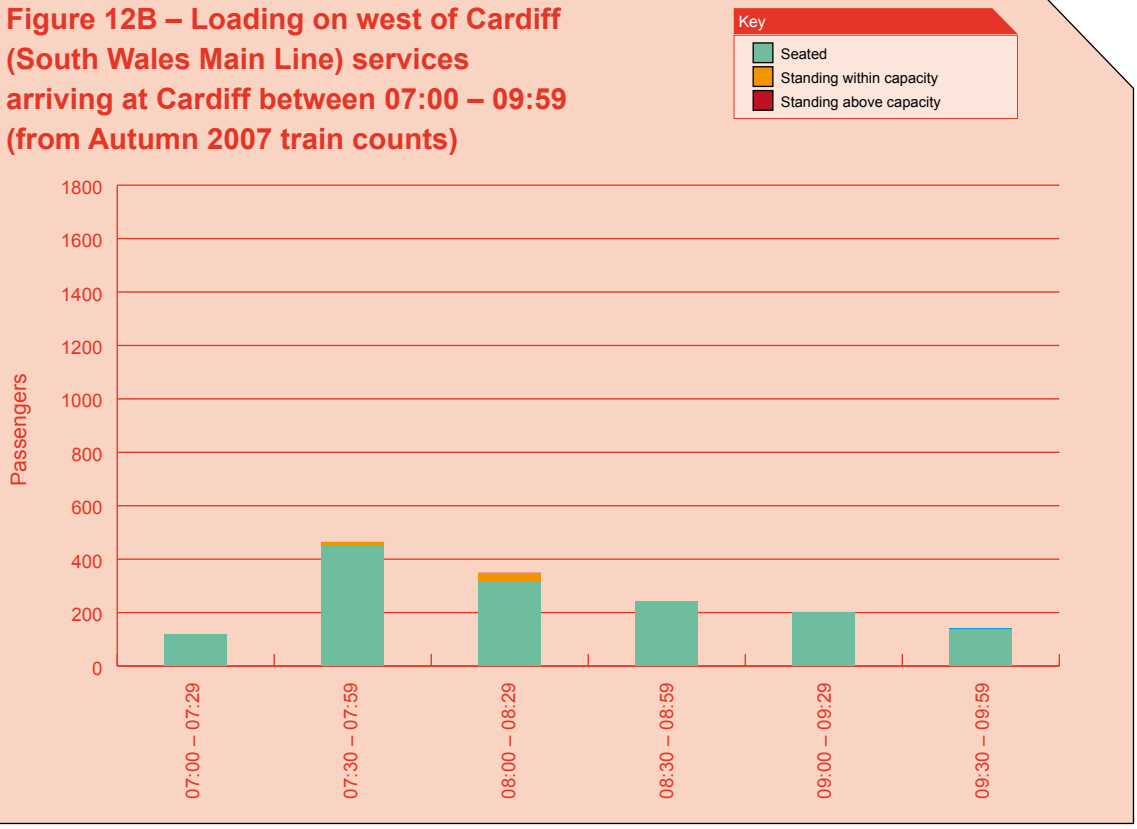


Figure 13A – Loading on Valley services departing Cardiff between 16:00 – 18:59 (from September 2006 train counts)

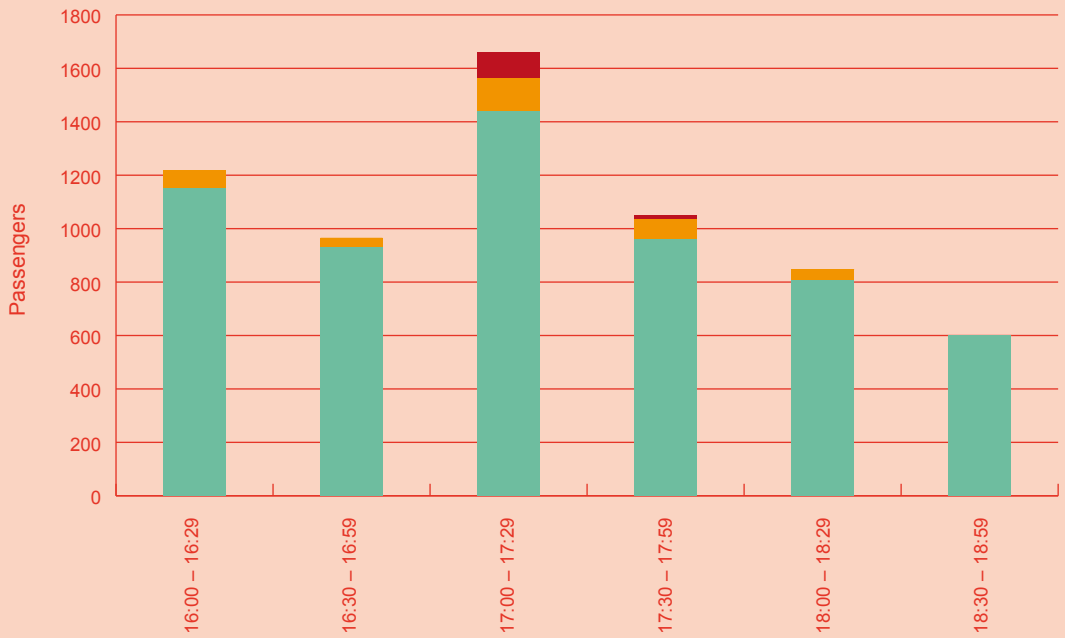


Figure 13B – Loading on west of Cardiff (South Wales Main Line) services arriving at Cardiff between 16:00 – 18:59 (from Autumn 2007 train counts)

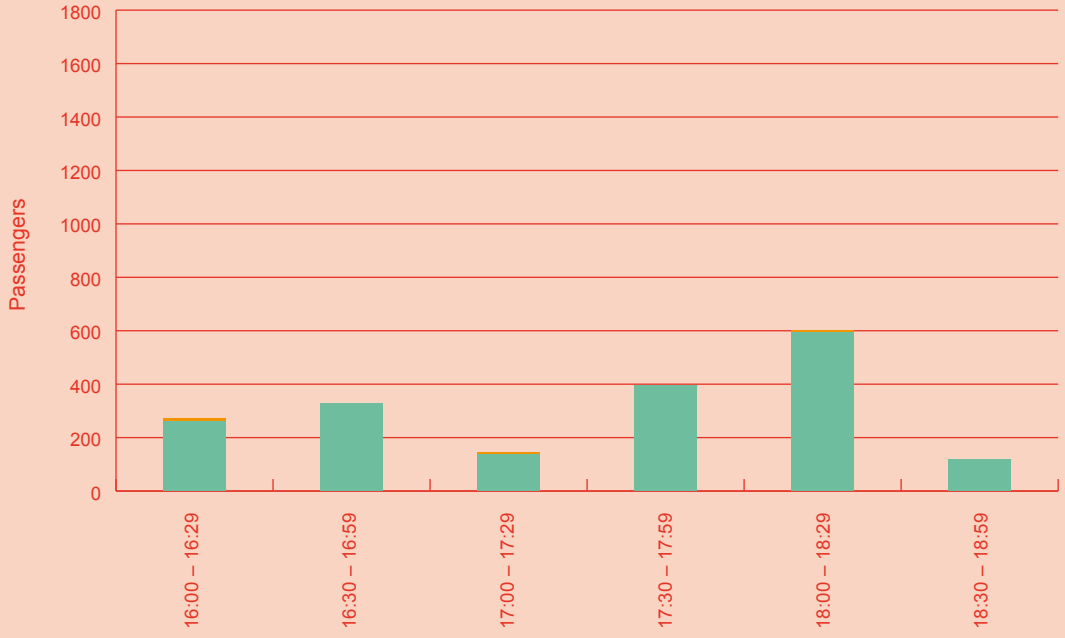


Figure 14 – South Wales Valleys crowding around Cardiff for the am peak hour (08:00 – 08:59) in 2006/07

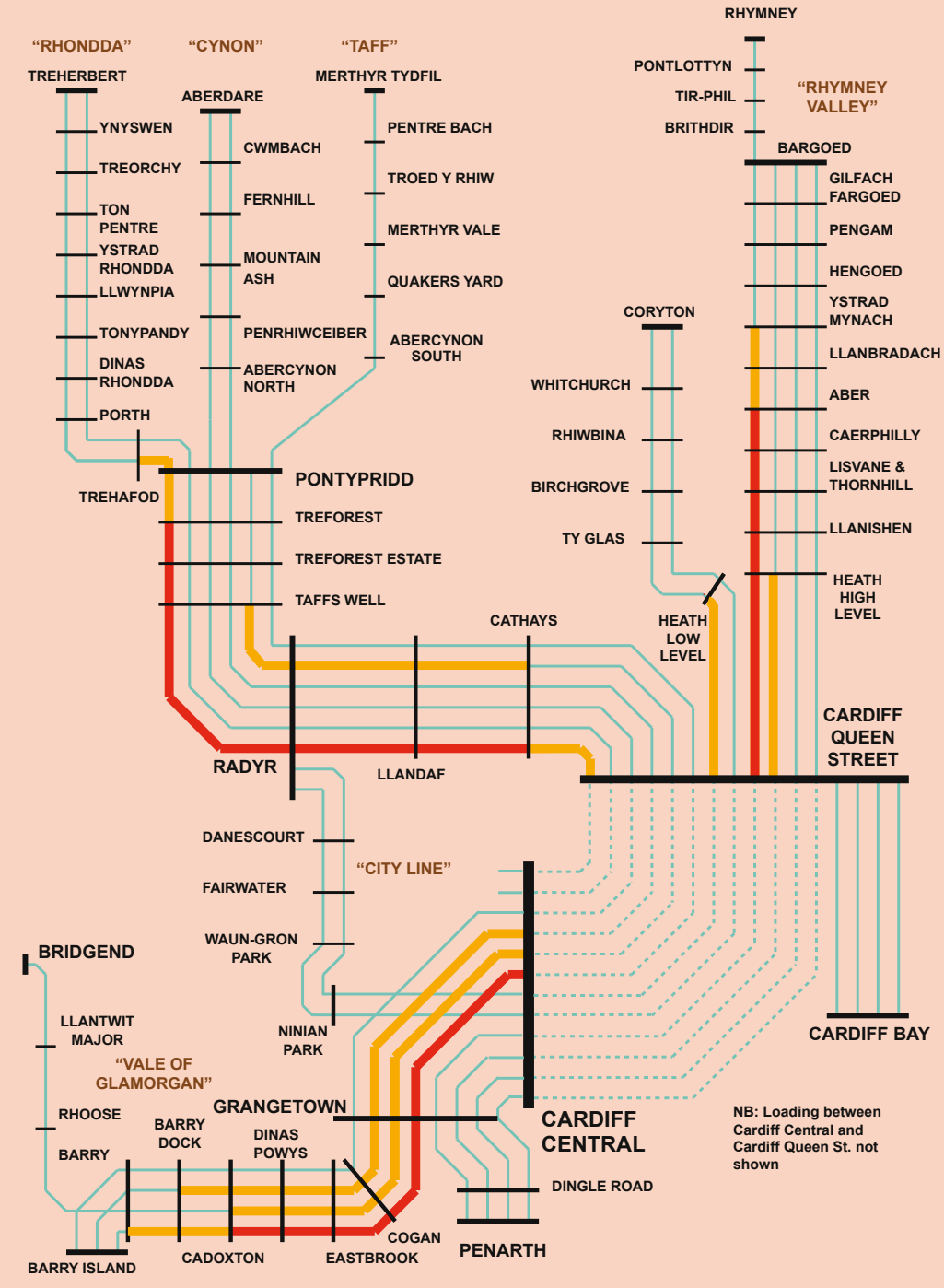
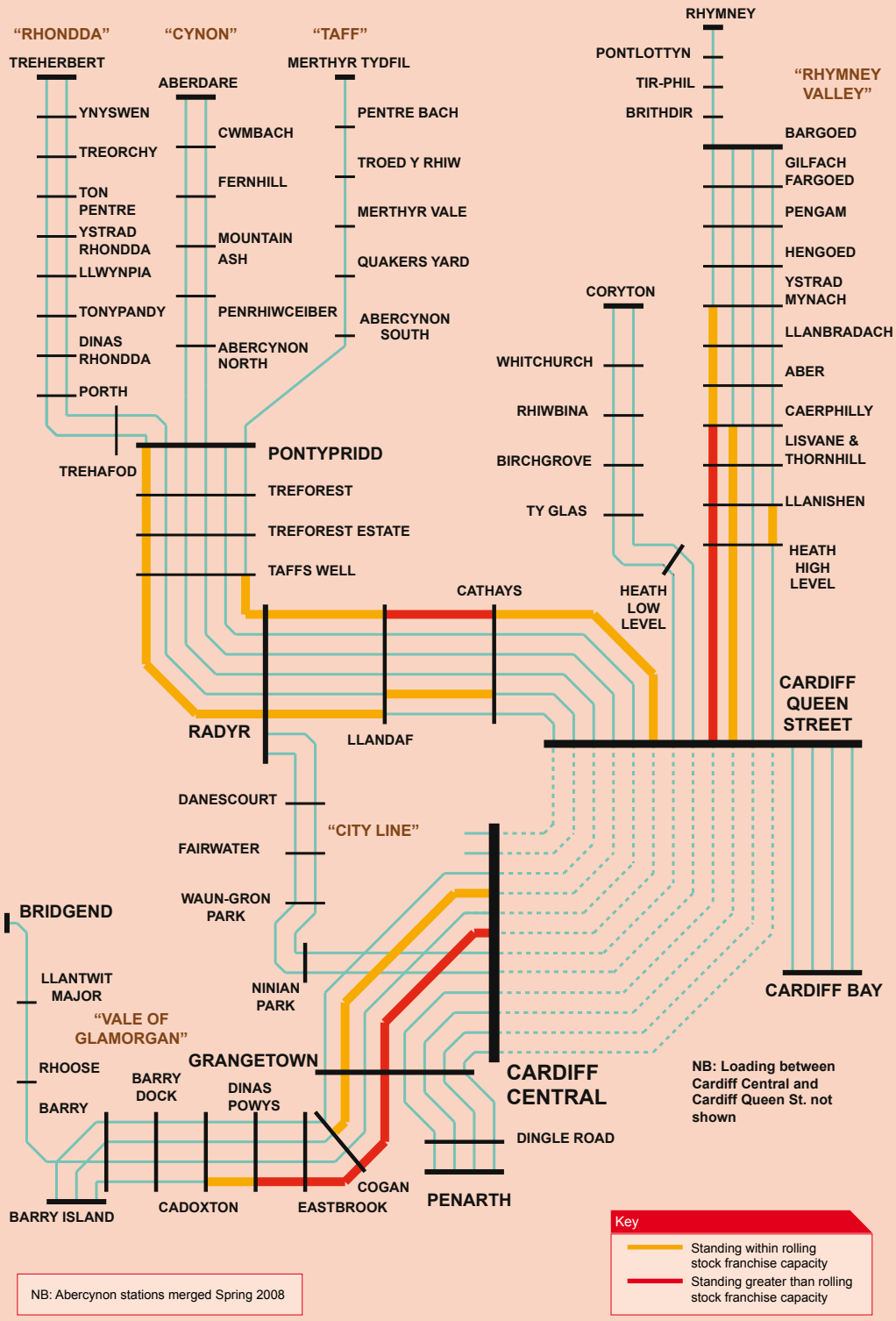


Figure 15 – South Wales Valleys crowding around Cardiff for the pm peak hour (17:00 – 17:59) in 2006/07



3.6 Current freight market profile

3.6.1 Background

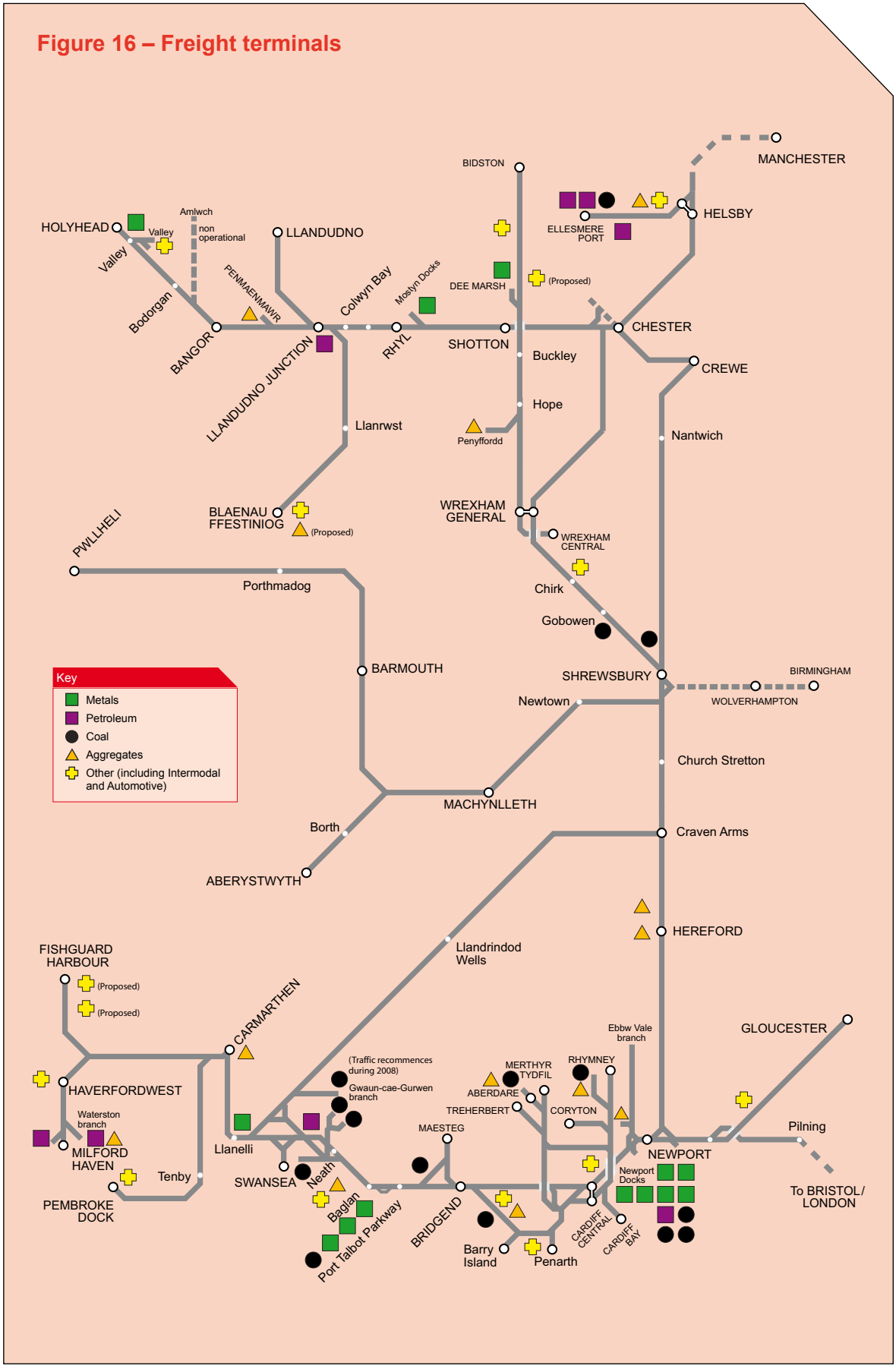
Within the UK, rail transport has a small share of the total freight market. Rail's market share, however, is growing year on year (8.5% to 11.5% of net tonne kilometers in the ten years since privatisation), and will continue to grow as the Working Time Directive impacts upon the economics of longer distance lorry journeys and possible increases in road operating costs including rising fuel costs. Chapter 3 of the Freight RUS has a comprehensive review of demand for rail freight over the last five years.

There are currently around 60 freight terminals in the Wales RUS area owned or leased by Freight Operating Companies (FOCs) including a number which are proposed, and some which are currently not receiving or forwarding traffic (see Figure 16).

Most handle single commodities, and the majority are in south Wales, and are individually listed in Appendix C. Many lie immediately adjacent to the network, and have defined boundaries with passenger running lines governed by Connection Agreements.

A full analysis of freight issues across all of Great Britain was carried out in the Freight RUS and issues specific to Wales were mentioned in Table 5.7 of that document, and which are picked up in the Chapter 6 of this RUS.

Figure 16 – Freight terminals



3.6.2 Freight-Only Lines in the Wales RUS area

In addition to the passenger network throughout the Wales RUS area, all of which is available to FOCs, some freight terminals are accessed by a number of Freight-Only Line branches (FOLs), amounting to a further 82 active route-miles. Most FOLs in the Wales RUS area are specific to individual forwarding or receiving freight terminals, and the majority are located in south Wales. The exception is the "Swansea District Line" between Briton Ferry and Llanelli, which forms a through route to west Wales bypassing Swansea itself. The relationship between the passenger and freight elements of the overall route network in the Wales RUS area is shewn in the table below:

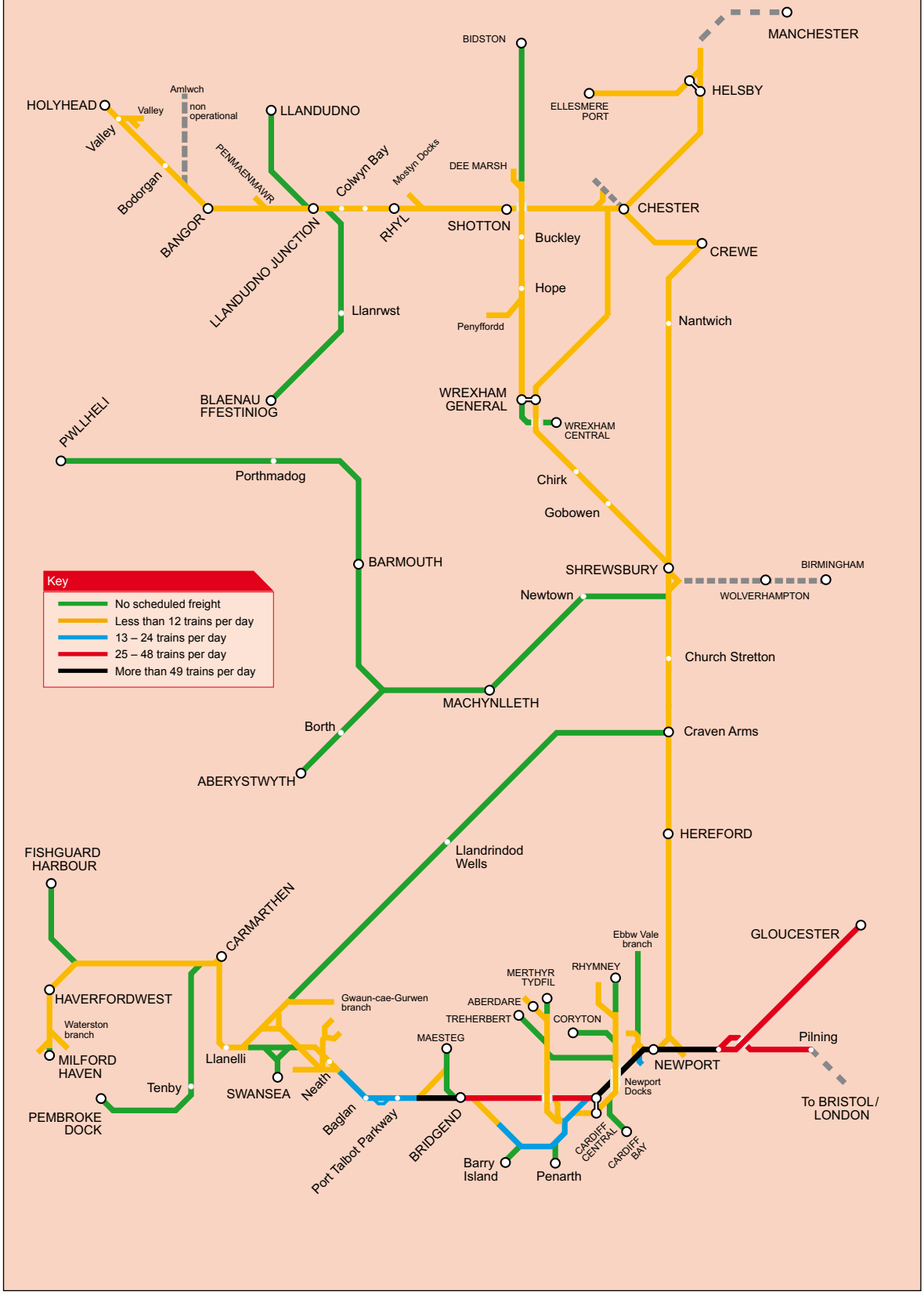
Route	Passenger route miles	Freight-Only Line miles	Comprising
13, GWML	113	16	Uskmouth, Machen, Tondu to Port Talbot
14, South & Central	489	47	Swansea District, Cwmgrach, Onllwyn, Gwaun – Cae – Gurwen, Waterston, Robeston, Jersey Marine South
15, Valleys	110	17	Cwmbargoed, Hirwaun, Barry Docks, Fords Bridgend
22, North Wales	182	2	Dee Marsh, Penyffordd, Valley
totals	**894**	**82**	

NB: The daytime Cardiff to Fishguard outwards and return boat-trains are routed via the Swansea District line, running non-stop between Cardiff and Llanelli and v.v.

The FOL mileage for north Wales quoted above excludes the currently closed branch between Blaenau Ffestiniog and Trawsfynydd. This line is strategically retained for possible future use (although is actually disconnected at Blaenau Ffestiniog).

The disused Amlwch branch (on Anglesey) is not counted in the above.

Figure 17 – Freight train paths (December 2006 WTT)



3.6.3 Baseline demand: freight

There is wide variation in the level of demand for freight paths across the Wales RUS area, and substantial tonnages of freight move both into and out of the country by rail. The busiest part of the network is around Newport and Cardiff, as can be seen from the diagram (Figure 17) illustrating planned freight train paths by route section. The density of freight train operation closely correlates with activity at the key freight terminals in the metals and coal commodity sectors which are dominant, mostly for whole trainload movements. The diagram shows all Working Timetable (WTT) paths, at a December 2006 baseline, not all of which operate every day. It does not illustrate trains which pass as short-term plan special traffic movements, and so overall illustrates an average capacity utilisation position.

Metals The busiest area of freight activity is in south Wales reflecting production at the major steelworks sites (at Port Talbot, Cardiff and Llanwern) and links to other Welsh sites at Trostre in west Wales and Shotton on Deeside. Substantial long-distance flows of steel for finishing in Wales traverse England, from the north-east and likewise there are substantial flows of finished product from Wales to the west Midlands, and the north-west. Scrap is moved to Cardiff Docks from various originating points. Some international flows also exist.

In north Wales there are flows from RTZ/ Holyhead (aluminium) and steel export traffic through Mostyn Dock.

Coal The principal power station in Wales is located at Aberthaw, on the coast between Cardiff and Bridgend. Welsh-produced coal is a major part of the intake at Aberthaw, which has a long-term future, but some coal is imported to Wales through the Royal Portbury Dock at Bristol, and passes by rail through the Severn Tunnel. Uskmouth Power Station near Newport also receives trainload coal in significant quantities.

A major opencast coal flow from Cwmbargoed (near Merthyr Tydfil) by rail restarted during January 2008, which uses the FOL branch to Ystrad Mynach on the Rhymney Valley section of the South Wales Valleys route.

Tower Colliery at Hirwaun (north of Aberdare) finally closed at end-2007 but coal traffic produced elsewhere continues to use paths on the route.

Traffic was due to flow again from the Gwaun-Cae-Gurwen (GCG) site, near Ammanford in west Wales, during 2008.

Intermodal There is one major intermodal terminal in Wales at Wentloog, to the east of Cardiff, which receives deep-sea container traffic from the port of Southampton by rail for onwards distribution by road to south and mid-Wales. North Wales is fed from terminals in north-west England.

Other commodities

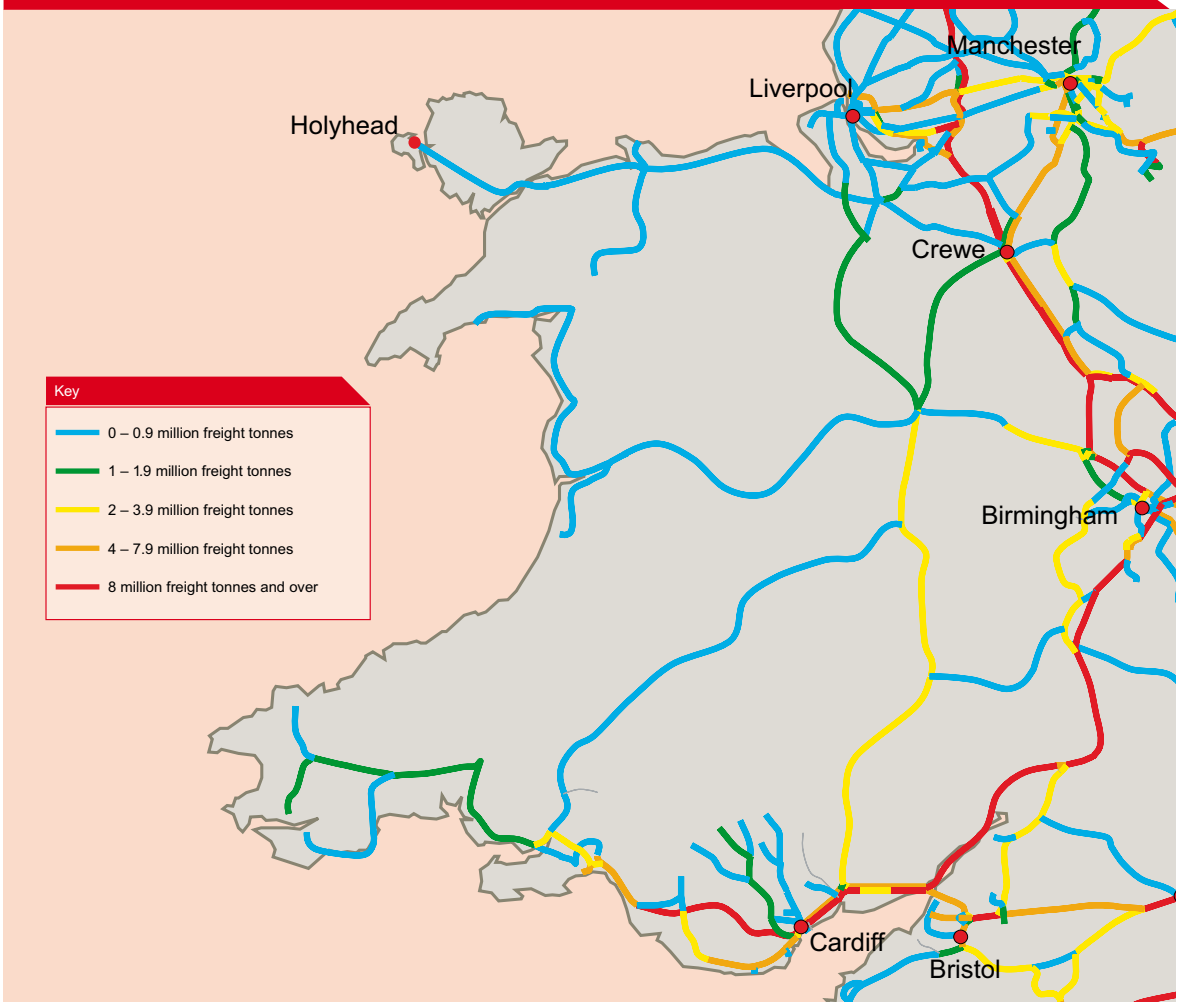
Oil products are moved from the refinery at Milford Haven, and a limited quantity of tar flows from Shellhaven to Llandarcy. **Automotive** products are conveyed by rail to and from the major Fords plant at Bridgend. **Aggregates** traffic is conveyed from a number of supply sources in south Wales as well as from Penmaenmawr in north Wales and a recently-opened terminal at Moreton on Lugg in Herefordshire. **Logistics** materials for Network Rail engineering purposes are an important part of the overall rail-freight market, illustrated by the recent development of enhanced facilities at Newport Alexandra Dock Junction, in close proximity to Newport Docks, for ballast and other items. In addition, terminal facilities exist at a number of locations in south-east and south-west Wales for Ministry of Defence traffic. **Forest products** are handled at a specialist terminal in north Wales, near Chirk, and **Nuclear** traffic is handled at Valley on Anglesey.

Demand for freight paths in Wales is basically stable, with some general growth anticipated.

Figure 3.3 within the Freight RUS (shown below) presents an overview of the freight volumes moved in the Freight RUS base year of 2004/05. Volumes in 2006/07 are expected to reflect moderate annual growth of the key commodities.

The issues for Wales identified by the Freight RUS are addressed in Chapter 6 of this document, as section 6.3.2.

Freight RUS extract: Figure 3.3 Gross freight tonnage on the network in the base year (2004/05)



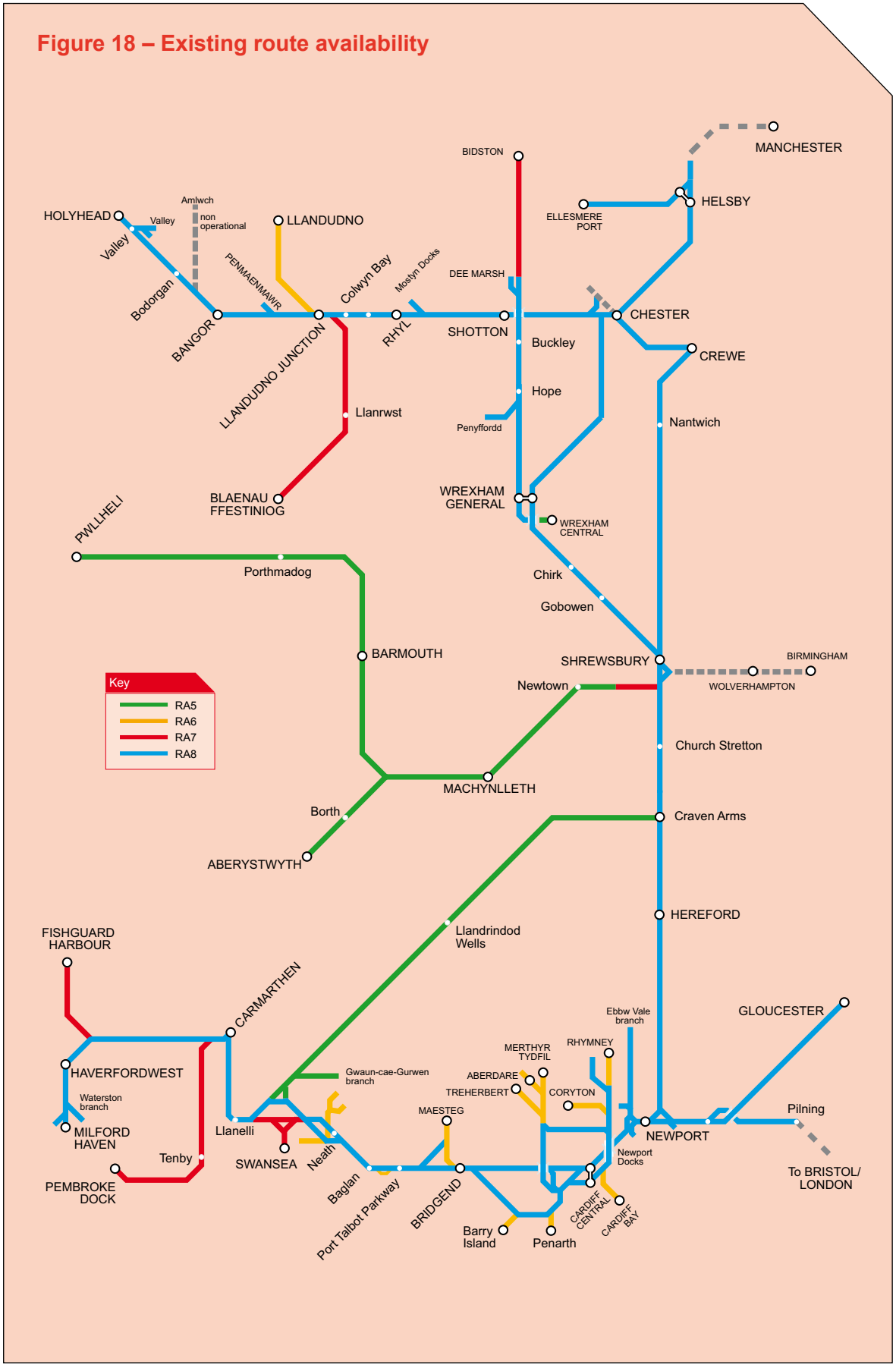
Annual tonnage shown in both directions. Routes with two different colour codes reflect differing tonnage on fast and slow lines.

3.6.4 Freight network capability – overview

Most of the main line routes comprising the Wales rail network have a published capability which enables heavy (RA8, up to 22.5-ton axle weight) axle-load traffic, as are the associated FOLs connecting the main coal loading points and metals terminals to the network. In many cases heavier loads are permitted by local dispensation (for example, RA10 for fuel tankers from the Milford Haven refineries, or to Aberthaw Power Station from east of Cardiff coal supply points, where newer, bigger bogie wagons have been introduced), and structures are kept under review accordingly (see Figure 18).

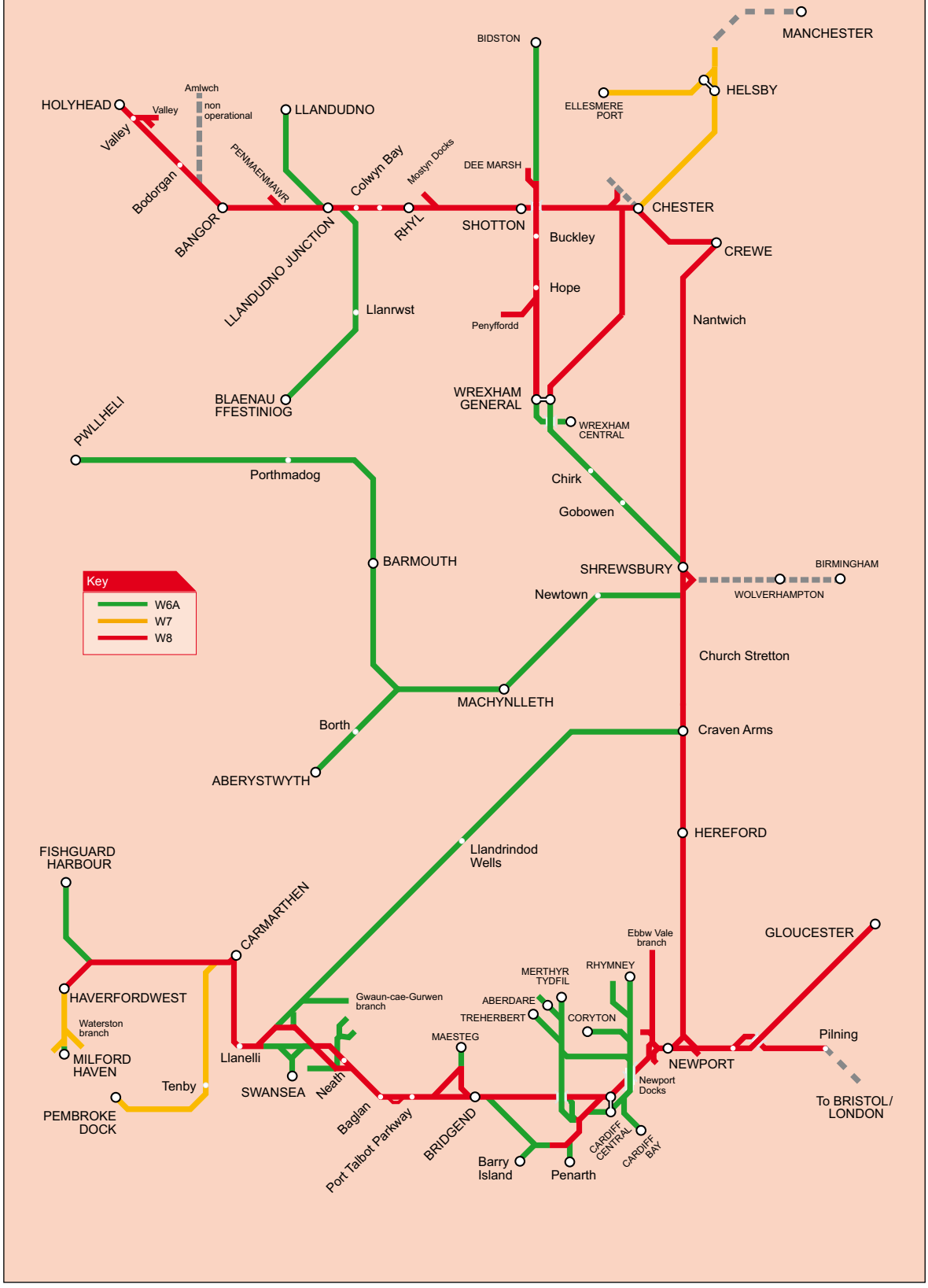
Gauge clearance for 8'6" containers (on conventional flat wagons) applies to the main lines across north Wales and south Wales as well as on the Crewe to Newport north-south route (see Figure 19).

Figure 18 – Existing route availability



NB: Dispensation for higher axle-loading may be granted in accordance with Table D5A of the Great Western and London North Western Sectional Appendices

Figure 19 – Existing freight gauge



3.7 Wales rail network

General remarks

Infrastructure characteristics on the routes within the Wales RUS area vary widely, reflecting historic service demands. Route capability is at different levels in line with the mix of primary, secondary and rural status designated sections. There are no electrified routes within Wales. Linespeeds vary greatly, from stretches of 90 or 100mph on the principal north Wales coast and the GWML in the south, and the north-south route along the English borders, to substantial parts of the rural network where speeds are in the 40 – 70mph band. Those routes with a high incidence of unmanned Level Crossings tend towards lower average speeds.

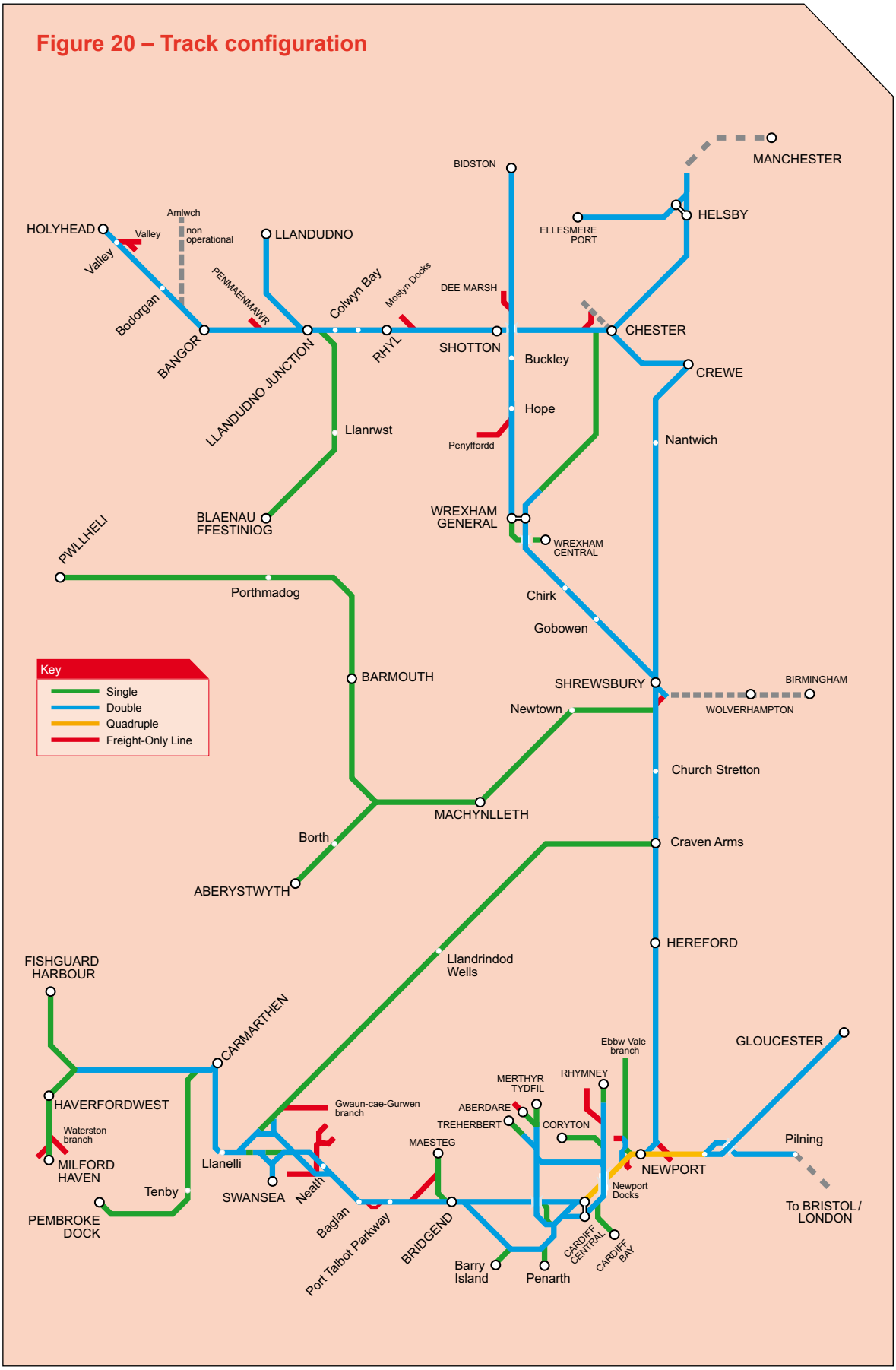
The easternmost part of the Great Western Main Line in south Wales, between the Severn Tunnel and Cardiff, is four-tracked. Elsewhere the majority of the infrastructure in Wales is designated secondary, and is mostly double-tracked. A significant component of the network in Wales is designated rural, and is single track with passing loops, see (Figures 20 and 21)

A large proportion of Route 14, namely the Cambrian Lines and the Heart of Wales Line, are classified as Fragile and no regular freight traffic is scheduled to use these sections, on which there are currently no freight terminals.

The following section will review each strategic route against the following criteria:

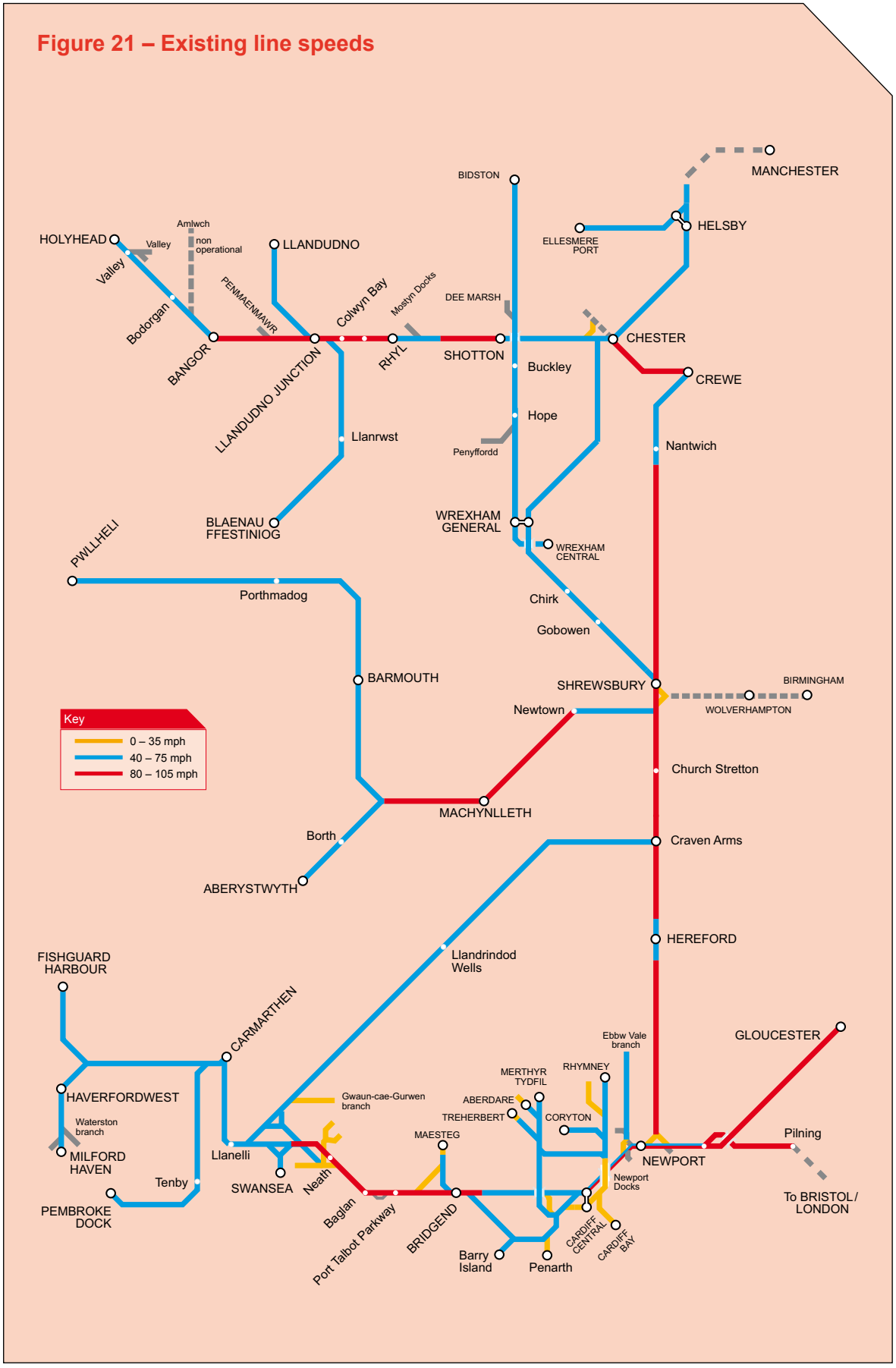
- capacity
- utilisation

Figure 20 – Track configuration



NB: Ebbw Vale passenger services commenced February 2008 (over former freight-only line)

Figure 21 – Existing line speeds



NB: At baseline, Ebbw Vale branch was 0 – 35mph freight-only line

Factors affecting capacity

Headways A variety of signalling systems feature across the Wales RUS area. The GWML in south Wales, and the Chester area have Track Circuit Block (TCB) signalling, which generally permits trains to follow one another at four- to six-minute headways on double track. Most of the secondary routes have Absolute Block signalling, with mechanical signalboxes at intervals ranging from three to ten miles, where route capacity is influenced by the longest distance between boxes. On the single-track rural routes the time taken by trains between passing-loops influences overall route capacity.

