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Route 15 South Wales Valleys



Section 1: Today's railway

Route context

The South Wales Valleys route is essentially a busy urban passenger network radiating from the Welsh capital city of Cardiff, and which has been experiencing gradual expansion since the late 1980s. The most recent addition to this local network has been the nineteen mile long 'Vale of Glamorgan' line which, from June 2005, gained hourly services linking Cardiff with Bridgend via Barry serving two new stations at Rhoose (for Cardiff International Airport) and at Llantwit Major. A key strength of the route is its excellent penetration of the city centre of Cardiff, for retail and employment purposes. As the majority of

trains serve both Cardiff Central and Cardiff Queen Street stations, this enables interchange with longer distance east – west services on the Great Western Main Line (GWML) at Cardiff Central. The rapidly growing Cardiff Bay area to the south of the city centre is also linked to the Valleys network by means of a shuttle service to and from Queen Street station.

The route contains the important coal-fired power station at Aberthaw on the 'Vale of Glamorgan' line, and a major opencast site at Cwmbargoed. The 'Vale of Glamorgan' line offers a diversionary route to the GWML (route 13) between Cardiff and Bridgend.

Today's route

The arteries of the Valleys route radiate northwards, southwards and westwards from Cardiff. The four main components running northwards are:

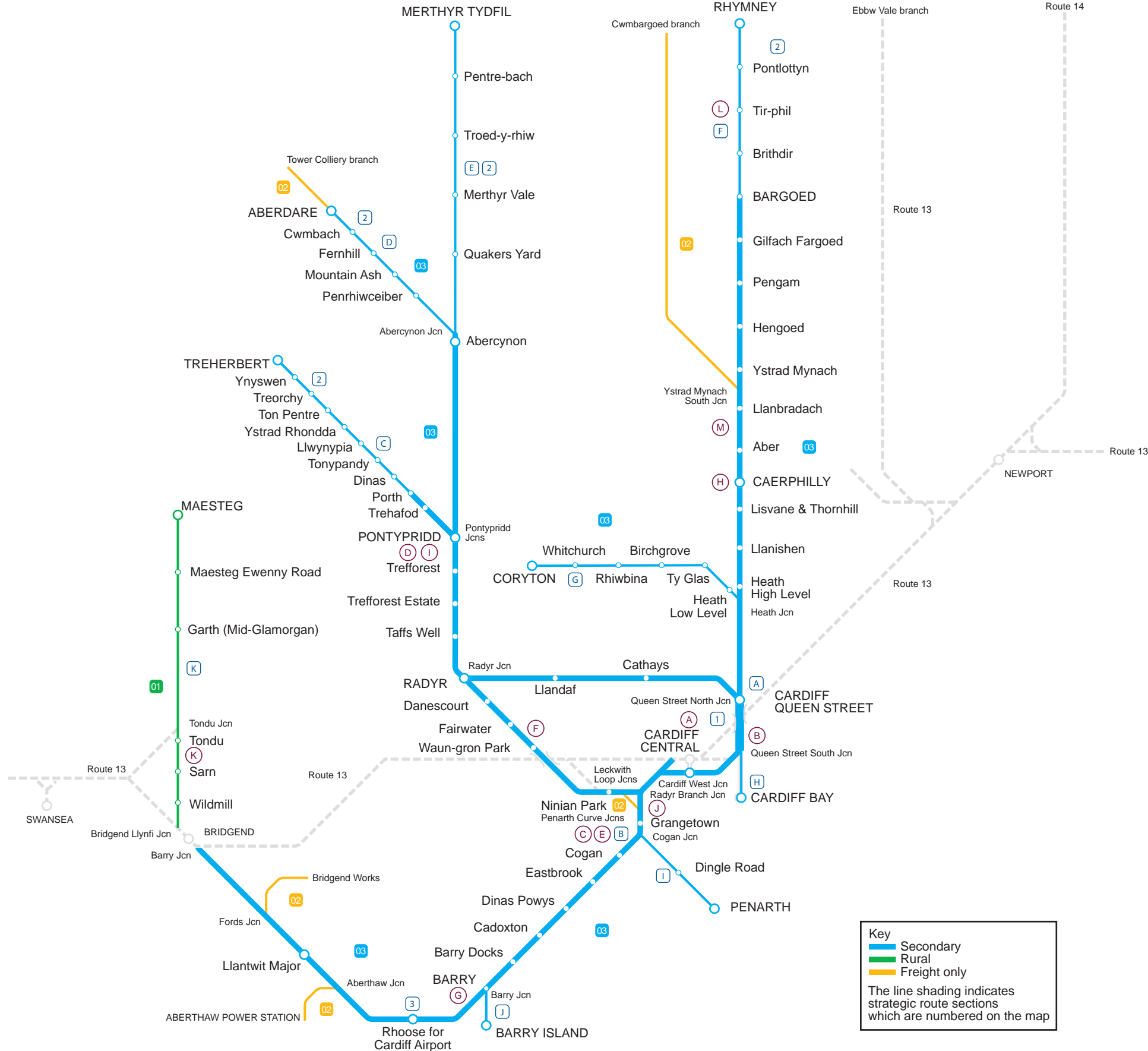
- the Taff Vale section from Cardiff to Pontypridd and Merthyr
- the Rhondda valley section from Pontypridd to Treherbert
- the Cynon valley section, from Abercynon to Aberdare, plus the freight-only section beyond Aberdare to Hirwaun/Tower Colliery
- the Rhymney valley section from Cardiff to Rhymney, off which a short branch diverges at Heath Junction to Coryton (which is within the Cardiff city area), plus the freight only line from Ystrad Mynach to Cwmbargoed.