Big and small trains The length of platforms at stations varies, and is best seen in terms of whether long-distance main line type services (deploying up to 250m-long intercity 125 or Virgin "Pendolino" rolling stock) are established on the various sections, as well as whether or not a more recently built station will have been specified for shorter regional-type services, where 100 metres will usually have been deemed sufficient for four-coach trains of various classes. In a few cases, such as on the "City Line" between Cardiff, Ninian Park and Radyr, new stations were constructed to cater only for two-coach trains. A number of smaller stations and halts in Wales (with very low passenger useage) have sub-standard length platforms, and stops at these are made in adherence to specific local safety instructions.

3.7.1 Route 13 Great Western Main Line

3.7.1.1 Capacity

The four-track GWML (to the east of Cardiff) enables passenger movements on the Main Lines to be segregated from freight which is mostly scheduled to use the Relief Lines. This provision of infrastructure mirrors the higher passenger volumes east of Cardiff Central, and the four tracks converge to two immediately to the west. Substantial numbers of trains terminate (from the east) at Cardiff Central and require to be turned around at that location, and shunt from the "Down" side to the "Up" side, which consumes available capacity and places pressure on platforming.

The renewal (during 2006/07) of the signalling controlled from Port Talbot incorporated an enhancement element to enable more flexible working west of Bridgend which will enable all traffic to be handled on one line if necessary when the other is blocked for engineering work or emergency purposes. Additionally, a new turnback facility was provided at Port Talbot Parkway station to enable services in either direction to be reversed if required.

To the extreme west of the GWML, between Bridgend and Swansea, the five new "Swanline" local stations added to the network in 1994/1995 impact upon route capacity as these are served by local stopping trains which are additional to the established through services. Furthermore, these trains now run through from Cardiff rather than being confined to Bridgend – Swansea.

3.7.1.2 Utilisation

The most heavily used part of the rail network in Wales is that surrounding Cardiff, and the main lines between Newport and Cardiff typically handle up to nine passenger trains per hour in either direction. (This figure includes the hourly services from Ebbw Vale to Cardiff Central introduced in February 2008, following reconstruction of the former Ebbw Vale freight line). Cardiff Central is the busiest station in Wales in terms of passenger train throughput as the self-contained South Wales Valleys (Route 15) services also all pass through Platforms 6 and 7 there, at a constant twelve trains per hour frequency throughout the day.

The construction of the new station at Llanharan (which opened in December 2007, and is mainly served by the addition of calls in Cardiff to Maesteg stopping trains) has intensified capacity utilisation of the GWML between Cardiff and Bridgend. This issue is explored further in Chapter 6, Gaps and opinions.

3.7.2 Route 14 South & Central Wales & Borders

3.7.2.1 Capacity

A large majority of Route 14 is double-tracked and offers ample capacity for current scheduled use. However there are two significant “pinch-point” locations where double-track was singled in the 1980s, and which now have a disproportionate effect on capacity where throughput requirements have increased. Capacity is further reduced in those instances where the single line causes pathing-time to be added to train schedules when constraints elsewhere on the network cause a “clash” over the single line sections, and can prolong station time and lead to inefficient platforming use.

On the long double-track section from Newport to Shrewsbury, capacity is constrained by the uneven headways between signalboxes, and which impacts particularly on heavy, northbound freight trains as they leave south Wales at Abergavenny and cross the border near Llanvihangel. This issue is picked up with Chapter 6, Gaps and options.

A substantial element of Route 14 is single-track with passing loops, and journey times are affected on the Cambrian, Heart of Wales and Pembroke Dock lines by the existence of Open types of Level Crossing which impose speed restrictions for sighting, where otherwise track conditions would permit higher speeds. Pathing opportunities on the Cambrian lines are led by the “slots” available on the densely trafficked West Coast Main Line (WCML) between Wolverhampton and Birmingham New Street as well as limited platform availability at the latter station where through services from Wales have to be turned around. (These services will be extended to Birmingham International in conjunction with the major December 2008 WCML timetable recast.)

Taken together these factors have led to a very high level of capacity utilisation between Shrewsbury and Aberystwyth where no more trains could be pathed without the construction of additional passing loops and upgrades to linespeed. Renewal of the current radio-based signalling system (RETB) and the introduction of European Rail Traffic Management System (ERTMS) will enable enhancements to be developed to aid performance and potentially permit the operation of additional services compared to the existing two-hourly pattern. (This is discussed further in Chapter 6, Gaps and options)

3.7.2.2 Utilisation

The introduction of the “Standard Pattern Timetable” in December 2005 through the award of the Wales & Borders franchise led to improved service frequencies on a number of sections of this route. In two instances this intensified utilisation exacerbates performance problems at those pinch-point locations where only a single track now exists on a former double-track formation.

To the west of Swansea, a five-mile single-track section between Cockett and Duffryn constrains timetabling where in most hours four movements across the section are needed (formerly two), and sometimes a fifth as well. Calls at Gowerton station (located on this single track) are thus omitted from a substantial number of west Wales services as a consequence, as they cannot be pathed to call.

To the north of Wrexham General station, a ten-mile single-track section to Saltney Junction, west of Chester, constrains timetabling flexibility on a part of the network now required to handle hourly services rather than the two-hourly previous requirement. This acts as a pathing constraint and often causes journey times on the newly introduced long-distance Cardiff to Holyhead services to be lengthened, and thus less attractive to users. This is manifested by prolonged station dwell times at Shrewsbury on north bound south Wales to north Wales journeys, between Cardiff and Holyhead.

Recent changes to the rolling-stock available for these long-distance services have seen the widespread introduction of class 175 “Coradia” vehicles themselves capable of 100mph running, where a broadly 90mph route capability has been established between Crewe, Shrewsbury and Newport. This was optimal for predominantly 90mph class 158 passenger stock. Until relatively recently the Shrewsbury to Chester section only catered for slower, 75mph class 150 “Sprinter” suburban-style rolling stock, and therefore the mismatch now is more pronounced.

A further factor influencing capacity utilisation on the route, notably between Abergavenny and Hereford, is where passenger service growth has tended to reduce the number of available freight paths. In the event of actual freight growth alongside continued/predicted passenger train frequency improvement this will lead to a “gap”, and is dealt with in Chapter 6 accordingly.

In much of rural west Wales, and along the length of the “Heart of Wales” line from Craven Arms to Llanelli, utilisation is low and surplus capacity therefore exists.

3.7.3 Route 15 South Wales Valleys

3.7.3.1 Capacity

The nature of the route is such that trains from all eight extremities to the north and south of Cardiff pass through the central corridor of this largely self-contained urban network, between Cardiff Queen Street (North Junction) and Cogan. Route capacity, in terms of the number of paths consumed, is thus practically saturated by the twelve trains per hour pattern of services which currently operates, linking north and south of Cardiff. The most recent addition to the South Wales Valleys network was the extension from Barry to Bridgend via the Vale of Glamorgan, which commenced operation in June 2005 with hourly services, and brought the frequency of operation of the Barry line up from three to four trains per hour. These are dovetailed with another four trains per hour on the Penarth line, which hitherto only had three. Eight trains per hour therefore use the section between Cardiff and Cogan Junction, one-third more than the former combined frequency of six trains per hour.

Further pressure on the central corridor infrastructure is imposed by the recent re-introduction (in early 2008) of freight trains from Cwmbargoed to Aberthaw Power Station, which can only run (in daytime) at the expense of two passenger train paths.

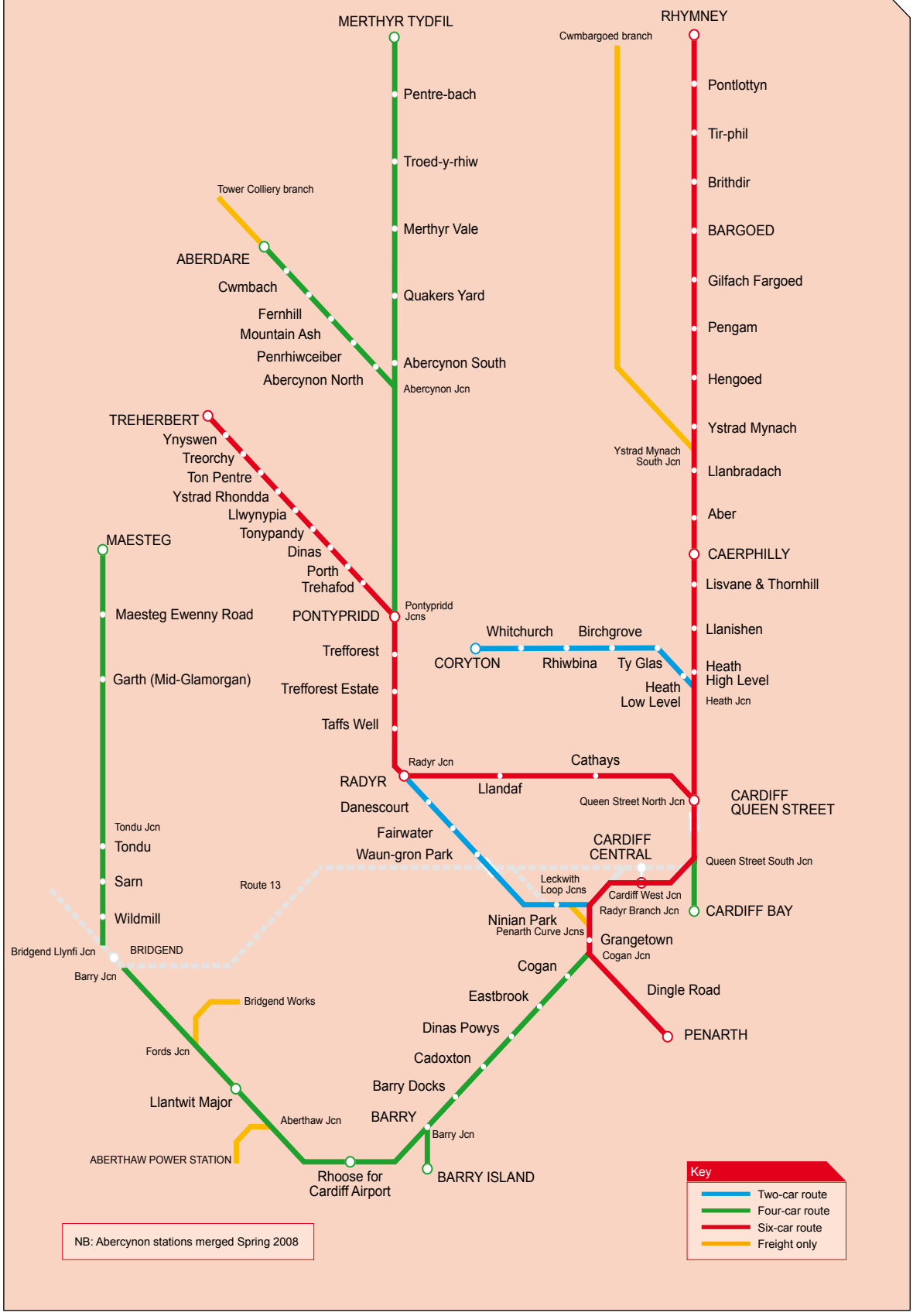
3.7.3.2 Utilisation

As practically all available paths through the Cardiff to Cogan Junction section are consumed, the strategy adopted to address passenger growth has been to accommodate steadily increasing passenger volumes by means of selective lengthening of train formations on the busiest individual corridors. (see Figure 22.) The current maximum train length that can be accommodated is 100 metres ie. four-car formations, and more than half of all peak hour services are diagrammed to be strengthened to four-car sets to cater for numbers mainly on the Taff corridor (between Cardiff and Pontypridd) and the Rhymney Valley (serving Caerphilly and Bargoed). A number of stations built to two-car capability (those in the Cynon valley, on the Aberdare line) have already been lengthened to four-car, and work took place during 2007/08 to handle six-car formations in future on other parts of the Valleys network, plus four-car formations on the Maesteg line (which will also serve local stations on the GWML between Cardiff Central and Bridgend). In this manner better utilisation is made of a finite number of paths in the short and medium term (see Figure 23)

Major signalling renewal of the Cardiff area presents an opportunity for more fundamental incremental capacity enhancement to permit an increase in the number of paths available through the “central corridor” for the medium and long term. This is explored further in Chapter 6, Gaps and options.

Figure 22 – South Wales Valleys – train lengths

Figure 23 – South Wales Valleys – train lengths with platform lengthening



3.7.4 Route 22 North Wales & Borders

3.7.4.1 Capacity

This route serves a number of diverse markets. The double-track line running along the north Wales coast provides most of the coastal towns with a direct link to Warrington (Bank Quay) and Manchester Piccadilly and thus good connectivity to the north-west, and Yorkshire and the north-east, as well as to Crewe for the south and the Midlands. In most hours the two trains per hour (ie. between Chester and Llandudno Junction) which operate only use a low/medium percentage of available capacity. Similarly the restricted service of six journeys per day on the Blaenau Ffestiniog branch and hourly services between Wrexham and Bidston represent low capacity take-up. Additional seasonal demand is met by strengthening with the deployment of two-car class 150 Sprinter trains instead of single unit class 153 operation, using the same paths.

The times at which the through London services are operated (which are additional to the ATW-franchised standard pattern domestic services) by high-capacity trains (mainly up to London in the morning, and returning down in the evenings) critically increase seating capacity at the times when it is most needed, reflecting business and day-out to the capital requirements.

As the “focal point” for a number of services (both within this RUS, and dealt with in the North Western RUS and the forthcoming Merseyside RUS), Chester station has limited capacity and imposes a degree of timetabling constraint which is undesirable. The West Coast Main Line timetable recast (in December 2008) will slightly accentuate this issue.

As a separate operation to the north Wales coast line and branches, the restricted passenger service (only operated outside the peak hours) between Ellesmere Port and Helsby carries very few passengers. Following disconnection of the refinery complex sidings at Stanlow, and cessation of forwardings from chemical plant sidings at Ince, available infrastructure capacity greatly exceeds current need.

Surplus capacity exists on the Wrexham-Bidston “Borderlands” line which is almost wholly double track but carries only an hourly passenger service, although the southern portion of the route to Dee Marsh (to the north of Shotton station) carries heavy axle-load freight traffic. The capacity (and performance) of this route is inextricably bound up with that of the electrified Merseyrail franchised network, in that Wrexham diesel trains are obliged to share extremely restricted facilities to turn back at Bidston station between intensive West Kirby electric services.

3.7.4.2 Utilisation

Utilisation of the North Wales Main Line (NWML) between Crewe and Bangor/Holyhead is mostly medium-category but this will slightly increase after December 2008. The major recast of Virgin West Coast services from London to the west Midlands, the north-west and Scotland will incorporate the introduction of a new hourly service from London to Chester, deploying class 221 “Voyager” five-car sets, with seven running into north Wales (to Bangor or Holyhead) giving a significantly improved overall service at Chester itself and the principal stations along the north Wales coast. Domestic Welsh services will be revised to integrate with the new pattern, which – taken together – will place slightly greater pressure on platforming at Chester. Greater utilisation (currently only at the low level) will also be made of the short branch connecting Llandudno Junction with Llandudno, to provide connections into and out of most Cardiff services. The Llandudno to Manchester service will also be adjusted such as to give more robust turnround margins at Manchester Piccadilly, in order to improve performance.

On the Wrexham – Bidston line the switch (from December 2006) from single unit class 153 operation to two-car class 150 Sprinter units reflected steadily growing demand, without any timetable alteration, thus giving improved capacity utilisation. The reduced dwell time of the newly introduced suburban-type units also aids timekeeping, which is further vulnerable to autumn adhesion problems.

3.7.5 Performance

3.7.5.1

A key influence on the operational performance of trains running within the Wales RUS area derives from factors outside the area, where long-distance services (from north Wales to Manchester and London Euston, from mid-Wales to Birmingham New Street and from south Wales to London Paddington and to Bristol and the southwest) share the network with other services often to highly utilised termini, over densely trafficked routes. In terms of delays attributable to Network Rail as the infrastructure provider the constraints of limited network capacity are further exacerbated by differing fleet performance features where 75/90mph types are pathed between trains capable of 100/125mph with differing acceleration and braking characteristics. In addition slower-moving freight accentuates this disparity of performance characteristics.

Conversely self-contained networks such as the South Wales Valleys, where passenger services no longer have any links to the GWML section, exhibit better performance characteristics, and all trains of one operator only are timed at the same speeds in an optimal manner without conflicts deriving from differing needs of multiple TOCs.

3.7.5.2

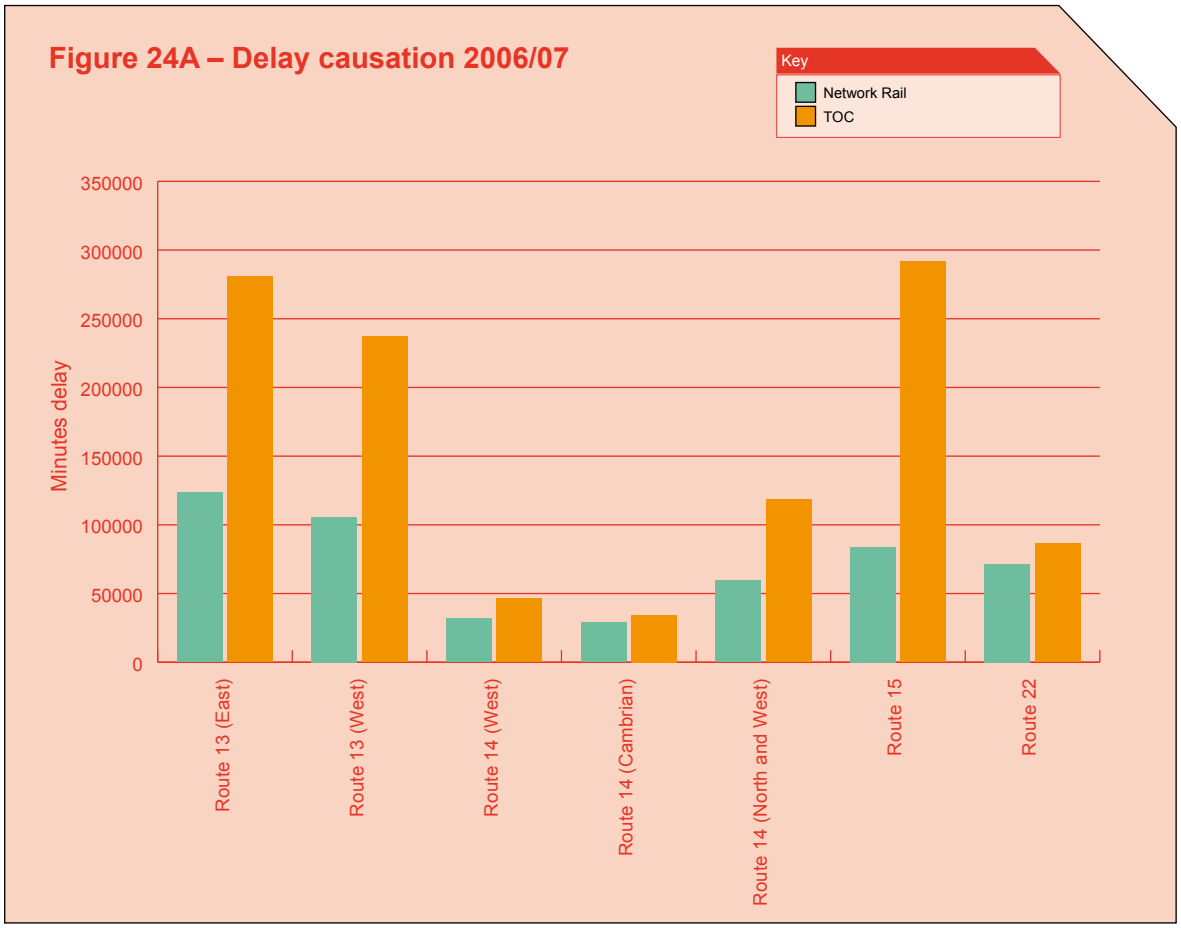
A strategic decision linked to the creation of the Wales-wide franchise was to pursue a focused train utilisation and maintenance regime such that fleet performance could be better managed, and the benefits of this approach have become apparent. Delays attributable to TOCs under the category Fleet are usually the predominant single cause, and after fleet shortages experienced in the first couple of years of the Wales & Borders franchise the situation has stabilised such that the principal depot at Cardiff (Canton) now exclusively services ATW needs with rolling-stock deployed in the West of England (ie. by FGW) now maintained at Bristol and elsewhere, freeing up capacity at Cardiff. Significantly better availability of the class 14x “Pacer” two-car units has been achieved in the last two years, reflected in Valleys performance levels, where this type is prominent in Wales.

3.7.5.3

Actual delay causation data for the year 2006/07 (baseline) is presented (in Figures 24A and 24B), primarily split between Network Rail and the Train Operators. It is further sub-divided into the five causes listed.

In terms of infrastructure reliability, this does not vary widely across the various route-sections in Wales. To the extent that long-life signalling equipment represents a key focus, much of that in the South Wales Valleys has been renewed, as has the Port Talbot area, with more major renewals programmed for the Newport and Cardiff areas, as well as the whole of the long Cambrian section. A clear asset strategy for the key engineering discipline of signalling has been developed over the past five to ten years, and which will continue to be implemented over the Wales RUS timescale.

Figure 24A – Delay causation 2006/07

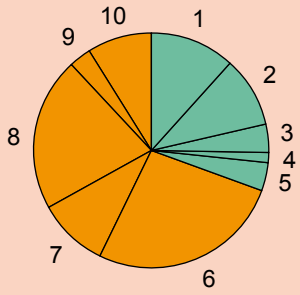


Delay causation – 2006/07

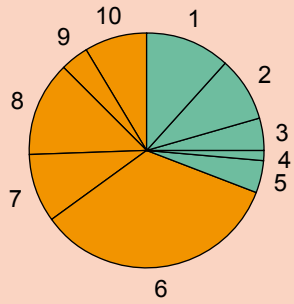
			Route 13 (East)	Route 13 (West)	Route 14 (West)	Route 14 (Cambrian)	Route 14 (North and West)	Route 15	Route 22
Network Rail	1	Points/Signals	47,454	40,559	11,918	8,741	15,955	22,587	24,738
	2	Network Management	39,640	30,128	8,337	6,220	13,057	18,356	10,128
	3	External	15,775	15,262	4,948	1,982	12,301	17,200	16,999
	4	Track	5,543	4,993	1,713	7,820	9,799	11,474	6,113
	5	Weather	15,218	14,880	4,769	4,063	8,457	14,401	13,354
		Subtotal	**123,630**	**105,822**	**31,685**	**28,826**	**59,569**	**84,018**	**71,332**
TOC	6	Fleet	108,312	117,858	23,378	14,306	47,411	105,292	35,122
	7	Train crew	38,924	31,621	8,500	3,650	16,456	16,778	8,615
	8	TOC (external)	85,851	44,908	2,650	1,421	33,335	133,362	16,287
	9	Stations	12,230	13,651	7,150	8,453	5,807	19,067	17,869
	10	Train operations	35,252	28,997	4,520	6,456	15,362	17,362	8,596
		Subtotal	**280,569**	**237,035**	**46,198**	**34,286**	**118,371**	**291,861**	**86,489**
		Grand total	**404,199**	**342,857**	**77,883**	**63,112**	**177,940**	**375,879**	**157,821**

Figure 24B – Delay attribution

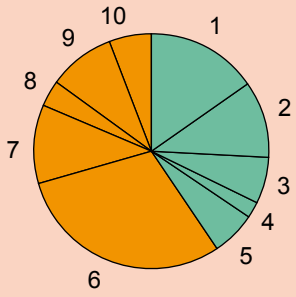
Route 13 (East)



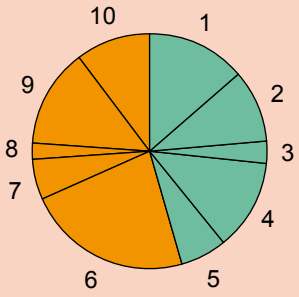
Route 13 (West)



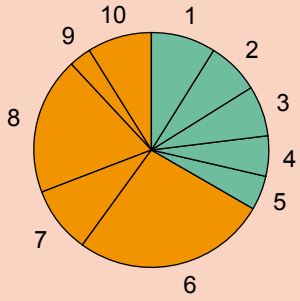
Route 14 (West)



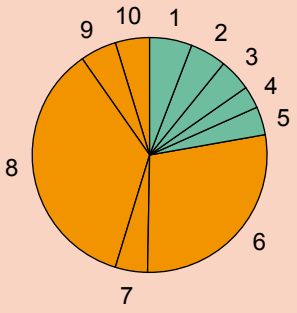
Route 14 (Cambrian)



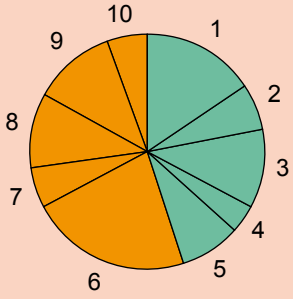
Route 14 (North and West)



Route 15



Route 22



3.7.6 Depots/berthing

The principal depots for the maintenance of trains in the Wales RUS area for the Wales & Borders franchise operated by Arriva Trains Wales are at Cardiff (Canton), Machynlleth (opened in August 2007) and Holyhead. The depot at Chester is operated by Alstom and handles the class 175 “Coradia” fleet now used wholly by the ATW franchise. ATW is a secondary user of the depot facilities at Crewe operated by LNW, and is likewise a secondary user at Shrewsbury of the depot facilities operated by London Midland.

Major depots of other operators in the Wales RUS area are those of First Great Western at Swansea (Landore), for long-distance London services and Bristol (St Philips Marsh) for urban Cardiff – Bristol and associated services.

In addition a number of overnight stabling-points throughout the Wales RUS area are used by ATW, and in each location there is a traincrew depot. These are located at Carmarthen, Pwllheli and Crewe, as well as at Chester station. For South Wales valleys services stabling points are used at Treherbert and at Rhymney. There is also a traincrew depot at Llandudno Junction (but no overnight stabling facility).

The other train operators providing services in the Wales RUS area are reliant on depot facilities located outside the Wales RUS area, namely:

CrossCountry: the Cardiff – Birmingham – Nottingham service is resourced from Birmingham (Tyseley) and Nottingham (Eastcroft) depots. (CrossCountry also use Bristol (Barton Hill) for the Cardiff extensions of their Bristol to Birmingham workings).

Virgin West Coast: the London – north Wales services are resourced from Manchester Longsight (the “Pendolino” electric fleet) and Derby Central Rivers (the “Virgin Voyager” diesel fleet).

Northern Trains: the Ellesmere Port – Helsby shuttle services are resourced from the Manchester (Newton Heath) depot, and integrated with local Warrington to Liverpool (Lime Street) services.

The open-access operator Wrexham, Shropshire & Marylebone Railway (WSM) uses network sidings at Wrexham General for overnight stabling.

3.7.7 Summary of baseline gaps

There are two distinct types of issue which are considered in this RUS, flowing from the baseline analysis of the way in which train paths on the network are used to meet passenger demand, and to connect sources and destinations of freight flows.

The first range of issues is about **utilisation** of the capacity available on the network as it stands, and identification of those locations where change will be required to address future growth.

The second range of issues is more to do with how passengers gain access to the network at **stations**, and that more are sought in line with new housing growth, as a reflection of demographic trends already captured in spatial plans and mirrored in the Regional Transport Plans.

For both of these general issues, it should be recognised that the current state of the network across the Wales RUS area, its extent, configuration and usage, reflects an upwards growth trend from the mid- to late-1980s. New generations of rolling-stock introduced then enabled the provision of more frequent services in some areas, in addition to which the passenger network in south Wales began to grow after a period of decline. Major industrial change in primary coal mining and steel manufacturing led to significant shifts in employment patterns in and around Cardiff. Thus the growth of passenger traffic has led to a situation where the network has generally become more intensively utilised, and in some cases train paths are now effectively full or nearly full.

The key theme, looking forward, is therefore how continuing growth in demand, coupled with pro-active stakeholder wishes for an increased modal split in favour of rail, can be catered for. This is more to reflect forward planning as distinct from reacting to an existing (or imminently projected) overcrowding situation arising from natural population increase and historic capacity shortage. The consequence of this on the gap analysis which follows is therefore less about the immediate ability of the network, or frustrated demand, but more about the timing of interventions, many of which are already recognised but not funded.

Figure 25 – Existing capacity utilisation

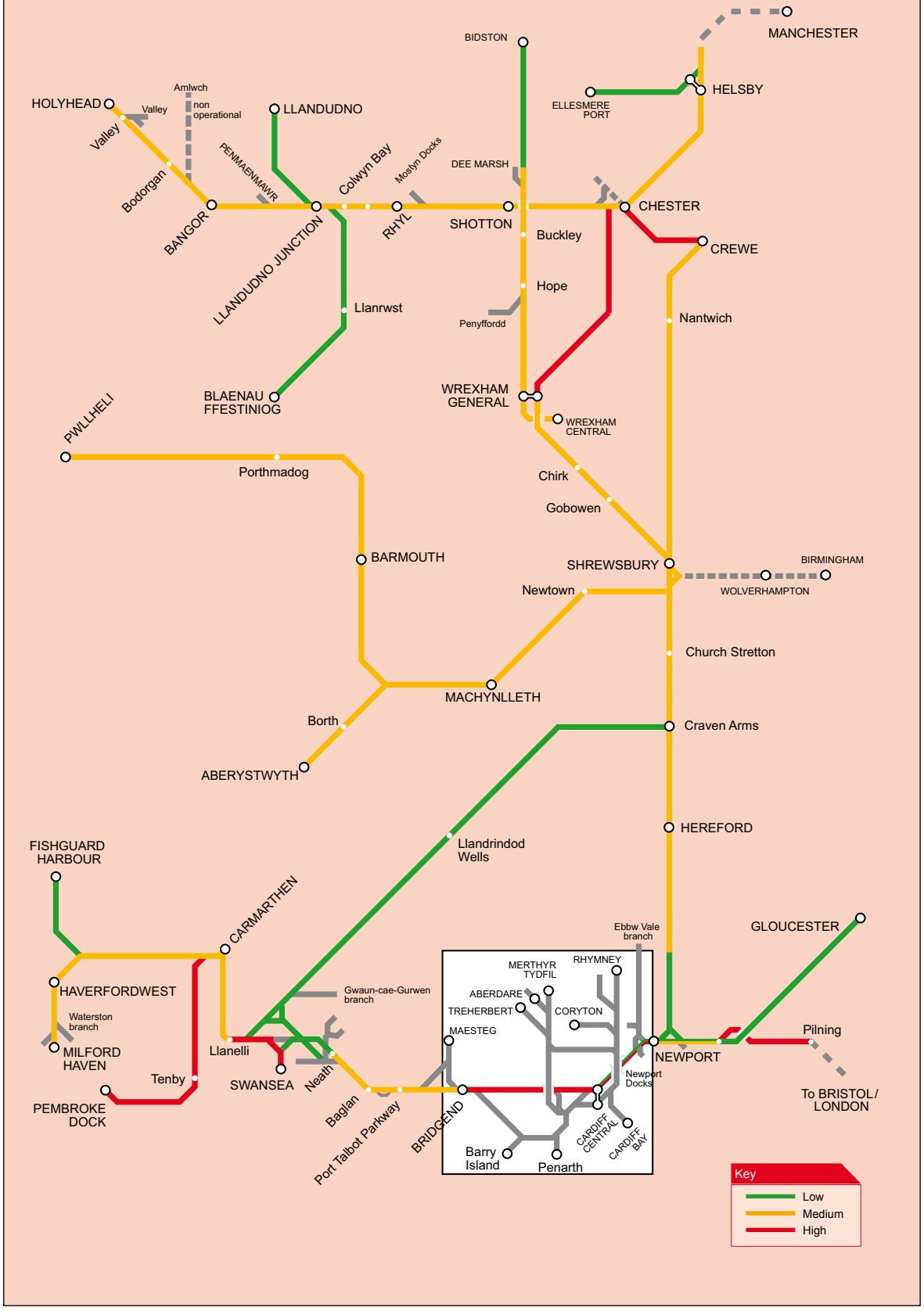


Figure 26 – South Wales valleys – existing capacity utilisation

3.7.7.1

In terms of **capacity utilisation**, the majority of the railway network in the Wales RUS area, around 900 route miles in total, is classified as low or medium use. (see Figures 25 and 26)

However, about 125 route-miles (approx. 15 percent) is classified as high utilisation, of which around half is within 30 miles of Cardiff. This is comprised mostly of the single-track extremities (approx. 48 route-miles) of the Valleys network, which see continual occupation and in effect operate at full capacity throughout the day, the balance being the 20 route-miles of the GWML between Cardiff and Bridgend (ie. the two-track section).

A key strategic development which took place in December 2005 was the introduction of the "Standard Pattern Timetable" across Wales, and which included more trains over long distances, and thus led to significantly increased capacity utilisation over a number of route sections, but which in itself was unaccompanied by any infrastructure enhancements (other than alterations to signalling on the Rhymney valley route between Ystrad Mynach and Bargoed, to accommodate four trains per hour rather than the three trains per hour hitherto).

The overall picture which emerges from baseline capacity analysis is that of a network where capacity on the four-track and double-track sections is broadly adequate for current and projected volumes, but **critically with a small number of significant "pinch-points"**. These tend to significantly restrict operational flexibility and can tend to create performance problems in the event of out of course running. They also cause sub-optimisation of pathing opportunities and occasionally extended journey times where single-line conflicts occur. This has been accentuated by increased frequencies of mainly very long-distance services, compared to shorter or more self-contained patterns.

To give an example, if a Manchester to Milford Haven service is slightly delayed at Stockport, it can miss its crossing of the WCML at Crewe, then run late over the 125-mile section to Newport, and subsequently miss its slot on to the GWML at Maindee West Junction, miss its booked platform at Cardiff Central and, in turn, miss its "slot" on the single-track (c.5 miles) section between Swansea and Llanelli. Conversely the linking up of formerly separate services is welcomed by passengers and has generated improved passenger volumes. The other principal section of singled (c.10 miles) former double-track main line, between Wrexham and Chester, now enjoys a doubled (ie. hourly in either direction) frequency of service compared to the two-hourly services that were the norm when the singling scheme was executed in the 1980s.

The trend of recent years has thus been that service provision across large parts of the Wales RUS area has expanded towards the limits of the available infrastructure, as constrained by the pinch-points which in themselves are comparatively short distances. A further constraint comes from **platform capacity at key stations**, notably Cardiff (both Central and Queen Street) and Chester. A number of schemes have already been instigated to address this longer-term general performance/capacity issue, the most notable of which was the addition of a fourth platform face (from July 2007) at Newport.

In addition to new infrastructure provided within Wales, long-term benefits to Wales accrue from additional platforms which have been constructed on the east-west axes at stations on the GWML in England used by Welsh services, for example at Swindon and at Bristol Parkway on the south Wales corridor, at Birmingham New Street and Wolverhampton on the mid-Wales corridor, and at Rugby on the WCML (South) on the north Wales corridor. Capacity across much of the Wales rail network is also influenced by platform capacity at Shrewsbury, a key interchange point

between routes. The GWML strategy is set to continue with more major interventions at Reading and Paddington which will beneficially impact upon reliability of established long-distance south Wales pathways.

The two-track section of the GWML in Wales between Cardiff and Swansea is under increasing pressure. To the extreme west of the GWML, between Bridgend and Swansea, the five local “Swanline” stations added to the network in 1994/95 impact upon route capacity as these are served by local stopping trains which are additional to the established through services.

On the more self-contained Valleys network, the pinch-point factor of the central corridor (between Cardiff Queen Street North Junction and Cogan Junction) was recognised some ten years ago as a constraint on pathing opportunities. The strategy adopted (prior to the major opportunity that re-signalling will present in 2012 – 2014) in recent years or so has been for train-lengthening, with platform-lengthening where appropriate, and which is ongoing.

Thus a **key theme** emerging from capacity baseline analysis was to recognise the **comparatively small number of pinch-points** affecting the long-distance services.

3.7.7.2

In terms of access to the network at **stations** throughout the Wales RUS area, these are plentiful inasmuch as on average there is one less than every four miles. The trend of the last twenty years has been the addition of a **substantial number of new stations** to the network. Many of these have been on re-opened branch lines although some have been added to main lines, in many cases at the sites of previously closed stations. Passenger traffic has thus, in many instances, grown in areas where freight has declined or disappeared, and continued further passenger growth may in some cases present a potential conflict with freight, a theme which is closely explored by this RUS. There are 248 stations in the Wales RUS area, of which 221 are in Wales and 27 are in England.

One new station at Llanharan (on the Great Western Main Line, between Cardiff and Bridgend) was opened during December 2007. In February 2008 a new train service commenced operation between Cardiff and Ebbw Vale and four of the six newly provided stations opened at the outset, the other two following in spring 2008.

Some of the new stations under consideration in the future are on main lines rather than on branches.

To put this passenger growth in context nearly all of the stations constructed in Wales in the twenty years prior to 2006/07 have been in the Sewta region, in south-east Wales (see Appendix B). Similarly, all seven further new station schemes in construction in 2007/08 were in this same region.

Looking ahead to the new stations under consideration by the four Welsh regional transport planning consortia, and the English shire counties and Merseyside & Halton Borough, the majority are again in south Wales, with some in the Wirral/north-west of England.

The comparatively small number of new stations now proposed during the Wales RUS ten-year timescale are described individually in the appropriate section of Chapter 6, Gaps and options.

4. Anticipated changes in demand

4.1 Future passenger demand

The starting point for forecasts of future passenger demand in the RUS area is the standard rail industry forecasting methodology as set out in the Passenger Demand Forecasting Handbook (PDFH). The Wales RPA was developed on this basis and forecasts all day growth of approximately 23 percent in eleven years to 2018/19 for all journeys, within, to and from Wales and approximately 34 percent in the nineteen years to 2025/26. These forecasts include predictable changes to the underlying factors such as the economy and the relative competitiveness of alternative modes of transport (mainly private cars); including rail fare increases at 1 percent above the retail price index. However they do not include any growth that might be stimulated by improvements to rail services over the RUS period.

In Wales historical analysis of journeys highlighted two concerns. The first is the long-term growth in commuting journeys into Cardiff and the second is recent all-day growth. Historical growth in commuting journeys to Cardiff has been higher than the PDFH forecasts for the period 1998/99 to 2005/06 by approximately 1 – 2 percent per year. Manchester and Leeds and other major urban areas outside London have also seen similar journey growth during this period. However, other urban conurbations in Wales have seen commuting journey growth broadly in line with the PDFH forecasts with some zones showing commuting journey growth lower than the forecasts.

The RUS explored the reasons for this growth. In part the growth has been stimulated by the introduction of the standard pattern timetable throughout Wales in December 2005 and also the introduction of ticket barriers at Cardiff's central stations. Stakeholders expect comparable growth in the short term since commuters by road now have longer journey times than the equivalent rail journey and car parking charges in Cardiff.

With stakeholder support, the RUS proposes a growth overlay for commuting flows to and from Cardiff for 2006/07 onwards. This starts at the current levels of 7 – 8 percent per annum and gradually reduces to 1.5 percent per annum in 2014. The Wales RPA growth forecasts for Cardiff commuting flows in 2016 of 1.2 percent per annum are proposed thereafter. This results in cumulative background growth forecasts for the commuting flows within the Cardiff zone for the eleven years to 2018/19 of approximately 44 percent with approximately 55 percent growth forecast to 2025/26.

In addition, in option development it is proposed to use a sensitivity test for commuting flows, of an extra 1 percent per annum in future years. This is to reflect the longer-term trend of growth in excess of PDFH forecasts. This sensitivity test forecasts commuting flow growth of approximately 61 percent to 2018/19, with 84 percent growth to 2025/26.

For commuting and all-day growth to destinations other than Cardiff, the situation is less clear. All-day journey growth in Wales since 2004/5 has been significant with growth of five percent or higher on the majority of routes in Wales in the calendar years to the end of 2007 and comparable growth in the first six months of 2008. However looking backwards, longer-term journeys growth has in some cases been significantly below the PDFH predictions. Therefore the RUS option appraisal uses the central case for

passenger journey growth of the Wales RPA growth forecasts with the Cardiff commuting adjustment. If the appraisal result has a quantified Benefit Cost Ratio (BCR) greater than two or less than one, then no additional demand scenario has been considered. All forecasts have associated uncertainties which are in part described by the relationship between how long short-term rates of growth will be sustained. Thus if the option appraisal estimates a quantified BCR of between one and two, then the potential demand on the route will be considered in more detail. The approach taken is to assess the order of change in background demand and new users needed to achieve a BCR of around two, and consider how this growth rate may be achieved.

In summary, as a result of this evidence and discussions with stakeholders, the RUS proposes central case forecasts for journeys to and from the Cardiff area for the commuting forecast of approximately 44 percent to 2018/19, with the all day forecast of approximately 29 percent to 2018/19. For the nineteen years to 2025/26 the comparable commuting forecast is approximately 55 percent, compared to an all-day forecast of approximately 39 percent per annum. Thus for journeys to and from the Wales RUS area the forecast growth is approximately 31 percent to 2018/19 and approximately 42 percent to 2025/26. Further detail by Wales RPA zone, for the RUS period of 2007/08 to 2018/19 are noted in Figures 27 – 29.

4.2 Future passenger train loads

The central case growth forecasts are reflected in the diagrams which indicatively outline crowding on Valley trains and South Wales Main Line trains west of Cardiff to and from the Cardiff central stations in the peak hour of 08:00 – 08:59 and 17:00 –17:59. The impact is outlined in Figures 30A/B and 31A/B. These figures note that a proportion of people are expected to stand for part of their journey on the majority of peak hour trains in both the am and pm. Indicative crowding on the Valley trains in 2018/19 is also shown on Figures 32 and 33. These figures note predicted crowding above train capacity on the routes to Pontypridd, to Ystrad Mynach and also to Cadoxton.

However the platforms on stations on the Treherbert and Rhymney routes are being lengthened to enable six-car trains to stop at these stations. Therefore when train lengthening is introduced on these routes the extent of train crowding is reduced. Figures 34 and 35 outline the indicative impact of this change if the trains are lengthened by 2018/19. Train crowding above capacity remains on the Barry line to Cadoxton since these stations do not have capability to take six-car trains, although these stations have capacity to enable four-car trains to call at these stations. Subject to value for money criteria, crowding greater than capacity could be reduced as part of a reconfiguration of the overall valley rolling stock use on these services.

The actual effects in future years may be more variable than is noted on these figures. In particular the 17:21 Cardiff to Maesteg train has a wide range of usage and so may be crowded above the current train capacity, especially on the first part of its journey to Llanharan; however the route has capacity for four-car trains which could assist to address this issue.

Figure 27 – Forecast growth 2018/19 in the Southern RUS area

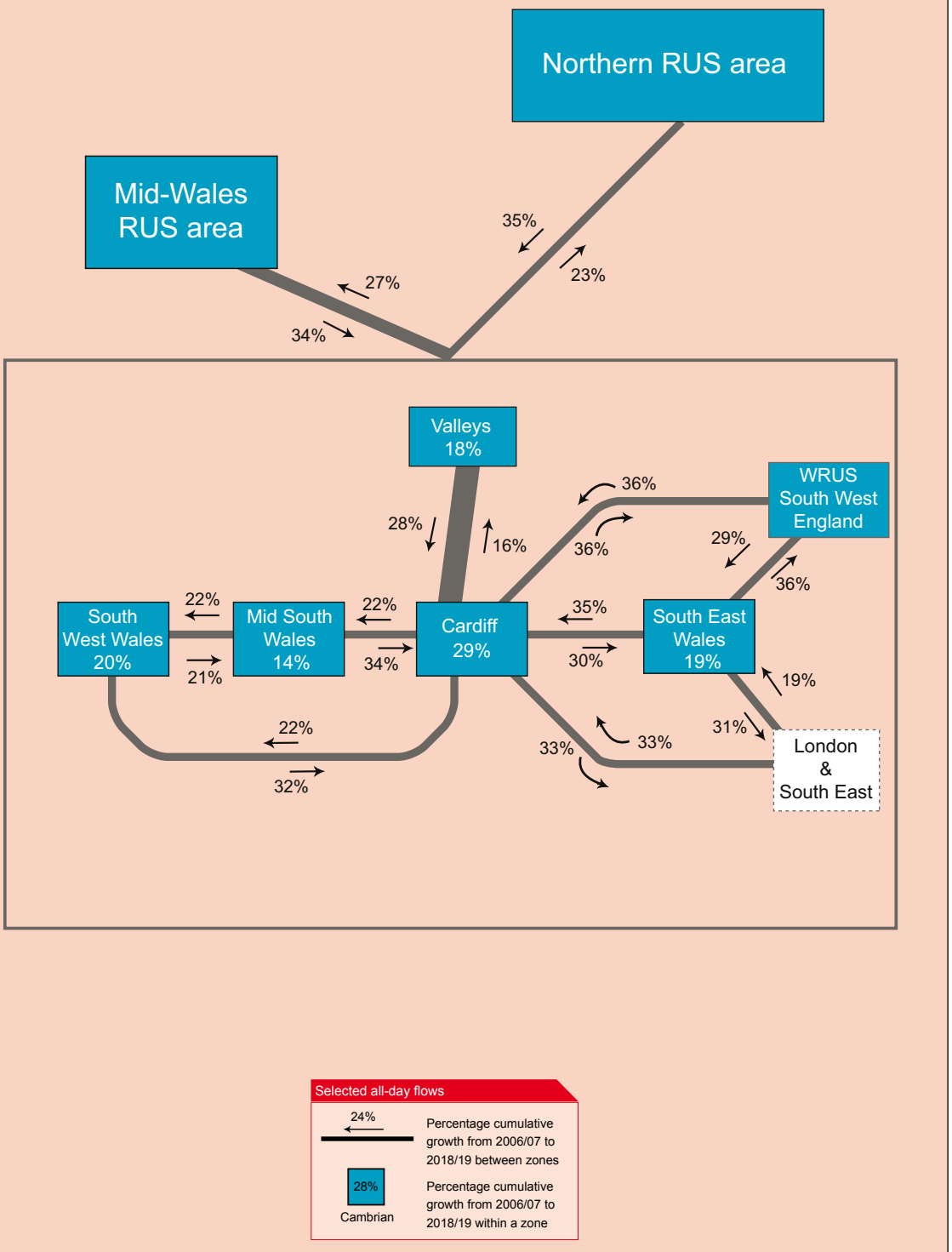


Figure 28 – Forecast growth to 2018/19 in the Mid-Wales RUS area

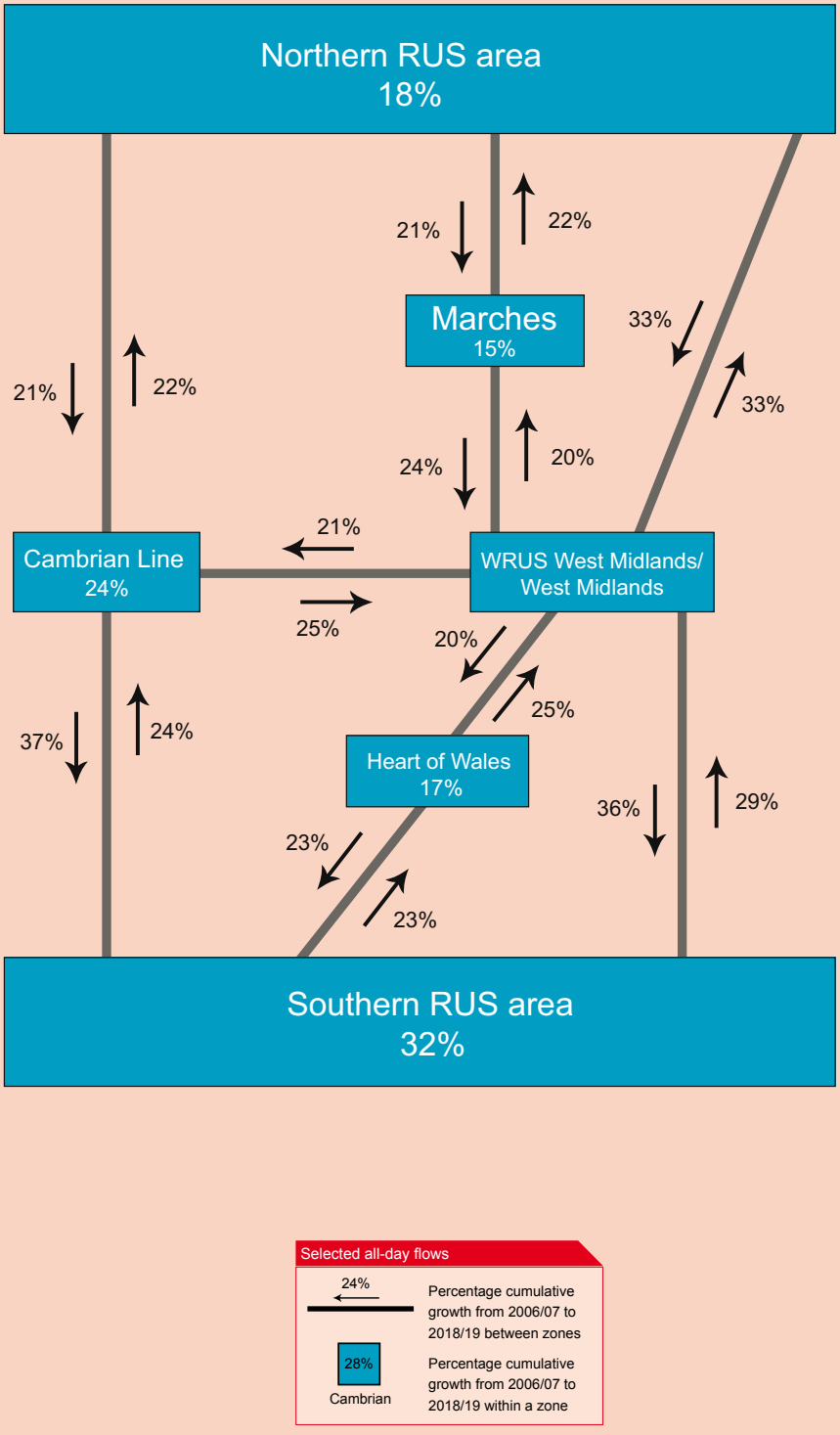
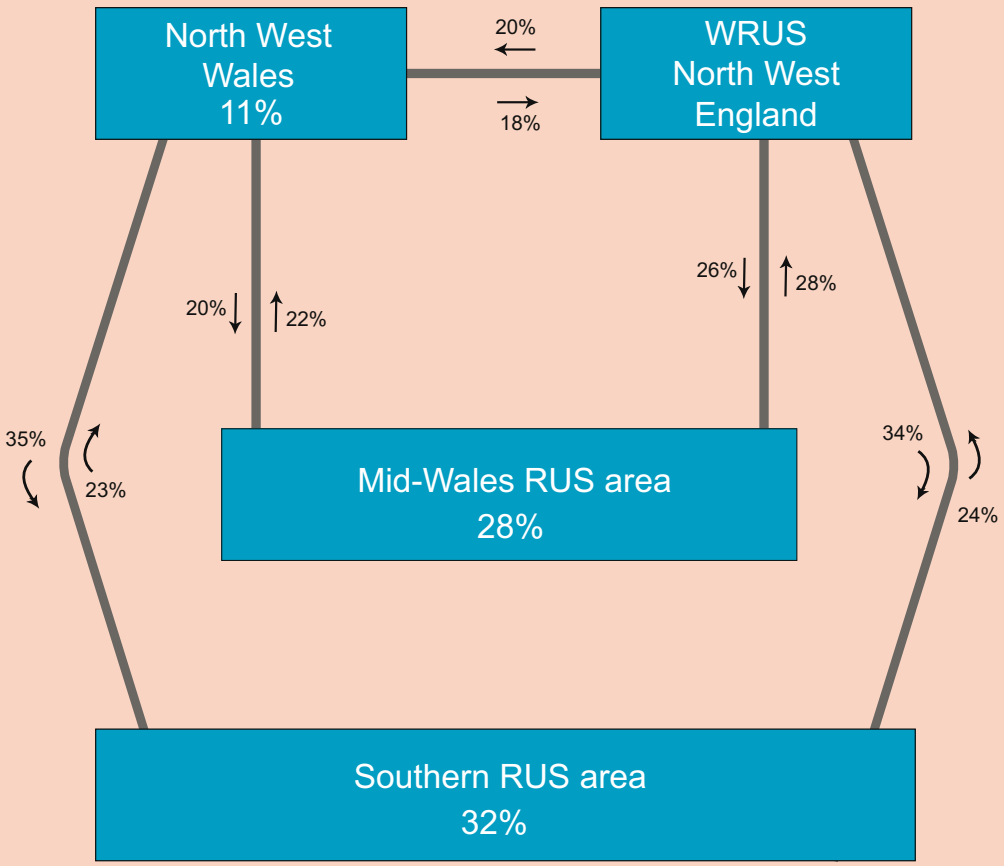


Figure 29 – Forecast growth to 2018/19 in the Northern RUS area



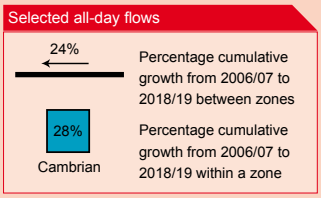


Figure 30A – 2018/19 forecast loadings on Valley services arriving at Cardiff between 07:00 – 09:59 (44% RUS growth forecasts)

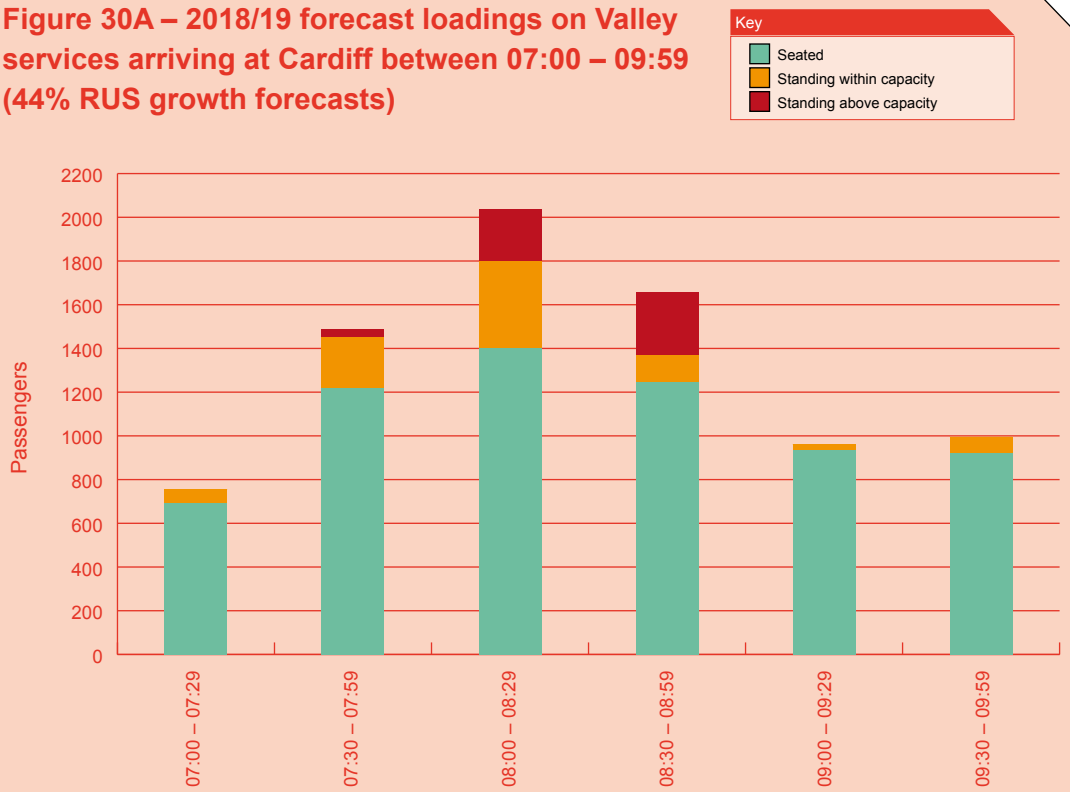


Figure 30B – 2018/19 forecast loadings on west of Cardiff (South Wales Main Line) services arriving at Cardiff between 07:00 – 09:59 (33% RUS growth forecasts from 2007/08)

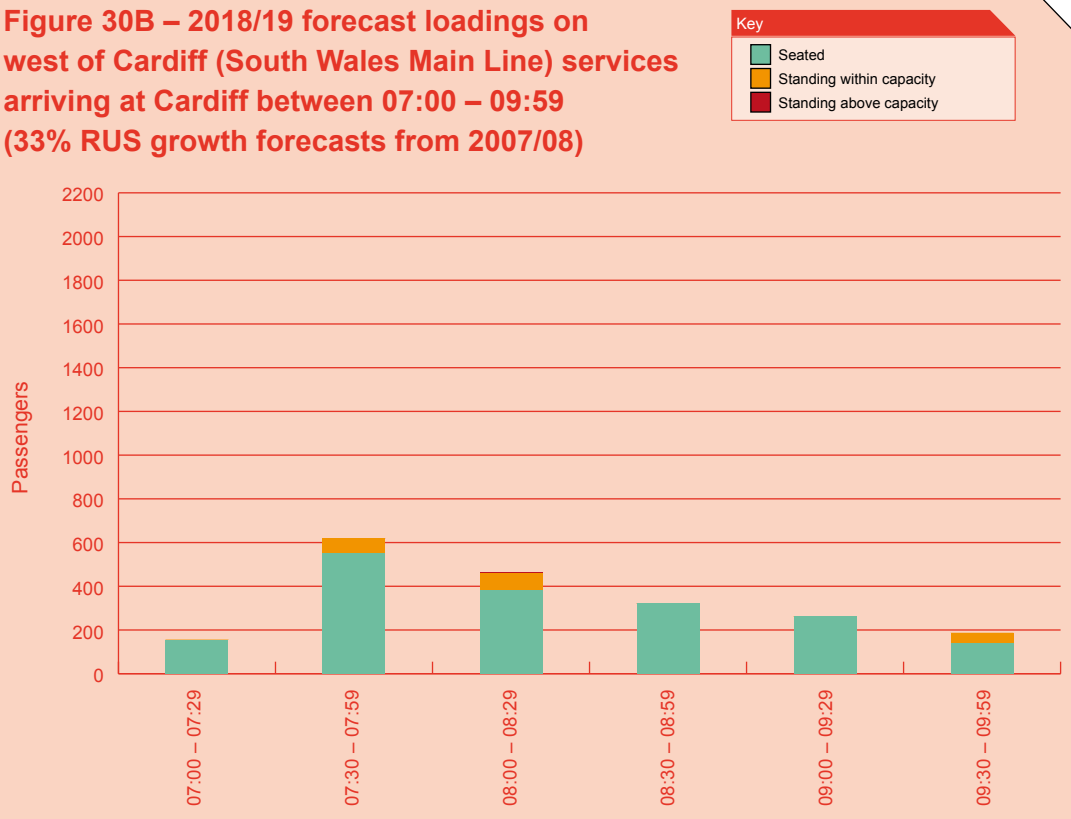


Figure 31A – 2018/19 forecast loadings on Valley services departing Cardiff between 16:00 – 18:59 (44% RUS growth forecasts)

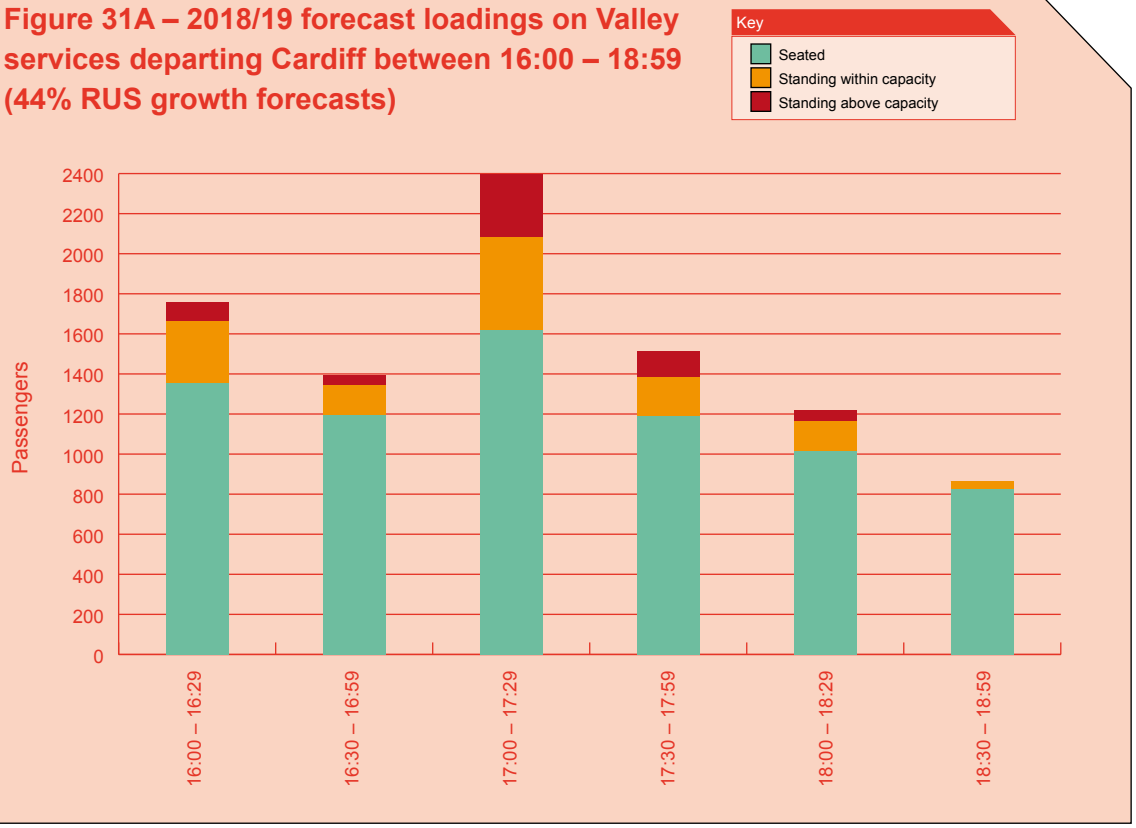


Figure 31B – 2018/19 forecast loadings on west of Cardiff (South Wales Main Line) services departing Cardiff between 16:00 – 18:59 (33% RUS growth forecasts from 2007/08)

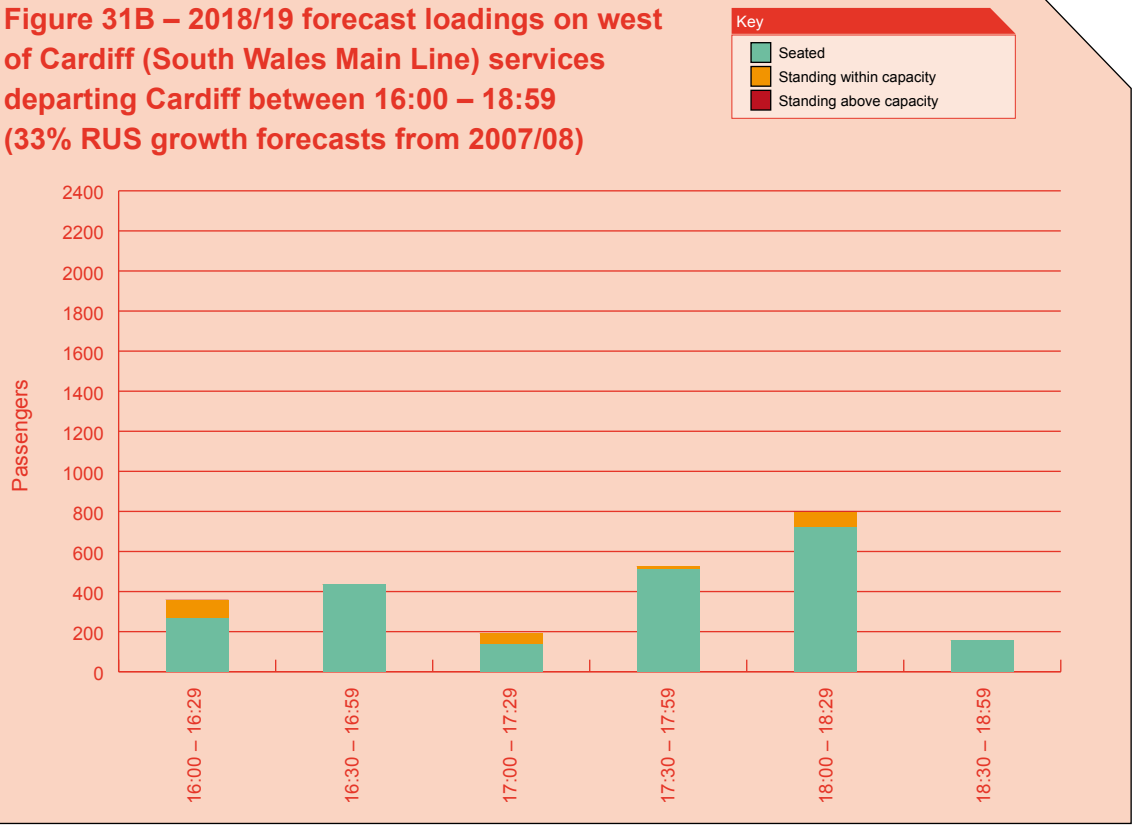


Figure 32 – South Wales crowding around Cardiff predicted for am peak hour (08:00 – 08:59) in 2018/19

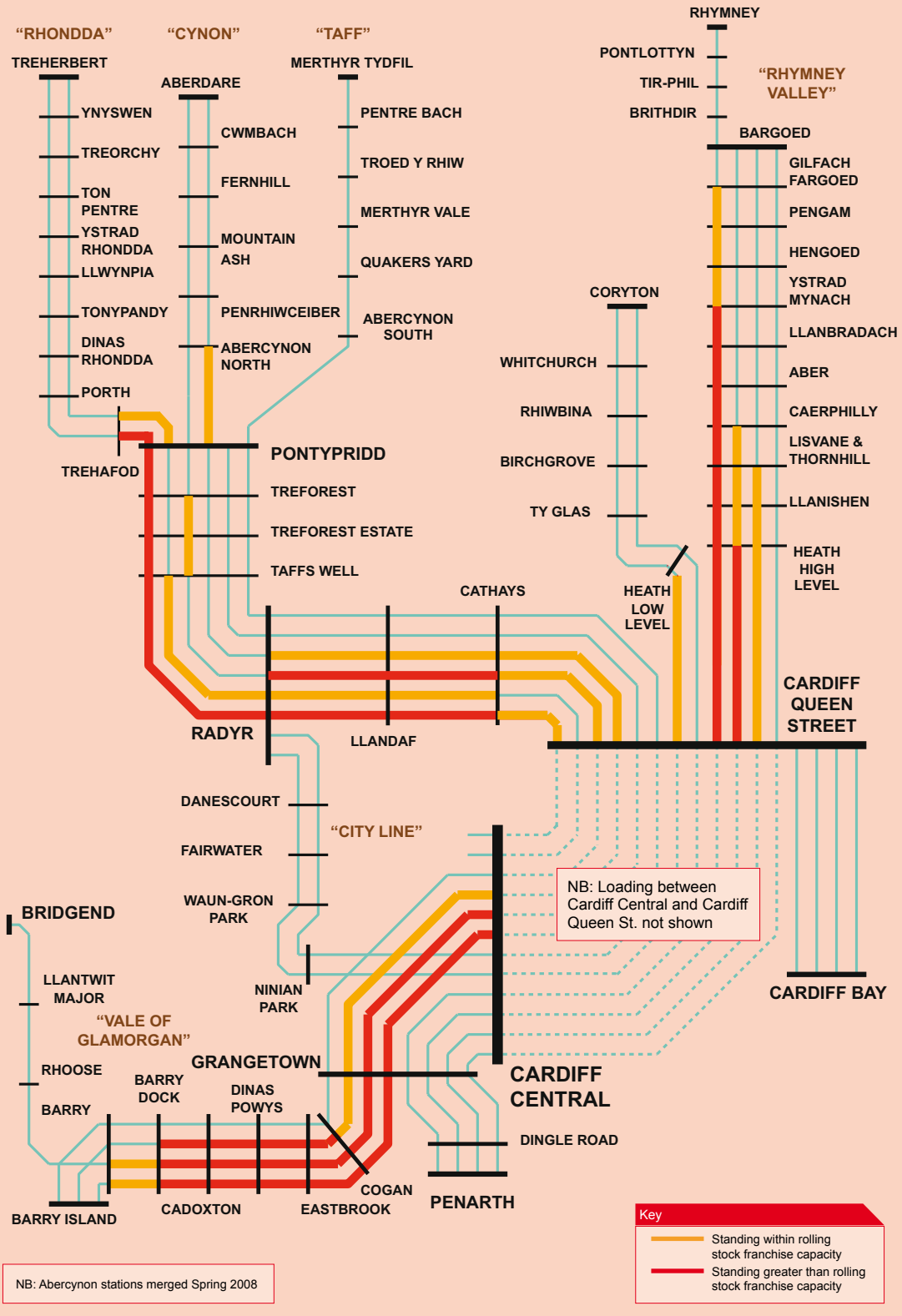


Figure 33 – South Wales crowding around Cardiff predicted for the pm peak hour (17:00 – 17:59) in 2018/19

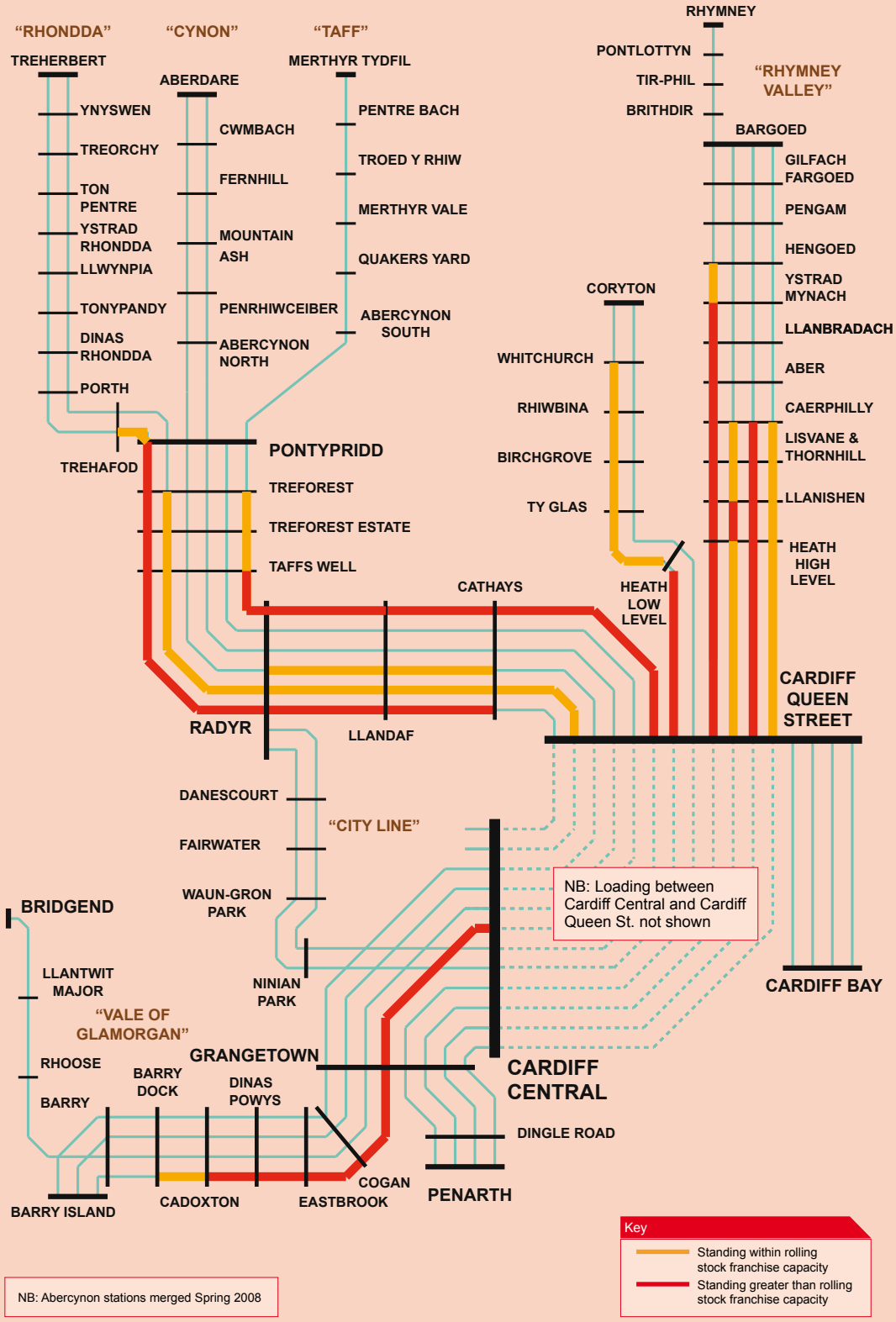


Figure 34 – South Wales crowding around Cardiff predicted for am peak hour (08:00 – 08:59) in 2018/19 with six-car trains from Treherbert and Rhymney to Cardiff

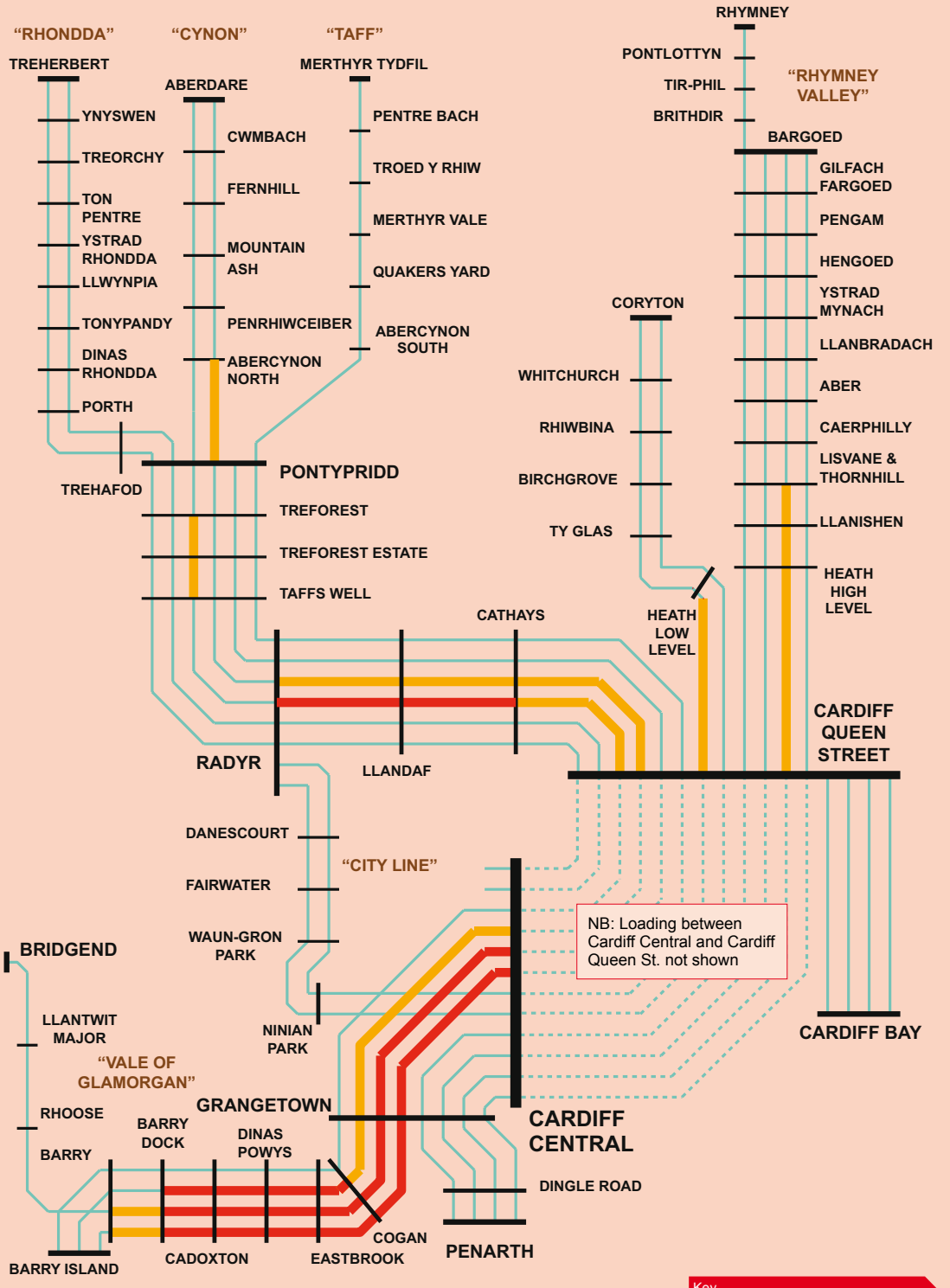
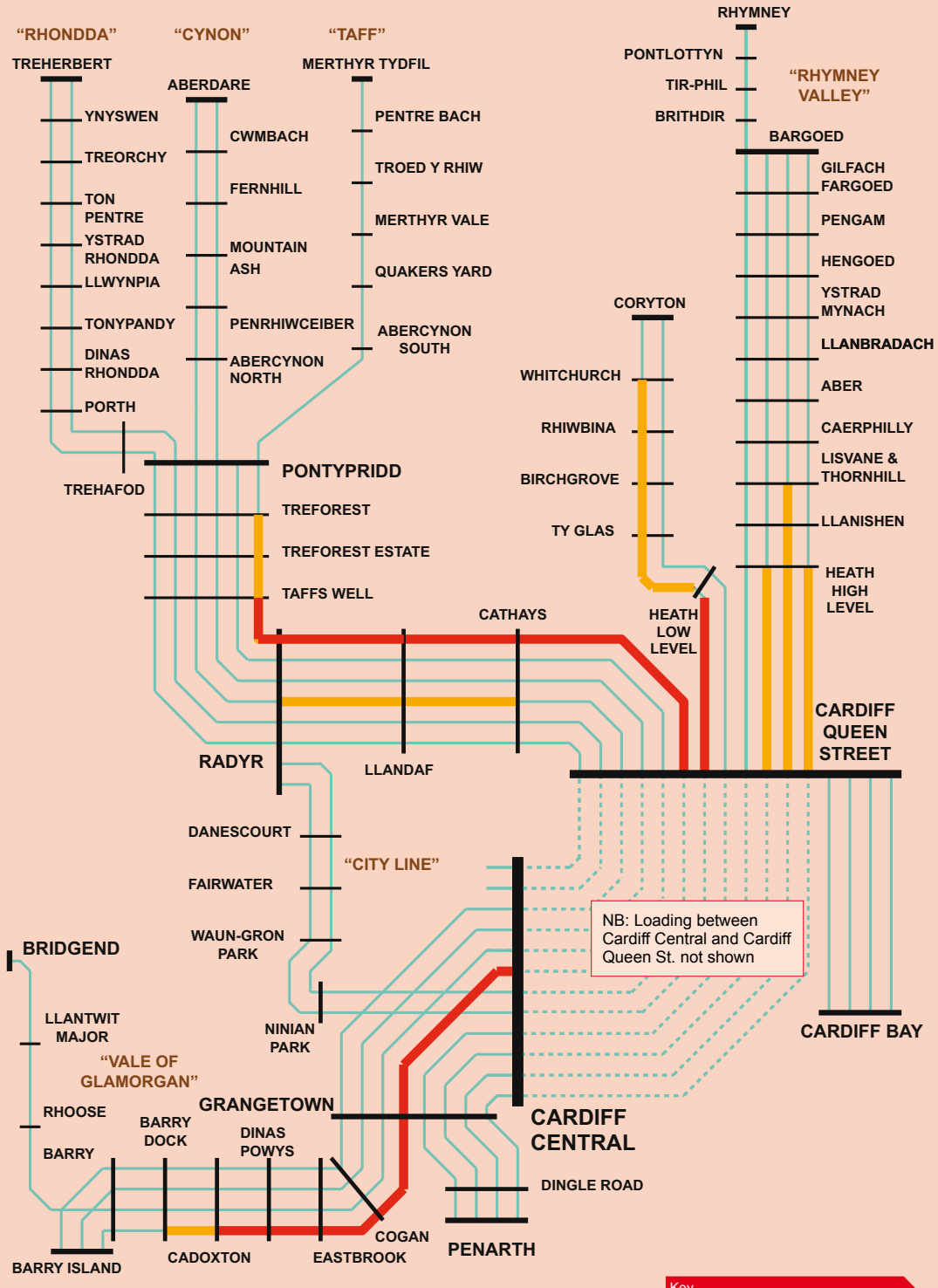


Figure 35 – South Wales crowding around Cardiff predicted for the pm peak hour (17:00 – 17:59) in 2018/19 with six-car trains to Treherbert & Rhymney to Cardiff



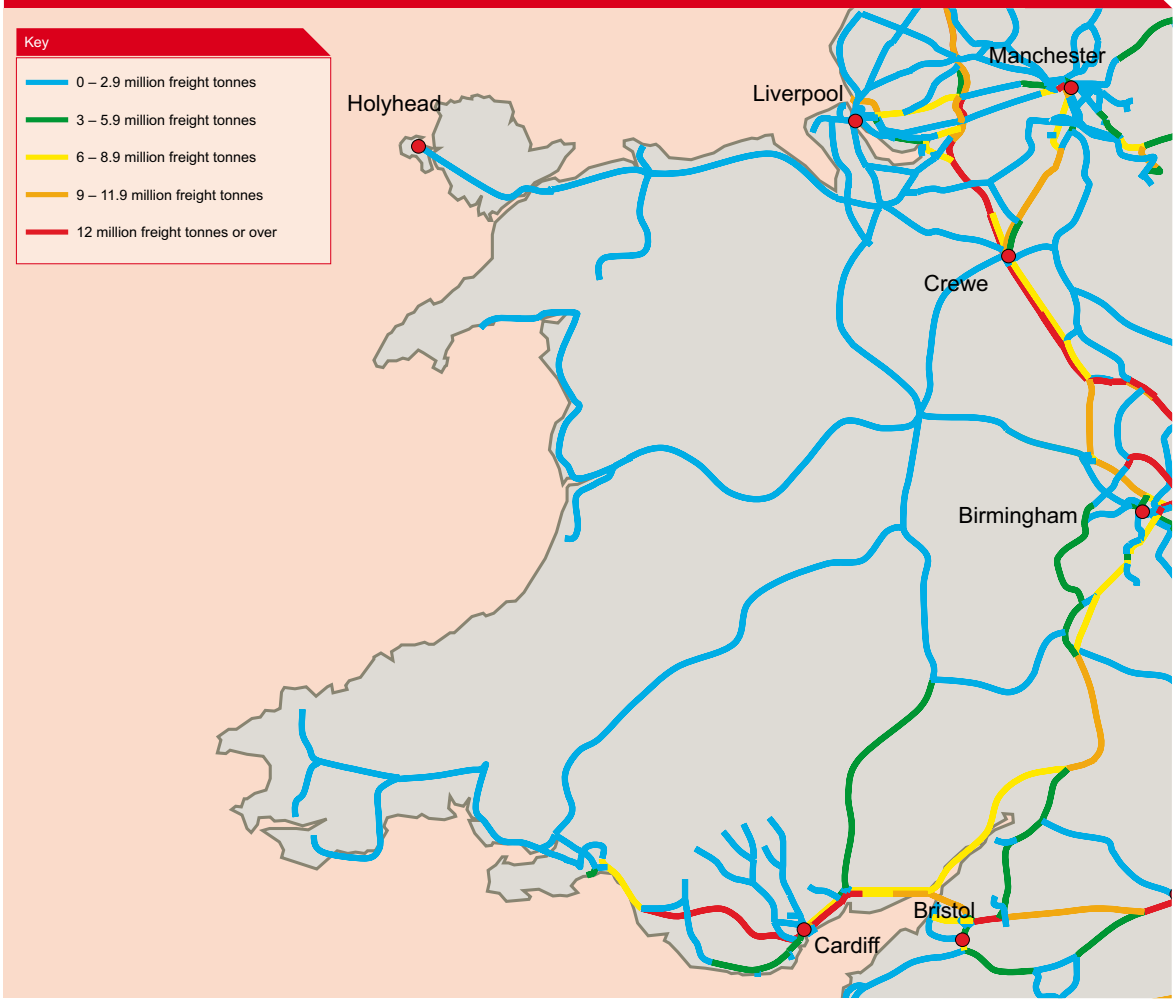
4.3 Future freight demand

Freight demand forecasts were developed for the whole of England, Scotland and Wales in the Freight Route Utilisation Strategy (Freight RUS) which was published in March 2007. The forecast freight demand for bulk commodities including Electricity Supply Industry (ESI) coal and the maritime intermodal container market were estimated using two methodologies: 'bottom up' developed by the Rail Freight Operators Association and 'top down' from the Rail Freight Group and Freight Transport Association, which analysed outputs from the GB Freight Model. The latter is an established modelling tool employed by the Department for Transport (and formerly the Strategic Rail Authority) to forecast freight growth.

The freight demand forecasts are for the ten years to 2014/15 and in the Wales RUS area there are expected to be modest changes to traffic from the base year of 2004/05. The forecast to 2014/15 noted in the Freight RUS Figure 4.1 shows a change of up to 4.9 extra trains per day for the whole of the Wales RUS area. The effect upon the freight tonnes moved per annum is more variable. The results to 2014/15 are noted on the extract of Freight RUS Figure 4.3 included here. The routes with the greatest change are the South Wales Main Line (SWML) and the north/south route to Crewe. Traffic on the SWML is forecast to increase to between six and over 12 million freight tonnes per annum. Likewise there is an increase in traffic on the north/south route from Newport to Crewe to between 3 to 5.9 million freight tonnes per annum. The Freight RUS notes that 'there are no significant capacity gaps identified in Wales…' and suggests in Table 5.7 three freight issues to be dealt with in the Wales RUS. Current expectations for further growth are expected to be accommodated within the existing infrastructure capacity. The forecast changes in trains per day for the key markets of construction, metals and petroleum are described in Figures B2 – B4 in Appendix B of the Freight RUS. It is expected that the general pattern of forecast growth defined in the Freight RUS will continue for the remaining years of the Wales RUS.

Longer-term forecasts are being considered by the industry and these take cognisance of the national planning framework. The Welsh Assembly Government support freight by operating a freight facilities grant scheme to encourage modal shift of freight from road to rail.

Freight RUS Extract: Figure 4.3 Gross tonnage on the network in 2014/15 for Base Case



5. Planned schemes

5.1 Introduction

This section lists the significant investment to the railway network in the Wales RUS area that is currently anticipated to be completed in the forthcoming years (ie. to the end of railway Control Period 4, in 2014), as part of our planned track and signalling renewals programme, as well as enhancements. Renewals often provide the most cost-effective opportunity to realise infrastructure enhancements as the incremental cost of progressing these, in conjunction with planned works, is generally significantly lower than progressing them as stand-alone projects.

5.1.1 Overview: asset-age profile

The overall context of this list should be seen alongside the trend of steadily increasing demands on network capacity (as described in the baseline gaps summary in Chapter 3) which will in turn necessitate **enhancements to signalling equipment**, and which will often be accompanied by physical works such as additional tracks or platforms or other structures. Signalling equipment is a long-life asset, and the current overall schemes outlook is for substantial renewals across much of the country.

Figure 36 illustrates the spread of different signalling systems across the Wales RUS area.

5.1.1.1 Main lines

A large proportion of the overall signalling renewals programme for the Wales RUS area will be in the south-east of the country, which reflects the installation of extensive new systems there in the 1960s which are now reaching the time to be renewed. Most of the South Wales Main Line (SWML) running across the country, from the Severn Tunnel towards Swansea and Llanelli, was then provided with Multiple Aspect Signalling (MAS) using Track Circuit Block (TCB) methods. Large numbers of mechanical signalboxes were superseded, and the new signalling enabled trains to operate at close headways.

As these installations are now approaching the end of their design life, this factor has influenced planning to cater for changed traffic requirements, as the opportunity now exists to implement changes in conjunction with renewals.

Less renewal of mechanical signalling took place along the north Wales coast line. The areas around Chester & Rockcliffe Hall, and in the immediate vicinity of Llandudno Junction utilise similar systems to those in south Wales but are newer, dating mainly from the 1980s.

Figure 36 – Signalling systems

5.1.1.2 Secondary and rural routes

Major investment took place on the rural lines in mid-Wales in the 1980s. This enabled a substantially reduced operating cost-base to be achieved through extensive signalbox closures, and the installation of a radio-based system on the Cambrian Lines (RETB), supervised from a central point at Machynlleth. On the lightly used Heart of Wales Line a No-Signalman Token (NST) system was installed, supervised from Pantyffynnon. The RETB arrangements on the Cambrian Lines were designed to last for around twenty years, in line with radio frequency availability, and the decision was taken in 2006/07 that this was the most appropriate UK location for renewal with the first application of ERTMS. The NST system on the Heart of Wales Line (between Craven Arms and Pantyffynnon, north of Llanelli) is not yet due for renewal.

The long north-south route between Newport and Crewe/Chester largely retains its original mechanical signalling, as does the Wrexham to Bidston branch, and much of the north Wales coastal main line, plus west Wales. Renewal is not planned until after the end of this RUS period i.e. not before 2019/2020. Where necessary on grounds of condition, minor works may be undertaken.

5.1.1.3 The Cardiff urban network

A different set of circumstances apply to the cluster of urban lines radiating from Cardiff, where exceptional funding circumstances which applied in the former county of Mid-Glamorgan (in the late 1990s) were able to be exploited. The timing of infrastructure renewals was synchronised in order to be optimised alongside the availability of EU Objective One funding in that area.

This was in recognition of the growth trends experienced during the 1990s which necessitated greater capacity provision than that which could offered by the original, ageing mechanical signalling regime. Much of the "Taff Vale" section of the South Wales Valleys network formerly controlled from a group of old signalboxes has been progressively renewed this century, and is now controlled from a modern signalling centre at Radyr. This, together with other physical works such as station improvement and platform lengthening which required minor signalling enhancement, has effectively set the strategy for this local network.

The installation of this new signalling equipment in much of the South Wales Valleys network was a major step forwards towards the creation of increased overall network capacity, and which was provided in anticipation of subsequent enhancement of the Cardiff Queen Street North Junction to Cogan "central corridor" for forecast long-term growth. This is planned to be delivered in conjunction with future Cardiff Area Signalling Renewal (CASR) works.

5.2 Planned renewals

The asset-age profile described is such that practically no signalling renewal activity took place in the Wales RUS area during the 1990s. The high-level national strategy for signalling renewal that was developed during this period and to date identified that, on condition grounds, the TCB systems throughout south Wales would progressively be renewed from around 2002/03 onwards with modern, Solid State Interlocking (SSI) signalling-based systems ultimately capable of being controlled from a single signalling centre. The national programme further set out that ERTMS methods would generally apply elsewhere, and that the first installation of this technology would be on the Cambrian Lines.

These factors have therefore driven the forward programme across the Wales RUS area since the late 1990s. Individual renewal schemes typically take between four to seven years to plan, design and implement. During this time Network Rail has worked with external stakeholders to identify incremental enhancement scheme opportunities which might be integrated with renewals, in order that synergies can be achieved, and detailed consultation has been underway since 2005/06 to set the strategy for the future capability needed.

The overall signalling renewal programme can most easily be summarised on a route by route basis, below:

Route 13 Control of the South Wales Main Line (SWML) section of the Great Western Main Line is exercised from three 1960s panel signalbox installations (PSB) at Port Talbot, Cardiff and Newport, covering the routes between Llanelli and the Severn Tunnel Junction and Chepstow.

The eastern portion of the Port Talbot PSB area (Port Talbot Signalling Renewal, PTSR) was renewed during the period 2004 to 2007, as the first phase of a programme to progressively renew the signalling infrastructure of the SWML. The opportunity was taken to carry out extensive rationalisation of facilities no longer required, whilst at the same time a modest degree of enhancement was completed to cater for expected future requirements and to better handle those periods when maintenance is carried out and to avoid the need for route closure, by installation of bi-directional working capability between Bridgend and Port Talbot. (The western portion of the Port Talbot PSB, handling the routes between Port Talbot, Swansea and Llanelli, is not yet due for renewal.)

The Newport PSB area (Newport Area Signalling Renewal, NASR) will be renewed next, in two phases over the periods 2008 – 2010 and 2012 – 2014, and preliminary works commenced in 2006/07 to enable rationalisation of the redundant aspects of the layout. These took account of a substantial increase in passenger traffic volumes since the 1990s, offset against the gradual reduction of freight traffic flows following colliery closures in the Newport valleys and cessation of steelmaking at Llanwern and the closure of the Ebbw Vale steelworks. An additional platform was opened at Newport station in August 2007, and new freight depot facilities were provided within the Alexandra Dock Junction complex to better cater for continuing freight movements. A key element of future rationalisation yet to be delivered is the reconfiguration of the layout at Severn Tunnel Junction station, to enable installation of more easily maintained trackwork.

The final element of SWML signalling renewals, CASR, will address the Cardiff Central PSB area, handling the main line from a point midway between Newport and Cardiff to a point approximately midway between Cardiff and Bridgend, near Llanharan.

Work commenced in 2007 on the construction of a new Signalling Control Centre for the whole of south Wales, at a site at Cardiff Canton, on the opposite side of the tracks to Canton depot, on land owned by Network Rail. The control of all three PSB areas described above will migrate into this new facility by 2014 – 17.

Route 14 Renewal of the radio-based signalling equipment for the whole of the Cambrian Lines, between Shrewsbury, Aberystwyth and Pwlhelli, is programmed to take place during 2007 – 2010 utilising ERTMS methodology. Control will continue to be exercised from a new centre at Machynlleth in order to ensure a seamless transition from the existing arrangements.

(The cluster of mechanical signalboxes in west Wales will be retained although Pembrey and Kidwelly might be consolidated.)

No renewals are planned for the Heart of Wales route between Craven Arms and Llanelli, nor for north-south between Chester/ Crewe and Abergavenny, except possible rationalisation of signalboxes locally within the Shrewsbury area.

Route 15 A large proportion of the South Wales Valleys route is controlled from a comparatively new Signalling Centre located at Radyr, covering the sections between Cardiff (Cathays), Pontypridd and Porth up the Rhondda Valley to Treherbert, towards Abercynon, and the “City Line” between Radyr and Ninian Park. One other signalbox will remain in the valleys, at Abercynon, to control the routes to Aberdare and to Merthyr.

The renewal of so much of the signalling covering the South Wales Valleys was carried out through the "Taff Vale Renewals" programme in 1996 – 2001, in conjunction with substantial Third Party and Objective One funded enhancements.

CASR will in addition embrace the busy central corridor of the South Wales Valleys between Cardiff Queen Street North Junction and Cogan Junction, and further incorporate the whole of the Rhymney Valley and Vale of Glamorgan sections into its scope. The whole will interface seamlessly with the earlier Radyr scheme, and has been developed in the expectation that further major enhancements will be required to be delivered alongside the renewed signalling systems.

Route 22 Except for the section between Rockcliffe Hall and Prestatyn, no major renewals of signalling equipment on this strategic route section are planned until after the time-frame of this RUS, other than minor works.

5.3 Enhancements (general remarks)

Although enhancements required by external stakeholders can often be delivered more cost-effectively at the time of asset-renewal than if procured independently, a considerable number of schemes have nonetheless been delivered independently of the main signalling renewal programme.

In some cases, enhancements have been funded by Network Rail directly where this has been justified through bettered performance, by reducing the exposure to penalty payments to train operators as the basis for incremental investment. An example of this has been the provision of a new, signalled turnback facility at Port Talbot station, within the PTSR programme, and the fourth platform at Newport ahead of the main NASR programme.

As far as possible where enhanced signalling has been recently installed, it has been carried out in such a manner that newly installed assets at old signalboxes can be adapted to new systems at minimum cost rather than being discarded. (An example of this is the new Vale of Glamorgan line mini-panel installed at Aberthaw Signalbox, and signalling equipment around Llantwit Major, which will be controlled from Cardiff in the future).

For trackwork, a number of sections of route within the South Wales Valleys (Route 15) have been renewed in the last ten years, and in many cases the opportunity was taken to improve linespeeds where old flat-bottomed or bullhead track was replaced by new steel-sleepered materials. Such enhancements were partly funded by Network Rail but critically exploited Third Party incremental funding to give higher speeds than would otherwise have been possible, on targeted sections to yield the greatest performance benefits.

For structures, a significant number of bridges and viaducts classified as "major structures" exist within the Wales RUS area, and some present an opportunity for enhancement where renewal of assets possibly 100 to 150 years old is due. An example is the Loughor viaduct, between Gowerton and Llanelli, originally dating from circa 1860, and which is due for renewal by 2012/13. The double track on this viaduct was reduced to a single line in 1986 to effect track renewal economies in combination with five miles of singling between Swansea (Cockett) and Llanelli (Duffryn), when the operational requirement at that time could be satisfied by such single-track provision. Recent passenger traffic growth has placed this section under greater operational pressure. Rather than Network Rail simply carry out its own structural renewals on a like-for-like basis, it was agreed with Welsh Assembly Government (WAG), as the major external stakeholder, that the options for reinstatement of double track would be developed in conjunction with structural assessment of the condition of the viaduct, in order that works potentially can be combined incrementally to minimise the cost of such network enhancement. This issue is discussed further in Chapter 6, Gaps and options.