Southwards and westwards components comprise:

- the short branch from Cardiff Queen Street to Cardiff Bay
- Cardiff to Cogan, Barry and Bridgend
- Cogan Junction to Penarth
- Barry to Barry Island
- Ninian Park to Radyr via the City Line
- Bridgend to Tondu and Maesteg.

The route comprises Strategic Route Section 15.03, with the exception of the Bridgend to Maesteg branch (15.01) and the freight only lines (15.02).

Route 15 South Wales Valleys



Current passenger and freight demand

Growth in passenger demand has been slightly higher than the PDFH forecasts over the last nine to ten years, comparable with other major urban areas outside London such as Manchester and Leeds.

The two main stations at Cardiff (Central and Queen Street) account for 67 percent of all passenger demand on the route, with significant secondary volumes carried to Pontypridd, Caerphilly, Barry and Bridgend.

There has been significant expansion of passenger services on most sections where demand for travel to Cardiff has grown in line with increased job/leisure opportunities in the capital.

Steadily growing passenger volumes in recent years have led to gradual fleet expansion which has put pressure on the main Cardiff Canton depot both for maintenance and stabling purposes.

The coal-fired power station at Aberthaw continues as a key power generator in Wales, and attracts traffic from a variety of sources which include Tower Colliery, on the freight line north of Aberdare, Cwmbargoed on the freight line north of Ystrad Mynach, Onllwyn on the freight line north of Neath, and off the route from Avonmouth.

Current services

Services are operated by Arriva Trains Wales. The operation is characterised by most services being linked across Cardiff thus catering for demand to both main stations with a simplified range of pairings of north – south origins and destinations. The bulk of services are self-contained to the local network, radiating from Cardiff Queen Street, although Maesteg services run over the GWML from Cardiff Central to Bridgend and are provided in conjunction with other secondary main line services. When major events are staged at the Cardiff Millennium Stadium adjacent to Cardiff Central station, special timetable arrangements are necessary to cater for the substantially increased demand created across the South Wales Valleys network.

The ‘inner’ sections of the route now all enjoy a minimum weekday frequency of four trains per hour, as far out as Pontypridd, Bargoed, Penarth and Barry. Some ‘outer’ sections have two trains per hour, namely Treherbert and Aberdare, as well as the City Line and Coryton branches. The others (Maesteg, Bridgend via the Vale of Glamorgan line, Rhymney and Merthyr) have hourly services.

DB Schenker operates freight services on the route. In addition to the substantial volumes of electricity supply industry (ESI) coal (from west Wales and Bristol Portbury Dock) there is also automotive traffic to and from the Ford factory at Bridgend.