5.4 The approach to Third Party investment in the Wales RUS area

A rolling programme of investment to enhance the railway network in Wales has been funded by the major stakeholder Welsh Assembly Government (WAG) and its predecessors over last 20 or so years, as new stations such as Cwmbran were added to the network (in the late 1980s) or new routes such as the Maesteg line (in the early 1990s). These were originally funded through Transport Grant awards to local authorities, and more recently using the powers established in The Railways Act 2005. These have generally been delivered by Network Rail, or in some cases by others through the Asset Protection agreements framework.

5.4.1 Delivery methods

5.4.1.1 Network Rail delivered projects

WAG has engaged contractually with Network Rail for delivery of enhancement schemes it wishes to see implemented either directly (for major projects) or has provided funding through individual unitary authorities for smaller schemes. A number of these schemes have been wholly expansion-driven and of a "stand-alone" nature unrelated to any renewals, one such example being the construction (in 2001/02) of a new section of line through Mountain Ash, on the Aberdare section of the South Wales Valleys route, together with the provision of a new passing loop facility to enable doubled passenger train frequencies over the single track route from Abercynon to Aberdare to be operated. The scheme followed on from earlier works to divert a nearby river, and were seen as part of a wider urban regeneration programme, using EU Objective One funding in conjunction with direct Welsh government support, for the client Rhondda Cynon Taff.

5.4.1.2 Projects delivered by Third Party contractors

As an alternative delivery mechanism, WAG has procured a major enhancement scheme, the reopening to passenger services of the Ebbw Vale branch line between Newport (Park Junction) and Ebbw Vale, by means of direct engagement with its own contractors, on completion of which the works were formally "handed back" to Network Rail for integration into the national network and subsequent maintenance. Network Rail carried out an "Asset Protection" role whilst works were underway on the branch line, effectively detached from the "live" running lines of the GWML section at Ebbw Junction. Again, the funding package for these major works was drawn together from a combination of EU Objective One funding following closure of the Ebbw Vale steelworks and job losses, in conjunction with direct Welsh government support, for the client Blaenau Gwent.

In addition Merseytravel has been a key investor in rail enhancement schemes in the north-eastern part of the Wales RUS area and adjacent region.

These schemes in the Wales RUS area are described here in terms of those underway or committed, and those at an advanced stage of feasibility. All represent future enhancements to infrastructure that will increase network capability beyond that set out in the preceding baseline chapters, and permit greater outputs to deliver explicit stakeholder growth requirements.

5.4.2 Recently completed and current schemes (to end of Control Period 3, 2004 – 2009)

A number of schemes have been recently implemented in the Wales RUS area and a further range of committed schemes is either currently under construction or planned for completion in the current Control Period up until 2009. By strategic route these are as follows:

Route 13 Great Western Main Line

Newport An additional fourth platform was added at Newport station during summer 2007, as an initial phase of works to take place between 2008 – 2011 to reconstruct the entire station and provide new bus interchange and expanded car-parking facilities. Completion of this enhancement ahead of actual signalling renewal enabled major renewals of switches

and crossings throughout the complex Newport station area to be carried out with minimal disruption to through services, by use of either of the two pairs of platforms created, and has left the configuration of the layout there ready for the next phases of signalling equipment renewals work.

Llanharan New station at Llanharan (between Pontyclun and Pencoed). Fully WAG-funded, to serve major local housing development on former colliery site. Llanharan station opened in December 2007, and is mainly served by existing hourly Cardiff to Maesteg services.

Ebbw Vale line Reopening to passenger traffic of the line from Ebbw Junction (west of Newport) through Park Junction to Ebbw Vale Parkway. This line serves five newly constructed intermediate stations at Rogerstone, Risca, Crosskeys, Newbridge and Llanhilleth, with an additional hourly train service between Cardiff Central and Ebbw Vale Parkway. The route opened in February 2008 and all six new stations were operational by spring 2008.

Route 14 South & Central Wales & Borders
Cambrian Lines Provision of ERTMS new signalling system in 2007 – 2010 (Network Rail-funded) to replace RETB signalling,

Cambrian Lines In conjunction with signalling renewal, the provision of additional passing loops (at Dyfi Junction, higher entry/exit speeds at Talerddig loop, and a lengthened dynamic loop at Welshpool) for improved performance and enhanced capability for future hourly service frequencies. The track has also been lifted at Dyfi Junction to reduce flooding risk. This is jointly funded between Network Rail and WAG.

Shrewsbury Enhanced capability for Platform 3 to cater for increased Cambrian Lines throughput, together with improved passenger access. This is proposed to be funded by Network Rail, WAG and Shropshire County Council, plus DfT Access for All grant assistance.

Route 15 South Wales Valleys
Vale of Glamorgan line The route between Barry and Bridgend was added to the South Wales Valleys network in June 2005, and hourly train services between Cardiff and Bridgend, serving new stations at Rhoose and at Llantwit Major were opened, with WAG-funded interchanges.

Maesteg branch Extension of platforms to four-car capability, to be completed during 2008. 100 percent WAG-funded.

Rhondda valley, Rhymney valley, Penarth branch# Extension of platforms to six-car capability, to be completed during 2008. 100 percent WAG-funded.

Merthyr line, half-hourly capability# Construction of a new passing-loop at Merthyr Vale to enable hourly Merthyr line frequency to be doubled, together with integration of the separate (North & South) stations on the Aberdare and Merthyr lines at Abercynon to become one, was completed during 2008. This scheme is 100 percent WAG-funded.

Route 22 North Wales & Borders
Chester station improvements.

Shotton improvements to interchange between low level and high level platforms.

Blaenau Ffestiniog branch new freight terminal Construction of new siding and slate waste handling terminal facilities at Blaenau Ffestiniog, together with branch track and structures upgrade, to Llandudno Junction station, and extended passing loop at Llanwrst, for trainload export of slate waste to destinations in north-west and West Midlands regions. (This development is subject to a successful Freight Facilities Grant application being made).

Wrexham General station Construction of traincrew accommodation, for the new Wrexham – London through services to be provided by open-access operator WSMR in 2008. Provision of train stabling facilities in the formerly disused bay platforms at the south end of Wrexham General station.

The Valleys platform lengthening and Merthyr line schemes (above) will build on the Standard Pattern Timetable (SPT) framework of twelve trains per hour through the Cardiff Queen Street North Junction to Cogan corridor, utilising existing infrastructure between those points, and will deliver (in conjunction with progressive train lengthening, introduced incrementally as required by increasing demand) the passenger growth capability envisaged to cater for short- and medium-term growth.

5.4.3 Potential enhancements in Control Period 4, 2009 – 2014

A number of potential enhancement schemes are planned for the Wales RUS area in the next Control Period 2009 – 14. By strategic route these are as follows:

Route 13 Great Western Main Line
Pilning Up and Down Goods Loops
Linespeed upgrade and conversion to passenger status, to give additional capacity and improved operational capability and reliability for the Severn Tunnel.

Newport Area Signalling Renewal (NASR) In conjunction with this, provision of an additional (fourth) platform at Severn Tunnel Junction station, and linespeed upgrade (not yet committed) between Severn Tunnel Junction and Newport over the Relief Lines.

In conjunction with the potential development of a service between Ebbw Vale and Newport, provision of a facing crossover on the Main Line at Gaer Junction, west of Newport.

Cardiff Area Signalling Renewal (CASR) In conjunction with the renewal, enhanced platform capability at Cardiff Central station, East Junction major re-modelling, increased bi-directional running capability, additional west-facing bay-platform, new connection Platform 4 to Valley lines.

Route 14 South & Central Wales & Borders
Crewe/Chester to Shrewsbury & Newport
Linespeed upgrade for reduced north-south journey times, plus possible redoubling of the single-track Chester (Saltney Junction) to Wrexham section for enhanced capacity. Signalling enhancement (up direction) at Abergavenny to improve headways (NRDF scheme).

Shrewsbury Abbey Foregate triangle
Provision of full-length goods loop between Shewsbury (Abbey Foregate) and Shrewsbury (English Bridge Junction) for through freight traffic avoiding Shrewsbury station, and enhanced bi-directional signalling on the southern approach routes to Shrewsbury station.

Cockett – Duffryn redoubling Restoration of double track on a five-mile section of the route between Swansea and Llanelli, in conjunction with structural renewal of the Loughor viaduct, for increased capacity and improved route performance, and potential development of Gowerton station as local interchange for Swansea west. (This is under consideration as an increment to the viaduct renewal works, themselves to be funded by Network Rail in 2010 – 2012, without prejudice to any funding/implementation date for the increment assuming provision is made.)

Route 15 South Wales Valleys
Longer-term growth capability In conjunction with CASR, creation of four through platforms for Valleys services at Queen Street and Cardiff Central stations, to cater for up to 16 trains per hour capability through the central corridor, and enhanced junction arrangements at Cogan. Provision of a fifth (bay) platform at Cardiff Queen Street station for self-containment of Cardiff Bay shuttle services. Remodelling of the Treforest East Curve (between Cardiff West Junction and Ninian Park, by Canton) to double-track, City Line speed upgrade to facilitate additional Merthyr line fast trains. An additional (bay) platform at Cardiff Central for Maesteg/GWML services, notionally Platform 5. A further platform at Cardiff Central for additional Valleys services, notionally Platform 8.

Barry additional turnback facilities at Barry station.

Pontypridd and **Caerphilly**, additional turnback facilities by means of additional south-facing bay platform at each. WAG-funded.

Route 22 North Wales & Borders
Both – assumed key funder Merseytravel.

Halton Curve (Feasibility to GRIP3) Reinstatement of bi-directional working to enable new, direct passenger train services between Chester and Liverpool Lime Street, serving Runcorn and Liverpool South Parkway.

Extension of Merseyrail electrified network (Feasibility to GRIP3) Electrification from Bidston towards Woodchurch/Shotton with the option of complete electrification through to Wrexham (which is proposed to be part WAG funded), and partial or complete replacement of Bidston – Wrexham diesel services by through electric trains from the central Liverpool loop.

6. Gaps and options

6.1 Gaps: process

Introductory remarks

A RUS Gap is broadly defined as the difference between what the system can currently supply, in terms of infrastructure and train services, and what is demanded of the system, in terms of what it needs to do for passenger and freight requirements, and at suitable levels of performance.

The overall process adopted during the Wales RUS process was first to identify and catalogue where gaps exist, as perceived by stakeholders across the whole industry, who were brought together as the Wales RUS Stakeholder Management Group (SMG). The "long list" of gaps thus assembled was then subjected to detailed analysis by this group, and sifted, in order to systematically identify those considered to need further, more detailed analysis.

This chapter outlines the process in detail before listing the actual gaps which were initially identified in the Wales RUS area. It then goes on to describe the way in which they have been analysed and developed in order to shape and define subsequently an emerging overall strategy.

6.1.1 Types of gap

Following the baseline processes described in the preceding chapters, each item was considered by the Wales RUS SMG in accordance with whether the type of gap was arising from:

Performance – where the performance outputs of the railway system fall short of requirements P

Journey times – where location to location journey times (passenger or freight) do not meet current or future needs T

Capacity – where the size, number and mix of services (passenger and/or freight) does not meet current or future needs C

Each was further classified by category:

- Supply and Demand mismatched now N
- Supply and Demand predicted will become mismatched in the future F
- Funders "key outputs" that are in scope and consistent with funds that are or are likely to be available O

6.1.2 Identification of gaps/issues

6.1.2.1 Baseline

The base-lining stage of the collation of data for the Wales RUS involved the calculation of capacity utilisation figures for the 900 or so route-miles of rail network in the defined area of scope. There is a considerable degree of correlation between those sections with **high utilisation** and items already within the Network Rail Route Plans for possible interventions within these sections. The gaps identified by this means are largely related to the contents of Chapter 3 (Current capacity, demand and delivery). The twin baseline themes that emerged out of this chapter, those of network capacity utilisation, and access to the network at stations, were summarised in section 3.7.7

6.1.2.2 Future

As well as measuring the utilisation of network capacity, the analysis of passenger loadings from individual train count figures pointed towards current overcrowding or locations where at expected growth rates, if projected forwards, **overcrowding** within the 10-year RUS timeframe might be expected in the absence of any other intervention. The gaps identified by this means are related to the contents of Chapter 4 (Anticipated changes in demand).

Publication of the White Paper in 2007, and the High Level Output Statement (HLOS), set out explicit targets to be met in this regard, in terms of load factors to be achieved by 2014.

6.1.2.3 Funders Key Outputs

The published plans of the four regional transportation planning consortia in Wales (Sewta, Swwitch, TraCC and Taith) plus those of the Welsh Assembly Government and Merseytravel were reviewed in order to catalogue the full range of Third Party funder aspirations, and which formed the bulk of the identified gaps and issues. Submissions from the English border shire counties, Passenger Focus and from individual user groups also formed an input into the overall preparation of the long list. During 2006/07 the first round of Welsh Regional Transportation Plans (RTPs) were being prepared in draft form, and thus plan scrutiny involved liaison with the four consortia regarding their earlier plans and in some cases individual Local Transport Plans (LTPs).

The relationship between the RTPs and the Wales RPA was set out in section 2.2.2 Planning Context. The gaps identified by these means are related to the contents of Chapter 5 (Planned schemes).

6.1.3 Classification of gaps

Each identified gap was numbered in accordance with its location within the 26 national strategic routes, of which four constitute the Wales RUS area, viz:

13	Great Western Main Line (ie. in south-east Wales)
14	South and Central Wales and Borders
15	South Wales Valleys
22	North Wales and Borders

Each was then classified according to type (performance, journey time, or capacity) and timescale (now, future or funder output). The distribution of the gaps across the Wales RUS area can be seen in Figure 37. They are fairly broadly spread with some clustering in the more densely populated, urban areas.

Then followed a brief qualitative description of the perceived nature of the gap, then, the source of the issue (in italics), and then any brief explanatory comments that were relevant.

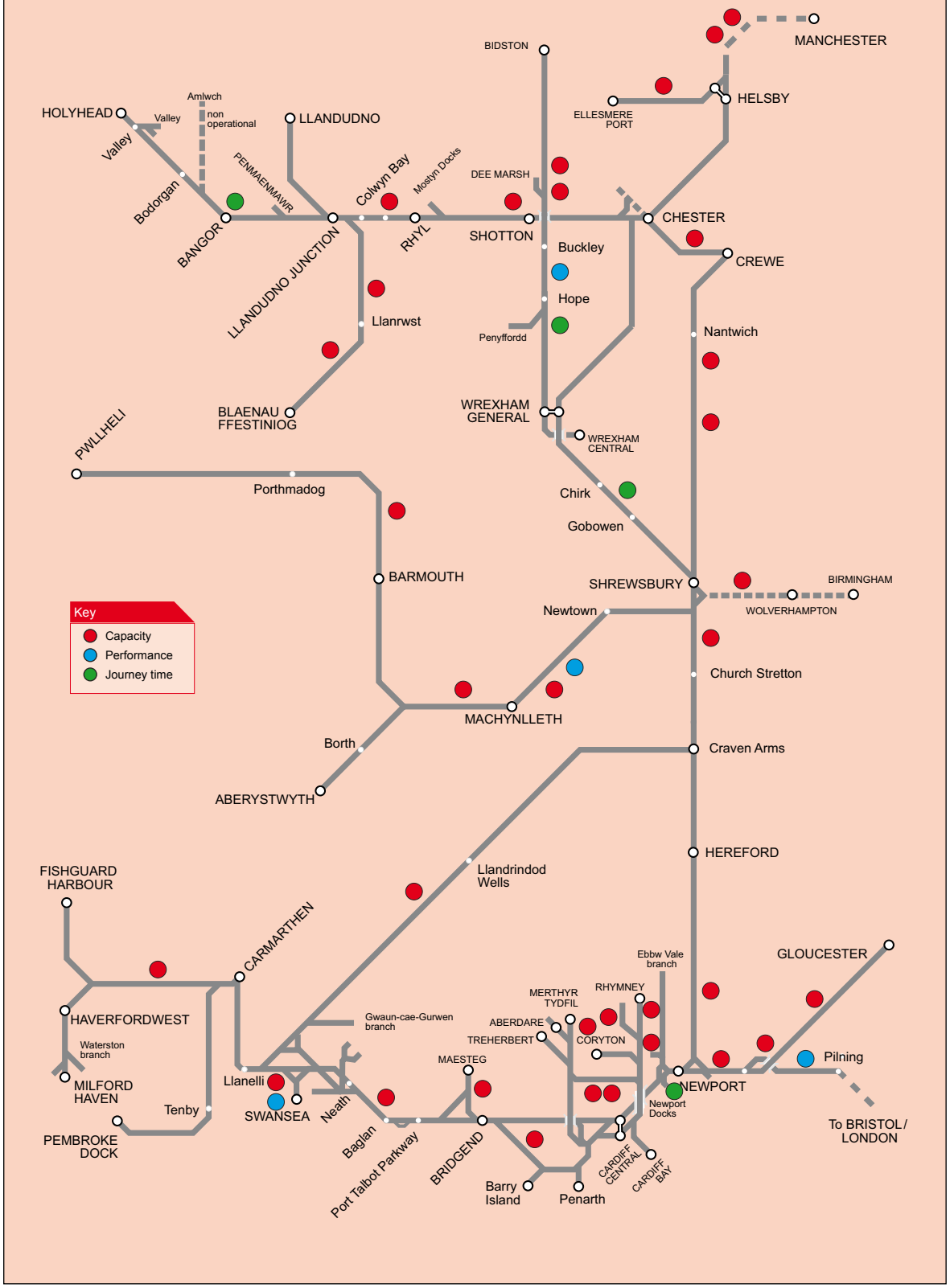
The aim was to reconcile all gaps with their then Network Rail Route Plan status taking into account where work might already have progressed within Third Party organisations, and with an emphasis on realistically likely funding sources, in accordance with Licence Condition 7.

The following list gives the decision based on consideration by the Stakeholder Management Group (SMG):

- warrants timetable planning/modelling resource
- economic appraisal required
- not to be considered further within this RUS.

Some gaps were essentially of a timetabling nature, without needing additional resource commitment. Other gaps would, if progressed, require additional resources, and/or enhanced infrastructure. The SMG objective was thus to generate two parallel workstreams in order to create the basis for making informed decisions with industry-wide value for money criteria applied. Demand analysis to determine likely Benefit: Cost ratios (BCRs) used standard industry techniques such as MOIRA. Where appropriate, a review was carried out of BCRs developed by others.

Figure 37 – Identified gaps



6.1.4 Review by the Wales RUS Stakeholder Management Group

A total of 41 gaps were initially identified through this process and a "long list" of these was reviewed by the Wales RUS SMG. Each was presented by type, and by its location, with the objective of deciding which warranted further evaluation, and sifted accordingly. In some cases, schemes moved forward as the Wales RUS process was underway during 2007. In each case the test was whether the identified issue had since been addressed, or was going to be addressed in the short term, in such a way that any strategic aspects of the gap in question could be deemed to have been already addressed.

Not all gaps are "new", and some are of long-standing and have featured in Route Plans of recent years. For example, the major Cambrian Line performance/capacity upgrade was under consideration during the period 2001 – 2007 with a funding decision being expected in July 2007, so was still an issue at the time of "long list" compilation during January – April 2007, and thus could be merely noted by the RUS. Ministerial approval was subsequently ratified in August 2007.

In a few cases it was established that perceived issues were not always infrastructure-constrained, and were driven by the franchise specification, or by the constraints of some types of deployed rolling stock. In addition where it was established that there was an outstanding issue, but a consensus by the entire group that it could not (or would not) be resolved then it was agreed to not proceed further within the RUS on that basis.

A brief explanation of the reasoning behind a decision for No Further Consideration within the RUS is given with this list. All gaps (numbered here) are accounted for subsequently within the options section (lettered) where some options embrace more than one gap.

6.2 "Long list" of gaps identified in the Wales RUS area

ROUTE 13 GREAT WESTERN MAIN LINE (in south Wales)		
Time	**Gap**	
13.01	T N	Journey times on SWML slow. RUS baseline evidence, user group Some services use 75mph rolling stock on a broadly 90mph route eg. class 153 units between Cardiff and Swansea **SAP 13.01/05**
13.02	P N	Journey times on SWML longer than planned. RUS baseline evidence, user group Occasionally happens if services wrongly formed eg. FGW making use of 75mph rolling stock on a broadly 90mph route, take longer between Cardiff and Bristol through the Severn Tunnel with attendant performance risk **SAP 13.01/05**
13.03	C N	Infrequent/inadequate ATW stopping service Cardiff to Cheltenham (two-hourly some times of day, not hourly all day), CrossCountry Nottingham – Cardiff services (Central Trains pre-November 2007) omit stations between Newport and Gloucester. (NB: ATW stopping services only ran between Cardiff and Gloucester prior to November 2007) Gloucestershire County Council/user group Comments: refranchising shifts service from Central Trains to new Cross Country operator **SAP 13.01/05** **Economic appraisal required**

13.04	C N	Inadequate frequency of calls by FGW stopping services Cardiff to Bristol/Portsmouth at Severn Tunnel Junction (reduced at December 2006 timetable change). Gloucestershire CC/user group (Comments: reduction in frequency not a consequence of infrastructure, some calls reinstated during summer 2006) **SAP 13.01/05**
13.05	C O	Additional stations sought between Cardiff and Chepstow (at St Mellons, Coedkernow, Llanwern and Magor). More frequent service Cardiff to Chepstow. Sewta strategy (Comments: will only be considered if stations are served by Relief Lines, with suitable line speed upgrade. Newport Area Signalling Renewal will deliver improved Chepstow turnback capability) **SAP 13.01/05**
13.06	C N	Peak crowding Cardiff to Maesteg services (current max. two-car sets). RUS Baseline evidence (Comments: Llanharan new station opening would exacerbate this except that all stations beyond Bridgend to Maesteg will be lengthened to four-car in early-2008). NB: Frequency uplift to Maesteg line 2tph is part of Sewta strategy **SAP 13.06/07** **Economic appraisal required**
13.07	C N	Low passenger numbers on Swansea to Cardiff "Swanline" stopping services, at the four local stations in the Swansea City and Neath – Port Talbot areas, compared to the use of train paths on high capacity utilisation section between Bridgend and Cardiff where formerly services only generally ran between Swansea and Bridgend. RUS Baseline evidence (Comments: Llanharan new station opening might need calls by these as well as Maesteg services. New Port Talbot station signalled layout permits turnbacks there, and thus has the potential to arrange services differently) **SAP 13.06/07** **Economic appraisal required**

ROUTE 14 SOUTH and CENTRAL WALES and BORDERS

Time	Gap	
14.01	P N	Performance is vulnerable over single-line section Cockett – Duffryn between Swansea and Llanelli. Swwitch strategy (Comments: situation exacerbated by all-Wales Standard Pattern Timetable with usually 2tph each way Swansea to Carmarthen, and fifth train for Heart of Wales Line in some hours) **SAP 14.01/02**
14.02	C N	Capacity is restricted over single-line section Cockett – Duffryn between Swansea and Llanelli, prevents adequate number of stops at Gowerton being offered (December 2006 SX timetable, 32 trains go through Gowerton, only 14 booked to call). Swwitch strategy (Comments: calls at Gowerton station omitted from many Swansea to Carmarthen/ Milford Haven services, and from all northbound Heart of Wales Line services, and one southbound) NB: Redoubling feasibility underway (applies to 14/01 too) **SAP 14.01/02**

14.03	C N / C F	Requirement for hourly frequency on core route into west Wales between Swansea and Milford Haven. Swwitch strategy, South West Wales Community Rail Partnership (Comments: single-line sections between Clarbeston Road and Haverfordwest, and between Haverfordwest and Milford Haven do not instantly permit hourly frequencies to operate. (Would require review of commercial timing allowance Also linked to Cockett – Duffryn constraint above). NB: Ample capacity exists Llanelli to Clarbeston Road (adjust paths beyond) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.04	C N / C F	Requirement for improved frequency of Heart of Wales Line services between Swansea and Shrewsbury. Swwitch, TraCC strategies, also Heart of Wales LTA user group (Comments: single-line sections Morlais Junction to Craven Arms could handle greater frequencies, but still need to recognise Cockett – Duffryn constraint above). **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.05	T O	Requirement for reduced journey times between south and north Wales via Shrewsbury, newly introduced 100mph class 175 rolling stock has potential in excess of existing line-speeds. WAG policy, in RPA, Taith strategy (Comments: current 90mph governing line-speed reflects past use of class 158 units since c.1990. Might require significant investment in track and signalling. Stopping pattern greatly influences end to end journey times. Pathing constrained by Wrexham – Saltney Junction single-line. Slowest section is Shrewsbury to Gobowen, longest section without intermediate stations. SAP 14.05/07 **Economic appraisal required**
14.06	C O	Requirement for additional services between Cardiff/Newport and Abergavenny, and additional intermediate stations at Caerleon (medium-term) and Llantarnam and Sebastopol (longer-term). Sewta strategy (Comments: need for possible turnback bay platform at Abergavenny recently identified) SAP 14.05/07 **Economic appraisal required**
14.07	C F	Requirement for accelerated/improved quality/additional services between south and north Wales via Shrewsbury ie. boost two-hourly frequency to hourly over medium- to longer-term. WAG policy (Comments: linked in to 05, 06 above. Reduces future availability of 2,000-ton freight paths in event of significant freight growth on this corridor) SAP 14.05-07
14.08	C N	Requirement for additional local stopping services between Crewe and Shrewsbury ie. boost two-hourly frequency to hourly. Shropshire County Council and Cheshire County Council policies, user group (Comments: Hourly paths would be available if required) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.09	C N	Requirement for additional frequency of calls at Nantwich, fastest growing settlement served by Crewe – Shrewsbury locals, car park development. Cheshire County Council policy, user group (Comments: occasional supplementary calls are made by long-distance Cardiff to Manchester fast services. Path constraints with crossing of WCML at Crewe) SAP 14.09 **Economic appraisal required**

14.10	C O	Requirement for Cambrian hourly services between Aberystwyth and Shrewsbury. WAG, TraCC policies, user groups (NB: Would require major infrastructure enhancements along route within Wales, and platform capacity expansion at Shrewsbury. In development) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS** Already undergoing WELTAG assessment/authorised August 2007
14.11	P N	Requirement for better reliability on Cambrian services between Aberystwyth and Birmingham New Street. WAG, TraCC policies, user groups (Line-speed upgrade between Wolverhampton and Shrewsbury under consideration following completion of signalling renewals on LNW Route 17) (Also, December 2008 WCML timetable recast will introduce extended turn-round times at Birmingham International to improve service resilience). **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.12	C N	Some overcrowding of ATW Cambrian services between Wellington/Telford and Birmingham. WAG, TraCC policies, user groups (London Midland (previously Central Trains) stopping services on the Shrewsbury to Wolverhampton corridor were thinned, putting more pressure on ATW services. Issue is combination of train lengths and stopping patterns and performance rather than infrastructure deficiency. West Midlands local passenger numbers are tending to place pressure on longer-distance ATW formations, some now having to be strengthened) NB: Further strengthening was implemented during 2007 with WAG funding, and the future situation and its linkage with the HLOS metric for the Birmingham area is under discussion between WAG and DfT during 2008. **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.13	C N	Some seasonal overcrowding of ATW Cambrian coast services between Machynlleth and Pwlhelli. TraCC concerns, user groups (Comments: numerous short and very short platforms inhibit strengthening) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
14.14	C F	Reduction in potential daytime freight paths (Machynlleth to Chirk timber movements) on Cambrian lines after hourly passenger services commence. Freight RUS (Comments: some freight paths will be available despite increased passenger hours of operation exploiting new signalling arrangements post-ERTMS introduction) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**

ROUTE 15 SOUTH WALES VALLEYS

Time	Gap	
15.01	C F	General growth, over short- and medium-term, in journeys by rail to Cardiff. WAG, Sewta policies, NB: Platform lengthening programme underway, will increase capacity on Treherbert – Cardiff and Rhymney – Penarth corridors from four-car to six-car, and Bridgend – Maesteg to four-car, in 2008. (Retains adherence to basic Standard Pattern Timetable structure of 12tph introduced in December 2005) **SAP 15.01/04**

15.02	C O	General growth over medium- and long-term in journeys by rail to Cardiff. WAG, Sewta policies, NB: Infrastructure through Cardiff Queen Street to Cardiff Central and Cogan Junction "central corridor" currently fully utilised by 12 passenger tph Standard Pattern Timetable (SPT). Comprehensive suite of enhancement options under development i.c.w. Cardiff Area Signalling Renewal (CASR) NB: Subsequently formally referenced in White Paper/HLOS. **SAP 15.02/03**
15.03	C F	General growth over long-term in coal moved by rail to Aberthaw Power Station Freight RUS, EWS/RFOA submission (Comments: Infrastructure through Cardiff Queen Street to Cardiff Central and Cogan Junction "central corridor" currently fully utilised by 12 passenger tph SPT. Service alterations agreed (ATW/EWS) to permit resumption of freight forwardings from Cwmbargoed, over the section southwards from Ystrad Mynach, from January 2008). **SAP 15.02/03**
15.04	C O	Continued growth in general demand on Vale of Glamorgan corridor, plus specific requirement for more frequent services at Rhoose for Cardiff International Airport WAG, Sewta policies, airport operator NB: Newly provided infrastructure between Barry and Bridgend is sufficient for half-hourly passenger frequencies. Cogan Junction constrains pathing for a ninth train if existing 8tph (4 Penarth, 4 Barry line) still required. One enhancement option for Barry station is under development (in conjunction with Cardiff Area Signalling Renewal, CASR) to enable different provision of Barry Island services. NB: Subsequent WAG request to consider possible additional station on the route, to serve St Athan **SAP 15.01/04** **Economic appraisal required**
15.05	C O	Requirement for half-hourly Merthyr service. Sewta strategy NB: New loop at Merthyr Vale committed, implementation 2008 **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
15.06	C O	Requirement for half-hourly Rhymney service. Sewta strategy NB: New loop at Tir Phil envisaged, will be reflected in CASR programme, subject to confirmation of implementation funding. **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
15.07	C O	Requirement for additional station at Energlyn, Rhymney valley. Sewta strategy NB: Linked to 15.06 above, will be reflected in CASR programme, subject to implementation funding. Would be served by additional stops in the (existing frequency) 4tph service between Cardiff and Bargoed. **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**

ROUTE 22 NORTH WALES and BORDERS

Time	Gap	
22.01	T N	Services perceived as very slow between Wrexham and Bidston Taith strategy, Wirral and Borderlands user groups (Comments: some recent track renewals have been carried out but line-speeds remain unchanged) **NO FURTHER WORK (expected to be addressed in 2008/09)**
22.02	P N	Performance perceived as poor between Wrexham and Bidston as units have 57-minute journey time and only three-minute turnround time in each hourly cycle. Taith strategy, Wirral and Borderlands user groups (Comments: recent switch from single-engined, class 153 single units to two-car class 150 operation has improved reliability, through reduced station dwell times and improved mechanical reliability) **NO FURTHER WORK (already being addressed)**
22.03	C N / F	Borderlands line between Wrexham and Bidston, more frequent services. Taith strategy, Wirral and Borderlands user groups (Comments: track capacity permits half-hourly without any upgrade) **SAP 22.03/4** **Economic appraisal required**
22.04	C O	Borderlands line between Wrexham and Bidston, electrification to permit integration with Liverpool third-rail electric urban services. Three new stations envisaged, at Beechwood and Noctorum, Woodchurch and Deeside. Merseytravel, Taith joint strategy, Wirral and Borderlands user groups MAJOR MERSEYTRAVEL/ TAITH ASPIRATION FOR IMPROVEMENTS, NETWORK RAIL TO GRIP 3 LATE-2007. NB: Substantial independent feasibility study carried out by Faber Maunsell for Taith and Merseytravel in 2005/06 **SAP 22.03/4** **Economic appraisal required**
22.05	C N	Borderlands line between Wrexham and Bidston, connectivity at Shotton. Taith strategy, Wirral and Borderlands user groups (Comments: feasibility underway for improved access between high level and low level stations. Numerous trains on North Wales Main Line not scheduled to call at Shotton Low Level) **NO FURTHER WORK (already being addressed)**
22.06	C N	Extremely sparse Northern diesel service between Ellesmere Port and Helsby. Helsby/Frodsham end of line effectively detached from frequent Merseyrail electric services at Ellesmere Port. Cheshire County Council, North Cheshire Rail user group (Comments: ample route capacity exists for hourly or half-hourly frequency shuttle passenger services if it were required) **SAP 22.06** **Economic appraisal required**
22.07	T N	Mismatch of line-speed limit with rolling stock capability along North Wales coast main line. Taith strategy, Cheshire County Council, North Cheshire Rail user group (Comments: considered on previous occasions but not actioned) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS** #New remit N-S refers (see gap 14.07)

22.08	C N	Services regarded as of insufficient frequency along North Wales coast main line. Particular issue with only 1tph west of Llandudno Junction. Taith strategy, Cheshire County Council, North Cheshire Rail user group (NB: 2008 WCML timetable recast introduces hourly all-day Virgin Voyager through running London Euston to Chester with some working of trains beyond to Bangor/ Holyhead. Will necessitate adjustment to ATW services) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS** #New remit N-S refers (see gap 14.07)
22.09	C O	Branch line from Llandudno Junction to Blaenau Ffestiniog, lower capability level than that which is sought for potential heavy freight flow (slate waste) in RA10 loads. Freight RUS, Taith strategy, WAG spatial plan/economic policy general issue (NB: Upgrade project about to reach GRIP4. Requires new terminal, p/way upgrade, plus alterations to passing loop at Llanrwst. Paths along NWML to Llandudno Junction already identified) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
22.10	C O	Branch line from Llandudno Junction to Blaenau Ffestiniog, some seasonal overcrowding on single class 153 units. Taith strategy (May 2007 diagrams have substituted class 150 two-car Sprinter unit as regular ie. seasonally strengthened branch resources) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
22.11	C N	Absence of through trains North Wales to Manchester Airport. Taith strategy (Former franchisee FNW had withdrawn these, will not be reinstated) **NOT TO BE CONSIDERED FURTHER WITHIN THE RUS**
22.12	C O	No through trains between Liverpool and Chester/North Wales coast line. Desire to create link between Liverpool John Lennon Airport and the area (ie. through Liverpool South Parkway). NWRA policy, Taith, Cheshire CC and Merseyrail strategies (Comments: Halton curve unable to take such trains until crossovers reinstated and signalling enhanced. Pathing issues would need to be investigated over WCML between Runcorn and Liverpool Lime Street) Just entering GRIP1 at time of SMG **SAP 22.12/13** **Economic appraisal required**
22.13	C O	No through trains between Liverpool and Chester/Wrexham. Desire to create link between Liverpool John Lennon Airport and the area. (ie. through Liverpool South Parkway). NWRA policy, Taith, Cheshire County Council and Merseyrail strategies (Comments: as 22.11 above, Halton curve unable to take such trains until crossovers reinstated and signalling enhanced. Pathing issues would need to be investigated over WCML between Liverpool Lime Street and Runcorn, further constraint of single line between Chester (Saltney Junction) and Wrexham, no turnback facility at Wrexham General station. Just entering GRIP1 at time of SMG **SAP 22.12/13** **Economic appraisal required**

6.3 Assessment of gaps

6.3.1 SMG scrutiny

The gaps/issues (ie. those set out in 6.2) subjected to the collective scrutiny of the Wales RUS Stakeholder Management Group (SMG) had been gathered from a number of sources in order to capture the concerns and outlook of all industry stakeholders. The full list reflected "gaps" based on performance as well as the judgement by train operators on the perception of journey times currently offered. This judgement further reflected existing levels of passenger train loading and overcrowding, and the suitability of rolling-stock types deployed in the Wales and Borders franchise, and by the long-distance operators also serving the Wales RUS area. The list further recognised the extent to which existing strategies to enhance and develop the railway network, particularly in the south-east region, the most densely populated part of Wales, were already being implemented.

The majority of the gaps identified (33 of the 41) could be classified as deriving from stakeholder/funder wishes for changed/enhanced future outputs, rather than explicitly being driven by current load factors which when projected forward would tend to suggest overcrowding by 2018/19, ie. the ten-year RUS timeframe. A small number of capacity gaps were unanimously agreed as being about franchise specification details, and rolling-stock provision, rather than about any constraints imposed by the capability of the network in itself.

The preliminary "long list" of 41 issues was refined into a shorter list of those which were deemed to warrant further, detailed consideration through the Wales RUS process. This involved either the application of train-planning and modelling resources or economic appraisal, or both.

Of the remainder (ie. those marked "Not to be considered further within the RUS") it was established that stakeholder wishes were either being met, or were about to be, or that a solution was in the early stages of planning. In some cases (for example, where it was felt that no solution was warranted), the gap was noted but not taken further, or possibly deferred to another RUS.

6.3.2 The Freight RUS: gaps in Wales

The Freight RUS, published in March 2007, provided a source of issues inasmuch as these were of a more local nature than the national focus of that study, and were deferred to the Wales RUS.

These issues were listed on p.55, Table 5.7 of the Freight RUS

- Cwmbargoed – Aberthaw (capacity constraints Cardiff to Cogan Junction)
- Blaenau Ffestiniog slate waste (upgrading of branch line)
- Machynlleth to Chirk timber (freight paths effect with passenger growth)

Also listed on p.122, Table B.9, Port Talbot dock possible imported coal flow. Comments on these four items are as follows:

1. Cwmbargoed resumption of coal traffic

This is being catered for by retiming a limited number of Valleys passenger services (during the daytime) to create paths through the Queen Street North Junction to Cogan corridor to enable coal trains to run from Cwmbargoed on the freight-only line to Ystrad Mynach, thence down the Rhymney valley to Cardiff and on to Aberthaw, between Penarth, Barry and Vale of Glamorgan trains. (Further comment is made below, see option 15F.)

2. Blaenau Ffestiniog new slate waste traffic

The proposal to shift slate waste from Blaenau Ffestiniog in north Wales to the north-west and west Midlands as aggregates for road construction would require the provision of a new terminal (to the north of the passenger station, on the branch line from Llandudno Junction) and a commensurate upgrade to track and structures for the heaviest type of bogie wagons, plus a lengthening of the passing loop at Llanwrst. A scheme was developed (to GRIP3) in 2007/08. Further progress would be subject to Third Party funding being forthcoming to match Network Rail and WAG pledges. Paths are reserved on the NWML in readiness (see option 22E).

3. Machynlleth to Chirk timber.
Daytime freight paths will exist following ERTMS implementation in Spring 2009 (see option 14F) if these are required.

4. Port Talbot dock – possible imported coal flow
No new coal traffic has been offered to rail through the deep-water facility at Port Talbot dock as was envisaged by the port operator when the Freight RUS was published, although the terminal remains available, as is its connection to the mainline network. A new coal flow to Rugeley commenced July 2007 from Bristol, via the Severn Tunnel, Hereford and Wolverhampton.

The freight industry gauge aspiration is confined to south-east Wales and referred to subsequently in chapter 8 of this document.

6.3.3 Aggregation/route by route initial comments

The 41 identified gaps can be broken down by type and by timescale, thus:

T Journey Time	4	(3 N – now, 1 O – funder ouput)
P Performance	4	(4 N – now)
C Capacity	33	(14 N – now, 6 F – future, 13 O – funder output)

By route, a number of factors suggested a way forward for aggregation of those gaps going forward for further consideration.

Route 13 – Great Western Main Line There were seven identified gaps in south-east Wales on this route, mostly in the Sewta region, but reaching into the Swwitch region too. Those gaps identified for further evaluation naturally split into two sub-groups, namely to the east of Cardiff (ie. on the four-track section of the London to Swansea route between Severn Tunnel Junction and Cardiff), and to the west of Cardiff, through Bridgend and on to Swansea.

In addition, although not initially identified as a gap per se, the SMG recognised a potential issue associated with the recently opened Ebbw Vale branch, which abuts the GWML at Ebbw Junction to the west of Newport. There are aspirations for further route upgrade of the branch, and the upgrade to passenger standards of the curve between Park Junction and Gaer Junction, which would enable an additional hourly service to operate between Ebbw Vale and Newport. There is also an aspiration for a short extension northwards beyond Ebbw Vale Parkway into the town centre of Ebbw Vale. Doubling of service frequencies on the branch would have a major capacity implication on mainline services through Newport, and these are addressed within the appropriate block (namely the extensive group **13.01/05**) of train modelling work.

Route 14 – South and Central Wales and Borders There were 14 identified gaps on this large, diverse route mostly in the Swwitch region, but encompassing the TraCC and Sewta regions too. The route naturally splits into three components, namely west Wales, including the “Heart of Wales” section, the north-south routes, and the Cambrian Lines section. There were two separate sets of issues on the long north-south section, firstly at the southern end in Wales, and secondly at the northern end, in Cheshire.

As the major upgrade programme for the Cambrian Lines was expected to be granted Ministerial approval in the summer of 2007 no further consideration within the Wales RUS was deemed to be required. (Initial planning had commenced in 2001/02, with a preliminary phase of level-crossing closures jointly funded by Network Rail and WAG executed in 2004/06 designed to facilitate/secure future line-speeds necessary for intensified operations on the single line.)

Route 15 – South Wales Valleys There were seven identified gaps in south-east Wales on this route, all in the Sewta region. In recognition of the advanced state of development of the Cardiff Area Signalling Renewal (CASR) programme already referred to in Chapter 5, the gaps cited for the South Wales Valleys were most usefully distinguished by time, namely into either short-term (ie. as related to today's railway, prior to any enhancement works) or medium- and longer-term, to incorporate the additional capability which will be created from enhancement plans being developed in conjunction with the renewals programme.

The major upgrade of the Cardiff Queen Street North Junction to Cogan Junction corridor is explicitly recognised in the HLOS, with identified DfT funding allocated to meet specified growth expectations for Cardiff.

Route 22 – North Wales and Borders There were 13 identified gaps in north Wales and on and around the Wirral peninsular. A different set of factors characterised the gaps identified on this route taking in Cheshire and Merseyside as well as the whole of north Wales as encompassed in the Taith region.

To a considerable extent, the substantial completion of the West Coast Route Modernisation programme (WCRM) by late-2008 has enabled a recast of train services to be implemented along the North Wales Main Line between Crewe, Chester and Holyhead, with redeployment of Virgin Trains WCML long-distance trains in a manner that enables a secondary recast of ATW domestic services. This recast will in itself address some of the identified gaps relating to improved service patterns and frequencies.

In addition to this factor, the other key driver for strategic change lay outside Wales as it came from Merseytravel, with two major scheme aspirations, which influenced how the gaps were bundled here. These have been developed alongside studies in other RUS areas, namely the North West RUS (Liverpool services outwith the Merseyrail franchise) and the Merseyside RUS dealing with the wider Liverpool third-rail DC electrified suburban network, and expansion options.

6.3.4 Gaps requiring detailed assessment

For those gaps that warranted further consideration (either involving Network Rail's Strategic Access Planning (SAP) train planning resources, or economic appraisal, or a combination of both) some aggregation subsequently took place for practical analytic purposes. Many route sections in the Wales RUS area carry a number of differing service groups (as depicted in Chapter 3 spider diagrams), such as the busy stretch of two-track railway between Cardiff and Bridgend where Cardiff to Maesteg and Cardiff to Swansea "SwanLine" stopping services are dovetailed between long-distance passenger and intense freight operations.

6.3.4.1 Those requiring train planning resources were bundled as below into 10 “blocks”:

13.01 – 05	GWML (East)	(NASR, new stns, RL upgrade, Severn Tunnel Junction remodel etc)
13.06/07	GWML (West)	(CASR, Maesteg, SwanLine, freight pathing)
14.01 – 02	West Wales	Swansea – Carmarthen, (Cockett – Duffryn re-doubling)
14.05 – 07	north and west	Linespeeds, Abergavenny turnback, freight pathing
14.09	north and west	Shrewsbury – Crewe section, Nantwich
15.01/04	Valleys	Short-term, Vale of Glamorgan, City Line increases
15.02/03	Valleys	Medium-term, post-CASR enhancements, 16tph)
22.03/04	North Wales	Borderlands Line-Merseytravel elect. electrification extension
22.06	Helsby to Ellesmere Port section	Improved shuttle frequency/better connections with Merseyrail electrics
22.12/13	North Wales	Effect of Halton Curve in conjunction with WCML/2008

Timetable and performance analysis is not an end in itself but is necessary to determine whether or not an option is practicable ie. the proposed service can actually be pathed reliably on the network.

6.3.4.2
Those that required economic appraisal or demand forecasting (ie. by Network Rail) were identified into nine distinct task areas, as follows:

13.03	Additional services between Cardiff and Gloucester (ie. Cheltenham from December 2007)
13.06	Additional services between Cardiff and Maesteg
13.07	Recast of “SwanLine” local services, Swansea/Neath – Port Talbot area local stations, and Pyle (Bridgend area)
14.06	Additional services between Cardiff and Abergavenny
14.09	Additional calls by fast trains at Nantwich
15.04	Additional services between Cardiff and Bridgend via the Vale of Glamorgan line
22.03/04	Major upgrade of Wrexham to Bidston “Borderlands Line”
22.06	Additional services between Helsby and Ellesmere Port
22.12/13	Additional services between Chester and Liverpool via Runcorn and Liverpool South Parkway

Appraisals typically compare the revenue implications and economic benefits of service specification changes (frequency, journey time, stopping pattern) against operating cost (OPEX) changes and any capital costs necessary to enhance infrastructure to permit such service alterations. To give an example, increasing the Maesteg service to half-hourly requires a doubled resource commitment, and would not physically be possible without a new passing loop on the single line at Tondu and increased turnround/platform capacity at Cardiff Central.

A further aspect of appraisal within the RUS was the review of any previously produced documentation (usually by consultants on behalf of the Regional bodies, eg. Jacobs for Sewta, Faber Maunsell for Taith/Merseytravel), for Third Party-funded enhancements, where business case development evaluation work had already been produced and it was unnecessary to duplicate this.

Furthermore, certain gaps (eg. 14.10 Cambrian Main Line upgrade and 22.09 Blaenau Ffestiniog slate waste) had already been appraised by Network Rail.

6.3.4.3 WelTAG appraisal in Wales

The Wales RUS options have been appraised using standard Department for Transport (DfT) and Welsh Transport Appraisal Guidance (WelTAG) appraisal techniques to produce the Transport Economic Efficiency results. WelTAG augments the DfT appraisal guidance (known as WebTag) with additional criteria within the economy section to cover Economic Activity and Location Impacts (EALI). As with WebTag, WelTAG requires the promoter to assess the environmental and social impacts qualitatively and quantitatively if possible.

The EALI measure, for schemes which significantly change the accessibility of one area compared to others, defines the impact of the scheme upon the performance of the local and potentially national economy. Thus one would expect that options which significantly increase the frequency of transport links would affect the performance of two or more local economies. EALI is proposed to be measured in terms of income and employment change. In the options which follow, for example that for Maesteg (13E) or Cambrian 14D may have EALI impacts.

Within the environmental section, the impact of the option upon environmental noise, local air quality and greenhouse gas emissions, landscape and townscape, heritage, biodiversity and water environment are measured. RUS options which improve services will encourage new rail journeys and since a proportion of these journeys will come from existing road users, there will be an environmental impact. Since all of the RUS options are improvements to existing rail routes, then positive environmental impacts are expected. The magnitude of the impact will depend upon the number of new users attracted to rail.

The third WelTAG element is social, which covers transport safety, personal safety, physical fitness, social inclusion and permeability, ie. the ease with which people can move by non-motorised modes. Thus schemes which encourage the use of rail as a safer mode of transport, compared to car use or air travel, or encourage interchange between modes and improve accessibility for pedestrians and cyclists, are likely to have positive social impacts. Option 22B, which proposes interchange improvements to Shotton station, is an example of this type of scheme. Finally, RUS options which encourage modal shift from car to rail are likely to show of Wales a small positive transport safety impact.

6.4 Evaluation

6.4.1 The national network influence on Wales

Train services in the Wales RUS area are a mixture of those which are provided as an integral part of the national network (and are of a long-distance and cross-boundary nature) plus domestic services which are specified within the Wales and Borders franchise.

For train-planning purposes the domestic services are principally influenced by (and to a large extent, coordinated with) long-distance east-west services for which the prescribed overall pattern is as follows:

London (Paddington) to Cardiff/Swansea	half-hourly/hourly	FGW
London (Euston) to Chester/north Wales	hourly/seven trains per day (December 2008)	VWC

To a lesser extent, the pattern in Wales is also shaped by these services:

South coast/Bristol to Cardiff	half-hourly	FGW
Nottingham/Birmingham to Cardiff	hourly	Cross Country

In the Merseyside region, ATW Bidston-Wrexham Central diesel-operated services are influenced by the pattern which operates on the self-contained Liverpool third-rail DC Merseyrail electrified suburban network on the Wirral peninsula, which in itself is wholly shaped by the Liverpool Central (low level) one-way loop.

The introduction of the Standard Pattern Timetable (SPT) brought major change to the domestic services operated in Wales and, following this after two years of consolidation, the main themes which emerged within the whole range of gaps can be summarised as follows:

- those involving continued passenger growth within the defined Wales RUS area, either generally or specifically driven by a proactive regional desire to increase rail modal split
- those arising from a stakeholder requirement to cater for faster growth in the key urban areas ie. Cardiff and Merseyside, or from an overt economic/ regeneration agenda as on Deeside
- those linked to the political arena of a desire for strengthened north-south links, and of national and strategic or political significance for Wales
- and for the freight sector, the question of future capacity for freight movement alongside continually growing passenger flows.