Figure 1 Tonnage

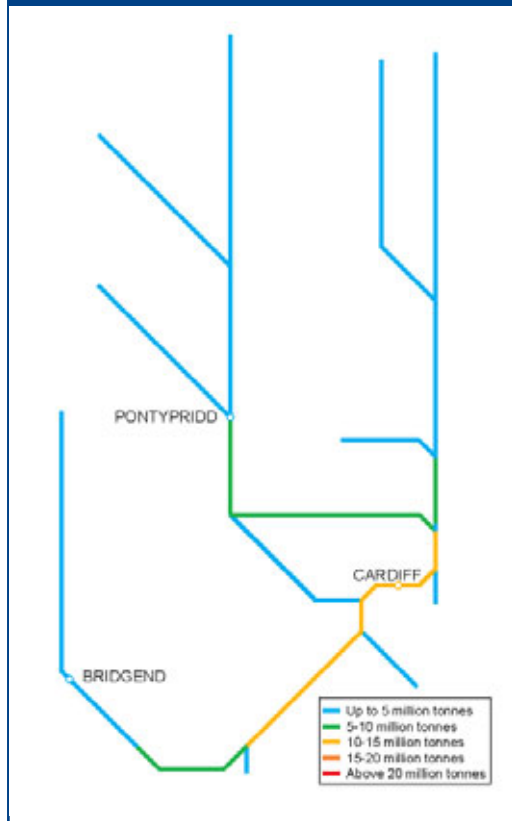


Figure 2 Current train service level (trains per hour)

Valley Lines service	
Treherbert – Cardiff Central	2 peak/2 off peak
Aberdare – Barry	2 peak/2 off peak
Pontypridd – Barry	4 peak/4 off peak
Merthyr Tydfil – Bridgend (via vale of Glamorgan)	1 peak/1 off peak
Coryton – Cardiff Central	2 peak/2 off peak
Rhymney – Penarth	2 peak/1 off peak
Bargoed – Penarth	4 peak/4 off peak
Cardiff Queen St – Cardiff Bay	5 peak/5 off peak

Figure 3 Current train service level (trains per hour)

Regional/Rural Services	Trains per hour each way
Maesteg – Bridgend (to Cheltenham Spa via GWML)	1

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	5	0	5
Train tonne km per year (millions)	446	188	633