All these four link back to the key theme stated earlier in Chapter 3 (Current capacity, demand and delivery) of network capacity and utilisation. The other key theme, that of access to the network at stations, generated a further set of gaps.

For practical train-planning purposes the above factors, namely the national timetable “drivers”, were assumed to apply throughout the Wales RUS timescale.

6.4.2 List of options assessed

The 41 gaps thus became, as a result of overlapping on common route sections, treated as options, following either SAP analysis or Network Rail economic appraisal/review, or both.

Some 24 options are reported on here.

Option	Gaps	Description
13A GWML(East)	13.01/02/04	stopping patterns
13B GWML(East)	13.03	Cardiff to Cheltenham hourly
13C GWML(East)	13.05	Llanwern (Sewta)
13D GWML(East)	13.01 – 05	Ebbw Vale to Newport (Sewta)
13E GWML(West)	13.06	Maesteg (Sewta)
13F GWML(West)	13.07	SwanLine (Swwitch)
14A West Wales	14.01/02	South Wales Main Line (Swwitch)
14B West Wales	14.03/04	Milford Haven, Heart of Wales (Swwitch)
14C NandW	14.05/07	north-south/national
14D NandW	14.06	Abergavenny (Sewta)
14E NandW	14.08/09	Shrewsbury to Crewe (Cheshire)
14F Cambrian	14.10 – 14	Cambrian Main Line (TraCC)
15A Valleys (short-term)	15.01	City Line (Sewta)
15B Valleys (short-term)	15.04	Vale of Glamorgan (Sewta)
15C Valleys (short-term)	15.05	Merthyr, two trains per hour (Sewta)
15D Valleys (medium-term)	15.06	Rhymney, two trains per hour (Sewta)
15E Valleys (medium-term)	15.07	Energlyn (Sewta)
15F Valleys (long-term)	15.02/03	overall growth (Sewta)
22A Deeside	22.01 – 04	Wrexham to Bidston (Taith)
22B Deeside	22.05	Shotton (Taith)
22C Merseyside	22.06	Ellesmere Port to Helsby (Cheshire)
22D North Wales	22.07/08	West Coast Main Line December 2008
22E North Wales	22.09	Blaenau Ffestiniog new freight
22F Merseyside	22.12/13	Halton curve (Merseytravel)

OPTION ASSESSMENT

OPTION No.13A

GWML-East (gaps 13.01/02/04)

GWML stopping train services performance/journey time

CONCEPT

Various rolling stock types used on the Great Western Main Line (GWML) have differing speed capability (75/90/125mph) and give rise to uneven calling patterns at intermediate stations, notably Severn Tunnel Junction, where the Gloucester and Bristol/London routes diverge, and timetabled calls may be constrained by the track layout of the existing three-platform layout.

OPERATIONAL ANALYSIS

All rolling-stock types are allowed the same time to pass through the Severn Tunnel (maximum line-speed 90mph), but slightly different end-to-end journey times apply to FGW trains between Bristol and Cardiff, depending on the allocation of either class 142 “Pacer” or class 150 “Sprinter” (both 75mph) or class 158 (90mph) units. Time exists in either cycle for Severn Tunnel Junction station calls to be made if specified. There is no immediate prospect of 75mph stock being removed from SWML services.

The timetable was tested against the future planned layout at Severn Tunnel Junction where it is intended that a four-platform layout (two each for the Gloucester and Bristol/London routes) will be introduced.

INFRASTRUCTURE REQUIRED

Additional fourth platform face (to be installed in connection with Severn Tunnel Junction East and West switches and crossings (SandC) re-modelling during Newport Area Signalling Renewal (NASR), in 2009 – 2011) to handle Up Tunnel line (ie. Bristol/London route-bound) departures.

CROWDING IMPACT

Not applicable

FREIGHT IMPACT

NASR will also reinstate a further Up Relief line from Magor/Undy to the western Severn Tunnel portal, which will ease freight train pathing and regulation for eastbound movements.

FINANCIAL and ECONOMIC ANALYSIS

Not applicable

CONCLUSION

Severn Tunnel Junction station calls can be made as specified by franchise requirements for all Cardiff to Bristol stopping services. Longer-distance Cardiff to Portsmouth semi-fast services can also call, when specified, to supplement this service level and the existing infrastructure does not inhibit this.

Planned renewals of S&C in the vicinity of Severn Tunnel Junction station (during NASR) will result in restoration of the fourth, currently disused platform. This will improve operational performance around the western Severn Tunnel approaches and ease platforming constraints.

In recognition of the above it was resolved by WAG/Sewta during 2007 that substantial improvements to passenger facilities would be pursued at the bigger, future Severn Tunnel Junction station in association with the planned alterations to track and signalling and restoration of the fourth platform.

This option is **recommended** inasmuch as additional Severn Tunnel Junction station stops may be made, and some were added (during 2007) to FGW Cardiff – Portsmouth services. All ATW Cardiff – Cheltenham services are already scheduled to stop at Severn Tunnel Junction.

(See also Option 13C: proposed Llanwern station)

OPTION ASSESSMENT

OPTION No.13B

GWML-East (gap 13.03)

Improved Cardiff to Cheltenham local train services

CONCEPT

Local services (operated by Arriva Trains Wales) run (from December 2007) between Cardiff and Cheltenham, calling at all intermediate stations (at Newport, Severn Tunnel Junction, Caldicot, Chepstow, Lydney and Gloucester), at hourly or two-hourly intervals. Two-car trains are usually deployed (class 158, 90mph) or occasionally a single (class 153, 75mph) former Regional vehicle.

(Prior to December 2007, the service ran only from Cardiff to Gloucester.)

The Sewta strategy (supported by Gloucestershire County Council in respect of the Chepstow to Gloucester/Cheltenham portion of the route) calls for the service frequency to be hourly throughout the day, amounting to five additional return trips between Cardiff and Cheltenham.

Additionally, there was a perceived gap inasmuch as CrossCountry services (previously Central Trains until November 2007) run at hourly intervals between Cardiff and Birmingham New Street/Nottingham, non-stop between Newport and Gloucester. Gloucestershire County Council and Sewta wanted to assess whether Chepstow calls could additionally be inserted into these services to give a radically improved pattern at Chepstow.

OPERATIONAL ANALYSIS

Hourly pathways exist for the Cardiff – Cheltenham local service, and the extra journeys to infill existing two-hour gaps could be added, at a cost of an additional set of operational resources.

This would enable a regular hourly interval service to be provided at Caldicot, Chepstow and Lydney stations throughout the whole day, where no other services call. It would lift frequency at Severn Tunnel Junction station to a regular two trains per hour (one each between Cardiff and Bristol, and Cardiff and Cheltenham).

The hourly Cardiff to Birmingham New Street/Nottingham CrossCountry (and vice versa) services could be retimed to call at Chepstow without breaking the turn round margin at Cardiff Central. The franchise specification does not however currently require that these CrossCountry services should call at Chepstow. (Not pursued further)

INFRASTRUCTURE REQUIRED

None

CROWDING IMPACT

None

FREIGHT IMPACT

Minimal

FINANCIAL AND ECONOMIC ANALYSIS	
Summary results: This quantified appraisal takes account of the rail timetable change as modelled in MOIRA. Costs and benefits are shown in 2002 prices and values assuming full benefits start in 2009/10.	
10-year appraisal	£ million
Costs (Present Value)	
Investment cost - RAB financed	0.0
Operating Cost	5.9
Revenue	–1.0
Other Government Impacts	0.3
Total costs	**5.2**
Benefits (Present Value)	
Rail user benefits	2.5
Non user benefits	0.2
Total Quantified Benefits	**2.7**
NPV	**–2.5**
Quantified BCR	**0.5**
Note: All figures are presented in 2002 market prices	

CONCLUSION

There is only a very weak case for the uplift to hourly all-day frequency between Cardiff and Cheltenham, and this option is thus **not recommended**.

(Refer to Option 13C (gap 13.05) for an enhancement of this proposal to include the ability to stop trains at a future new Llanwern community and park and ride station.)

OPTION ASSESSMENT

OPTION No.13C

GWML-East (gap 13.05)

Llanwern station

CONCEPT

Future major “brownfield” housing development of approximately 4,500 homes at Llanwern (three miles east of Newport, adjacent to the four-track section of the SWML) on the site of the former steel-making end of the Corus Llanwern plant is planned by Newport City Council, in furtherance of the Wales Spatial Plan. The development is envisaged to include a new (Relief Lines) Park and Ride station, which would be served by local trains. (All passing services are currently scheduled to run on the Main Lines). The proposed station site is close to the M4 motorway and (by road) is roughly equidistant between Cardiff and Bristol via the Second Severn Crossing.

An earlier proposal by Sewta to develop a second station on this section of the GWML nearby at Magor (between Severn Tunnel Junction station and the proposed Llanwern station) has now been dropped, and stakeholder activity is focused solely on Llanwern, together with substantial enhancement of the existing Severn Tunnel Junction station.

OPERATIONAL ANALYSIS

It would not be possible to cater for any new station on the higher-speed Main Lines between Newport and Severn Tunnel Junction owing to the high density of fast, non-stop services. A performance improvement scheme is under development to investigate raising the linespeed on the slower Relief Lines (currently average limit is 45 – 50mph, not normally used by any passenger trains) to 75mph, in conjunction with NASR. (NB: The evaluation of this option assumes that such upgrade would have happened beforehand.)

Diversion of the Cardiff to Cheltenham stopping trains to use the Relief Lines between Newport and Severn Tunnel Junction in order to incorporate calls at a new island platform at Llanwern was tested.
It was assumed that this would be on a regular-interval hourly basis, and that if high levels of demand were generated this would be catered for by longer trains than the two-car sets currently allocated to the Cardiff to Cheltenham service group, but possibly increased to hourly frequency.

It was further assumed that the track and signalling alterations, and upgrade of Severn Tunnel Junction station to a four-platform configuration, would have been implemented beforehand. At Newport, trains would be required to use the crossovers east of the station to switch between the Main and the Relief Lines in order to continue to use the main island platform faces 2 and 3, or platform 4.

As a further test the possible diversion of the hourly, stopping service from Cardiff to Bristol (operated by FGW) to the Relief Lines between Newport and Severn Tunnel Junction to call at a new Llanwern station was considered. This was found not to be possible, mainly in terms of broken turn-round margins at Cardiff Central but also as a consequence of pathing conflicts at Newport.

INFRASTRUCTURE REQUIRED

New station at Llanwern (island platform, 150m length, served by upgraded Relief Lines only) assumed to be fully developer-funded in conjunction with s.106 arrangements by promoter Sewta on behalf of Newport City Council. The track would require to be slewed to accommodate the platform, and accessed off a new overbridge (fully developer-funded).

NB: The business case for Relief Lines upgrade to 75mph is not yet established.

CROWDING IMPACT

Minimal

FREIGHT IMPACT

None. An hourly 45mph freight path (class 7, 2,600 tonne) in either direction on the upgraded Relief Lines was positively identified, otherwise freight paths assumed to benefit by running at up to 75mph where previously on a speed-restricted section.

FINANCIAL AND ECONOMIC ANALYSIS

No costs have yet been developed by Network Rail. A Commercial Agreement between Network Rail and Newport City Council for the proposed Llanwern station was being put in place at March 2008.

CONCLUSION

Demand forecasting work (by Sewta) to create an evidence base for the new Llanwern station commenced in 2007, and suggested sufficiently strong levels of trip generation to justify more detailed consideration.

Further work by Newport City Council and Sewta, to define the viability of Llanwern station and potential train service usage, is necessary in conjunction with the engineering feasibility study to be undertaken by Network Rail.

Timetable design work has provisionally demonstrated that a new station at Llanwern could be accommodated on the GWML if constructed as an island platform served only by Relief Line trains scheduled to call additionally (as opposed to extra trains), provided that the line-speed is increased to 75mph. A contribution towards the costs of line-speed raising scheme may be required from the station promoters.

OPTION ASSESSMENT

OPTION No.13D

GWML-East (gaps 13.01-05)

Longer-term impact of further Ebbw Vale route upgrade on the GWML.

CONCEPT

The Ebbw Vale branch abuts the GWML at Ebbw Junction to the west of Newport. February 2008 saw the introduction of new hourly train services running directly between Cardiff Central and six new stations at Rogerstone, Risca, Crosskeys, Newbridge, Llanhilleth and Ebbw Vale Parkway, over a former single-track freight line which closed c.2002 following the cessation of activity at Ebbw Vale steelworks.

The longer-term aspirations envisage further route upgrade of the branch, and on the GWML itself between Newport station and Gaer Junction, which would enable an additional hourly service to operate between Ebbw Vale and Newport. A short extension of the line northwards beyond the initial Ebbw Vale Parkway station into the town centre of Ebbw Vale is also sought. This proposed doubling of service frequencies on the branch would have a major capacity implication on mainline services through Newport, as the GWML would have to additionally accommodate the extra hourly services over the single-track eastern chord between Park Junction and Gaer Junction (currently a freight-only line) and thence into Newport station.

Prior to such further infrastructure enhancement, it was also necessary to evaluate whether the initial hourly direct Cardiff to Ebbw Vale service (currently running directly over the double-track western chord between Ebbw Junction and Park Junction) could also be modified to accommodate calls at Newport (where a reversal would be needed in either direction, then using the eastern chord instead of the western chord), recognising the increased journey times between Western Valley stations and Cardiff that this would cause.

OPERATIONAL ANALYSIS

The paths used on the newly reinstated branch involve hourly northbound and southbound services between Cardiff and Ebbw Vale Parkway passing each other “dynamically” on a short stretch of re-doubled track between (just south of) Risca and (just north of) Crosskeys. These paths are determined by the length of this section of double track, the number of station calls and dwell times, and the speed capability of the class 150 two-car “sprinter” units deployed.

Existing Cardiff direct services The branch paths (at xx.35 from Cardiff Central) were found to be not suitable for being switched to run between Newport and Ebbw Vale Parkway via the eastern FOL chord (and v.v.) inasmuch as the trains could not then be pathed on the GWML between Newport and Cardiff after reversal at Newport (ie. on Platform 4 on the north side of the station), nor accommodated at Cardiff Central on account of platforming/junction clashes. This is therefore not recommended for further consideration.

Future additional hourly Newport – Ebbw Vale services Paths were identified for this incremental service. Assuming the hourly Cardiff – Ebbw Vale direct services remained in their now established paths on the GWML and on the branch, the extra trains would have to “lay over” at Newport station for 22 minutes in each hour. No dedicated bay platform provision for such a service exists. Blocking one of the three accessible through platforms (2, 3 or 4) is not recommended, so services would therefore be required to shunt out of Newport station (most probably towards the Maindee triangle) accordingly.

INFRASTRUCTURE REQUIRED

Increased provision of double-track beyond Crosskeys up the valley to a point north of Llanhilleth, additional platforms at Newbridge and Llanhilleth stations which have each been built with one platform just on the initial single line, and the upgrade of signalling equipment to passenger standards of the eastern chord between Park Junction and Gaer Junction. An additional station in Ebbw Vale itself (north of Ebbw Vale Parkway) plus track extension, and modifications to signalling.

A facing crossover on the Main lines at Gaer Junction would also be necessary, to permit “right-direction running” of Down trains (ie. from Newport station towards Ebbw Vale) through the Main line tunnel on the Down Main track to Gaer Junction, and thence to Park Junction, and Up the Western Valley to Ebbw Vale. Turnback facility at/adjacent to Newport.

CROWDING IMPACT

Not considered.

FREIGHT IMPACT

Minimal, confined to Machen Quarry flows.

FINANCIAL AND ECONOMIC ANALYSIS

(Not undertaken by Network Rail.)

CONCLUSION

It should be understood that this is a medium- to longer-term Sewta strategic aspiration and awaits further WAG/Sewta (Jacobs) business case development and funding. Third Party funding (ie. by WAG) is being sought in CP4. The business case presented at a future stage will have to include attributable infrastructure costs off the branch, namely upgrade of the eastern chord between Park Junction and Gaer Junction to passenger-signalled standards, together with the Main Lines facing crossover at Gaer Junction, and a turnback facility to use at or adjacent to Newport station.

The demand forecast for new users of possible additional Ebbw Vale to Newport direct services was defined by Sewta in their RPP bid report for the Ebbw Valley Rail Study Phase II and used in the Sewta Rail Strategy Study of January 2006. Both reports pre-date the introduction of the Ebbw Vale to Cardiff service in 2008. The demand forecast and business case results should be reviewed against the actual journeys and revenue of the newly provided service (from January 2008) before the scheme is developed further.

(The short extension northwards from Ebbw Vale Parkway to a new town centre station is undergoing feasibility independently of the Newport additional services option, and time has been built into existing Cardiff – Ebbw Vale Parkway resource schedules to permit such journey extension without alteration to existing main line slots between Cardiff and Ebbw Junction. It is expected that a funding decision for this will be reached in 2009).

OPTION ASSESSMENT

OPTION No.13E

GWML-West (gap 13.06)

Additional trains between Cardiff Central and Maesteg, calling at all intermediate stations namely Pontyclun, Llanharan, Pencoed, Bridgend, (these four stations are on the double-track Great Western Main Line) and Wildmill, Sarn, Tondu, Garth, Maesteg (Ewenny Road) and Maesteg (all on the single-track branch line).

CONCEPT

Hourly train services between Cardiff and Maesteg were introduced in 1992. The Sewta strategy now calls for an increase in the service frequency from its current hourly level to half-hourly throughout the day, amounting to fifteen additional return trips between Cardiff and Maesteg. This would achieve the Sewta goal of provision of a half-hourly service at similarly sized towns such as Merthyr Tydfil and Aberdare, based on population figures and journey-to-work patterns driven by the jobs market in Cardiff.

OPERATIONAL ANALYSIS

Utilisation of the double-track section of the GWML between Cardiff and Bridgend by passenger trains in peak hours is HIGH when FGW operate two Paddington HSSs, and ATW operate hourly Maesteg services, hourly semi-fast Carmarthen to Manchester services, and two-hourly Swansea local services, (ie. in those hours which these trains run), plus freight from and to the Port Talbot/Margam complex.

An additional hourly Cardiff – Maesteg service was capable of being pathed between Cardiff Central and Bridgend, to give half-hourly spacing with the existing hourly service, but consumed a freight path. In addition it was not possible to demonstrate that it could be platformed satisfactorily at Cardiff Central without the assumption of a new, west-facing bay platform being provided. Two additional sets of resources would be required.

INFRASTRUCTURE REQUIRED

The timetable modelling presupposes that an additional passing loop on the single line from Bridgend to Maesteg would be installed, at a point slightly to the north of Tondu. This prospective infrastructure enhancement is currently at GRIP3, Single Option Selection.

(Client, Bridgend County Borough Council/WAG)

CROWDING IMPACT

Not applicable.

FREIGHT IMPACT

This option would consume an existing hourly path (leaves two freight paths per hour, one “clean” between Cardiff Central and Margam, and one using either Miskin or Stormy Goods Loops). The take-up of freight paths varies day by day.

FINANCIAL AND ECONOMIC ANALYSIS

(Not undertaken by Network Rail).

The appraisal for Sewta carried out by consultants Jacobs with a new station at Brackla notes a revised result for base growth of an NPV of £24.3m and a BCR of 1.7. The BCR without the new station is noted as likely to be at 1.3. Both sets of appraisal results may be optimistic because they include background journey growth to 2059 whilst RUS economic appraisals are capped at 2026 and also the train operating costs per annum estimated are lower than comparable RUS estimates for two trains with four crew.

That element of the SEWTA rail strategy for this enhancement was approved in principle in 2001, subject then to funding availability. It has since proceeded to GRIP3. (NB: The original submission was bound up with two new station aspirations on the GWML, at Llanharan and at Brackla. Llanharan station was subsequently authorised separately in 2005/06, and was opened in December 2007. It is already being served primarily by the hourly existing Maesteg train frequency. The Brackla additional station proposal is not being further considered).

CONCLUSION

The scheme has a positive business case demonstrated by Sewta, and this was subjected to revision during 2007 following the advance completion of Llanharan station.

Pathing over the HIGH utilisation Cardiff – Bridgend double-track section of the GWML is tight. The option is **recommended** only on the basis that implementation is carried out in conjunction with alteration to SwanLine services in order that the effect on freight path availability is minimised.

(See option 13F (gap 13.07) below).

Further, the scheme cannot be entertained without provision of the additional west-facing bay platform (notionally platform 5) at Cardiff Central, to permit turnback of the extra hourly trains.

It is noted that the funding bid (for the new passing loop on the branch) by Sewta is for 2009/10 and 2010/11, ie. in advance of CASR timescales. Prior to the running of two tph between Cardiff and Maesteg, if no additional platform capacity at Cardiff Central had become available, an interim solution of just running at half-hourly intervals, between Bridgend and Maesteg, with one additional unit exploiting the west bay platform at Bridgend is possible. No business case for this interim option has been assessed.

Finally, the paths identified for additional Maesteg services do not have the ability to cater for any more station calls (ie. the proposed Brackla, immediately east of Bridgend) on the HIGH utilisation Cardiff – Bridgend double-track section of the GWML.

OPTION ASSESSMENT

OPTION No.13F

GWML-West (gap 13.07)

Revision to pattern of stopping train provision between Cardiff Central and Swansea, calling at all intermediate stations west of Bridgend namely **Pyle**, Port Talbot Parkway, **Baglan**, **Briton Ferry**, Neath, **Skewen** and **Llansamlet**.

CONCEPT

“SwanLine” services were introduced c.1994/95 between Swansea and Bridgend, to serve the five then newly provided local stations (in **bold** above). Under the current franchise arrangements these trains run through to Cardiff, usually at two-hourly intervals, and consume a path on the busy section between Bridgend and Cardiff. The service is regarded as unattractive to users at this low frequency, with extremely restricted journey to work options for Swansea commuters.

The completion of the Port Talbot area signalling renewal in 2007 introduced a new turnback facility at Port Talbot station, intended primarily for turnbacks from the Cardiff direction, but actually capable of use by services in either direction. Owing to very light “SwanLine” passenger loadings, the proposition was to test whether a more useful service could be offered by the committed resources (ie. two equivalent trainsets), and if these could be better utilised by running at an improved hourly frequency at the four “SwanLine” stations in the Swansea and Neath and Port Talbot urban areas (ie. in the Swwitch region) only, to give an accentuated Swansea Bay focus.

Pyle station (further east, in the Bridgend area, and thus within the Sewta region) would then be served by additional calls of the hourly Carmarthen to Manchester services which currently run non-stop between Port Talbot and Bridgend. Pyle station is a railhead for Porthcawl. This would give improved connectivity in this part of the Bridgend area than that available from the existing service.

(Such alteration would necessitate passengers for Bridgend/Cardiff at the four local stations west of Port Talbot having to change at Port Talbot in future)

OPERATIONAL ANALYSIS

Hourly paths for an all-stations service between Swansea and Port Talbot Parkway, using the turnback facility there, are available. The hourly Carmarthen to Manchester path can be marginally flexed (ie., west of Cardiff) to embrace regular calls at Pyle.

INFRASTRUCTURE REQUIRED

None

CROWDING IMPACT

Not applicable

FREIGHT IMPACT

A slight increase in available capacity would occur west of Bridgend if two-hourly "SwanLine" paths between Cardiff and Port Talbot Parkway were eliminated, but a slight decrease would occur east of Bridgend if Maesteg passenger services became half-hourly.

FINANCIAL AND ECONOMIC ANALYSIS

The withdrawal of the Bridgend to Cardiff service once every two hours causes this option to produce a negative Net Present Value so no BCR can be quoted.

CONCLUSION

This option is **recommended** but only in conjunction with 13.06 above.

On a standard-hour basis it would be necessary for the proposed additional hourly Maesteg service to take the place of the Swanline journey between Cardiff and Bridgend to counter act the revenue and journey dis-benefit, and to preserve vital freight pathing opportunities. In any event the Maesteg half-hourly proposal would require a bay platform at Cardiff Central to enable turn round of the additional service. Thus SwanLine restructuring is not recommended be implemented independently of introduction of additional Maesteg services.

OPTION ASSESSMENT

OPTION No.14A

Gaps 14.01/02

West Wales train services pattern.

CONCEPT

Train services in west Wales are sub-optimally distributed, and calling patterns compromised, by the existence of a stretch of single track on the otherwise double-track main line from Swansea to Carmarthen and Clarbeston Road. The five-mile long single track is between Cockett, in the western suburbs of Swansea, and Duffryn, to the east of Llanelli, where the River Loughor is crossed on a viaduct. One intermediate station, at Gowerton, lies on this single-track stretch, with just the former Down (ie. westbound) platform in use for trains in either direction. (The disused former Up platform is still in existence). Less than half of all trains passing through Gowerton can be scheduled to make stops there owing to pathing limitations.

This tight pathing further compromises route performance. Delays on this section can have a "knock-on" effect with connections into and out of long-distance high-speed services east of Swansea, as interchange passengers from the Pembroke Dock line for Cardiff and English destinations are a high proportion of those travelling in west Wales.

The former station site at Cockett is still partially evident, and its disused platforms remain in situ.

The Loughor viaduct, which formerly carried double track, is one of a number of major structures around the Welsh coastline, and renewals are planned in 2010 – 2012. It underwent structural assessment during 2007/08 to determine the extent of renewals works needed. In view of the constraint imposed by the single line on the timetable, WAG/Swwitch requested Network Rail to consider provision for reinstatement of a double-track capable viaduct, as incremental to the overall renewal and major possessions that the structural renewals activity will cause, and the cost of provision of such double-track capability is being identified. In practice this would probably mean reinstatement of plain double track and associated alterations to signalling controls between Cockett and Duffryn, a distance of five miles.

The possibility of carrying out structural works in a manner that would permit subsequent double-track reinstatement (ie. by making provision) rather than simultaneously is recognised. This would however cause a diseconomy in terms of possessions as the structural works are likely to necessitate a period of route closure during which it would make sense to exploit this for tracklaying.

Swwitch wished to understand whether double-track reinstatement would give sufficient timetable flexibility to permit all trains to call at Gowerton within existing resource commitments. As a lower priority, Swwitch further sought to ascertain whether consideration could also be given to Cockett station re-opening. This former station is located in a busy residential suburb of Swansea, and if re-opened would have an approximately 10-minute rail journey into Swansea.

OPERATIONAL ANALYSIS

The existing pattern of train services basically comprises an hourly semi-fast Carmarthen to Manchester service and a two-hourly all stations Pembroke Dock to Swansea service, plus four through trains per day between Shrewsbury and Swansea over the “Heart of Wales” line (and which reverse at Llanelli station). The single line thus typically handles four or five movements in the busiest hours. Small performance gains would be expected.

All passing train services could be scheduled to call additionally at Gowerton if no single-track section existed to impede pathing.

Further, if an economic case were made for station re-opening at Cockett, it is likely that calls there could also be added if the single-track section impeding pathing had been doubled.

INFRASTRUCTURE REQUIRED

Reinstatement of double track throughout between Swansea and Carmarthen in conjunction with structural renewal of the Loughor viaduct, removal of the double to single leads at Cockett and at Duffryn, requisite signalling alterations at Port Talbot PSB, re-opening of the abandoned (formerly Up) platform at Gowerton station, new footbridge, and associated DDA-compliant access, with enhanced car parking provision at these stations.

The current cost (without risk and construction inflation) of the basic incremental enhancement component is in the order of £20 – £30 million. There is expected to be a small additional cost to operate and maintain this enhanced infrastructure.

CROWDING IMPACT

None.

FREIGHT IMPACT

None expected since freight to and from West Wales uses the Swansea District Line, between Briton Ferry and Llandeilo Junction, near Llanelli, thus avoiding the main line through Neath and Swansea (except when this route is not available when engineering work is taking place).

FINANCIAL AND ECONOMIC ANALYSIS

Continuing, with Swwitch. (Will undergo WelTAG appraisal during Autumn 2008).

WAG/Swwitch is, with Network Rail, assessing the business case for these proposals. There are small reliability benefits expected, some slight journey time savings on the long-distance services and additional revenue and journeys resulting from stopping trains half-hourly at Gowerton.

WAG/Swwitch are undertaking wider business case analysis of the benefits that would accrue in west Wales from improved services, especially at Gowerton station which is envisaged as a much higher throughput Parkway-style station and Lliw Valley railhead, if more frequent, clockface interval train services were provided. A further factor is the possible re-opening of Cockett station, where rail journey times would be very attractive compared to road as a consequence of increasing traffic congestion to the western side of the city of Swansea.

Economic activity and location impact: Probably moderate beneficial impact as a result of changing road congestion and encouraging public transport accessibility.

CONCLUSION

Further consideration of this option is required once demand forecasting has been completed, and the wider regional benefits assessed.

OPTION ASSESSMENT

OPTION No.14B

Gaps 14.03/04

West Wales train services (west of Carmarthen), and on the “Heart of Wales” line between Swansea/ Llanelli and Shrewsbury, quantum.

CONCEPT

Swwitch strategy for the west Wales region calls for hourly frequency of service on the western extremity of the South Wales Main Line (SWML) beyond Carmarthen, to Haverfordwest and Milford Haven. A two-hourly frequency pattern is currently operated through to Milford Haven, generally as an alternate hours extension to the hourly clockface Manchester to Carmarthen long-distance regional service operated by Arriva Trains Wales. Haverfordwest has been developed as the principal sub-regional transport interchange where numerous west Wales bus services radiate from the station forecourt.

The joint Swwitch/Tracc strategy for central Wales calls for additional services to be offered on the “Heart of Wales” line, compared to the current four trips per day each way spread over 16 hours, with four-hour average intervals between trains.

COMMENTARY

No detailed operational analysis was undertaken as the infrastructure in the west Wales area (double track from Llandeilo Junction to Clarbeston Road station, and single track thence to Milford Haven with a passing loop at Haverfordwest) is sufficient to permit an hourly frequency to be sustained if required, in the same manner as the existing two-hourly off-peak cycle. This reflects current freight traffic volumes to and from the refinery complexes at Waterston and at Robeston, two trains per day maximum, south of Haverfordwest.

On the “Heart of Wales” line, five crossing loops are provided at intervals on the ninety-miles-long single-track route, at Llandeilo, Llandovery, Llanwrtyd Wells, Llandrindod Wells and Knighton, which provide capability for significantly more than the current four trains per day. However, the single-track section between Cockett and Duffryn limits opportunities overall.

A fifth train-path in either direction between Swansea and Shrewsbury has been identified, utilising the same type of class 153 single-unit trains as are routinely deployed on the route.

No economic case for a fifth Heart of Wales line train can be made on the basis of deployment of a whole set of additional train resources: this would produce a BCR of only 0.3.

OPTION ASSESSMENT

OPTION No.14C

Gaps 14.05/07

Reduced journey times and improved frequency of services between north Wales and south Wales, and Manchester and south Wales, on the “North and West” route via Hereford.

CONCEPT

The 2005 introduction of the “Standard Pattern Timetable” by Arriva Trains Wales as an integral part of the Wales and Borders franchise specification saw the establishment of new, through services between Holyhead/Bangor and Cardiff, at two-hourly intervals, mostly operated by comparatively new, 100mph-capable class 175 “Coradia” rolling stock fitted with air conditioning. These units also work most Manchester – Carmarthen services, giving a combined frequency of three trains in every two hours on the corridor between Shrewsbury and Newport along the border counties. There are calls from WAG to provide strengthened public transport links between north and south Wales, where the rail mode is competitive on journey time compared to roads.

In the short-term, a suitably timed premium service for business and other users is sought, which would be faster than current regular interval services, and geared to giving a full day (say five to six hours) in the capital city of Cardiff from Bangor and other principal north Wales stations along the route through Wrexham General.

In the medium- to longer-term it is envisaged that demand for north-south Wales and Manchester to Carmarthen services will grow such as to warrant half-hourly frequencies over the Chester/Crewe to Newport section for more or all of the day, at reduced journey times, better exploiting the class 175 “Coradia” trains 100mph capability.

OPERATIONAL ANALYSIS

In isolation, pathing for passenger trains on both service groups to each run at hourly instead of at the existing combined frequency of three per two hours is clearly possible (ie. south of Shrewsbury). However, the nature of the route (in terms of gradients, and the spacing between signalboxes) is such that this would “shut out” (for loaded journeys, in the northbound direction) paths for freight trains (ie. over the section between Newport and Hereford/Shrewsbury) of the trailing load capability of around 2,000 tonnes plus now sought by freight train operating companies. Such trains can currently only be pathed in those hours when only one passenger train operates, as constrained by the geography around Abergavenny (in Monmouthshire) and Pontrilas (in Herefordshire).

Two exercises were thus undertaken, the first being to identify paths for an additional pair of business-needs timed “premium” north-south trains, southbound in the morning to arrive Cardiff by 10:30, and northbound returning from Cardiff for north Wales at around 16:15 – 16:30 hrs. This proved to be possible, at current line-speeds, with wholly additional train resources. A further option is also being considered by WAG, for another pair to give a facility for business and other travellers to north Wales from the south.

A further exercise was undertaken to identify paths for northbound 2,000 tonnes-loaded freight trains, focusing on the critical section of the route in Wales, on the border at Llanvihangel Bank. This identified that (with one qualification) northbound paths exist, if these additional freight trains were looped appropriately. This regulation would require to be at Panteg Up Goods Loop (to the south of Pontypool and New Inn station) to let a first passenger train past, and then again at Pontrilas Up Goods Loop to let a second passenger train past, similarly at current linespeeds. The qualification is that where two successive passenger trains require to be at 30-minute intervals of dispatch from Cardiff Central in future, a three-minute delay on the second of these would be imposed before the freight train could be inside the loop, clear, at Pontrilas, under existing block signalling arrangements.

For Cardiff – Holyhead trains travelling via Wrexham, the single-track section between Wrexham General and Chester (Saltney Junction) does not permit both groups (ie. Cardiff – Holyhead and Birmingham – Chester) to each be hourly.

INFRASTRUCTURE REQUIRED

In the high-growth scenario of doubled passenger train frequencies throughout the day, and long-term freight growth (for example on flows of coal from south Wales or Bristol to the midlands or to the north), the current “North and West” route infrastructure (in terms of Goods Loops provided for the regulation of slower-moving freight trains) could only support paths for such freight trains at night when no passenger services operate.

An additional Intermediate Block Signal (IBS) would therefore require to be installed at a suitable point north of Abergavenny station to overcome this constraint in the event of both growth scenarios developing.

In order to handle four trains per hour (ie. two each way) between Wrexham and Chester, at least partial re-doubling of the single track section between Wrexham General and Chester (Saltney Junction) would be necessary.

In order to reduce journey times beyond what can be achieved by omitting stops at some less busy stations, line-speed improvements would assist. The slowest section is that between Wrexham and Shrewsbury which would offer most potential for upgrade.

CROWDING IMPACT

None

FREIGHT IMPACT

There would be a reduction in route freight capacity (ie. for 2,000-tonnes-plus trains), if more passenger trains were run in the xx.20/50 ex-Cardiff slots to Holyhead/Manchester, respectively. This could be overcome by enhancements to Absolute Block signalling arrangements between Abergavenny and Pontrilas to create suitable paths, by allowing for the disparate route performance of fast passenger trains against heavy, slower-moving freight trains.

FINANCIAL AND ECONOMIC ANALYSIS

Feasibility commenced during 2008.

Infrastructure cost inputs: The capital costs of the infrastructure line speed proposals are not available at this stage.

However the Wales RUS has estimated the capital cost that could be spent to have a positive Net Present Value and a benefit cost ratio greater than 2, assuming revenue and generalised journey time gains on the Cardiff to Holyhead trains only. The growth forecast of 41 percent from 2007/08 to 2025/26, an average of 1.2 percent is assumed to apply. No operational costs have been included in this assessment.

Typical long-distance journey times between north and south Wales (for example, between Bangor or Llandudno and Cardiff) are in the range four to five hours.

An estimated £4.0 million could be spent to achieve a 15-minute journey time improvement and have a positive NPV and a BCR of 2. This capital cost is assumed to be at GRIP stage 1 and RAB financed at 4.4 percent per annum from Control Period 4 onwards.

30-year appraisal	£ million
Costs (Present Value)	
Investment cost - RAB financed	6.7
Operating Cost	0.0
Revenue	–2.5
Other Government Impacts	0.7
Total costs	**5.0**
Benefits (Present Value)	
Rail user benefits	9.1
Non user benefits	0.7
Total Quantified Benefits	**9.7**
NPV	**4.8**
Quantified BCR	**2.0**

Note: All figures are presented in 2002 market prices

CONCLUSION

It is **recommended** that this option continues through the major feasibility study described above, and that this includes consideration of Wrexham – Chester partial or full redoubling, and also embraces more detailed feasibility for the Abergavenny area signalling enhancement outlined above.

It is also recommended that development of the signalling enhancement at Abergavenny proceeds irrespective of the passenger business upgrade feasibility outcome, to recognise expected freight growth and the important diversionary status of the Newport – Shrewsbury section of the route when Birmingham to Bristol via Gloucester undergoes major upgrade, tentatively in 2010/11. This is a candidate NRDF scheme accordingly.

OPTION ASSESSMENT

OPTION No.14D

Gap 14.06

Additional stopping train services between Cardiff and Abergavenny.

CONCEPT

Sewta long-term strategy calls for the provision of a half-hourly train service frequency at Abergavenny.

There is a further call for up to three additional stations on the section of the route between Newport and Abergavenny, at Caerleon, Llantarnam (south of Cwmbran) and Sebastopol (between Cwmbran and Pontypool and New Inn stations). Of these, preliminary feasibility has been instigated for Caerleon only.

In addition, Sewta plans call for two further additional local stations between Cardiff and Newport, at St Mellons (in the eastern suburban area of Cardiff) and at Coedkernow (on the western outskirts of Newport) which might be served by an hourly Cardiff – Abergavenny local train service ie. a third train per hour, in addition to existing Manchester and north Wales long-distance regional services.

These are long-term plans and as yet are unsupported by demand forecasting or other evidence.

OPERATIONAL ANALYSIS

(14C, above, looked at two trains per hour for Abergavenny/long distance)

As an interim measure prior to major north-south improvements, outline consideration was given to running additional trains (between Cardiff and Abergavenny only) in the "slots" which are currently unused by long-distance Holyhead services ie. the alternate, xx.20 Cardiff departures northbound (and vice versa southbound). Within a "standard-hour" approach this was possible, at the cost of an additional set of resources.

INFRASTRUCTURE REQUIRED

A turnback facility would be required, clear of the running lines, for frequent use, ideally by means of a reinstated third platform, on the Down (southbound) side of Abergavenny station.

CROWDING IMPACT

None

FREIGHT IMPACT

Being confined to south of Abergavenny, where signalling is mostly controlled from Newport under Track Circuit Block (TCB) arrangements with closer headways, there was minimal anticipated freight impact.

FINANCIAL AND ECONOMIC ANALYSIS

Summary results:

This quantified appraisal takes account of the timetable change as modelled in MOIRA. Costs and benefits are shown in 2002 prices and values assuming full benefits start in 2009/10.

30-year appraisal	£ million
Costs (Present Value)	
Investment cost - RAB financed	8.1
Operating Cost	12.5
Revenue	–1.7
Other Government Impacts	0.5
Total costs	**19.4**
Benefits (Present Value)	
Rail user benefits	4.1
Non user benefits	0.4
Total Quantified Benefits	**4.5**
NPV	**–14.9**
Quantified BCR	**0.2**

Note: All figures are presented in 2002 market prices

CONCLUSION

On the basis of the current appraisal assumptions, this option appears not to warrant further consideration.

In the longer-term, if the Ebbw Vale to Newport (see option 13D) additional services were introduced, there exists a sub-option to run these through to Abergavenny, utilising a third set of resources, In this scenario, with a turnback bay at Abergavenny provided, there may then be a case for marginally accelerating the fast Cardiff – Holyhead services by only calling at Pontypool and New Inn with the (additional) Abergavenny local trains. (Cwmbran calls to remain in all trains).

OPTION ASSESSMENT

OPTION No.14E

Gaps 14.09

Additional calls at Nantwich.

CONCEPT

Two distinct train services are provided between Shrewsbury and Crewe. An hourly frequency, long-distance regional service between Carmarthen/Cardiff and Manchester is provided by ATW, which in most hours runs non-stop between Shrewsbury and Crewe. Additionally, a stopping service at two-hourly intervals is provided (also operated by ATW), calling at all intermediate stations, namely Yorton, Wem, Prees, Whitchurch and Wrenbury (all in Shropshire), and Nantwich (in Cheshire). In addition, Wem, Whitchurch and Nantwich enjoy a small number of extra calls, off-pattern, by a handful of the regional fast services.

As a growing residential town, Cheshire CC seeks an improved service at Nantwich, to offer a through facility for commuters and others to Crewe and Manchester all day.

COMMENTARY

The two-hourly “slots” used by the all-stations service would be available on an hourly basis if required. However attention was focused on flexing the regional paths to determine whether Nantwich calls could be regularly encompassed after the WCML 2008 recast. Manchester – Cardiff trains are currently timed throughout in 90mph class 158 timings.

Using class 175 Coradia timings it nonetheless cannot be demonstrated that the additional calls at Nantwich could be encompassed, owing to the fixed limitations imposed by crossing the WCML at Crewe North.

This option cannot currently be pursued, on the grounds of pathing constraints imposed by the WCML 2008 timetable recast at Crewe, with very limited opportunities for Cardiff to Manchester trains to cross the main routes. Limited slots exist at Newport to path these services on the Great Western Main Line. However the option should be kept under review in case the constraints ease at a future stage and allow the additional stops at Nantwich to be pathed without journey time disbenefit.

OPTION ASSESSMENT

OPTION No.14F

Gaps 14.10 – 14

Cambrian (various)

CONCEPT

A two-hourly interval service is provided on the single-track Cambrian Main Line between Aberystwyth and Shrewsbury, and then through to Birmingham New Street, serving principal stations only east of Shrewsbury. Connections with the Cambrian Coast section (running from Dyfi Junction through Barmouth and Porthmadog) to Pwlheli are provided at Machynlleth. Eastbound and westbound Cambrian main line trains generally cross one another in the passing loop at Talerddig, to the west of Caersws.

WAG/TraCC strategy calls for a substantial betterment in base route performance and an increased route capability to permit hourly frequency services between Aberystwyth and Shrewsbury. To allow this additional passing loop facilities are needed.

COMMENTARY

A new passing loop between Aberystwyth and Machynlleth is required to give an hourly frequency capability, and this is identified to be constructed at Dyfi Junction. Additional "dynamic" loop capability is also required at a suitable point between Machynlleth and Shrewsbury, and this is identified to be provided between Fron/Cilcewydd and Welshpool, by means of a westwards extension to the existing Welshpool loop. Additional platform capacity at Shrewsbury is also planned, and it is envisaged that Platform 3 will be upgraded such as to be able to cater for westbound Cambrian departures (ie. after arrival from Birmingham, and reversal). A journey time reduction between Welshpool and Talerddig is also necessary to ensure timely crosses at the three loops.

On this basis hourly paths in either direction between Aberystwyth and Shrewsbury can be identified, where Up and Down trains would routinely cross at Dyfi Junction., Talerddig and Welshpool. These would be in addition to the existing structure of two-hourly frequency ATW trains each from Aberystwyth and from Chester to Birmingham New Street, which combine to give an hourly interval limited-stop service east of Shrewsbury, in addition to the London Midland hourly all-stations (ie. between Shrewsbury and Wolverhampton) stopping service between Shrewsbury and Birmingham New Street.

The appraisal for this scheme has been developed by WAG and Network Rail to measure improvements in reliability and changes to journey time and revenue arising from increasing train frequency to Aberystwyth. The infrastructure scheme has been authorised and the Third Party funded infrastructure upgrade will be implemented during 2007 – 2009 in association with Network Rail funded ERTMS implementation works. These have the twin objectives of improved reliability and future enhanced route capability.

OPTION ASSESSMENT

OPTION No.15A

Gap 15.01

South Wales Valleys: continued short term growth (Taff Vale corridor)

CONCEPT

A steady increase in demand across the South Wales Valleys, over the last ten years, has gradually required the provision of longer trains where the capacity of two-car sets has been overtaken, and more trains have run strengthened as four-car sets, on those routes where platform length permitted this. A further programme of platform lengthening was underway in 2006 – 2008 on key routes to cater for the long-term trend by means of creation of six-car capability.

Prior to further infrastructure upgrade in the Queen Street (North Junction) to Cogan "central corridor", which caps Valleys train frequencies at a maximum of 12 trains per hour (tph), increased use could be made of the "City Line" between Radyr and Cardiff Central via Ninian Park, which has some spare capacity. Some growth paths can be identified between Porth/Pontypridd and Cardiff Central, running non-stop past the four City Line stations, under certain qualified circumstances, within the 12tph "cap" mentioned.

OPERATIONAL ANALYSIS

Two additional paths per hour can be identified between Porth/Pontypridd and Cardiff Central, if linked to Cardiff Central to Treherbert SPT workings, with compliant turnround at Porth station. This would provide additional seats at stations north of Radyr, but not at Llandaff or Cathays, nor would it assist in catering for demand to Cardiff Queen Street.

Performance over the single-track Treforest East Curve (between Ninian Park station and Cardiff Central, close to Canton depot) would be significantly tightened.

INFRASTRUCTURE REQUIRED

None

CROWDING IMPACT

Some benefit at stations between Radyr – Pontypridd/Porth inclusive, for flows to Cardiff Central.

FREIGHT IMPACT

None

FINANCIAL AND ECONOMIC ANALYSIS

Not initiated

CONCLUSION

At existing line-speed constraints via the City Line, this option only has limited benefits if actual short-term growth exceeds expectations. The capability will exist (from Summer 2008 onwards) of running some trains between Treherbert and Cardiff Central (ie. in the customary paths through Cardiff Queen Street) as six-car instead of four car formations. This will provide more seats at all stations between Pontypridd and Cathays.

This short-term option is not therefore recommended, as the outputs can be delivered through train lengthening.

(See option 15F in respect of long-term use of the City Line)

OPTION ASSESSMENT

OPTION No.15B

Gap 15.04

South Wales Valleys: continued short-term growth (Vale of Glamorgan corridor).

CONCEPT

Since the opening of the Barry – Bridgend "Vale of Glamorgan" (VoG) line in 2005, with regular hourly all-stations services provided between Cardiff and Bridgend (integrated with three tph to Barry Island), passenger levels have met forecasts at the two new stations at Rhoose and at Llantwit Major. At the time of construction, additional signalling capacity was provided on the VoG route (ie. between Aberthaw and Bridgend) for an eventual increase to half-hourly frequency of passenger operation when demand warranted this.

Sewta/WAG policies may call for this uplift in the short- to medium-term, ie. prior to any capability increases on the Queen Street North to Cogan Junction central corridor which might permit more trains to operate over this HIGH utilisation section of the route, which is shared through Grangetown with the four tph service from the Rhymney line to Penarth.

During 2007, proposals for major employment growth at RAF St. Athan were announced and WAG/Sewta requested that an additional VoG line station also be considered in connection with this development. Such a facility might be located at the former Gileston station site, which has road access, at the eastern end of the St Athan complex.

As an associated issue, increased volumes of coal to Aberthaw Power Station (ie. from Cwmbargoed, w.e.f. January 2008) have necessitated adjustment to the SPT to create freight paths through the Queen Street to Cogan Junction corridor. Identification of long-term freight paths alongside sustained passenger growth is necessary.

OPERATIONAL ANALYSIS

The eight passenger tph between Cardiff Queen Street and Cogan Junction (where the four tph to Penarth and the four tph towards Barry diverge), plus growing volumes of coal to Aberthaw Power Station, preclude the identification of additional passenger train paths between Cardiff and Bridgend via Barry and the VoG.

However it is possible to switch one of the three Barry Island line services per hour to become a second VoG service. This would give the desired half-hourly frequency over the VoG line to Bridgend, calling at Rhoose and at Llantwit Major, and would retaining the existing four tph pattern of service at all stations between Barry and Cogan.

At existing line-speeds there is insufficient turn round time at Bridgend station to permit Down VoG trains to call additionally at a new St. Athan station, thus arriving later, or for VoG trains to return earlier from Bridgend in the Up direction to call additionally, within the fixed Queen Street-Cogan Junction "slots".

INFRASTRUCTURE REQUIRED

None, for two VoG tph alone.

CROWDING IMPACT

Not applicable in the short term.

FREIGHT IMPACT

Possibly minor impact confined to freight train path timings between Barry and Aberthaw.

FINANCIAL AND ECONOMIC ANALYSIS

Summary results: This quantified appraisal takes account of the rail timetable change as modelled in MOIRA and moderated to reflect zonal pricing in the Cardiff area. Costs and benefits are shown in 2002 prices and values assuming full benefits start in 2009/10.

10-year appraisal	£ million
Costs (Present Value)	
Investment cost - RAB financed	0.0
Operating Cost	11.0
Revenue	–0.6
Other Government Impacts	0.2
Total costs	**10.5**
Benefits (Present Value)	
Rail user benefits	3.3
Non user benefits	0.2
Total Quantified Benefits	**3.5**
NPV	**–7.1**
Quantified BCR	**0.3**

Note: All figures are presented in 2002 market prices

CONCLUSION

The option is not recommended yet on economic grounds. However if the proposed St Athan station development goes ahead the additional revenue earned might give a satisfactory result relative to the additional costs calculated above. To physically achieve the time-saving necessary to embrace an extra stop there would need to be an offsetting line-speed improvement. Full WelTAG appraisal would be required in the further development of this option.