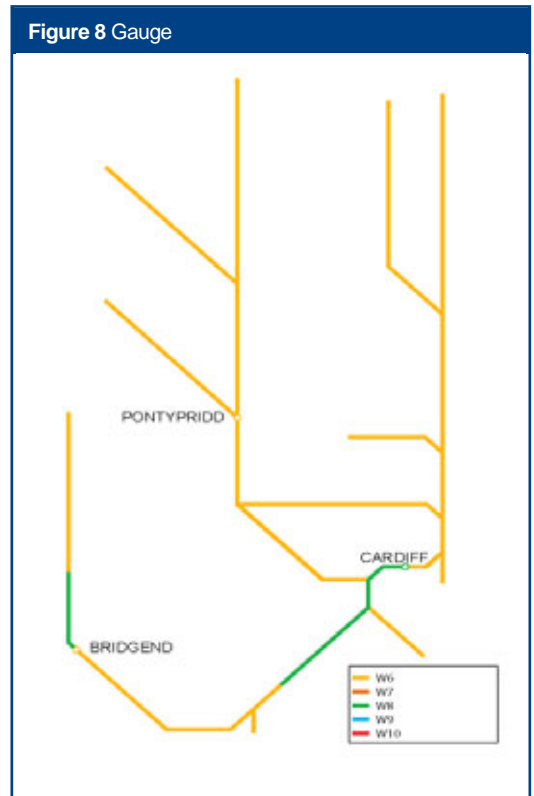
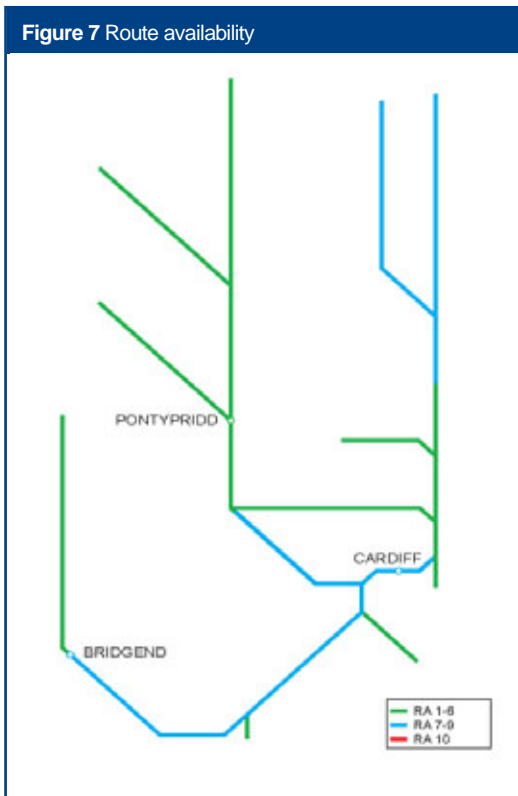
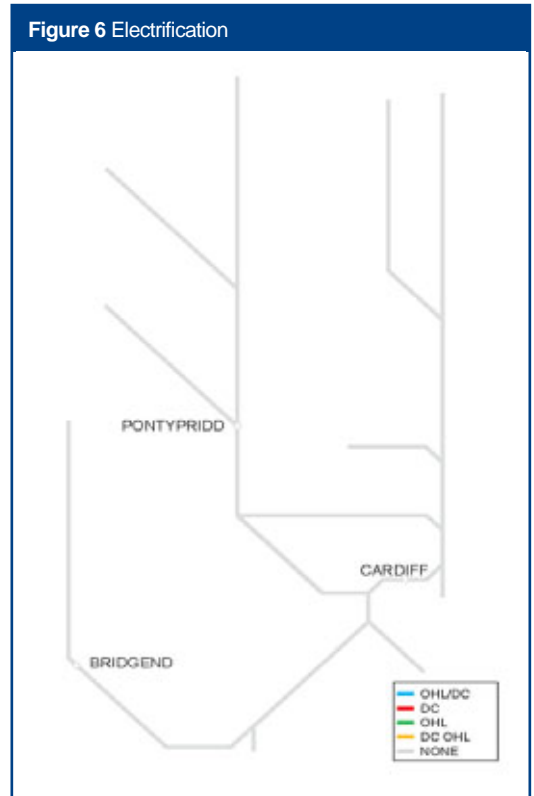
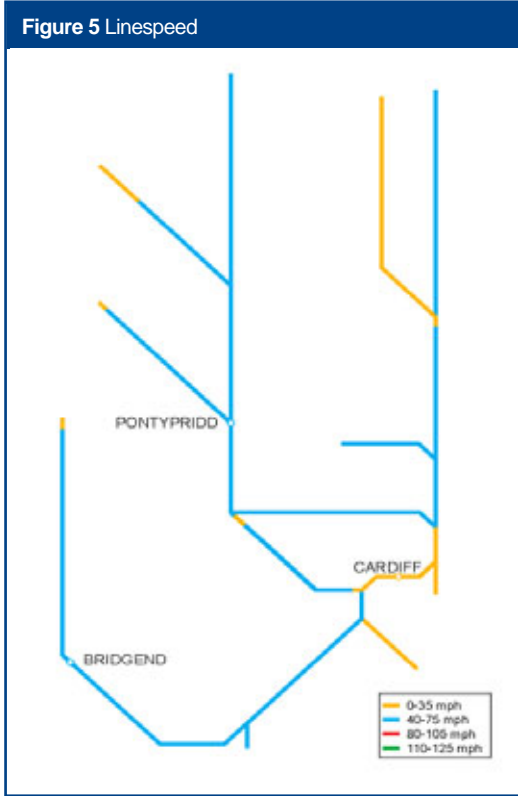
Figure 1 shows the total annual tonnage levels on the route.

Figure 2 and Figure 3 show the current levels of service.

Traffic volumes are summarised in Figure 4.

Current infrastructure capability

The following maps set out the capability of the current network:



Current capacity

The northern extremities of the route are single track, with double track south of Porth, Abercynon and Bargoed. The Cardiff Bay branch, the Coryton branch, Cogan Junction to Penarth, Barry to Barry Island and Bridgend to Maesteg are also single track. Passenger services are provided wholly by Arriva Trains Wales, and in many cases the paths utilised now fully consume available capacity particularly over the single track stretches of most routes at their outer extremities and through the 'bottleneck' at Cardiff Queen Street. Whilst the basic train size is a two-car diesel multiple unit, increasing numbers of trains are scheduled for four-car operation, particularly in the peak hours, although certain route sections (Heath Junction Low Level to Coryton, and the City Line) are limited by two-car length platforms. The expansion of passenger services has been such that at peak hours network capability is practically fully taken up.

Regular coal flows remain in the Cynon Valley and the Rhymney Valley, and the major power station at Aberthaw receives coal from within the route as well as from further afield. Pathing freight trains through Cardiff Queen Street from the Rhymney Valley necessitates minor alterations to the passenger standard pattern timetable.

The increase in patronage at Cardiff Queen Street station has on occasions necessitated restrictions to be imposed on the number of passengers allowed on to the narrow platforms at peak times.

Figure 9 shows the peak trains per hour trains on key sections of the route.

Figure 9 Current train service level (peak trains per hour)

Route Section	Number of trains
'Taff Vale' section, Pontypridd to Radyr	6
Rhymney Valley, Heath Junction to Cardiff Queen Street	6
Cardiff Queen Street to Cardiff Central	12
Grangetown to Cardiff Central	8
Cardiff Queen Street to Cardiff Bay	5
Maesteg to Bridgend	1

Current performance

Following on from the significant performance gains made by Arriva Trains Wales in 2007/08 to surpass their PPM target of 90.1 percent, a higher PPM target of 92.5 percent for April 2009 is being surpassed, with a current forecast PPM MAA of 92.7 percent.

The Temporary Speed Restriction (TSR) reduction strategy aims to reduce the number of TSRs on the route to 19 by 31 March 2009. We continue to increase handback speeds post engineering possessions at locations where there is a performance gain, for example, handback at 80mph delivers 65 percent reduction in delays compared to a 50mph TSR. We are continuing with a sustained High Output Track Renewal programme throughout the route. For 2009/10 it is proposed to report speed restrictions in two methods: planned speeds (those that are applied during the time we are enhancing and renewing the network) and unplanned speeds (condition-driven speeds). We will then be measured on the number of unplanned speeds, and for this the Western route will have a target of ten unplanned speeds by 31 March 2010.

Figure 10 shows the forecast 2008/09 PPM for the main TOC running along the route.

Figure 10 2008/09 PPM

TOC	Forecast MAA	As at period
Arriva Trains Wales	92.7%	10

Section 2: Tomorrow's railway: requirements

HLOS output requirements

Figure 11 Total demand to be accommodated by Strategic Route

Routes	Annual passenger km (millions) forecast in 2008/09	Additional passenger km (millions) to be accommodated by 2013/14
South Wales Valleys	153	13

Figure 12 Peak hour arrivals to be accommodated by Strategic Route

City	Peak three hours			High- peak hours		
	Forecast demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Forecast demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Cardiff	8,500	900	39	4,000	600	43

Future demand in CP4

The Government's White Paper – Delivering a Sustainable Railway, forecasts that the number of journeys into the centre of Cardiff during the three hour morning peak period will increase to 9,400 by the end of the next regulatory control period (CP4) in 2014.

At the rate of growth projected within the Sewta strategy, five percent year on year, the need for more paths is expected to become a critical issue by 2013 – 2014, beyond the committed platform lengthening scheme due for completion in 2008/09 and which will permit widespread six-car operation. The principal options under consideration are for additional platforms at both Cardiff Central and Cardiff Queen Street stations and greater operational flexibility for services between these two key stations. Development of these options within the Cardiff Area Signalling Renewal scheme will enable Sewta objectives to be implemented in conjunction within the planned renewals in 2010 – 2012 in a cost-effective manner, subject to agreement with the Welsh Assembly Government over incremental funding arrangements.

The immediate aspiration for frequency increase north of Cardiff on the Merthyr line has been met by remodelling at Abercynon and the construction of a passing loop between there and Merthyr Tydfil, which was completed in 2008. It is planned that half hourly services to Merthyr will commence in May 2009.

South of Cardiff, Sewta anticipates improved frequencies on the Vale of Glamorgan section in the medium term between Barry and Bridgend. These changes to cater for long-term demand growth are consistent with the basic Standard Pattern Timetable and will build on the recent programme of platform lengthening.

The establishment of a new Defence Training Academy at RAF St Athan with a potential 5,000 new jobs would increase demand on the already successful Vale of Glamorgan line services. The Planning application for this major development is expected to be considered in Summer 2009.

The DfT and Welsh Assembly Government (WAG) jointly commissioned Wales Rail Planning Assessment (WRPA) recognised that growth in traffic levels were mainly in South Wales. A forecast of future passenger demand undertaken for the WRPA indicates an increase of 35 percent by 2016 and to 48 percent by 2026.