If it were necessary to make a trade-off between services, with the Barry to Barry Island section losing one of its three trains per hour in order that the Vale of Glamorgan could gain a half-hourly service, then once an additional bay platform at Barry station is provided (within CASR), this would give the capability for shuttle services between Barry and Barry Island in connection with Cardiff – Bridgend VoG services to be operated if required. In these circumstances the increase of VoG services to half-hourly could proceed whilst a three tph service was retained at Barry Island.

It would be further possible to offer a four tph service at Barry Island if required, by means of two shuttle connections to/from VoG services at Barry, and two through services each hour.

OPTION ASSESSMENT

OPTION No.15C

Gap 15.05

South Wales Valleys: short-term growth (Taff corridor)

CONCEPT

Sewta policies call for an enhanced service frequency at the top end of the Taff Vale which, north of Abercynon South station, currently enjoys only an hourly frequency on the single-track section to Merthyr Tydfil (at the intermediate stations of Quakers Yard, Merthyr Vale, Troedyrhiw and Pentrebach), and where there is a continuing economic regeneration agenda. The adjacent Cynon Valley branch from Abercynon North to Aberdare has (from 2004) had a service improvement to a half-hourly frequency, which has led to continuing growth in demand. The aim is to provide four trains per hour at the newly combined Abercynon station (replacing the existing Abercynon North station, at the South site) with two each from Aberdare and from Merthyr.

Feasibility was undertaken during 2004/05 regarding the construction of an intermediate passing loop approximately midway on the single track, at Merthyr Vale, to enable a half-hourly frequency to be operated between Cardiff and Merthyr. This is to be achieved within the current 12tph SPT framework, by the extension northwards of the hourly Pontypridd turnback trains each hour, and v.v., without any change to the quantum of paths through the central corridor.

COMMENTARY

This would require a passing loop at Merthyr Vale, between Abercynon and Merthyr is required with associated signalling alterations, which will be implemented at Abercynon signalbox. At a future stage the area controlled by Abercynon signal box will be subsumed into the new, wider Cardiff area of control as part of the Cardiff Area Signalling Renewals. The timing of this will be driven by whatever decision is taken on merging the Radyr Signalling Centre control area (with which Abercynon “fringes”) with Cardiff in the longer-term.

This proposal is being implemented. The date for introduction of half-hourly frequency Merthyr services has been agreed between WAG and ATW, for May 2009.

OPTION ASSESSMENT

OPTION No.15D

Gap 15.06

South Wales Valleys: medium term growth (Rhymney corridor).

CONCEPT

Sewta policies call for an enhanced service frequency at the top end of the Rhymney Valley which, north of Bargoed, currently enjoys only an hourly frequency on the single-track section to Rhymney (at the intermediate stations of Brithdir, Tir Phil and Pontlottyn) and where there is a continuing economic regeneration agenda. Bargoed and stations south thereof have (from 2006) had a service improvement and now enjoy a quarter-hourly frequency, which has led to continuing growth in demand.

From summer 2008, the completion of the platform lengthening programme will enable Rhymney Valley trains to be strengthened to six-car formations where necessary, initially envisaged in the peak hours.

Feasibility has been undertaken in order to identify the optimum location for an intermediate passing loop approximately midway on the single track, to enable a half-hourly frequency to be operated. This is envisaged to be achieved within the current 12tph SPT framework, by the extension northwards of one of the three Bargoed turnback trains each hour, and v.v., without any change to the quantum of paths through the central corridor.

COMMENTARY

A new passing loop at Tir Phil, between Bargoed and Rhymney would be required, together with associated signalling alterations. However such signalling alternations at Bargoed would be only used for a short period, as the old mechanical Bargoed signal box will be subsumed into the new, wider Cardiff area of control as part of the Cardiff Area Signalling Renewals (CASR) programme. The timing of the enhancement ought ideally to be funded so as to coincide with Network Rail renewal timescales.

OPTION ASSESSMENT

OPTION No.15E

Gap 15.07

South Wales Valleys: medium-term growth, new station at Energlyn (Rhymney corridor)

CONCEPT

Linked to 15D, see above

Stations in the Rhymney Valley, between Caerphilly and Rhymney, are fairly evenly distributed and serve mostly established communities. New housing has been constructed around the Energlyn area two to three miles north of the Caerphilly urban area, and Sewta plans call for an additional station to be provided (between Aber and Llanbradach stations) to cater specifically for potential demand at Energlyn.

The existing quarter-hourly frequency along the Rhymney Valley (ie. south of Bargoed) is planned to cater for this demand.

COMMENTARY

No change to the 12 passenger tph SPT is envisaged in terms of presentation at the critical Queen Street North Junction location, and the four Rhymney Valley tph paths would be flexed north of Aber to allow the insertion of an Energlyn call in either direction in each passing service.

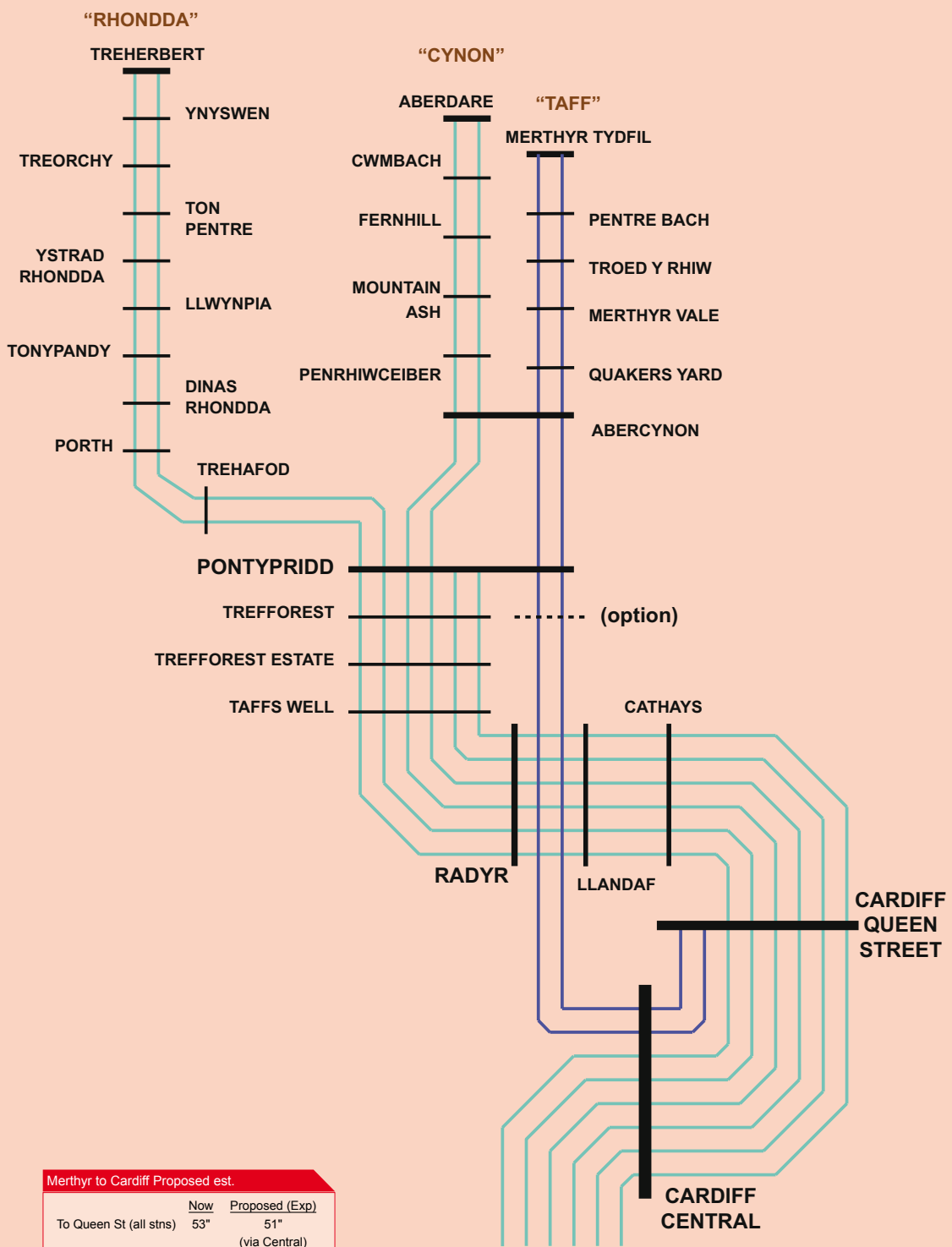
Network Rail have developed a notional timetable as part of the Rhymney two tph GRIP works, to confirm this assumption. It is not expected that Energlyn station would be constructed ahead of that scheme

This would require a new, two platform station at Energlyn, plus associated DDA-compliant access arrangements. Six-car platform length specified.

Sewta submitted this scheme to WAG in 2001, when Ministerial Approval for the funding was granted in principle. It now awaits allocation of funding. It is assumed that no additional rolling-stock requirements would be triggered, and that Energlyn passenger levels would be absorbed within ongoing platform lengthening and subsequent train-strengthening activities of the next five to ten years. There may be a journey time impact to existing rail users north of this location.

Further, this proposal should be progressed in conjunction with, or after, the CASR-driven Rhymney 2tph (ie. Tir Phil passing loop) scheme, subject to final WAG/Sewta confirmation of business case and funding release.

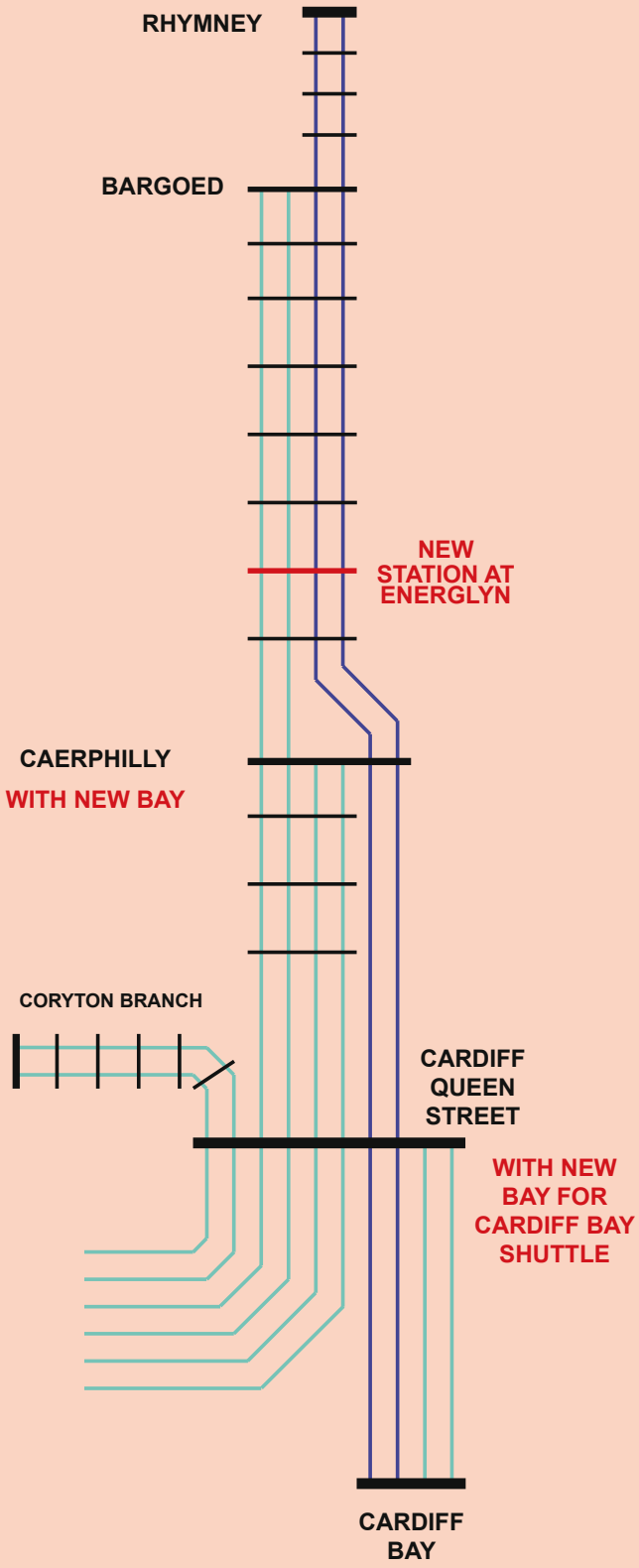
Figure 38 – Taff Vale "Merthyr Express" (Addition of Bay Platform at Pontypridd Station)



Merthyr to Cardiff Proposed est.

	Now	Proposed (Exp)
To Queen St (all stns)	53"	51" (via Central)
To Central (all stns)	57.5"	48" (via City Line)

Figure 39 – Rhymney corridor “Bargoed Express”



OPTION ASSESSMENT

OPTION No.15F

Gaps 15.02/03

South Wales Valleys: longer-term growth (Taff Vale and Rhymney corridors)

CONCEPT

The Sewta strategy for the South Wales Valleys urban network has been one of a steady growth in the frequency of train services offered, and selective expansion of the reach of the network, to increase rail modal share. Most recently, a programme of platform lengthening on key routes, together with upgrade of single-track sections where these constrained capacity (new passing loops provided at Mountain Ash, on the Aberdare line, and at Merthyr Vale, on the Merthyr line, from 2008) has facilitated growth around the 12tph Standard Pattern Timetable (SPT) framework.

Looking to the longer term the Sewta policy is for this increased modal share for rail to grow further to counter congestion. In conjunction with the signalling renewal of the Cardiff area (programmed for 2010/13) a number of enhancements have been planned to unlock the current 12tph "cap" through the Queen Street North to Cogan Junction central corridor. This is in order that more frequent services (to achieve urban "turn up and go" standards) can be provided, targetted at the northern side of the Cardiff City area, and taking in the biggest population centres in the valleys themselves at Pontypridd and Caerphilly.

The Sewta Rail Strategy Study (Final Report, January 2006) under "Integration" states that "… the core Cardiff and Newport journey to work areas extend out to Barry, Pontypridd, Caerphilly and Cwmbran. Here there is a need to provide attractive rail services to access jobs in Cardiff and Newport and to reduce use of the highway network…".

Expansion of the layout at Cardiff Queen Street station to four through platforms is envisaged, with closer signalling headways between there and Cardiff Central, plus enhanced platform capability at Cardiff Central to supplement the existing Valleys platforms 6/7.

In order to meet the growth/capacity requirements set out in the HLOS the objective is to move the South Wales Valleys network forward towards a 16tph capability through the central corridor. Within this framework, the specific requirement is then eventually for an additional two tph to operate on each of the Taff Vale and Rhymney corridors to Cardiff Queen Street, combined with journey time reductions on longer-distance journeys.

On the Taff corridor, a major Park and Ride facility at Abercynon is envisaged, close to the busy A470, coupled with accelerated journeys between the Merthyr line stations and Cardiff, in conjunction with more direct routeing of some journeys over the City Line (See figure 38).

On the Rhymney corridor, a six tph frequency is planned at Caerphilly, recognising the increasingly important role of the successful, Caerphilly Transport Interchange integral with the centrally sited station. Some journeys from stations north of Caerphilly would be accelerated by non-stop running between there and Cardiff Queen Street (See Figure 39).

As an associated issue, increased volumes of coal to Aberthaw Power Station (ie. from Cwmbargoed from January 2008) have necessitated short-term adjustment to the SPT to create freight paths through the Queen Street – Cogan Junction corridor. Identification of long-term freight paths alongside sustained passenger growth is necessary.

OPERATIONAL ANALYSIS

Building on the 12 passenger tph SPT framework, the additional paths (to operate during the peak hours, after implementation of the major central corridor enhancement works) were identified.

These would give an eight tph throughput between Pontypridd and Radyr (currently six tph) and a six tph throughput between Caerphilly and Heath High Level (currently four tph). Existing two tph frequencies on the Coryton branch and on the City Line (stopping trains) would remain unchanged. Existing four tph frequencies at the three stations between Caerphilly and Cardiff would continue, but more seats would be offered as some trains serving these stations would commence at Caerphilly. Fast running of certain longer distance paths is anticipated. As an interim measure prior to construction of the additional Valleys platform (8) at Cardiff Central, it is proposed that the peak extra Rhymney valley services would run to Cardiff Bay in shuttle paths, whilst the shuttle unit stood down for a round trip.

INFRASTRUCTURE REQUIRED

In addition to central corridor works (ie. between Queen Street and Cogan Junction) additional, south facing bay platforms will be necessitated at Pontypridd and at Caerphilly. Self-containment of Cardiff Bay shuttles at Cardiff Queen Street, by means of an east-side bay platform will also be necessary. Double-tracking of the Treforest Curve at Canton, also depot enlargement to cater for stabling of significantly larger fleet in long-term. An additional platform (8) at Cardiff Central for Valleys use.

CROWDING IMPACT
The requirement stated by DfT as the High Level Output Statement (HLOS) “capacity metric” is for the provision of 600 additional seats on trains into Cardiff in the high (morning) peak-hour, by 2014 (the end of CP4) compared to a base (2008/09) of 4,000.
FREIGHT IMPACT
A four through platform layout at Cardiff Queen Street will assist freight pathing of loaded trains from Cwmbargoed trains by means of the identification of a standard-hour freight path south of Ystrad Mynach through Cardiff in the off-peak hours.
FINANCIAL AND ECONOMIC ANALYSIS
This has been developed within the CASR programme during 2008/09. The draft determination by ORR in July 2008 confirmed the £19 million capital funding allocation for this objective. Further work to confirm infrastructure costings continues. Past Sewta/Jacobs analyses have suggested a generalised BCR of 1.2 for future Valleys train provision to handle projected growth trends, based on typical revenues generated and additional rolling stock leasing and operating costs.
CONCLUSION
Provision for long-term Valleys growth has been anticipated by means of a suite of major joint DfT/WAG-funded enhancements to the CASR programme. It is **recommended** that these continue in development in order to synchronise with the renewals opportunity which will not re-occur for 30 or 40 years.

Figure 40 – Expansion of suburban Liverpool network

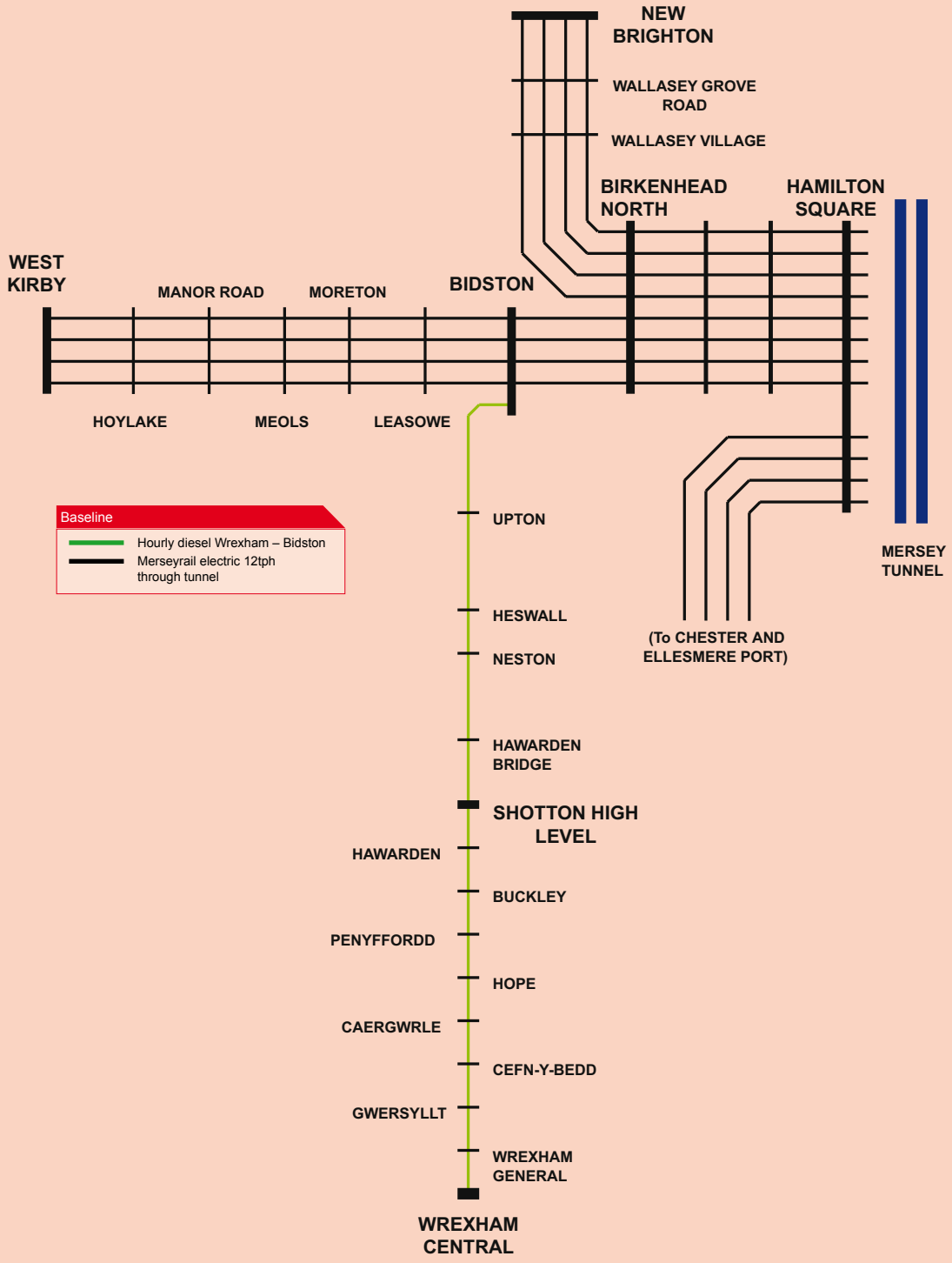
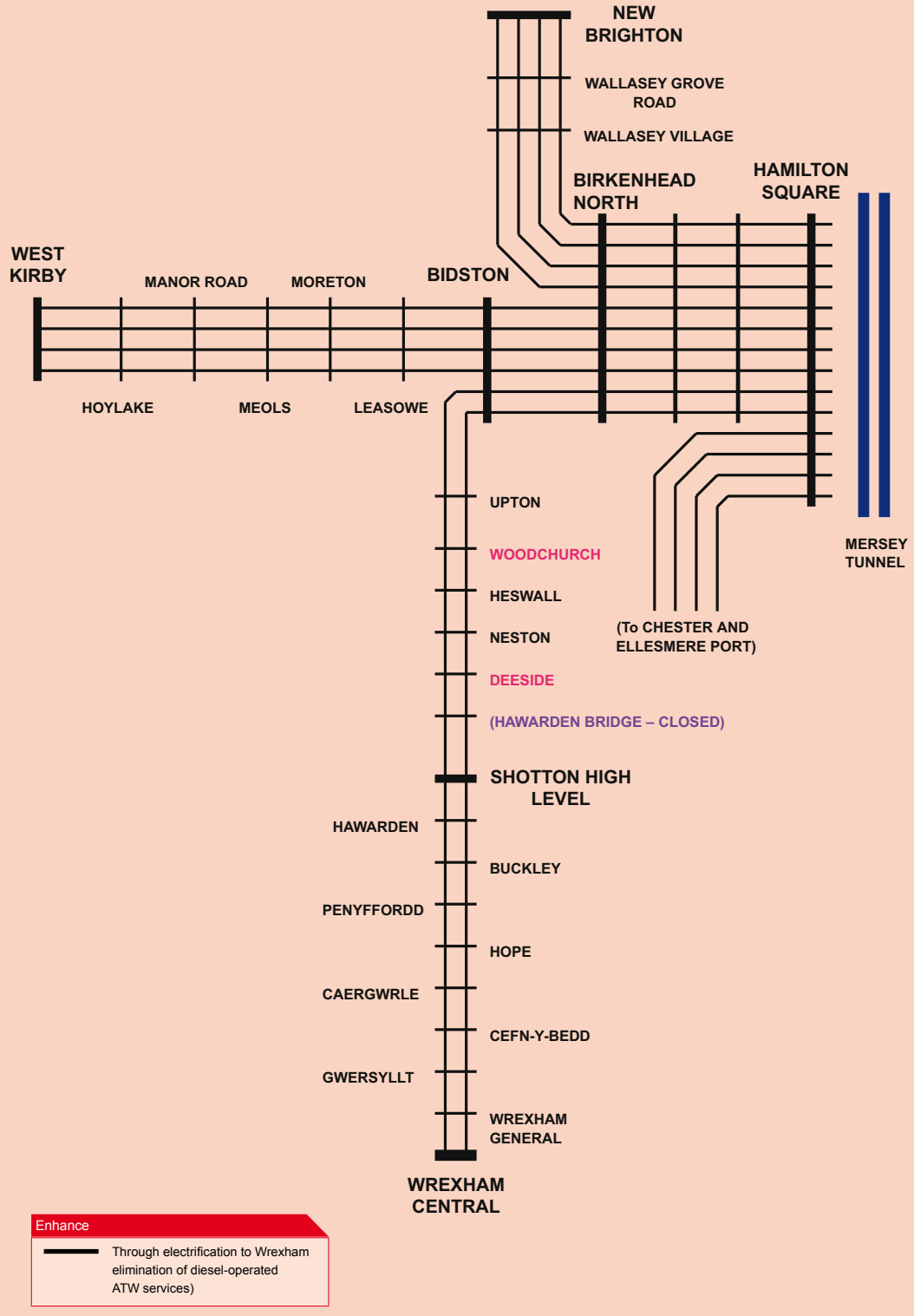


Figure 41 – Expansion of suburban Liverpool network



OPTION ASSESSMENT

OPTION No.22A

Gaps 22.01 – 04

Deeside: Wrexham to Bidston “Borderlands” line major service upgrade.

CONCEPT

An hourly, all-stations service (mostly excepting Hawarden Bridge) is operated by Arriva Trains Wales between Wrexham Central, Shotton (High Level) and Bidston, utilising two two-car class 150 “Sprinter” diesel units. Services are timed to connect at Bidston with West Kirby to Liverpool Central third-rail DC electric services which constitute part of the wider Liverpool suburban network, and are operated within the Merseyrail franchise (see Figure 40.) Line-speeds between Wrexham Central and Bidston are relatively low, and constrain current performance.

In furtherance of wider Deeside economic regeneration policies supported jointly by WAG, the Mersey-Dee alliance and the Flintshire, Merseyside and Cheshire local authorities, the Taith and Merseytravel joint regional transportation requirement is for the Borderlands Line to be integrated into the electrified Liverpool suburban network to improve connectivity and access to jobs on Deeside. Through electric services between Liverpool Central and the Wrexham line are sought, at half-hourly intervals comparable with existing Merseyrail Wirral Line through electric services to Chester and to Ellesmere Port, together with two additional stations, at Woodchurch (in Merseyside) and at Deeside Business Park (in Flintshire).

Preliminary studies on behalf of the above bodies to estimate demand were carried out (by Faber Maunsell and First Class Partnerships) over the period 2004/05, and suggested that certain electrification and service frequency improvement options had a sufficiently positive business case to progress to more detailed design assessment. Infrastructure costs were only the considered in very broad terms. Network Rail were instructed by Merseytravel (on behalf of the Merseyside PTE) during 2007 to develop a shortlist of electrification and frequency improvement options and produce more detailed capital cost estimates.

The options amounted to extension of electrification just within Merseyside (from Bidston to Woodchurch), further south and over the border into Wales to Shotton to embrace the new Deeside Business Park station in Flintshire, or all the way to Wrexham Central. The first two would necessitate the retention of residual ATW diesel services for connections from local stations south of Woodchurch or south of Shotton), the latter would enable their elimination. Existing Merseyrail three-car electric multiple-unit trains would be deployed.

OPERATIONAL ANALYSIS

Paths for a half-hourly frequency of additional, through electric trains from the Borderlands Line into Birkenhead and Liverpool Central, around the one-way loop and returning towards Shotton/Wrexham were identified. These paths would embrace additional Woodchurch calls if that station were added to the route.

In the options for electrification just over the Welsh border to Deeside/Shotton, or all the way to Wrexham Central, it was assumed that Hawarden Bridge station would be closed and that a new station at Deeside Business Park, a little way to the north, would instead be provided.

Depending on the option selected, residual diesel-operated services may still be required, between Wrexham Central and either Shotton High Level or Woodchurch. Without any linespeed improvements it would be necessary to retain the existing diesel train resources to maintain the hourly service level. Complete route electrification to Wrexham Central would, however, permit elimination of the ATW diesel service (see Figure 41.)

There would be an issue with performance around the one-way loop on account of the intensification of the base 12tph off-peak frequency to 14tph throughout the day and a high-peak 16tph (to be quantified)

INFRASTRUCTURE REQUIRED

Provision of third rail DC electrification from Bidston southwards on the line towards Wrexham Central (to Woodchurch, to Shotton High Level, or all the way to Wrexham Central).

Two additional stations (two platforms, initially three-car but capable of extension to six-car EMU length) at Woodchurch and at Deeside.

Depending on the option selected, for residual diesel operation between Wrexham Central and either Shotton High Level or Woodchurch, new crossover installations would be required at either location for turnbacks, plus platform re-arrangement to enable expedient passenger interchange between newly provided electric and residual diesel services, together with the associated overall route re-signalling enhancements. Track improvement to secure line-speed reductions.

Platform lengthening (to three-car EMU) at both Wrexham stations, plus Heswall.

CROWDING IMPACT

Not yet tested

FREIGHT IMPACT

Minimal.

Paths for three steel trains per day from the south to the Corus Dee Marsh plant would be safeguarded.

FINANCIAL AND ECONOMIC ANALYSIS

Not yet initiated by Network Rail. The GRIP 3 outputs were being finalised during April 2008, and which contain costs for various options. Further work on business case development was planned to take place during Summer 2008 accordingly. Further work to identify 25kV overhead electrification costs was requested by Merseytravel

CONCLUSION

Further work on option development should take place and be linked to the Merseyside RUS workstreams. Should electrification (either third-rail DC or overhead AC) prove unaffordable Tram Train offers a possible alternative.

OPTION ASSESSMENT

OPTION No.22B

Gap 22.05

Deeside: Connectivity at Shotton

CONCEPT

Taith policies call for an improved passenger environment at a number of north Wales stations, and specifically at Shotton High Level (on the Borderlands Line) and Shotton Low Level (on the north Wales coast line) to encourage greater interchange between services on either route, as well as improved car-parking and passenger information provision. A footpath exists between the two pairs of platfoms.

COMMENTARY

At the current, hourly frequency of Shotton calls on the two separate routes at the High Level and Low Level platforms interchange opportunities are acknowledged to be very limited.

This would require passenger facilities/lighting, etc.

This proposal is already in implementation.

Strategically compatible with 22.03/04 above for half-hourly frequencies at Shotton High Level if Borderlands line electrified, better interchange opportunities to/from north Wales coast.

OPTION ASSESSMENT

OPTION No.22C

Gap 22.06

Merseyside: Ellesmere Port to Helsby, very sparse passenger service at Ince and Stanlow stations.

CONCEPT

Half-hourly frequency train services are provided (within the Merseyrail franchise) at Ellesmere Port from there to Liverpool Central via Hooton, as part of the electrified Liverpool suburban network.

Hourly services are provided at Helsby by Arriva Trains Wales, running between Llandudno, Chester and Manchester Piccadilly via Warrington Bank Quay.

The connecting line between Ellesmere Port and Helsby, through Stanlow and Ince, enjoys a very limited service (operated by Northern Trains) of only two trains in the early morning and two in the afternoon, outside peak times. There is local interest in better service frequencies on the Ellesmere Port to Helsby section, to offer meaningful links from Helsby to Birkenhead and Liverpool (via Hooton) and, in the other direction, from Ellesmere Port to the Warrington and Manchester directions.

OPERATIONAL ANALYSIS

The provision of a dedicated set of diesel-train resources would enable either an hourly or a more intensive half-hourly Ellesmere Port to Helsby shuttle operation, with optimised Liverpool Central connections at the former, and good connections to Warrington at the latter, serving the intermediate stations at Stanlow and Ince.

Station platform layouts at both ends of the shuttle route enable such a service to be operationally self-contained with no impact on existing services.

INFRASTRUCTURE REQUIRED

None

CROWDING IMPACT

N/A

FREIGHT IMPACT

Minimal

Paths for three coal trains per day from Ellesmere Port to Fidlers Ferry would be safeguarded.

FINANCIAL AND ECONOMIC ANALYSIS

Summary results: This quantified appraisal takes account of the timetable change for the diesel services. Costs and benefits are shown in 2002 prices and values assuming full benefits start in 2009/10.

10-year appraisal	£ million
Costs (Present Value)	
Investment cost - RAB financed	0.0
Operating Cost	3.7
Revenue	–0.1
Other Government Impacts	0.0
Total costs	**3.6**
Benefits (Present Value)	
Rail user benefits	0.5
Non user benefits	0.01
Total Quantified Benefits	**0.5**
NPV	**–3.2**
Quantified BCR	**0.1**

Note: All figures are presented in 2002 market prices

CONCLUSION

This option is not recommended in view of the very low level of benefits estimated.

OPTION ASSESSMENT

OPTION No.22D

Gap 22.07/08

North Wales coast line: general service level improvements.

CONCEPT

Taith strategy calls for a generally improved service level along the north Wales coast line, particularly between Bangor and Llandudno Junction where only hourly stopping services are currently provided. Better long-distance links (to the Midlands and London) are also sought.

COMMENTARY

Existing route capability permits such frequency increases if required.

The committed WCML December 2008 timetable changes will bring significant change to the overall coastal route service pattern by the introduction of regular, through London to Chester fast services (at hourly intervals) provided by Virgin West Coast.

Of these seven will proceed beyond Chester to Bangor(2)/Holyhead(5), in excess of the five trains per day currently with a sixth to Llandudno, and give a better spread to key destinations. All are to be operated by class 221 Virgin Voyager stock, with a standard calling pattern (between London Euston and Crewe) of Milton Keynes only.

In connection with the above, ATW domestic services will be adjusted, to create a new Holyhead to Birmingham New Street (via Wrexham General, with reversal at Chester) through service at two-hourly intervals, integrated with the Holyhead – Cardiff two-hourly services on the other hour. Crewe – Chester ATW shuttle services will be adjusted to reflect the extra Virgin West Coast London to Chester (and beyond) journeys. A slight increase in connectional facilities at Llandudno Junction for Llandudno is also envisaged.

The changes described deliver an overall improvement to North Wales Coast service levels. More fast long-distance trains will run over the Bangor – Llandudno Junction section identified by Taith as the poorest served currently by the hourly stopping trains between Holyhead and Cardiff/Crewe.

OPTION ASSESSMENT

OPTION No.22E

Gap 22.09

North Wales: Blaenau Ffestiniog new freight flow.

CONCEPT

There has been interest in a scheme to remove trainload quantities of slate waste (2,000 tonne block trains, to various midlands and northern destinations) from a new terminal just north of Blaenau Ffestiniog station.

COMMENTARY

Viable tonnages are not possible on the branch in its current condition as its Route Availability (RA) is too low. If this RA were to be upgraded, then three train paths per day to Llandudno Junction, and beyond (after reversal in the sidings there) to destinations beyond Chester can be identified (and paths for such trains have been reserved accordingly).

No changes to established branch passenger services are required.

This would require a new terminal and connection at Blaenau Ffestiniog, plus associated signalling alterations.

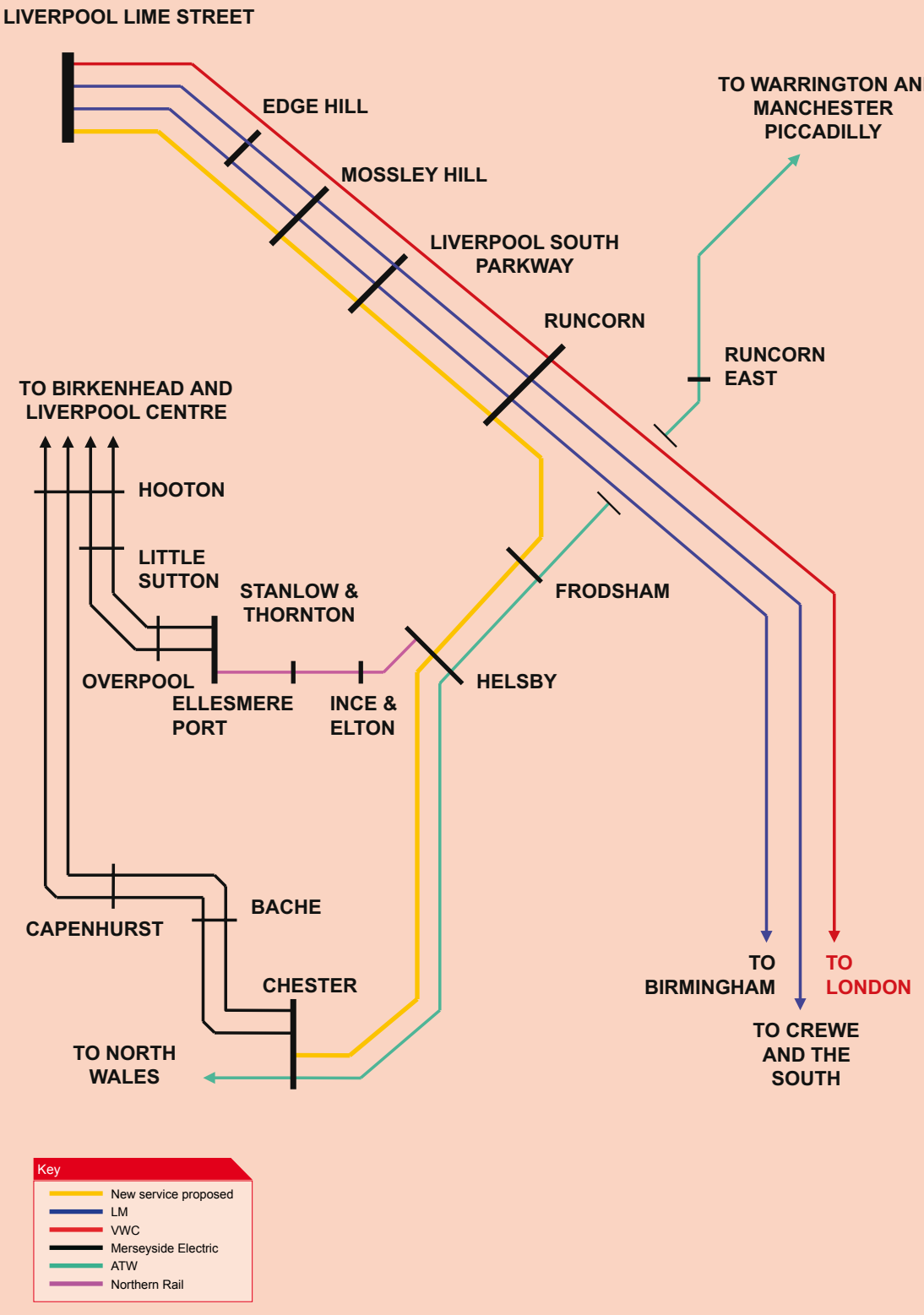
Extension to the length of the passing loop at Llanrwst North, to cater for long freight trains, 20 x JNA wagons, class 66 hauled.

Run-round facility at Llandudno Junction clear of through running lines.

This scheme has a strong estimated BCR. Welsh Assembly Government and Network Rail have allocated monies for this scheme subject to finalisation of the business case and provision of other funding contributions.

Further progress is subject to a successful Freight Facilities Grant bid.

Figure 42 – Cheshire and Halton Curve



OPTION ASSESSMENT

OPTION No.22F

22.12/13

Merseyside: Restoration of the “Halton Curve”, Cheshire

CONCEPT

Two railway lines cross over one another near Frodsham, the Liverpool branch of the West Coast Main Line (WCML) running roughly south-east to north-west, and the Chester to Warrington route running roughly south-west to north-east (see diagram). They are joined by the “Halton Curve”, but no regular trains are scheduled along this route (except a nominal Summer Saturdays working) and, following damage to switches and crossings in the 1980s, crossovers were removed such that the curve can only be used in one direction, ie. from the Helsby side towards Runcorn. (Regular Chester to Liverpool and v.v. services had already been withdrawn by the 1970s.)

Restoration of the curve (that is, for use in either direction) and provision of new crossovers would in principle permit train services to again run directly between Chester and Liverpool Lime Street via Helsby, and create a potential new cross-river link from West Cheshire to Runcorn and to Liverpool South Parkway (opened 2006). The wider desire for strengthened public transport links in this region is supported by the North West Regional Development Agency and by Merseytravel, together with the Cheshire County and Halton Borough councils (see figure 42).

OPERATIONAL ANALYSIS

(Post-December 2008 WCML timetable recast)

An hourly path in either direction can be identified between Chester and Liverpool Lime Street via Helsby, serving all stations (except Edge Hill), to be operated by 75mph class 150 two-car “Sprinter”-type diesel trains. This presupposes that an upgraded Halton Curve would still remain single track.

Such a service is envisaged to be operated in accordance with the Merseytravel specification for Liverpool local services outwith the (DC electric) Merseyrail franchise. It can be accommodated at Chester station within the existing platform capacity.

Performance of such additional services on the WCML together with the relatively close spacing of Up and Down movements over a reinstated Halton Curve would be critical and an assessment of performance is to be undertaken before a final view on the acceptability of such a new train service can be reached.

INFRASTRUCTURE REQUIRED

New crossovers required (1) facing, at Halton Junction, on the WCML Liverpool branch and (2) trailing, at Frodsham Junction on Chester Warrington section, plus all associated signalling alterations. Upgrade or partial renewal of permanent way on the Halton curve itself.

CROWDING IMPACT

Not applicable.

FREIGHT IMPACT

Not assessed.

FINANCIAL AND ECONOMIC ANALYSIS

At the levels of estimated infrastructure costs derived from the GRIP3 work carried out in November 2007, the initial BCR developed of 0.63 appears too low to warrant approval. This reflects only very crude passenger levels assumptions with a potentially high margin of error.

However, extensive further demand forecasting work is acknowledged by the client Merseytravel to be necessary.

CONCLUSION

It is therefore recommended that this further work take place in order to refine forecast demand levels taking a wider regional economic view.

Further work on option development should also take place and be carried into the Merseyside RUS workstreams.

7. Consultation process

7.1 The Draft for Consultation

This section outlines the key outputs that have informed the development of this strategy.

The Wales Route Utilisation Strategy (RUS) Draft for Consultation was published in May 2008, along with a press release announcing its publication. The document outlined a number of gaps between the present capability of the rail routes throughout Wales and the English border counties (in terms of capacity and performance), and the predicted demand for passenger traffic up to 2018/19. A set of options was proposed for bridging those gaps.

The Wales RUS Consultation Draft document was distributed to a wide range of stakeholders and a period of twelve weeks was given for responses. The consultation period ended on 22 August 2008.

During the consultation period, stakeholders were invited, either collectively or individually, to a briefing session at which specific issues were discussed.

7.2 Consultation responses

A total of 54 consultation responses were received and these are broken down as follows:

Government and Local Authorities	16
Train operators, & the Association of Train Operators (ATOC)	4
Open Access operators	1
Trade Unions, Government agencies	5
User Groups	16
Assembly Members	1
Members of the public	11

7.3 Key themes in the consultation responses

7.3.1 Range of responses

The volume of responses was considerable, and representative of the whole Wales RUS area. Individual responses to the Wales RUS Consultation Draft varied considerably in length, and the subjects commented upon were broadly in proportion to the extent of coverage of the railway network in the different regions with particular emphasis on issues in the most heavily populated south-east Wales area.

7.3.2 General themes

In general there were no responses which were in profound disagreement with that which was stated in the Wales RUS Consultation Draft, and a large number were broadly positive towards the interventions proposed. Many supportive views were expressed, albeit often with reservations specific to the area of interest of the respondent.

The general themes arising from analysis of all the responses are broadly as follows:

- it was widely considered that the forward view of passenger demand growth was understated.
- there was a recurring view that there was insufficient that is “visionary” for Wales and that the 30-year time period was inadequately considered.
- freight interests felt that the Wales RUS Consultation Draft document lacked sufficient detail of how potential freight growth might be accommodated on the network.
- on boundaries (and “gateways” in England for journeys to Wales) the principal Train Operating Company (TOC) Arriva Trains Wales considered that more was necessary on setting the context of connectivity-type issues outside of Wales. This comment referred also to an understatement of the importance of the Cardiff to Nottingham service group, which (during the preparation of the Wales RUS Consultation Draft) transferred from the former regional railways Central Trains franchise to the CrossCountry Trains franchise, which was enlarged from its earlier scope to embrace this and the Birmingham-Stansted Airport group.

In this final version of the Wales RUS, there has been scrutiny of actual demand growth in 2007/08 compared to that analysed as Baseline (2006/07) which was reported upon in the Wales RUS Consultation Draft. The higher rate of growth still being experienced has been assessed, primarily in terms of Valleys overcrowding forecasts, and Chapter 4 herein thus reflects this revised view. The other issues mentioned above, namely future provision for freight traffic, and a longer-term scenario, are referred to subsequently, in Chapters 8 and 9.

7.3.3 Appraised options

Following on from the generality of views expressed on future strength of demand growth, a key theme amongst the consultation responses was some questioning of the economic appraisal summary results. This applied to these options which had low calculated Benefit to Cost Ratio (BCR) and Net Present Value (NPV) values:

- 13B hourly Cardiff to Cheltenham services all day (fill gaps)
- 14A Heart of Wales fifth train
- 14D hourly Cardiff to Abergavenny service
- 15B half-hourly Vale of Glamorgan services
- 22C hourly shuttle services between Ellesmere Port and Helsby

The assumptions regarding the additional resource costs, particularly for rolling stock leasing costs, that formed the basis of these appraisals (which were set out in Chapter 6: Gaps and options) have all been reassessed, in the light of the slightly higher than originally projected growth trends, by way of a form of sensitivity test. Revised figures have been substituted where applicable in Chapter 6. The appraisals were in accordance with WelTAG guidance and were found to be robust. The conclusions have not changed as a result.

7.3.4 Great Western Main Line (GWML) Cardiff to Bridgend capacity utilisation

In contrast to the view expressed by some stakeholders that freight growth prospects were understated in the Wales RUS Consultation Draft, others (including Sewta) questioned the mix of services on the busy section of the GWML between Cardiff and Bridgend. This consists of non-stopping First Great Western (FGW) London – Swansea services, semi-fast Arriva Trains Wales (ATW) Manchester – Carmarthen and stopping Cardiff – Maesteg services and two freight paths per hour (with contractual/firm rights). The high level of capacity utilisation declared was questioned, when (in the busiest hours) up to eight paths are taken. Sewta has under consideration a plan for a new station on the GWML at Brackla, immediately to the east of Bridgend, close to the junction with the Vale of Glamorgan line.

A timetable study to assess whether an additional train per hour to Maesteg, calling at the three intermediate stations between Cardiff and Bridgend, could be added (subject to the branch capacity upgrade between Bridgend and Maesteg) had shown that no further station stops were possible. This is partly because the additional station dwell time cannot be encompassed in the rolling stock diagrams, and also because main line capacity utilisation has intensified since the opening of Llanharan station in 2007.

The number of services that can be accommodated on the Cardiff – Bridgend section (passenger and freight) also reflects platform capacity at Cardiff Central. Route capacity (in this case) is further constrained by the time taken by a Maesteg-bound train from Cardiff having to cross the Up (eastbound) line at Bridgend to gain access to the branch. Taken together seven or occasionally eight paths per hour is the maximum possible on this highly utilised section of GWML, allowing for the mix of stopping and fast services and junction margins, and where maintaining satisfactory operational performance is critical, in Wales and further afield.

7.3.5 The Ebbw Vale line re-opening

The introduction of a new, hourly passenger train service from Cardiff to Ebbw Vale took place in February 2008. The addition of around nineteen miles of railway route and six new stations to the Wales passenger network was a major event. The most strongly expressed views within the consultation responses were those regarding desires for a future additional hourly Newport to Ebbw Vale direct service. (This was addressed in the Wales RUS Consultation Draft as Option 13D).

The new stations were provided with four-car-length platforms from the outset to cater for longer term requirements. Passenger numbers on the Cardiff train services, particularly on Saturdays, are already at a higher level than

that anticipated, and this has necessitated some strengthening from two-car to four-car formations where possible. Future provision for such additional Newport services is discussed in Chapter 8.

7.3.6 Future extensions to the network

There was some mention amongst consultees, particularly RailFuture, of a belief in the need for more line re-openings in Wales than those alluded to in the Wales RUS Consultation Draft as Sewta strategic aims, namely beyond Ebbw Vale Parkway to Ebbw Vale Town, and from Pontyclun to Beddau. The latter would serve Llantrisant, a designated Strategic Opportunity Area (SOA). Another aspiration of Sewta is for a further, short branch off the Ebbw Vale line, from Aberbeeg (to the north of the newly opened station at Llanhilleth) to Abertillery.

In the South Wales Valleys, Route 15, Sewta registered a view that the possible extension of Aberdare line services to Hirwaun along an existing freight-only line was now seen as higher up the strategic regional prioritisation than stated in the previous long-term plan, with greater planned housing growth. Hirwaun similarly has SOA status.

Taith likewise registered a view that re-opening of the closed route from Menai Bridge Junction (west of Bangor) to Caernarfon should be considered.

In west Wales there was a view that Heart of Wales services would be of greater use if they ran more directly to Swansea (this would be via a new north to east connection at Gowerton, in conjunction with re-opening of the northern portion of the old route from Pontardulais to Swansea (Victoria) which used to cross over the main Swansea to Carmarthen line at Gowerton).

In both these latter cases portions of the routes in question have either been removed, or built upon, and the junctions which connected them to the network have been eliminated.

7.3.7 Additional station proposals

In a similar manner a number of consultees, principally three of the four Regional consortia, noted various longer-term proposals for additional stations, whilst acknowledging that most had not yet undergone any explicit development work, nor had been linked either to being served by existing train services which would be expected to absorb the extra demand generated, or by additional train services.

In the Sewta area, additional stations are aspired to on the GWML between Cardiff and Newport, at St Mellons and at Coedkernew. Within the Newport city area future developments to the west of Newport station are envisaged as possibly promoting a case for an additional station on the recently opened Ebbw Vale branch, between Ebbw Junction and Park Junction. Further up the valley two further stations are also envisaged, at Pye Corner and at Cwm.

In the TraCC area, an additional station is aspired to at Bow Street/Llandre, between Aberystwyth and Borth on the Cambrian Main Line section.

In north Wales, Taith registered an interest in potential extra stations along the north Wales coastal main line from Chester to Holyhead, at Saltney, Queensferry, Mostyn, Holywell Junction (noted in the Wales RUS Consultation Draft), Kinmel Bay and RAF Valley, on Anglesey. The Shrewsbury to Chester partnership and rail user group both mentioned additional stations at Lache, Rossett (noted in the Wales RUS Consultation Draft) and Johnstown. On both these route-sections it is acknowledged that so many extra stations would necessitate additional trains rather than deceleration of existing services, and on the latter the aspiration is solely on the basis of future re-doubling of single track (between Wrexham and Saltney Junction) being implemented.

The impact of the additional train services on network capacity that these stations would require is considered in Chapter 9.

NB: In south-west Wales Swwitch have affirmed a lack of interest in the promotion of a new station at Cockett (west of Swansea) as had been included in Appendix B.

7.3.8 The all-Wales Standard Pattern Timetable (SPT)

Most responses which mentioned the all-Wales SPT, introduced by Arriva Trains Wales in 2006, were in a favourable context. One suggestion made was that some of the newly introduced two-hourly frequency Cardiff to Bangor and Holyhead trains ought to be switched instead to run to Llandudno, in view of the frequent absence of suitable connections at Llandudno Junction. However, the December 2008 recast of north Wales main line services introduces additional shuttle journeys between Llandudno Junction and Llandudno for much of the day, which will significantly improve the long-distance journeys potential between south Wales and the borders and Llandudno for the conference and leisure markets.

A view was expressed that there ought to be a restoration of through services from north Wales to Manchester Airport, by extension of the ATW hourly Llandudno to Manchester Piccadilly (via Chester and Warrington Bank Quay) service.

7.3.9 Carno (mid-Wales region)

The biggest individual submission came from the Carno Station Action Group. During the development (in 2006/07) of the Cambrian Main Line upgrade proposals (dealt with as Option 14F in Chapter 6) this group was formed in order to campaign for a new station at Carno, between Caersws and Machynlleth, where there is currently a level crossing adjacent to the old station closed in the 1960s. Carno was not mentioned in the Wales RUS Consultation Draft as an additional station proposal at this location, having been dismissed during option development for Cambrian Main Line enhancement. (Rather than build a new passing loop at Carno, at relatively high cost, and where it was suggested that the crossing time could be used as a passenger stop if two extra platform faces were constructed, it was decided to retain and improve the capability of the existing passing loop at Talerddig, to the west of Carno, at a much lower cost, to deliver the required route performance improvement). Furthermore a new station at Carno was not part of any published draft rail strategy of TraCC for mid-Wales, and does not therefore constitute a gap. It formed the basis of an appeal under the newly instituted National Assembly for Wales petition procedure. As the decision has been taken to retain the loop at Talerddig a station at Carno could only be accommodated with extensive additional infrastructure.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3ª

8. Strategy

8.1 Introduction

The baseline position was set out in Chapter 3, and Chapter 4 identified where overcrowding might be expected if "steady state" capacity prevailed as natural growth occurs. Investment to upgrade infrastructure in the Wales RUS area is dynamic, and Chapter 5 summarised planned schemes, in order that remaining "gaps" between the current and the required position could be set out. These were subjected to more detailed analysis and in Chapter 6 were reported on as 24 "options". In a number of cases, mainly in south-east Wales, preliminary business case development and appraisal of options had been carried out on behalf of bodies such as Sewta by consultants. This has been noted here rather than repeated, with further comment from RUS scrutiny where appropriate.

As a result, some options are recommended where a satisfactory economic result is anticipated. In some cases further appraisal work is recognised as being necessary, whilst some do not demonstrate a sufficiently strong economic return to meet industry Benefit: Cost Ratio (BCR) and Net Present Value (NPV) criteria, and therefore cannot be recommended by the RUS unless adequate Third Party funding has been identified.

The themes flowing from baseline analysis were to do with network capacity/utilisation (see section 3.7.7.1) and access to the network at stations (section 3.7.7.2). There was also some consideration of the impact on Wales of the national rail network (see section 6.4.1) and the way domestic Welsh train services are integrated with long-distance services as shaped by key points in England. Account was taken of the Network Rail renewals programmes for Wales, which are especially important in terms of signalling equipment, as well as considering all Third Party funder interests.

Having evaluated all the options within both key themes the recommendations are brought together here in the appropriate geographic/regional and spatial context, as well as to underpin the basis of a 10-year programme of enhancements. Nearly all options in the Wales RUS area can conveniently be placed within the four regional consortia groupings for south-east, south-west, mid-Wales and north Wales, the latter being linked to the English grouping in north-west Cheshire/Merseyside. However, one group of options can be treated as of national Welsh importance, for the long route along the border counties connecting through the Shrewsbury "hub" with mid-Wales. This mirrors the evolving policies of the Welsh Assembly Government behind the "One Wales" government commitment launched during 2007 which has increased the emphasis on stronger rail communications on this key corridor.

The majority of gaps were categorised as in the future, rather than where supply and demand were perceived to be mismatched now. Similarly most gaps reflected a capacity issue (rather than performance or journey time) and some were seen as stakeholder-driven rather than responding to an identified supply/demand mismatch. It is thus implicitly assumed that the options to address the gaps will be funded by Third Parties who are able to do so in the timescale of this 10-year Route Utilisation Strategy, although precise timescales are not necessarily defined yet. This chapter therefore seeks to draw together coherently the individual recommendations so as to set out an overall strategy.

8.2. Principles

The general principle adopted throughout the Wales RUS has been to consider simpler and lower cost interventions before turning to more complex and expensive solutions. In the first instance optimising use of existing infrastructure has been examined. Timetabling solutions have always been sought as preferable to infrastructure works, subject to there being no unacceptable performance impact. The next step has been to consider progressive lengthening of trains where heavy demand exists to the maximum practical size and only then to look towards infrastructure enhancement. Again the range of options is considered in order, from simpler schemes such as platform extensions, through more far-reaching measures such as signaling and power-supply upgrades, or capability works for heavier/longer freight trains, to more comprehensive investment in the whole of a line of route.

8.2.1 Overview

The railway network in the Wales RUS area has reached its current state of development as a result of earlier strategies in which three distinct factors have played a part, namely:

- there has been a significant level of **Third Party investment** committed, over the last 20 years, with the purpose of expanding the network, mainly in the most heavily populated south-east region.
- the conscious act of creation of the Wales & Border franchise brought together the services formerly run by separate train-operating companies in different parts of Wales and the English border counties, in a **unified** manner with a common resources pool for Arriva Trains Wales (ATW) domestic services.
- this was achieved in a manner that was **complementary** to the continuing provision of the long-distance east-west services linking England with north and south Wales by other, “Inter City”-type, train-operators Virgin West Coast (VWC) and First Great Western (FGW).

Within this framework, a major change from December 2005 was the introduction of new long-distance services directly linking north and south Wales, with a gradual transition towards deployment of more suitable rolling stock types for journeys which can be of over three hours duration. A steady move towards better overall reliability has come from more robust resourcing arrangements, which has put the needs of the national franchise uppermost (eg. the construction of the new, practically self-sufficient diesel depot for most of the class 158 unit Cambrian fleet at Machynlleth), rather than this service continuing to rely on being a secondary user at depots not controlled within the Wales & Borders franchise. This strategy to address fleet and availability issues can be regarded as effectively complete for domestic services provided by ATW.

Capacity utilisation of certain key parts of the network by passenger services has been increasing steadily, in some cases to the practical limits of what is available. Therefore in some locations it will be necessary to enhance the infrastructure if future stakeholder expectations are to be met at required levels of reliability.

The freight situation has largely remained steady in recent years. There have been no significant terminal closures, and although Tower Colliery finally ceased to mine coal at the end of 2007, coal from the local area is still forwarded from that location. There

has been some evidence of a renaissance of flows, such as opencast coal from Cwmbargoed to Aberthaw Power Station. During 2007 a major imported Electrical Supply Industry (ESI) coal flow (via the Port of Bristol, and the Severn Tunnel) to English power stations such as Rugeley, commenced movement by rail in Wales utilising the long north-south route between Newport and Shrewsbury where previously freight volumes had been in decline. There is a clear risk that continued passenger growth will in some cases potentially compromise potential future freight growth opportunities, particularly on congested route sections where network utilisation is close to capacity.

Rail is seen as useful inasmuch as it can contribute significantly towards social and environmental goals in Wales. Development of the Wales rail network has continued to be dynamic, partly reflecting a changing political and economic national agenda. After many years of decline, traffic levels in mid-Wales have grown on the Cambrian main line between Aberystwyth and Shrewsbury, where rail journey times are competitive with roads. The most substantial investment in the route yet, to cater for improved performance and the potential for hourly service frequencies, was developed and approved in 2007. To a large extent the recommended strategy reflects the developing political and spatial agenda for Wales, and builds on past strategies.

Notwithstanding the infrastructure pinch-points, trains in Wales are typically relatively short, and in many cases future naturally occurring growth can be expected to be catered for by train-lengthening rather than an increase in the number of train paths. The pro-active stance already taken in the South Wales Valleys towards platform-lengthening to accommodate longer trains will ensure some years of growth are catered for, provided that train-lengthening is effected as demand dictates, subject to a satisfactory business case and rolling stock availability. However, a more fundamental approach will be needed for the longer term around the Cardiff city region, and beyond the point where the capacity gained from platform lengthening for a constrained number of train paths is sufficient more radical infrastructure enhancement will be needed to permit improvements to train frequencies as well.

8.2.2 Appraisal

Many of the options represent aspirations which are consistent with the Wales Spatial Plan but do not have sufficient transport economic benefits to justify the costs of the option, as described in Chapter 6. These have been appraised using standard techniques. Their results as defined in Chapter 6 may not generally meet the hurdle criteria adopted in other parts of the United Kingdom.

All appraisal guidance acknowledges the importance of qualitative impacts and WelTAG is no exception. Some of the options presented in Chapter 6 may have significant qualitative impacts which could encourage funders to view these options more favourably. For example, Welsh Assembly Government (WAG) and the Regional consortia are considering seeking European Union convergence funding for schemes that enable employment growth and regeneration and encourage modal shift in the valleys and west Wales and elsewhere.

8.2.3 Improvements to frequencies

The most frequently recurring stakeholder expectation – in the urban areas particularly – is for improvements to train frequencies. In the context of the provision of rail infrastructure, and momentarily setting aside appraisal results, this leads to two possible ways forward:

Some frequency improvements would be possible without the necessity for intervention to enhance the infrastructure. However, an explicit “trigger” such as the building of a new station to meet regional planning objectives, which would generate additional revenue and other quantifiable benefits, with no loss of benefit to existing rail users (assuming surplus seats are available), could be an important factor in the overall investment decision.

Other frequency improvements will not be possible without infrastructure enhancement schemes being brought forward.

8.2.3.1 Non-infrastructure constrained growth

There were some options considered where more paths can be identified, mainly in areas of low or medium utilisation of route capacity. An example was increasing the frequency of services between Cardiff and Cheltenham to hourly throughout the day (although this option does not have a satisfactory BCR).
One case was identified, with the “SwanLine” stopping services, of non-optimal use of paths on a high utilisation route section, on the Great Western Main Line in south-east Wales, and the strategy recommends a package of change to remedy this situation which is consistent with Regional Transportation Consortia objectives.

8.2.3.2 Infrastructure constraints to growth

Of the options addressed, around two-thirds would require investment to create additional capacity on the network either through train lengthening or where current utilisation prevents more paths from being made available.

A small number of potential bottlenecks are acknowledged in the Wales RUS area, the status of which reflects increased service levels provided since the major 2004 franchise re-letting, giving growth in recent years. In the two main regional cases (in south-west Wales, between Cockett and Duffryn, and in north Wales/Cheshire, between Wrexham General and Saltney Junction to the west of Chester), a doubling of throughput over both stretches of single track has practically consumed all available capacity, prompting the proposals for reinstatement of double track where it formerly existed. Although both bottlenecks are not lengthy in themselves (five and ten miles respectively), their impact on route performance can spread across around two-thirds of the wider Welsh railway network. In the latter case the recently-announced additional north-south trains cannot call at Wrexham General owing to insufficient capacity.

These are seen as medium-term schemes for delivery if business cases can be made and/or funding identified, but for which planning and investment decisions will need to be firmed up during 2008/09 to align with Network Rail renewals programme timescales.

In the Cardiff City region, where passenger volumes are already commensurate with the developed status of the urban network, more fundamental measures will be required beyond the existing platform lengthening programme, and which are only practical/cost-effective if executed in conjunction with Cardiff Area Signalling Renewal (CASR). The additional capacity created is required to provide for long-term demand growth, over a 5 to 25 years timescale. The recommended strategy to provide this additional network capability is explicitly aligned with the Government’s High Level Output Specification objectives.

These three schemes to address infrastructure bottlenecks can be seen as passenger-market driven. A fourth is largely attributable to the freight-market as the “driver”, on the long route linking south and north Wales. Here, the infrastructure is currently adequate for existing demand, but could rapidly become inadequate if expected passenger growth takes place as well as further significant freight growth. A major freight flow over the route commenced in the summer of 2007, with heavy 2,000-tonnes-plus trains using modern locomotive haulage, compared to the lower payloads that were once the norm with smaller, older-type locomotives.

In view of the importance of the Newport to Shrewsbury section as a diversionary route between south Wales and the Midlands (when the more direct Gloucester route is unavailable) it is recommended that a pro-active stance is taken such that the signalling constraint at Abergavenny be tackled ahead of it becoming a problem. This is in order that

the national objective for long-distance north-south passenger growth is not constrained by the infrastructure, and that the requirements for freight growth and diversionary capability are also met.

8.2.4 Access to the network at stations

8.2.4.1 Background

There has been a substantial number of new stations added to the network in recent years, principally in south Wales, in the Sewta and Swwitch regions. Some have been built on re-opened branch lines whilst others have been added to main lines and extra stopping trains provided. (These are set out in Appendix B)

In broad terms those on branch lines, where there was no conflict between Train Operating Companies (TOCs), or between a TOC and a Freight Operating Company (FOC), have been implemented readily. However, those on main lines have necessarily been subjected to more rigorous timetabling analysis. Only a small number of current new stations proposals are potentially supportable on capacity/ performance grounds, under certain qualified circumstances.

The majority of new stations which have been added to the network in recent years have performed satisfactorily by generating new business and contributing beneficially in the wider spatial context. To a large extent these were the ones where suitable circumstances (a sufficiently dense catchment area, with suitable train services provided cost-effectively to meet estimated demand) were first identified. Fewer likely locations now offer themselves for new stations at already-built areas. Those most likely to generate satisfactory levels of future demand are thus expected to be targetted at new/growing settlements or as yet un-built development areas where a specific regeneration or growth agenda exists. The promoters will be expected to pursue these in connection with the negotiation of developer funding contributions reflecting planning gain, in accordance with the new stations code of practice.

This guidance was published by Network Rail in June 2008, entitled Investment in Stations: a Guide for Promoters and Developers.

The small number of additional new stations now sought by the regional consortia are mainly either in south Wales, or the Wirral/ Flintshire area, and are considered below by region. None are firmly proposed in either south-west Wales (the Swwitch region) or in mid-Wales (the TraCC region).

8.2.4.2 National Stations Improvement Programme (NSIP)

In 2007 the strategic wish of funders for visible improvements to stations led to the identification of top priority stations within the Wales RUS area for inclusion in the NSIP plans alongside those for England, outside of other committed programmes, to make changes mostly in Control Period 4 (2009 – 2014). The primary driver is improvement of the service environment including passenger facilities, security and overall visual quality. A further aim was that candidate stations be geographically spread, and with some element of maximising Third Party funding opportunities.

It should be noted that the NSIP arrangements are in addition to any station works which would be going forward as part of wider RUS-recommended schemes, such as at Cardiff Queen Street, where the driver for change is additional infrastructure for more train paths which leads to a consequential requirement for additional platform capacity in this particular case.

The stations in the Wales RUS area currently selected are as first phase projects are as follows:

Swansea

Shrewsbury

Chester

Llandudno

Rhyl

Cardiff Central

Hereford

Aberystwyth

Port Talbot Parkway

Carmarthen

Severn Tunnel Junction.

Additionally improvements will be made to passenger facilities such as customer information systems and shelters at various locations.

8.2.4.3 Public Transport Interchange and car parking at stations

The Welsh Assembly Government and the local authority consortia are committed to sustainable transport and in particular to improving public transport and interchange between modes in order to achieve the outcomes set out in "One Wales: Connecting the Nation" – the Wales Transport Strategy. The priorities under this strategic approach are:

- reducing greenhouse gas emissions and other environmental impacts from transport
- integrating local transport
- improving access between key settlements and sites
- enhancing international connectivity
- increasing safety and security.

The Welsh Assembly Government and the consortia are seeking to secure better joint working between public transport operators, both rail and bus, to ensure better national and local connectivity and are supporting the development of a number of sustainable travel towns across Wales – one in each consortia area.

There is an ongoing commitment to an investment programme in the improvement of public transport interchanges at a number of locations across the Taith area, for example, the award-winning facility at Flint station and there is currently a major station improvement and interchange scheme being progressed with Welsh Assembly Government funding in partnership with NSIP at Llandudno.

The provision of car parking space at stations in the Wales RUS area varies widely, and in practically all cases where it is provided it is well used or full already.

For all new stations the provision of car parking space is an integral feature of the overall design, and reflects its importance particularly in rural areas where there may be no bus service to a railway station. The Welsh Assembly Government has funded public transport interchange and car parking provision at all new stations on the new Vale of Glamorgan and Ebbw Valley railway lines where permitted by the site footprint.

At a number of stations (such as at Bangor and Chester) general development of the station buildings and surrounding area will actively increase car park provision where there is known demand, whether or not this is provided free or at a charge to customers. A major new car park development took place recently in mid-Wales, at Newtown station, involving the conversion of a former goods yard area into modern, secure space. Similarly, upgrade works have improved car park provision at Carmarthen, linked in to good bus to rail interchange facilities as well. WAG recognises the importance of interchange and station car parking facilities to encouraging modal shift and will continue to encourage the Regional consortia to address station car parking issues through the preparation of Regional Transport Plan bids for funding where this is consistent with wider RTP objectives. There is no explicit requirement on the station operator to provide new car park facilities within the franchise agreement.

Best practice is further illustrated by current Sewta projects for park and ride development at the bigger sites in south-east Wales, using potential Welsh European Funding Office (WEFO) support for European funding which is available over the period to 2015. Examples are at Abercynon, Taffs Well, Rhymney, Bargoed, Pengam and Ebbw Vale Parkway.

8.2.4.4 Station Travel Plans

Travel plans can help ease capacity problems at station car parks. Increasing demand for rail travel has led to an increase in demand for parking at stations and car parking is a major issue with passengers. Car parking provision fared poorly in the spring 2007 National Passenger Survey, achieving a 46 percent satisfaction score. TOCs and Network Rail are constantly looking to increase car parking capacity. However in many cases it is simply impossible to create enough parking places to meet demand. Further, in some cases local authorities refuse planning permission for a bigger car park: stations are traffic generators and many local authorities are keen to reduce congestion and environmental issues associated with car travel to stations.

A station travel plan would essentially do two things: make better use of existing car park space; and promote alternative modes of travel to the station. Every station has different issues, and the decisions about which measures are to be introduced must be taken locally and collaboratively. It is key to have joint working between TOCs, Network Rail and, crucially, local authorities. There are five stages to the Station Travel Plans project, listed below.

1. Selection of pilot stations: completed May 2008
2. Research and planning: June 2008 – March 2009
3. Implementation: April 2009 and ongoing
4. Monitoring and evaluation: date to be confirmed
5. Recommendations and forward strategy: 2011

The Association of Train Operating Companies (ATOC) invited TOCs, Local Authorities, PTEs and Network Rail to propose stations to include in the pilot programme. ATOC also convened a multi-stakeholder Steering Group to select the pilots and agree a workplan. Over 70 applications were received, of which 24 pilots were selected, corresponding to 31 stations. A variety of station sizes and types were selected.

One of these pilots is in the Wales RUS area: Shotton. Shotton is used by commuters and shoppers travelling to Chester, Wrexham and Liverpool and for local shopping in Shotton. Although close to walking and cycling routes, access to and between the stations and from the town centre is not easy due to steep ramps and footbridges. There is considerable potential to increase walking and cycling to/ from the stations. There are some car parking spaces but these are not dedicated to rail users and often all spaces are occupied.

More information on Station Travel Plans is available from ATOC at www.stationtravelplans.com

8.2.5 Extensions to the network

As with stations, the most obvious candidate routes (ie. those with a suitable business case to warrant such major capital investment) for being added to the passenger network in the Wales RUS area have already been implemented: these were (in the 1990s) the Maesteg, City and Aberdare lines and, more recently, the Vale of Glamorgan and Ebbw Vale lines. An important factor was that none of these routes had been previously closed, which basically meant that structures and permanent-way were intact, although additional signalling was often needed together with construction of the additional stations to be served, and fully Disability Discrimination Act (DDA) compliant access. A short extension from Ebbw Vale Parkway station to a town centre station a little to the north is in prospect within CP4.

This aspect of the overall strategy for the Wales RUS area can thus be seen as effectively complete. One short section of existing freight railway branching off the Great Western Main Line west of Newport, at Gaer Junction, to Park Junction on the Ebbw Vale line is the only potential short/medium-term addition to the passenger railway network in Wales to permit

future running directly between Newport and Ebbw Vale (if a decision to implement this option is taken in CP4/5).

Sewta has a long-term plan for re-opening between Pontyclun (on the Great Western Main Line, between Cardiff and Bridgend) and Beddau, if major future housing growth takes place in that locality. Following cessation of freight traffic in the 1990s this line remains in situ but disused. Subject to full business case development, the potential may exist for shuttle services from a reconstructed bay platform at Pontyclun to run to Beddau to connect with the hourly Cardiff – Maesteg services (proposed to become half-hourly) which call regularly at Pontyclun.

In addition Sewta also envisage extension of Aberdare line trains to Hirwaun, using an existing freight-only line, which would necessitate the creation of an additional passing loop at or near Aberdare station.

8.2.6 Other links across Wales

Steady progress has been made in Wales with the identification of designated bus links to railway stations from the larger settlements not on the railway network, notably in the South Wales Valleys. These are advertised alongside train services in ATW train timetables and offer through ticketing by way of a policy of planned integration at stations with specially provided bus stops to facilitate rapid interchange between modes.

The stated policy of WAG is that the Traws Cambria network of express long-distance bus services will be developed further, and some of these already offer key rail links, for example between Carmarthen and Aberystwyth railway stations, serving Lampeter.

On those corridors where bus is the most cost-effective mode, further potential may exist for more pro-active integration with rail, with the objective of all non-rail served towns (above a defined population level) having a designated nearest railway station, and these towns appearing in national rail timetable publications accordingly, in the manner which already applies in ATW Booklet 5, South Wales Valleys.

The application of this policy would necessitate the provision of specific facilities at more stations in Wales to promote smooth interchange, together with integration of advertising. As a minimum recommended provision all County towns could be addressed where not directly rail-served.

8.2.7 Rolling stock

No major changes to the fleet of rolling stock deployed by ATW are stipulated during the remaining franchise life, which is broadly coincident with the Wales RUS timescale. Some fleet growth, by means of the use of similar types of vehicles to those already deployed, has already taken place and will continue as demand dictates across the network.

Some additional class 158 two-car trains suitable for deployment on the Cambrian Lines, and based at Machynlleth, are also anticipated subject to further discussion between WAG/ DfT for addressing future growth between Shrewsbury and Birmingham where services are partly provided through the Wales & Borders franchise. This will contribute towards achieving the HLOS capacity objective for Birmingham. Similarly some fleet adjustment in north Wales will contribute towards achieving the HLOS capacity objective for Manchester inasmuch as ATW operate the Llandudno to Manchester (Piccadilly) service via Chester and Warrington, as well as running into Manchester from Crewe with trains from Cardiff.

The FGW fleet of IC125s, refurbished during 2007/08, will continue to be deployed on the London Paddington to south Wales route during the Wales RUS timescale. On the Bristol to south Wales corridor trains will continue to be provided with either two-car, three-car or four-car formations, including refurbished class 158 units (90mph)

For services operated in north Wales by Virgin West Coast, the “Voyagers” are relatively new and so the situation will remain static for the Wales RUS timescale.

CrossCountry will similarly continue to utilise modern class 170 “Turbostar” stock on the Cardiff to Gloucester and Nottingham corridor.

8.2.8 The future for freight

Freight traffic continues to be important throughout the Wales RUS area, primarily in the more industrial regions in the south and the north of the country. The major signalling renewal programme for south Wales has recognised this importance which is reflected in the nature of the busy four-track section of the Great Western Main Line (GWML) between Severn Tunnel Junction and Cardiff which will be retained and adapted to better handle freight by the planned re-design of the eastern approaches to Cardiff Central.

Major changes to the way in which freight movements are handled on the GWML have already been made at Newport where activity is now focused on the south side of the line, to reduce conflicts with passenger movements on the main lines around the Alexandra Dock Junction complex. Further west, as a consequence of the recent Port Talbot (East) area signalling renewals, two-way working ability was additionally provided between Bridgend and Margam over the two-track section of GWML, thus increasing the time the route can remain open whilst maintenance is carried out on one track or the other, and avoiding the need for costly diversions via Tondu.

The GWML in south Wales handles substantial volumes of coal and metals traffic, as well as featuring the primary multimodal terminal for the region at Wentloog, east of Cardiff. Growth in the volumes of these commodities expected to be moved by rail was set out in Chapter 4. To a very large extent such growth can be handled within existing capacity on the four-track section.

Within the south Wales valleys, provision will be made within the Cardiff Area Signalling Renewals (CASR) programme to cater for any growth that might take place in trainload coal traffic to Aberthaw Power Station, from either the Cwmbargoed or Tower Colliery sites, or via the GWML. This will be by means of greater capacity through Cardiff Queen Street station once four through platforms are in place, and (between Cardiff and Barry) by reduced headways after re-signalling to modern standards. The CASR programme also includes enhancement of the down Llandough freight loop (between Grangetown and Cogan stations) to allow greater flexibility.

8.2.8.1 Multi-modal freight terminals, future provision

The Wales Freight Strategy was published by the Welsh Assembly Government in May 2008, after an extensive consultation exercise. This identified a likely need for new multi-modal terminals in the future and recommended that potential sites (on railway land, or at sites capable of being easily and cost-effectively connected to the network) be suitably safeguarded.

To take this principle further, it is recommended that a range of sites across the country be nominated accordingly, and protected by regional plans. These are identified as being in addition to the further potential which already exists at the recently established Wentloog freight distribution centre, east of Cardiff, where there is an established intermodal presence. The sites are as follows, set out by the Welsh Regional Transportation Plan (RTP) areas.

South-east Wales	Newport Docks, Barry (no.2 Dock)
South-west Wales	Port Talbot (Margam), Carmarthen, Haverfordwest
Mid-Wales	Aberystwyth
North Wales	Mostyn, Llandudno Junction

In the English border counties (Herefordshire, Shropshire and Cheshire) addressed by the Wales RUS, one further potential site can be identified as having future multi-modal use potential, namely that within Hereford city centre, at the former Bulmers site. In Shropshire a new terminal at Donnington is already under development, actually located near to Wellington on the Shrewsbury to Wolverhampton section adjoining the Wales RUS area. For Cheshire the most obvious potential site would be at Crewe, albeit again immediately outside the defined Wales RUS area.

8.2.8.2 Freight network capability

Freight operators envisage a trend towards larger and longer trains in the future, which would better exploit pathways where these are scarce, as well as catering for growing freight tonnages within contained resources. On some routes the length of freight trains is governed by the maximum length of goods loops provided, but over-length freight trains can in some circumstances be planned to run on the basis of looping not being required, for example at night (on the long sections from Newport to Hereford, and thence through to Crewe) when no passenger trains are running.

The Freight Operators' concept is for trains of up to 775m in length to be catered for. Much of the railway in south Wales is already compatible with this aim, when taken together with the four-track section between Severn Tunnel Junction and Cardiff on which freight traffic currently has exclusive use of the Relief Lines. These give direct access to Llanwern steelworks, the Uskmouth Branch and the Alexandra Dock Junction complex in Newport, Wentloog and the Cardiff Tidal complex, and freight trains therefore do not require to be looped.

Beyond the four-track section freight loops are in place at Pilning (on the English side of the Severn Tunnel) and at Miskin, midway between Cardiff and Bridgend on the two-track section of the GWML. The lengths of these loops are as follows:

Pilning Up Goods Loop	1338m
Down Goods Loop	1492m
Miskin Up Goods Loop	826m
Down Goods Loop	781m

For flows from the Avonmouth complex to south Wales, the Pilning loops represent a vital component of the infrastructure to enable freight and passenger services jointly to be planned and regulated through the busy Patchway Junction to the Severn Tunnel. West of Cardiff the Miskin loops similarly provide capacity for freight trains proceeding between the four-track section (at Cardiff West, where it becomes two-track) to the Margam area. Beyond this, the Swansea District line is lightly used and has ample freight capacity for trains to west Wales and around the connection at Hendy Junction to the Heart of Wales Line for the Pantyffynnon to Gwaun-Cae-Gurwen branch line (due to be reopened in 2008/09).

Freight capability issues across the network as a whole are being addressed through the development of a Strategic Freight Network introduced by DfT in the 2007 White Paper.

8.2.9 Performance

The principal train operator in Wales, Arriva Trains Wales, is categorised as providing Regional services, whilst those provided by First Great Western and Virgin West Coast are categorised as long-distance services.

The overall Public Performance Measure (PPM) for both these sectors is set by the Governments HLOS and rises to 92 percent at the end of Control Period 4 (in 2012/13).

Significant lateness and cancellations are required to reduce as follows:

Regional – by 27 percent
Long-distance – by 36 percent

These targets will be delivered through a Long Term Performance Plan (LTPP) being developed between Network Rail and each operator. This process will devolve ownership of the initiatives and targets to local level within the operators and the various Network Rail functions. The ORR's draft conclusions on Network Rail funding for CP4 (published in July 2008) identified £160 million for performance schemes to help deliver the targets. The final determination (published 30 October 2008) referred specifically to the performance on the Cardiff to Barry corridor as being the basis of a potential scheme (at Cogan Junction) to qualify for investment under this heading. The upgrade of this busy junction is envisaged in conjunction the Cardiff Area Signalling Renewals (CASR) programme, and is seen as complementary to the enhancement works described as Option 15F in Chapter 6 (Gaps and Options).

8.2.10 Maintenance access

In general the pattern of useage of the railway in the Wales RUS area is considered suitable to deliver maintenance compliance. The principal exception is the Severn Tunnel where a specific cyclical renewal programme is necessitated to maintain performance and safety reflecting the extreme and aggressive environment, and which leads to a more intense civil engineering inspection regime. This puts additional strain on the diversionary route via Swindon, Kemble and Gloucester (outside the Wales RUS area, but regularly used for London to south Wales trains when the Severn Tunnel is unavailable) which in part is single track.

8.3 Recommendations

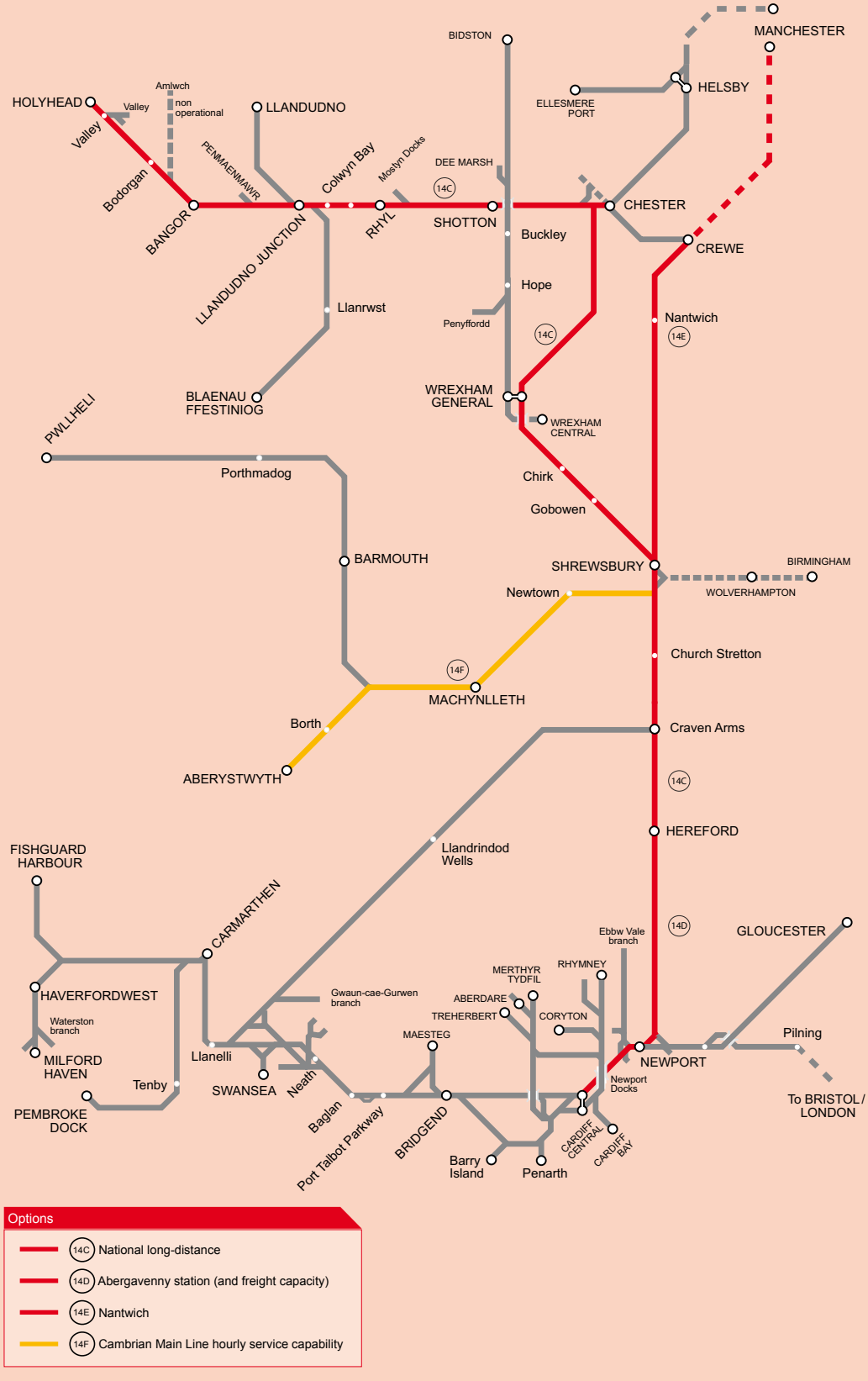
In the preceding chapters the options were presented by which of the four strategic routes they lie on, namely the Great Western Main Line (13), South & Central Wales & Borders (14), South Wales Valleys (15) and North Wales and Borders (22). These correspond broadly to the four defined Welsh regions for transportation planning purposes, namely Sewta, Swwitch, TraCC and Taith, and the English border counties.

In this section the options are ordered differently so as to present an overall, Wales-wide picture first. The group of long-distance services linking north and south, from Holyhead and Manchester to Cardiff and Carmarthen, straddles all four Welsh regions and the English border counties, that is, the whole of the defined scope of the Wales RUS area. In terms of railway geography and connectivity, Shrewsbury is the "hub" for much of Wales as six routes radiate from there, spreading across the mid-Wales region as well as being a pivot for the increasingly important north-south traffic. It is therefore appropriate to include reference to the Cambrian Lines within this national/overall grouping. The major upgrade decision for the Cambrian Line was affirmed during the course of development of this RUS during Summer 2007. Subsequently, the north-south dimension has become of increasing importance, so a national Wales-wide grouping is presented here first.

The larger part of the recommended strategy, in terms of numbers of schemes which will influence the major portion of future enhancement investment spend, naturally addresses south-east Wales. Here the largely urban character of the most populous of the regions corresponds well with the ability of the railway network to handle an ongoing, mostly Third Party-funded development agenda. Critically, this is in alignment with the Network Rail renewals programmes going forward in the Wales RUS timescales.

After addressing the national picture, (Figure 43) and then the south-east Wales region this section then deals with the south-west region, and finally with north Wales and Cheshire/ Merseyside which are closely linked.

Figure 43 – Options: north-south and mid-Wales



8.3.1 The national picture/north-south, and mid-Wales

The options addressed in this section are as follows:

14C (gaps 14.05/07)	north-south/national long-distance upgrade
14D (gap 14.06)	additional trains Cardiff – Abergavenny
14E (gaps 14.08/09)	additional calls at Nantwich (Cheshire)
14F (gaps 14.10-14)	Cambrian main line major upgrade

The main issues in this section are those of journey time for the long journeys between north and south Wales, and improved performance and increased frequency between mid-Wales and the Midlands across the Shrewsbury "hub".

Control Period 3 (current, until March 2009)
There is a clearly stated stakeholder requirement to improve links between north and south Wales by means of journey time reduction and some improvement to frequency. A feasibility study was initiated in early 2008 to address linespeed and capacity issues (option 14C) on behalf of the client Welsh Assembly Government (WAG). This will identify the costs of infrastructure upgrade necessary to reduce journey times (eg. between Bangor and Cardiff), and will address bottlenecks and the impact of passenger train frequency increases on freight capacity where a potential problem has been identified. It is recommended that more detailed design work for signalling alterations at Abergavenny proceed in 2008/09, as a Network Rail Discretionary Fund (NRDF) initiative.

The existing infrastructure is capable of supporting a limited number of additional "premium" trains (ie. not calling at all stations) between north and south Wales, subject to identification of available rolling stock. As a first step funding was announced in October 2008 by WAG to enable the commencement in December 2008 by Arriva Trains Wales of an additional, limited-stop southbound, morning train from Holyhead to Cardiff, with afternoon northbound return, to fulfill a daytime business demand for travel to the capital from north Wales.

Upgrade works to increase network capacity (option 14F) on the Cambrian Main Line between Aberystwyth and Shrewsbury commenced in early 2008, in conjunction with the renewal of Radio Electronic Token Block (RETB) signalling by European Rail Traffic Management System (ERTMS). In addition to this, in conjunction with planned renewals of switches & crossings (S&C) in the Shrewsbury area, an enhancement scheme to increase the extent of bi-directional signalling on the southern approaches to Shrewsbury station will be developed by Network Rail. These works would be in support of the proposal to increase the capability of Platform 3 at Shrewsbury for bi-directional use, consistent with the anticipated frequency increase of Cambrian services. Furthermore, the possible lengthening of the Abbey Foregate triangle (to the south of Shrewsbury station) to accommodate full-length freight trains and improve regulation will be evaluated.

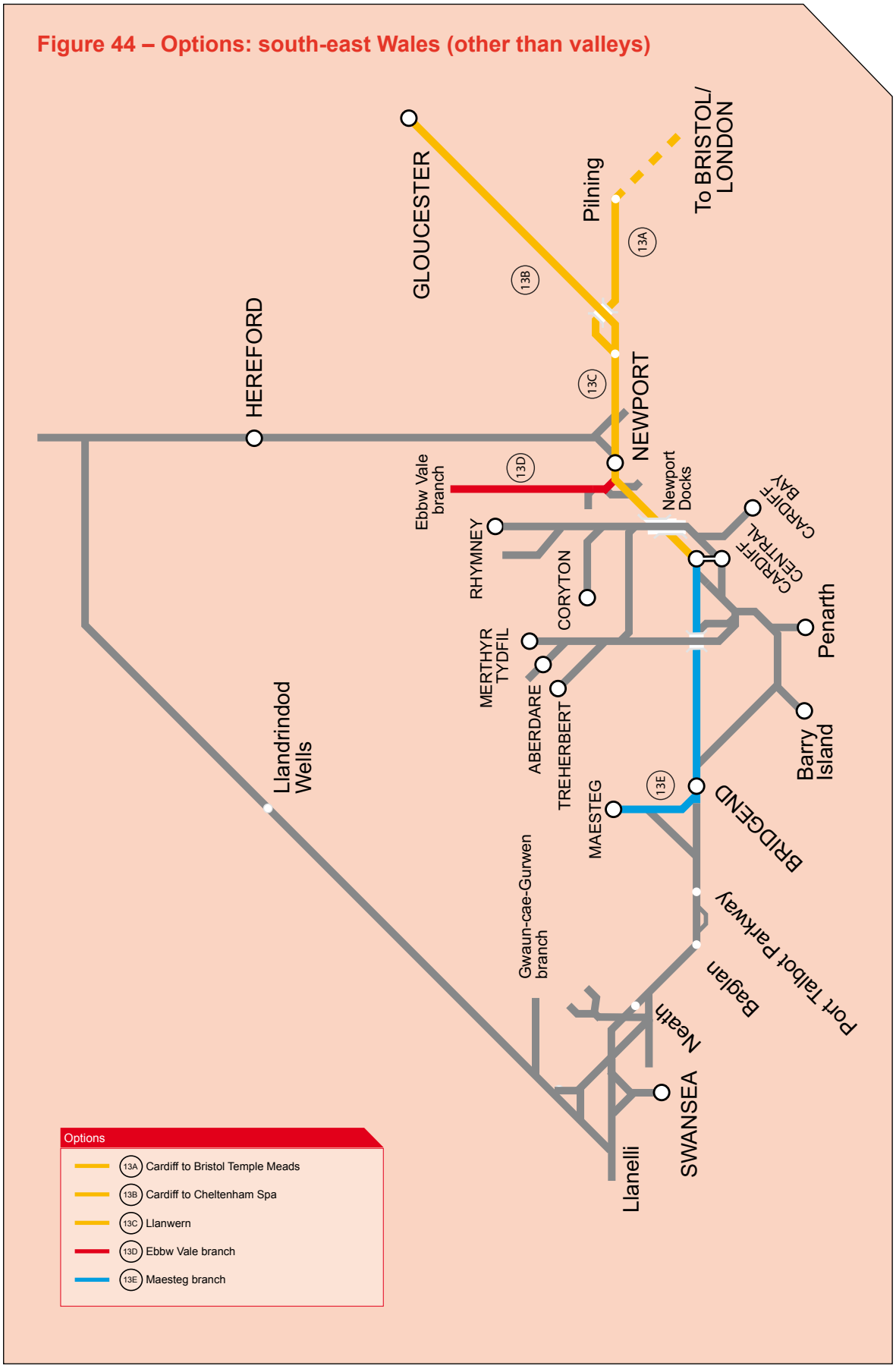
For option 14E it proved impossible to add Nantwich calls to the hourly Manchester-Carmarthen services owing to pathing constraints between Manchester and Crewe which, tied in to more intensive West Coast Main Line (WCML) operations in 2009, rule this option out. It should be revisited when future timetable changes take place.

Control Period 4 (2009 – 2014)
No economic case could be made for a short-term increase of frequency of trains (option 14D) to half-hourly throughout the day at Cwmbran/ Abergavenny, which (if turnbacks were required) would necessitate the construction of an additional south-facing bay platform.

In the longer term, it is nonetheless recommended that such a bay platform be considered within signalling renewals proposals, and passive provision made to give future flexibility.

Subject to suitable feasibility results and availability of funding for long-distance journey time reductions and frequency increases, some of the unused Cardiff – Holyhead xx.20 “slots” from Cardiff Central (and v.v. southbound) might be taken up during CP4 after completion of upgrade works, namely linespeed improvements and possibly partial or full reinstatement of double track between Wrexham General and Chester (Saltney Junction).

Figure 44 – Options: south-east Wales (other than valleys)



8.3.2 South-east Wales (other than Valleys)

The options addressed in this section are as follows:

13A (gaps 13.01/02/04)	stopping patterns Severn Tunnel Junction – Cardiff
13B (gap 13.03)	increase Cardiff – Cheltenham to hourly frequency
13C (gap 13.05)	new station at Llanwern
13D (gaps 13.01 – 05)	Additional trains Ebbw Vale – Newport
13E (gap) 13.06	Additional trains Cardiff-Maesteg

The main issues in this section are the increased demands that will be placed on the Great Western Main Line in south Wales, resulting either from additional services from two adjoining branch lines when these gain doubled service frequencies in the medium- to longer-term, or the step change, necessary to cater for a potential new station at Llanwern, east of Newport, which would require some local passenger trains to be switched from the Main lines to the Relief lines, hitherto only regularly used by freight trains.

Control Period 3 (current, until March 2009)

Design activity for the major Newport and Cardiff area signalling renewal schemes will continue throughout this period, in conjunction with development of enhancement options. The preparatory works for remodelling of trackwork at Severn Tunnel Junction, together with alterations to the station configuration, will also commence towards the end of CP3.

Some refinements to the pattern of calls at Severn Tunnel Junction station (principally by FGW services running between Cardiff and Bristol, and further afield) were made in 2006/07 and additional calls could be provided (option 13A) on the existing infrastructure if specified. The number of calls might therefore be further reviewed when station improvements are made there, and increased car parking capacity provided.

No economic case was found for any early increase in the frequency of the ATW Cardiff to Cheltenham stopping services (option 13B) in order to create an unbroken hourly pattern (but see option 13C in CP4).

Freight gauge

The Freight RUS documented the industry aspiration for enhanced loading gauge clearance throughout Britain. Figure 6.2 in that document set out the aspiration for W10 (that is, 9' 6" containers on standard flat (1000 mm platform) wagons) and Figure 6.3 illustrated that for W12 (similar to W10 but for 2.6m-wide boxes rather than the standard 2.5m width). For the south-east region of Wales there is thus an aspiration for W12 gauge on the routes to the Wentloog International Freight Terminal, east of Cardiff, from Gloucester via Chepstow and from Bristol (Patchway Junction) through the Severn Tunnel. This aspiration will be recognised as and when any structural renewals works take place on these sections.

Control Period 4 (2009 – 2014)

In the medium- and longer-term, the number of passenger train paths through the Severn Tunnel is expected to remain steady at four trains per hour, comprised of two long-distance FGW trains per hour from London to South Wales, and two regional services per hour between Bristol and Cardiff. The Newport Area Signalling Renewals (NASR) project will give marginally reduced headways through the tunnel, with a beneficial performance impact when services are perturbed.

For the long-distance trains, the introduction of the InterCity Express Programme (IEP) (from 2016 onwards) will give increased seating capacity.

Naturally occurring growth could be absorbed on the Bristol to south Wales corridor by further

train lengthening (the typical existing train formation is two or three vehicles and could increase to four when required thereafter).

Major planned housing development at Llanwern (option 13C) is expected to take place during this period, which may drive the construction of a new Park & Ride station, some three or four miles east of Newport. Subject to such a station being constructed on the Relief Lines (only) and the increase in the linespeed to 75mph being implemented, with appropriate funding contributions, it is recommended that this scheme could be accommodated by diversion of the ATW local services from the Main Lines on to the Relief Lines between Newport and Severn Tunnel Junction. This is a significant scheme as provision of the new station, the Relief Line speed increase and any service frequency increase are all linked and would need to be justified and funded as a package.

During CP4 it is recommended that the opportunity be taken to achieve synergy with the NASR project to enhance the layout in the Newport area, by the installation of a facing crossover on the Main Lines at Gaer Junction to provide direct access between Newport station and the Ebbw Vale branch. This was undergoing feasibility study during early 2008, and authorised by summer 2008. This is in order to contain the costs of such enhancement by full integration with the programme of works for NASR. The Newport area enhancement package for potential upgrade of the Gaer Junction to Park Junction freight-only line (FOL) should also include a designated turnback siding at or near Newport for reversal of the additional trains clear of running lines.

A decision on funding for further enhancement of the Ebbw Vale branch (to provide for an additional hourly service between Ebbw Vale and Newport, and the northwards extension to Ebbw Vale town) could be required in CP4 subject to development of a satisfactory value for money case from the ongoing feasibility and business case development work.

West of Cardiff

Funding for capacity enhancement on the Maesteg branch, to permit half-hourly services (option 13E), compared to the current hourly frequency, to operate between Cardiff, Bridgend and Maesteg could become available during CP4, subject to further development of a satisfactory value for money case from the ongoing feasibility and business case development work.

It is recommended that such an upgrade only be implemented in conjunction with restructuring of the Cardiff to Swansea “SwanLine” stopping services, plus the provision (within the CASR programme) of a west-facing bay platform (between platforms three and four) at Cardiff Central station to handle turnround of the additional services. (Prior to the provision of this bay platform within the CASR programme, a branch-only shuttle between Bridgend and Maesteg can give a two trains per hour frequency on the branch.)

Figure 45 – Options: south-east Wales valleys, short/medium term

8.3.3 South-east Wales (Valleys)

The options addressed in this section are as follows:

15A (gap 15.01)	additional trains via the City Line
15B (gap 15.04)	additional Vale of Glamorgan (VoG) trains between Cardiff and Bridgend
15C (gap 15.05)	half-hourly Cardiff – Merthyr services
15D (gap 15.06)	half-hourly Cardiff – Rhymney services
15E (gap 15.07)	new station at Energlyn, Rhymney Valley line
15F (gaps 15.02/03)	overall Valleys passenger growth/longer-term

The main issue facing the South Wales Valleys route is steadily increasing demand over an expanded network which has placed more pressure on the central corridor through Cardiff. Further train lengthening on key routes could be possible during CP3 and CP4 as a consequence of platform lengthening, and major central corridor works planned for implementation during the later part of CP4 will subsequently enable frequency increases to be provided over the busiest inner sections between Pontypridd and Cardiff, and Caerphilly and Cardiff, into CP5 and beyond.

Control Period 3 (current, until March 2009)
As a consequence of the extensive programme of platform lengthening being carried out on the Rhondda and Rhymney corridors during the period 2006 – 2008, it will be possible to lengthen trains to cater for growth, depending on emerging crowding, in the immediate future and into the medium-term (ie. possibly within CP3, and more likely during CP4).

It is physically possible to run a limited number of additional trains (option 15A) between Pontypridd and Cardiff taking advantage of spare capacity on the City Line (between Radyr and Ninian Park), provided that this was done in conjunction with existing Treherbert – Cardiff journeys for continuity at Cardiff Central Platforms 6 and 7. This option is not recommended, as it is not likely to be needed to meet predicted growth levels, as train lengthening (of selected services, in the peak hours) over the usual route will provide more seats to and from Llandaf and Cathays stations, between Radyr and Cardiff Queen Street on existing services.

On the Vale of Glamorgan line, diversion of one of the three trains per hour from Cardiff to Barry Island (option 15B) to give a half-hourly Bridgend service instead is physically possible on the existing infrastructure. However, there is no business case for this at present. It is considered that the potential large scale of development and employment opportunity at St Athan could possibly significantly alter traffic projections, particularly if a new station were built. The planning application for this major development is expected to take place during spring 2009. Further appraisal work should be instigated during 2008/09 if the development goes ahead, within which line-speed improvements would be critical to achieve satisfactory train productivity.

The completion of a new passing loop at Merthyr Vale on the Pontypridd to Merthyr route during 2008 permits the introduction (option 15C) of the new half-hourly service between Cardiff and Merthyr (announced for May 2009) by extension of the current hourly Cardiff to Pontypridd (terminating) service. This will adhere to the established six trains per hour Standard Pattern Timetable south of Pontypridd, with two trains per hour each from Cardiff to Treherbert, Aberdare and Merthyr.

Figure 46 – Options: south-east Wales valleys, medium/long-term

Control Period 4 (2009 – 2014)
Renewal of the signalling equipment (CASR) in the Cardiff area is planned to be carried out during this period, in parallel with potential enhancements to the South Wales Valleys Cardiff Queen Street to Cogan Junction corridor. On completion of a revised track layout at Cardiff Queen Street station, with four through platforms and a new bay platform for the Cardiff Bay shuttle service to substantially self-contain this part of the operations, the overall route capacity (option 15F) will increase from the existing limit of twelve trains per hour throughput (in either direction) to sixteen. The Cardiff Queen Street works will incorporate fully DDA-compliant access to the new and enhanced platforms.

The enhancements planned would permit the frequency increases sought by Sewta and the Welsh Assembly Government to be achieved in the medium-term and longer term. These are expected to be necessary to address demand growth after the shorter-term measures already being taken through the current, major platform lengthening programme on the Treherbert and Rhymney corridors, which will enable progressive train lengthening from four-car to six-car as dictated by growing demand. This approach will deliver the HLOS peak-hour capacity requirement of an additional 600 seats into Cardiff.

Provision will also be made within CASR for an additional, bi-directionally signalled platform to be added at the south side of Cardiff Central (provisionally numbered Platform 8). This will confer significant additional operational flexibility for Valleys trains, especially when peak volumes grow beyond the existing 12tph base and improved access to and from Canton depot is needed, without compromising performance. Platform 8 is planned to be physically added in CP5, as a last stage of CASR.

The major capacity enhancement at Cardiff Queen Street needs to be complemented by some extra, more minor works at Pontypridd and Caerphilly stations (by the provision of a south-facing bay platform at each station for turnback of the additional trains) in order that the desired overall South Wales Valleys network growth potential can be realised. A further, additional platform scheme at Barry also forms part of this potential package of CASR-associated enhancements This would permit restructuring of Barry line and Vale of Glamorgan services (see option 15B above) without detriment to Barry Island frequencies if so desired.

In the Rhymney valley, the provision of an additional passing loop (option 15D) at Tir-Phil (midway between Bargoed and Rhymney) to permit half-hourly frequency train services to operate to Rhymney, can be handled optimally in conjunction with the CASR works which will transfer signalling control of the whole valley to the new South Wales signalling centre at Cardiff. Completion of CASR will see closure of the three existing signalboxes, at Heath Junction, Ystrad Mynach and Bargoed. Assessment of the business case will include consideration of timing issues including the trade-off between linking signalling element of the infrastructure works to the CASR programme or implementing earlier.

At this time, the new station at Energlyn (option 15E) can also be built, and calls there added to a modified Rhymney valley four/six trains per hour timetable structure (two each to Bargoed and to Rhymney, which would serve Energlyn, plus two peak-hour Caerphilly extras).

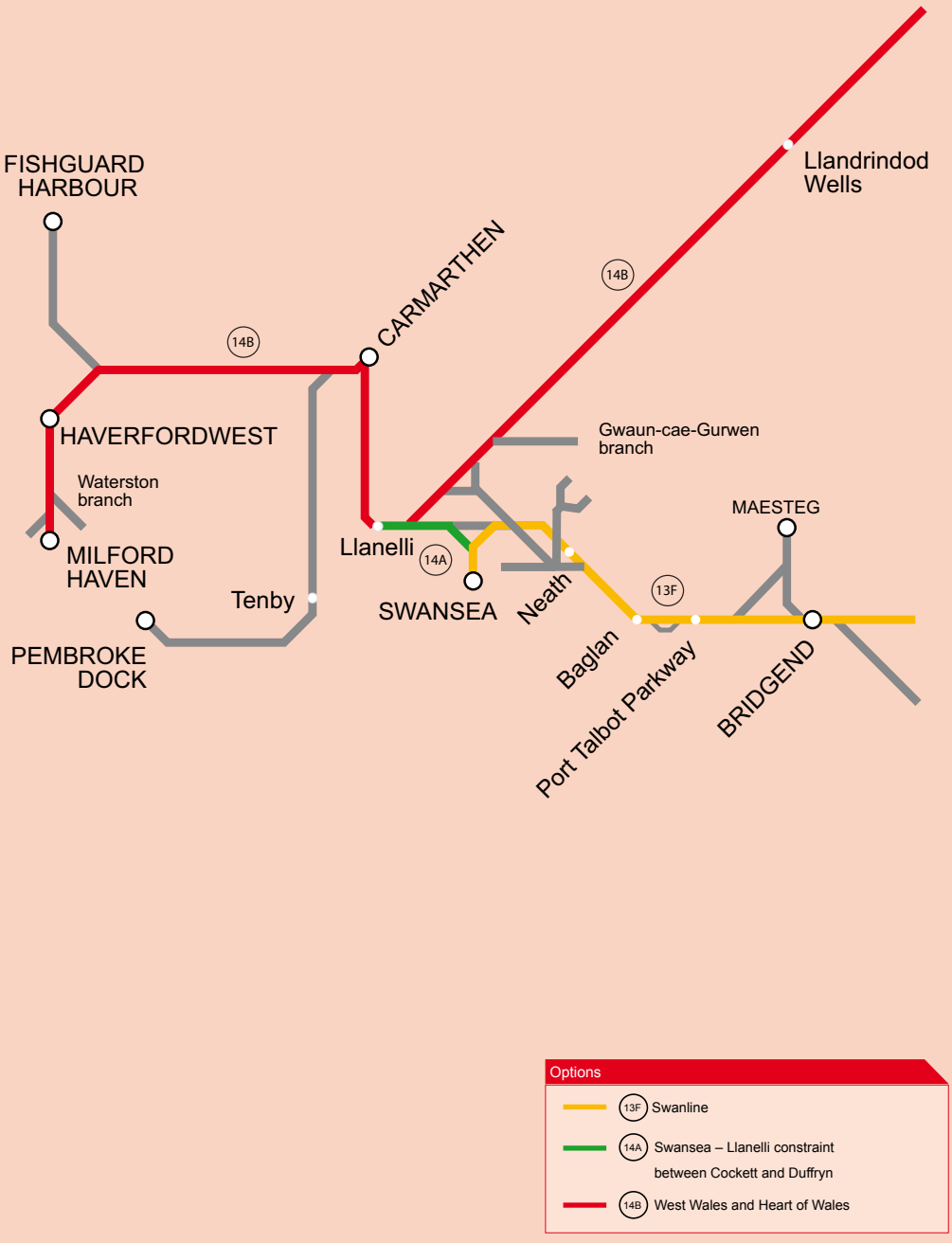
The additional operational flexibility achieved by the works to the central corridor would potentially permit some flexing of the established Standard Pattern Timetable (SPT) to tailor frequencies to demand, depending on how rates of growth on the various routes north and south of Cardiff develop.

Control Period 5 (2014 – 2019)
The Ministerial statement by WAG of 2 June 2008 referred to the provision of up to an additional 1200 peak-hour seats to be made available by new Taff Vale and Rhymney line express services after the completion of the works to permit more trains to run through the valleys central corridor.

After signalling renewals are basically completed during CP4, as a last stage of works probably involving demolition of the old Cardiff Central Panel Signal Box (after controls are transferred to the new Control Centre, at the former Canton Milk depot site north of the diesel depot on the other side of the GWML), the site will then be cleared to permit actual construction of the additional Cardiff Central Platform 8.

This will enable improved matching of rolling stock to peak and off-peak levels of demand on South Wales Valleys services as it will create the ability to take trainsets working the extra peak-hour services out of service after the morning peak, without disruption to the basic all day 12tph SPT framework. Equally it will enable evening peak supplementation. The ability of the Valleys local network to recover train service performance if perturbations occur will also be improved.

Figure 47 – Options: south-west Wales



8.3.4 South-west Wales

The options addressed in this section are as follows:

13F (gap 13.07)	SwanLine stations, frequency increase
14A (gaps 14.01/02)	single track constraint, Swansea and Llanelli
14B (gaps 14.03/04)	more frequent trains in west Wales, and on the Heart of Wales (HoW) line

The principal issue facing the route in this part of Wales is optimisation of the use of resources where much of the spread of population is relatively low-density.

Control Period 3 (current, until March 2009)
East of Swansea: the infrastructure is currently in place which would permit restructuring of the "SwanLine" stopping trains (option 13F) between Cardiff and Swansea, to offer improved hourly frequencies (compared to the existing, poor two-hourly frequency) at all five local stations at Pyle, Baglan, Briton Ferry, Skewen and Llansamlet. This would be achieved by means of concentrating existing train resources between Port Talbot and Swansea, which could provide better journey to work opportunities for Swansea commuters from the four stations in the Swwitch region, plus a better all-day service. Passengers at Pyle could be better served by additional stops in existing, hourly Manchester to Carmarthen services.

It is, however, recommended that this option is most appropriately considered in conjunction with the Maesteg upgrade (see 7.3.2 above, option 13E), such that passenger train paths over the busy Cardiff – Bridgend section are in effect swapped, and that the freight capacity effect then remains neutral rather than worsened if Maesteg frequencies were doubled and the lightly loaded Cardiff – Swansea stopping trains remained.

West of Swansea: the existing infrastructure is sufficient to permit an hourly frequency of operation beyond Carmarthen to Haverfordwest or Milford Haven (option 14B) though the RUS demand forecasts show that there is unlikely to be sufficient growth to justify this. Likewise, some surplus capacity exists between Craven Arms and Llanelli, over the long single-track "Heart of Wales" route, to permit some additional trains to run if these could be economically justified. The pathing constraint between Llanelli and Swansea is acknowledged but not insuperable.

Control Period 4 (2009 – 2014)
It has been demonstrated that restoration of double track (option 14A) between Swansea and Llanelli over the single-track Cockett – Duffryn section would de-constrain timetabling such that all trains (ie. including "Heart of Wales" services) could in future call at Gowerton station, and thus deliver the Swwitch requirement. However the benefits arising from the improved performance (gap 14.01) are not sufficient to justify the expenditure required; therefore satisfactory enhancement funding (eg. EU convergence) will need to be obtained if the scheme (which would address gaps 14.01, 14.02 and 14.03) is to proceed.

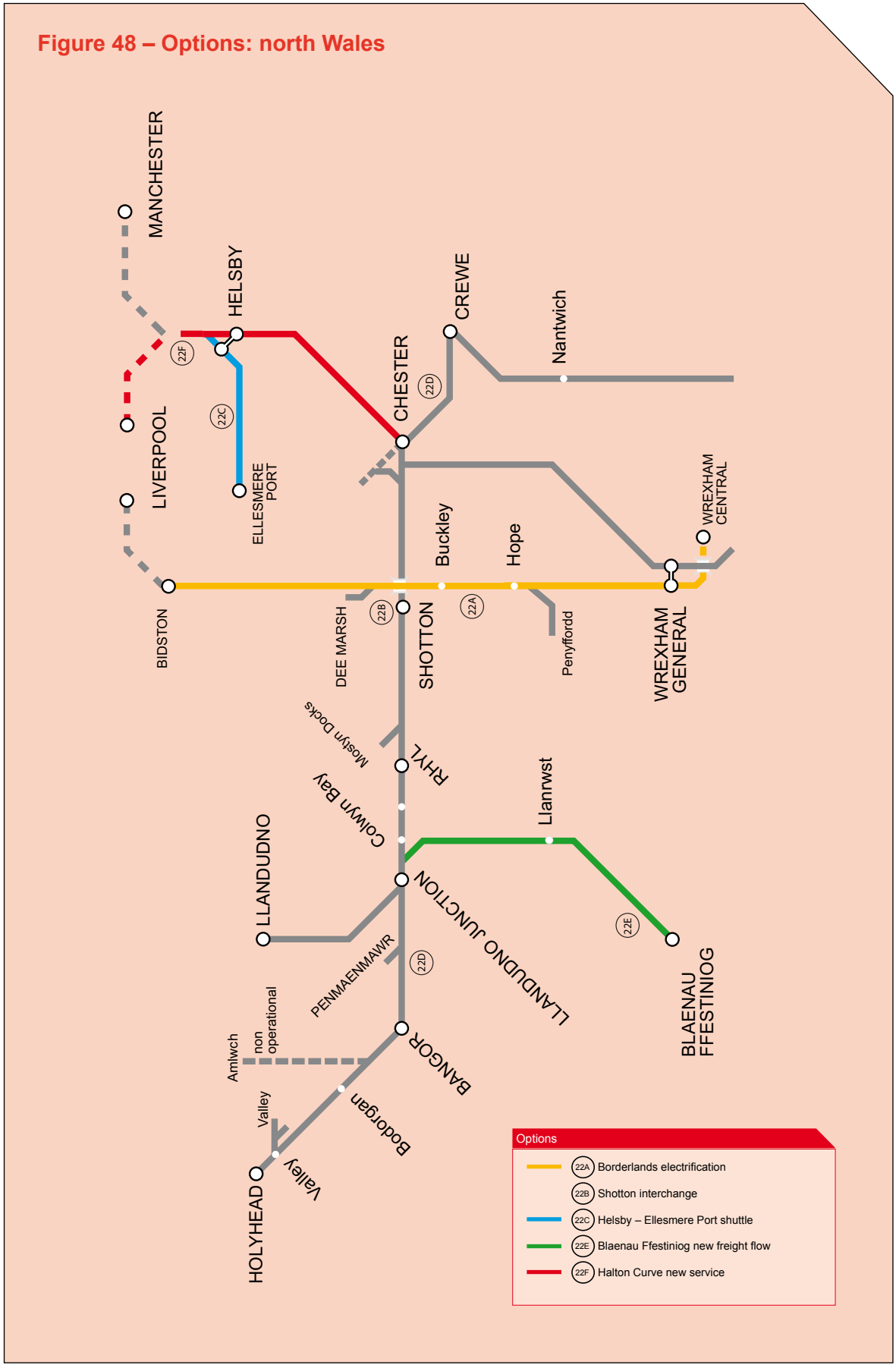
No options for the westernmost section of the railway in west Wales, that between Clarbeston Road and Fishguard Harbour, were developed within the Wales RUS, and the future of this section is largely tied to the continued presence of the ferry link to Rosslare in southern Ireland (operated by Stena Line) and the requirement in the Wales & Borders franchise for the provision of boat-train connections twice per day primarily to connect with sailings.

Similarly, no options were developed for the Swansea District section of railway between Briton Ferry and Llandeilo Junction near Llanelli, avoiding Swansea. This very lightly utilised section is primarily used by freight trains, including those carrying steel to

Trostre and petroleum products from Milford Haven and Llandarcy. The daytime Cardiff to Fishguard Harbour (and return) boat-trains also use this double-track section, plus one other train. The maintenance costs of the Swansea District section are relatively high inasmuch as there are numerous viaducts, cuttings and tunnels compared to the alternative route between Cardiff and west Wales via Swansea Landore.

In principle it offers a marginally faster and more direct route for west Wales passengers by the avoidance of train reversal at Swansea station, but there is little/no interest in diversion of existing services because of the significance of Swansea as a destination for west Wales passengers. There is no identified settlement to the north of Swansea which might usefully justify the economic provision of a new station on the route (ie. if a new service were to be developed) and housing is relatively dispersed. Timetable slots via this route are nonetheless available when needed as a diversionary route if that via Swansea is not available.

Figure 48 – Options: north Wales



8.3.5 North Wales, and Cheshire/Merseyside

The options addressed in this section are as follows:

22A (gaps 22.01-04)	Wrexham Central – Bidston "Borderlands Line"
22B (gap 22.05)	Shotton interchange arrangements
22C (gap 22.06)	Helsby – Ellesmere Port shuttle services
22D (gaps 22.07/08)	Crewe – Holyhead overall service provision
22E (gap 22.09)	new Blaenau Ffestiniog freight flow
22F (gaps 22.12/13)	Liverpool – Chester via Halton curve services

Two options in this region would involve major expenditure (22A and 22F), and development work took place during 2007/08 whilst the Wales RUS was in preparation. It was too soon to conclude on these options within Wales RUS timescales, and many of the benefits and costs arise outside of Wales, as a result of which further development will continue within the Merseyside RUS during 2008/09 building on the initial work already carried out.

Control Period 3 (current, until March 2009) (Taith region)

The four "gaps" for the Wrexham Central to Bidston "Borderlands Line" addressed immediate service quality (performance, and slow journey time) issues as well as the broader wishes of Merseytravel and Taith for a substantial expansion (option 22A) of the third-rail electrified Merseyrail network radiating from Liverpool. It is recommended that work continues to identify whether the immediate gaps can be dealt with through a frequency increase and/or minor linespeed improvement works.

It is also recommended that the improvements to interchange arrangements (option 22B) between the high level platforms at Shotton station (on the Borderlands line) and the low level platforms (on the north Wales coast line) go ahead.

During 2007/08 feasibility and optioneering work for the electrification scheme was started, which will continue into the remainder of this control period. The final decision will depend on confirmation of likely costs and benefits, the performance impact of additional half-hourly through electric service between the Liverpool Central loop and the Wrexham Central line (increasing loop throughput from its 12 trains per hour (tph) all day level to 14tph, which would be a major utilisation increase), and the effect on performance on the wider Merseyrail Wirral network.

The revised train services to be introduced along the north Wales coast line from Crewe to Holyhead, as part of the committed December 2008 major West Coast Main Line timetable change (option 22D), give a substantial improvement at Chester through the provision of an hourly all-day through London Euston service, of which more will run through to Bangor/Holyhead than currently. Secondary improvements, mainly the link-up of ATW Holyhead to Chester services with Chester to Birmingham New Street services to create a two-hourly through Holyhead to Birmingham New Street (ie. via Wrexham General and Shrewsbury) service, are also planned. Holyhead to Cardiff services will remain substantially similar to the current, two-hourly pattern.

In addition to the above changes one Virgin West Coast morning journey from Chester to London will be extended to start from Wrexham General, and similarly an evening journey from London to Chester will be extended through to Wrexham General. These changes are in addition to the service provided by the open-access operator Wrexham, Shropshire and Marylebone Railway (WSMR)

between Wrexham General and London Marylebone via Shrewsbury services, which commenced operation in April 2008.

In planning terms, feasibility work on upgrading of the Blaenau Ffestiniog branch to make it fit for a major, new slate waste freight flow in 2,000t payload trains (option 22E) is complete, and progression to the single option definition stage prior to subsequent implementation could proceed subject to the funding contribution from a terminal operator being agreed, to match provisional Network Rail and WAG investments. On this basis preliminary works could if required commence towards the end of CP3.

(Merseyside & Cheshire)
During 2007/08 feasibility and optioneering for reinstatement of the “Halton Curve” (option 22F) also started, which will continue into the remainder of this Control Period. Work done within this RUS to assess the availability of the extra train paths for future, additional hourly trains between Liverpool Lime Street and Chester should continue, and the effect on performance over the relevant parts of the West Coast Main Line between Liverpool and Crewe will need to be quantified within further option definition works.

Control Period 4 (2009 – 2014)
(Taith region, and Merseyside & Cheshire)
Subject to further work mentioned above, and confirmation of business case benefits and suitable Third Party funding arrangements and business case benefits, both of the major initiatives for the Borderlands Line electrification (option 22A) and Halton Curve reinstatement (option 22F) would undergo detailed design and proceed to implementation in this period.

Short/medium-term options for service frequency enhancements and/or journey time improvements of the Wrexham – Bidston route could be investigated further, and might provide an alternative means of delivering benefits if a satisfactory case for electrification cannot be made. The applicability of the tram-train concept to this option is mentioned in Chapter 9.

8.4 Summary of recommendations

Of the 24 options which were considered in Chapter 6 the overall status of those which are recommended or otherwise is given below:

Option	description	conclusion
13A GWML(East)	stopping patterns	done
13B GWML(East)	Cdf-Cheltenham hrly	no proven business case
13C GWML(East)	Llanwern (Sewta)	no proven business case[1]
13D GWML(East)	Ebbw V.-Npt (Sewta)	develop in CP4
13E GWML(West)	Maesteg (Sewta)	develop in CP4
13F GWML(West)	SwanLine (Swwitch)	no stand-alone case[2]
14A West Wales	SWML (Swwitch)	no proven business case[3]
14B West Wales	MH + HoW (Swwitch)	no proven business case
14C N&W	north-south/national	develop in CP4
14D N&W	Abergavenny (Sewta)	no proven business case
14E N&W	Shrewsbury-Crewe (Cheshire)	not yet possible
14F Cambrian	Camb ML (TraCC)	being implemented
15A Valleys	City Line (Sewta)	not required
15B Valleys	VoG (Sewta)	no proven business case
15C Valleys	Merthyr 2 tph (Sewta)	done
15D Valleys	Rhymney 2 tph (Sewta)	develop in CP4
15E Valleys	Energlyn (Sewta)	develop in CP4
15F Valleys	overall growth (Sewta)	develop by end-CP4
22A Deeside	Wrex-Bid (Mtvl/Taith)	consider further in Merseyside RUS
22B Deeside	Shotton (Taith)	being implemented
22C Merseyside	EP-Helsby (Cheshire)	no proven business case
22D North Wales	WCML/2008	being implemented
22E North Wales	Bl.Fest new frt	await funder
22F Merseyside	Halton curve (Mtvl)	consider further in Merseyside RUS

1 Develop specific analysis if required by Sewta on behalf of the developer of Llanwern.

2 To be developed in conjunction with Option 13E.

3 No business case on reliability grounds, Swwitch is considering the wider regional social and economic case, and major park and ride development at Gowerton, in line with WelTAG procedures.

Of the 24 options it can be seen that some are not recommended to be pursued further, two are to be further considered within the Merseyside RUS, and most have either been done or are in implementation in CP3, or are recommended to continue development into CP4, that is, the period 2009 – 2014. Of these, all are proposed to be Third Party-funded enhancements (ie. by Welsh Assembly Government) or are in accordance with the HLOS (ie. the major Valleys option 15F) with DfT funding, in line with the Office of Rail Regulation (ORR) Final Determination published 30 October 2008.

CP3	(done or being implemented – 5, no proven business case – 6)	11
CP4	(develop – 6, others – 7)	13
	Total	**24**

9. A longer-term scenario

An overall picture of how the railway network in the Wales Route Utilisation Strategy (RUS) area might look in five to ten years' time was given in the preceding chapter. In section 8.2.3 the stakeholder requirements for more frequent services in numerous parts of the network were addressed, identifying those where surplus capacity exists, or where interventions are planned to fulfill an increased requirement. Section 8.4 summarised the recommended options to be delivered in Control Periods 4 and 5, that is, until 2019.

The Government's "Delivering a Sustainable Railway" White paper (published in July 2007) anticipated continued long-term growth in the use of the railway. Specifically, it is suggested that in England and Wales there could be an overall doubling of passenger and freight traffic over the next 30 years. The Wales Transport Strategy "One Wales: Connecting the Nation" (published in May 2008) identifies a range of outputs required of the Welsh transport system.

9.1 Fleet replacement

The long-distance fleet deployed by First Great Western to link south Wales and England will be due for replacement before 2019 and the InterCity125 diesel trains (comprised of two power cars and eight carriages of seating) are planned to be replaced by longer InterCity Express Programme (IEP) units, of up to ten carriages' length. The higher-capacity IEP train will be configured as self-propelled (ie. diesel-powered), electrically powered by 25kV overhead catenary, or bi-mode (able to use diesel or electric power).

Similarly the need for widespread fleet renewal, on the basis of the age of much of the rolling stock used to operate domestic Arriva Trains Wales (ATW) services, will broadly coincide with the end of the current franchise.

In the long-term electrification of the Great Western Main Line from London Paddington has been proposed. A first phase to Maidenhead, for inner London services will be provided by Crossrail, with potential further phases extending further west to the outer Thames Valley, and to Bristol and Cardiff/ Swansea. In this scenario electric IEP trains would be procured rather than diesel.

Electrification of part or all of the north Wales main line (NWML) between Crewe and Holyhead, from Crewe to Chester or further west, is also being considered as a long-term option.

Alongside main line electrification, evaluation of conversion of the South Wales Valleys route is a further option which is now being addressed, as the dense pattern of suburban operation lends itself well to electric operation of three-car or four-car Electric Multiple Units (EMUs) which would replace existing diesels. This would bring benefits of faster journey times through improved acceleration and braking, and better ability to cope with gradients, as well as yielding environmental benefits through a reduction in emissions.

These options are being considered by the Network RUS electrification workstream.

Tram-train technology offers the prospect of linking areas of high population density, that are not currently served by train, to the network by less costly means than construction of new lines to heavy-rail standards or re-opening of old trackbeds. It could also relieve congestion at busy stations and improve journey opportunities by diverting some services off the heavy-rail network onto suitably prioritised street running. The concept will be the subject of a trial in South Yorkshire. If the trial is successful then suitable locations elsewhere will be examined and Cardiff offers considerable potential, particularly for the Cardiff Bay area to meet the on-street running aspiration of Cardiff Council to better serve the area which has expanded away from the existing Cardiff Bay station. The Coryton and Radyr (City Line) routes may also be suitable for conversion to Tram-train operation.

The Wrexham – Bidston line, and the desired through running to Liverpool, may be a suitable candidate for tram-train operation, which would not involve street-running but could exploit a dual-mode diesel vehicle also capable of third-rail electric running on the Liverpool underground system, whilst using existing conventional height platforms.

9.2 Doubled volumes in 30 years' time

In Section 3.1.1 reference was made to the prevalence of comparatively small types of train used on domestic services within the Wales RUS area, ranging from single units on the most rural services, through the most common size of two-car sets on urban and long-distance services, to a limited number of three-car sets which sustain the north-south Wales and Carmarthen to Manchester routes. Growth around Cardiff has required increasing deployment of four-car trains, with more recently a move towards some six-car operations becoming necessary. Cardiff to Bristol and Portsmouth services operated by First Great Western (FGW) have recently been strengthened from two-car to three-car using reformed class 158 vehicles, and a next increment to cater for growth would be the provision of four-car trains (or even five-car or six-car through the use of two-car and three-car sets in multiple). This route will be further addressed in the Great Western RUS.

For much of the network it is envisaged that further lengthening of trains will cater for the long-term increase in demand, around the framework of the now well-established Standard Pattern Timetable. In a few cases more platform lengthening will be required, although some route-sections are effectively unconstrained where provision already generally exists for long trains, such as along the north Wales coast. Growth in freight traffic is likely to be accommodated by longer and heavier trains, by making more frequent use of current timetabled paths and by timetabling of additional paths where possible. Beyond this capacity exists (or will exist after recommended interventions to address the key pinchpoints have been implemented) for enhanced frequencies where train lengthening is not able to cater for long-term increases in passenger demand or where additional freight paths cannot be accomodated.

This section considers each of the main route sections, in north, mid- and south Wales in turn, in order to set out how the vision of doubled volumes for passenger and freight might be achieved.

9.2.1

On **Route 22**, for north Wales, route capacity exists for services to be increased in frequency from the current two or three trains per hour to three or four along the double-track main line from Crewe and Chester to Holyhead. A number of new stations have been proposed and if they are developed, one means of serving them might be for the ATW Holyhead to Cardiff, Holyhead to Birmingham and Llandudno to Manchester services to be accelerated, with an additional stopping train per hour running from either Llandudno Junction or Bangor to Chester. This could be extended to Liverpool if the proposal to reinstate the Halton Curve proves to be viable, and which would create the sought after link between the north Wales towns and Liverpool as well as feeding Liverpool John Lennon airport traffic through Liverpool South Parkway station, subject to capacity between Runcorn and Liverpool Lime Street.

Even with four passenger trains per hour between Llandudno Junction and Chester it would be possible to find paths for at least double the current number of freight trains.

On the other sections of Route 22, capacity already exists to double the frequency on the Wrexham – Bidston line. Between Llandudno Junction and Blaenau Ffestiniog, beyond providing two-car trains all year round instead of the existing single car for much of the year, the next increment to accommodate further growth might be to adopt a two-hourly standard pattern instead of the existing six trains per day non-standard interval arrangement, by making regular use of the intermediate passing loop regularly.

9.2.2

On **Route 14**, within mid-Wales, route capacity will exist for services to be doubled in frequency along the Cambrian Main Line between Aberystwyth and Shrewsbury. Portion working between Shrewsbury and Birmingham of combined Holyhead to Birmingham (International) and Aberystwyth to Birmingham (International) trains, and vice versa, will be enabled by the planned upgrade of Platform 3 at Shrewsbury to allow such joining and splitting moves so that ATW trains between Shrewsbury and Birmingham formed of four cars or six cars in future make optimum use of available paths over the busy West Coast Main Line (WCML) between Wolverhampton and Birmingham.

Along the border counties, from Newport to Crewe and to Chester (subject to Wrexham – Saltney Junction re-doubling identified in option 14C) capacity exists for half-hourly frequencies which would be combined with more four-car working to create doubled capacity. This would still permit doubling of the number of freight paths, subject to signalling upgrades to improve headways.

9.2.3

On **Route 13**, in south-east Wales, substantial capacity increases will be achieved through IEP deployment in substitution of InterCity 125 (IC125) operation by FGW on the London to Cardiff/Swansea route, by virtue of higher seating capacity per train. Paths exist for peak frequency operation from Swansea (namely half-hourly currently towards London in the morning, and returning in the evening) to be extended into the off-peak hours as and when necessary. The potential will also exist for hourly operation (by ATW) of four-car units from Cheltenham and Gloucester to Cardiff, extended as appropriate to Maesteg. Further west potential exists (as demonstrated in option 13F) for doubled frequency of local services between Port Talbot and Swansea if required.

There is capacity on the Great Western Main Line (GWML) to cater for the proposed additional Ebbw Vale to Newport services at a future stage, provided that a suitable turnback facility is created at or near Newport station. These services are likely to be formed of two-car sets at the outset but could become four-car in the longer-term.

9.2.4

On **Route 14** in west Wales, substantial capacity increases can be achieved by running longer trains within current patterns, albeit not optimally unless Cockett – Duffryn double-track reinstatement is carried out. The two-hourly interval beyond Carmarthen to Milford Haven could double to hourly without intervention to the infrastructure. If required longer trains could deliver a large capacity increase on the Pembroke Dock branch, and likewise on the Heart of Wales line and to Fishguard Harbour.

9.2.5

On **Route 15** for the south Wales valleys, a substantial capacity increase will result from implementation of the works funded through the High Level Outpout Specification (HLOS) and which were described in detail in Chapter 6 (Gaps and options) as option 15F. Taken together with the more immediate platform-lengthening programme for the Treherbert and Rhymney routes, the six-car capability created together with a future sixteen trains per hour frequency through the Valleys central corridor gives doubled passenger throughput potential for a large part of the Valleys network. More efficient resource utilisation may be possible if the outstanding shorter-platform stations on the Barry line, and on the Vale of Glamorgan section (where a four-car limit applies), were addressed in the longer-term. The less heavily loaded Radyr (City Line) and Coryton sections are not envisaged to require interventions beyond the existing two-car capability.

9.3 Alternative growth scenarios

The demand forecasts used in this RUS represent the growth projections derived from the housing, population and employment forecasts contained in the DfT's TEMPRO model. Longer-term demand forecasts are very uncertain and extremely sensitive to economic conditions, so it is appropriate to consider the effect on the recommendations of the RUS if demand is higher or lower than forecast.The measures recommended in the RUS are expected to cater adequately for forecast passenger and freight growth in the period to 2019. With the exception of some services in south Wales, crowding is rare, and across the day a significant number of extra passengers could be carried on current services. Where the RUS proposes passenger train lengthening, much of it can be implemented as and when needed by those specifying and operating the services; the approach of the Welsh Assembly Government has generally been to fund necessary infrastructure works (eg. platform lengthening) before they are required so that train lengthening is dependent only on rolling stock availability.

In the event that passenger or freight growth does not meet the RUS forecasts, then clearly it would be possible to delay or abandon interventions where appropriate, provided that decisions are made in time to avoid major expenditure commitments. It should be remembered that where an intervention requires additional infrastructure, this work is usually best value if carried out at the same time as the scheduled renewal of that infrastructure.

10. Next steps

10.1 Introduction

This Route Utilisation Strategy (RUS) will become established sixty days after publication unless the Office of Rail Regulation (ORR) issues a notice of objection within this period.

The recommendations of an RUS form an input to decisions made by industry funders and suppliers on, for example, franchise specifications, investment plans and the Government's High Level Output Specification (HLOS).

10.2 Network Rail Route Plans

The Route Plans for Network Rail Strategic Routes 13 (Great Western Main Line), 14 (South & Central Wales & Borders), Route 15 (South Wales Valleys) and Route 22 (North Wales & Borders) together include all the routes covered by this RUS. The Route Plans were published as part of the Strategic Business Plan (SBP) in November 2007, and are updated regularly. They list all significant planned investment on the route, including scheduled renewals as well as committed and aspirational enhancements. Those published in March 2008 cite some improvements included in the RUS; the next edition (April 2009) will incorporate the RUS conclusions as well as the SBP recommendations.

10.3 Access Charges Review

The ORR review of Network Rail's funding requirements and access charges for the period 2009 – 2014 concluded on 30 October 2008. This RUS has informed Network Rail's input to the review and this is discussed below.

10.4 High Level Output Specification (HLOS)

In July 2007 the Department for Transport (DfT) issued its HLOS to define the outputs it wishes to buy from the rail network during the next Control Period ie. 2009 – 2014. This HLOS, and an accompanying Statement of Funds Available (SoFA) has been used by ORR to set the funding requirements of Network Rail over that period, taking into account other obligations and funder's reasonable requirements. Network Rail prepared its SBP in conjunction with industry stakeholders to present the industry's response to the HLOS. The recommendations of this RUS, where they fall within the 2009 – 2014 period, are part of the rail industry's recommendations incorporated within Network Rail's SBP application for funding via the Access Charges Review.

10.5 Ongoing access to the network

This RUS will also help to inform the allocation of capacity on the network through application of the normal Network Code processes.

10.6 Review

Network Rail is obliged to maintain an RUS once it is established. This requires a review using the same principles and methods used to develop the RUS:

- when circumstances have changed
- when so directed by ORR
- when (for whatever reason) the conclusion(s) may no longer be valid.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Appendices

Appendix A – Service groups

The scope of services was all those operating wholly within the defined Wales Route Utilisation Strategy (RUS) area, plus those through services running through to/from Wales, as specified within the Arriva Trains Wales (ATW) franchise (December 2006 timetable "baseline"):

- south Wales linking to Gloucester (Cheltenham from December 2007)
- mid-Wales linking to Birmingham
- north Wales linking to Manchester Piccadilly via Warrington Bank Quay.

In addition, services provided by other Train Operating Companies (TOCs):

- south Wales to London and to Bristol and Portsmouth First Great Western (FGW)
- south Wales to Birmingham and Nottingham CrossCountry (CC)
- north Wales linking to London Virgin West Coast (VWC).

South Wales Main Line (jointly aligned to Swwitch and Sewta)

GBTT	Service	TOC	Frequency
125	Swansea to London*	FGW	hourly
125	Cardiff to London*	FGW	hourly
128	Maesteg to Cardiff	ATW	hourly
132	Cardiff to Gloucester (stopping)	ATW	2-hourly
127	Ebbw Vale to Cardiff (started Feb.09)	ATW	hourly
123	Cardiff to Bristol and Portsmouth†	FGW	hourly
123	Cardiff to Bristol and Westbury/Weston SM†	FGW	hourly
57	Cardiff to Birmingham and Nottingham	CC	hourly

* combined to be half-hourly between Cardiff and Paddington (SX only)

† combined to be half-hourly between Cardiff and Bristol Temple Meads (this group incorporates one CrossCountry South West – North East round trip originating at Cardiff, via Bristol Temple Meads (rev.)

South-west Wales (Swwitch-aligned)

GBTT	Service	TOC	frequency
128	Swansea/Carmarthen to Milford Haven*	ATW	2-hourly
128	Swansea to Whitland and Pembroke Dock	ATW	2-hourly
128	Carmarthen to Cardiff (through to Manchester)	ATW	hourly
128	Swansea to Cardiff stopping ("SwanLine")	ATW	2-hourly

* Carmarthen – Milford Haven is often an extension of service from Manchester in practice.

Irish ferry connection (non-aligned to any individual Regional Transport Consortium)			
128	Cardiff – Fishguard Harbour boat trains	ATW	2 tpd

Mid-Wales (TraCC-aligned)			
GBTT	**Service**	**TOC**	**Frequency**
75	Aberystwyth to Shrewsbury and Birmingham	ATW	2-hourly
75	Pwllheli to Machynlleth	ATW	2-hourly
129	Swansea to Shrewsbury	ATW	4 tpd

North – South (non-aligned to any individual Regional Transport Consortium)			
GBTT	**Service**	**TOC**	**Frequency**
131/81	Cardiff to Holyhead	ATW	2-hourly
131	Carmarthen/Cardiff to Manchester	ATW	hourly
131	Shrewsbury to Crewe stopping	ATW	2-hourly

North Wales (Taith- and Merseytravel-aligned)			
GBTT	**Service**	**TOC**	**Frequency**
81	Holyhead to Crewe	ATW	2-hourly
81	Llandudno to Manchester	ATW	hourly
81	Chester to Crewe	ATW	hourly
81/65	Holyhead/Llandudno to London Euston*	VWC	5/6 tpd
102	Llandudno to Blaenau Ffestiniog	ATW	6 tpd
101	Wrexham to Bidston	ATW	hourly
109	Warrington to Ellesmere Port via Helsby	NT	4 tpd
75	Chester to Birmingham via Shrewsbury	ATW	2-hourly
* (from December 2008)			
81/65	Chester – London integrated	VWC	hourly
81/65	Holyhead/Bangor to London Euston	VWC	7 tpd

South-east Wales (Sewta-aligned)			
GBTT	**Service**	**TOC**	**Frequency**
129	Valleys, Treherbert to Cardiff	ATW	half-hourly
129	Valleys, Aberdare to Cardiff	ATW	half-hourly
129	Valleys, Merthyr to Cardiff	ATW	hourly
129	Valleys, Rhymney to Cardiff*	ATW	hourly
129	Valleys, Bargoed to Cardiff*	ATW	thrice-hourly
129	Valleys, Coryton to Cardiff	ATW	half-hourly
129	Valleys, Penarth to Cardiff	ATW	quarter-hourly
129	Valleys, Barry Island to Cardiff†	ATW	thrice-hourly
129	Valleys, Bridgend to Cardiff via Barry†	ATW	hourly
129	Valleys, Cardiff Bay to Cardiff Queen St	ATW	quarter-hourly
129	Valleys, Cardiff to Radyr via City Line	ATW	half-hourly
* combined to be quarter-hourly between Bargoed and Cardiff † combined to be quarter-hourly between Barry and Cardiff			

Appendix B – New stations: Wales

Chapter 3: Baseline (section 3.6.7.2) noted the relatively high numbers of "new" stations in Wales, these are reconciled as follows alongside future aspirational station openings.

Time-frame	On main lines	On branch lines	Total
Past 20 years	8	18	26 (Note a)
In construction during 2007/08	1	6	7 (Note b)
Future (medium-term) possibility	5	2	7 (Note c)
Future (long-term) possibility	2	4	6 (Note d)
In England	0	4	4 (Note e)
Total in Wales RUS area	16	34	50 grand total new and proposed

Notes

(a) 26 new stations have been added to the network in the past 15 – 20 years or so, all in south Wales (of which four are in the Swwitch region). These were at:

(Mainline)
Pencoed, Pontyclun, Cwmbran (Llansamlet, Skewen, Briton Ferry, Baglan), and Pyle.

(Branchline)
Maesteg, Maesteg Ewenny Road, Garth, Tondu, Sarn, Wildmill, Aberdare, Cwmbach, Fernhill, Mountain Ash, Penrhiwceiber, Abercynon North, Ninian Park, Waungron Park, Fairwater, Danescourt, Llantwit Major, Rhoose.

(b) In 2006 – 2008 seven stations were under construction in the Sewta region:

(Main line)
Llanharan (opened December 2007).

(Branchline)
Ebbw Vale, Llanhilleth, Newbridge, Crosskeys, Risca, Rogerstone (all opened by Spring 2008).

(c) Future stations aspired to in the medium-term (within the RUS timeframe).

(Main line)
Brackla, St Mellons, Coedkernew, Llanwern, Caerleon.

(Branch line)
Energlyn, Ebbw Vale Town.

(d) Future stations aspired to in the longer-term (beyond the Route Utilisation Strategy (RUS) timeframe).

New branch
Talbot Green, Llantrisant, Gwaun Meisgyn, Beddau.

Main line
Llantarnam, Sebastopol.

(all above in Sewta region)

(e) Future stations aspired to in England (within the RUS timeframe).

(Branch line)
Beechwood & Noctorum, Woodchurch, Deeside Industrial Park (actually in Taith area), all three linked to Bidston – Wrexham proposed Merseyside extension of electrification.

Halton Curve
Beechwood (aka Runcorn South).

Note to accompany this Appendix
The future stations mentioned are those that appear in the published Draft plans of the four Welsh Regional consortia, and of Merseytravel and Cheshire County and Halton Borough Councils.

Differing degrees of business case development apply and in a number of cases funding is not seen as "realistically likely" within the ten-year RUS timeframe. All are mentioned in the Gaps/Options section.

Others
A number of other new station aspirations have been put forward by external stakeholders but have not had any explicit development work carried out. These were as follows:

South-west Wales Swwitch region
Cockett (within the Swansea urban area, approximately one mile west of Swansea, between Swansea and Gowerton stations)

North Wales Taith region
Holywell Junction (on the north Wales coast main line, approximately four miles west of Fflint, between Fflint and Prestatyn stations)

Rossett (on the Chester to Shrewsbury line, approximately five miles north of Wrexham, between Saltney Junction and Wrexham General stations)

Appendix C – Freight terminals in the Wales RUS area

Chapter 3: Baseline (section 3.5.1) illustrated the distribution of freight terminals across the Wales RUS area. These are listed here in fuller detail.

Route 13: GWML	Commodity
Caerwent	MoD
Llanwern Corus	Metals
Uskmouth branch, Orb	Metals
Uskmouth branch, Power Station	Coal
Newport Docks	Coal
Newport Docks	Metals (Scrap)
Newport Docks	Metals
Machen Quarry	Aggregates
Cardiff Wentloog	Intermodal
Cardiff Docks, Tremorfa	Metals
Cardiff Docks, Castle Works Celsa	Metals
Cardiff Docks	Coal
Cardiff Docks	Scrap
Cardiff Docks, HCB Energy	Petroleum
Parcslip (Aberbaiden)	Coal
Port Talbot, Abbey Works Corus	Metals
Port Talbot Docks, Grange	Coal
Port Talbot Docks, Grange	Metals
Port Talbot Iron Ore Terminal	Metals (temp. disused)
Baglan Bay	Chemicals (temp. disused)
Route 14: west Wales	
Neath Abbey Wharf	Aggregates
Cwmgrach	Coal
Onllwyn	Coal
Swansea Docks	Coal
Llandarcy refinery	Petroleum
Trostre Corus	Metals
Carmarthen	Cement (temp. disused)
Milford Haven Robeston	Petroleum
Milford Haven Waterston	Petroleum
Milford Haven Waterston	Aggregates
Pembroke Dock	MoD
Haverfordwest	MoD
Trecwn	Intermodal (proposed)
Fishguard Harbour	Intermodal (proposed)
Gwaun cae Gurwen	Coal

Route 14 continued: North to South	
Chirk Kronospan	Forest products
Shrewsbury Smallshaws	Domestic Coal
Moreton on Lugg	Aggregates
Hereford (Barrs Court)	Aggregates (disused)
Route 15: South Wales valleys	
Cwmbargoed	Coal
Cwmbargoed	Aggregates
Hirwaun Tower Colliery	Coal
Hirwaun Tower Colliery	Aggregates
Barry Dock	Intermodal, Chemicals
Aberthaw Power Station	Coal
Aberthaw Cement	Aggregates (temp. disused)
Bridgend Fords	Automotive
Route 22: north Wales	
Shotwick	Forest Products (Paper)
Dee Marsh Corus	Metals
Dee Marsh (“Tubework Sidings”)	Automotive (not yet in use)
Penyffordd	Cement
Ince	Glass (potential new aggs. traffic)
Ince	Chemicals (fertiliser) (temp. disused)
Stanlow	Petroleum (disused)
Ellesmere Port	Petroleum
Ellesmere Port Docks	Coal
Ellesmere Port Eastham	Petroleum (disused)
Mostyn Dock	Metals
Llandudno Junction	Petroleum (disused)
Blaenau Ffestiniog	Aggregates (proposed)
Trawsfynydd (line closed from Blaenau Ffestiniog)	Nuclear Waste
Penmaenmawr	Aggregates
Valley	Direct Rail Services Nuclear Waste
Holyhead, Anglesey Aluminium	Metals

Appendix D – Glossary of terms

ATOC	Association of Train Operating Companies
ATW	Arriva Trains Wales
CASR	Cardiff Area Signalling Renewal
cl.	Class (of train)
DDA	Disability Discrimination Act
DfT	Department for Transport
Down	The line normally used by trains travelling away from London
Dwell time	is the time a train is stationary at a station
EWS	English, Welsh & Scottish Railway
ERTMS	European Rail Traffic Management System
FGW	First Great Western
FOC	Freight Operating Company
GBTT	Great British Timetable
GWML	Great Western Main Line
GRIP	Guide to Railway Investment Process
HLOS	High Level Output Specification
IBS	Intermediate Block Signal
Intermodal trains	trains conveying containers which could be moved by road, rail or sea
Merseytravel	Merseyside Passenger Transport Authority and Executive
MOIRA	Industry standard demand forecasting model
NASR	Newport Area Signalling Renewal
NRDF	Network Rail Discretionary Fund
ORR	Office of Rail Regulation, the economic regulator for the railway industry
RA	Route Availability
RETB	Radio Electronic Token Block signalling
Sewta	South East Wales Transport Alliance
SMG	Stakeholder Management Group
SOFA	Statement of Funds Available
SPT	Standard Pattern Timetable
SSI	Solid State Interlocking signalling
SWML	South Wales Main Line
Swwitch	regional transport consortium for west Wales
Taith	regional transport consortium for north Wales
TCB	Track Circuit Block signalling
TOC	Train Operating Company
tph	Trains per Hour
TraCC	regional transport consortium for mid-Wales

Up	The line normally used by trains travelling towards London
v.v.	vice versa
WAG	Welsh Assembly Government
WCML	West Coast Main Line
WelTAG	Welsh transport Plannning and Appraisal guidance
WSMR	Wrexham, Shrewsbury and Marylebone Railway
WTT	Working Timetable

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