The WRPA informed the Wales RUS, led by Network Rail, which was published in November 2008 providing a view of the next ten years.

Future demand beyond CP4

Demand growth is expected to continue well into CP5, for both freight and passenger businesses. Beyond that the Government's July 2007 White Paper challenged the industry to plan for a doubling of demand in the subsequent 30 years.

Section 3: Tomorrow's railway: strategy

Figure 13 summarises the key milestones during CP4 in delivering the proposed strategy for the route. Further explanation of the key service changes and infrastructure enhancements are set out in the following sections.

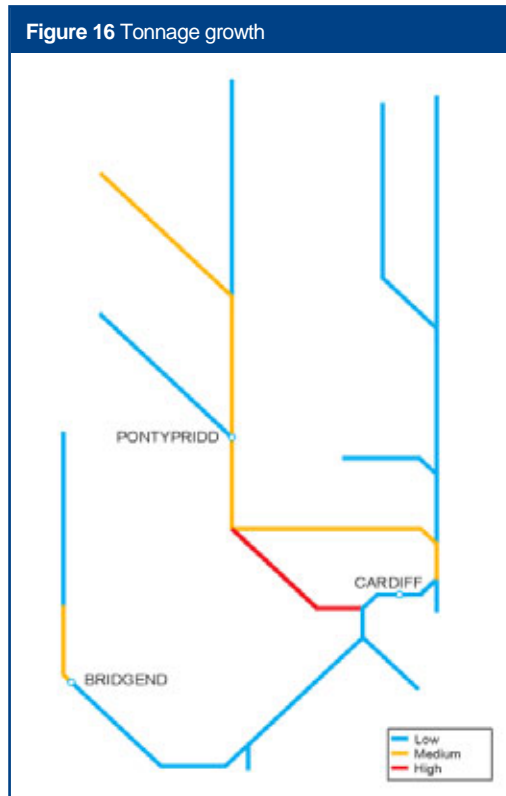
The measures will also allow the total additional passenger KM to be accommodated.

Figure 15 shows how the HLOS load factor targets for locations on the route are met by the proposed strategy.

Figure 13 Summary of proposed strategy milestones			
Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2010/11		Cogan Junction enhancement	Additional capacity – improved reliability
2011 – 13		Cardiff Area Signalling Renewal (CASR)	Improved reliability – facilitates remodelled track layout throughout the Cardiff area and additional platforms at Cardiff Central and Queen Street – signalling controls migrate to new South Wales signalling centre – signal box closures
2010 – 13		Cardiff Queen Street station area – remodelled track layout and additional platforms	Additional capacity – improved reliability
2012/13		Ninian Park – Radyr (City line)	Reduced journey times – improved reliability
2012/13		Trefforest Curve doubling of single line	Additional capacity – improved reliability
2012/13		Additional platform faces at Barry, Caerphilly and at Pontypridd	Additional capacity for extra services

Figure 14 Capacity enhancements to meet HLOS peak capacity in CP4				
Description	Additional vehicles involved	Station served	0700 – 0959 Capacity Impact	0800 – 0859 Capacity Impact
Train lengthening	6	Cardiff	600	200

Figure 15 Impact on HLOS peak capacity metric								
London Terminal s and regional Hubs	Peak three hours				High peak hours			
	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4
Cardiff	9,400	28,400	29,000	32%	4,600	11,500	11,700	39%



Strategic direction

The Department for Transport and Welsh Assembly Government's (WAG) joint Wales Rail Planning Assessment (WRPA), published in July 2007, evaluated rail traffic and infrastructure requirements for the next twenty years. The WRPA recognised the constraints on infrastructure capacity in south east Wales and endorsed the need for development of schemes to address the most heavily utilised section through the centre of Cardiff.

The Wales Rail Planning Assessment was published in July 2007, and was followed by the Wales Route Utilisation Strategy (RUS). The Wales RUS Final version was published in November 2008.

Sewta (South East Wales Transport Alliance) is a consortium of ten unitary authorities and works in partnership with the Welsh Assembly Government and Network Rail and the transport operators towards the development of transportation strategies for the region, and coordinates third party enhancement schemes on the route. There is continuing interest in providing greater capacity and reduced journey times, to offer improved frequencies as an attractive alternative to road, particularly in the congested A470 corridor between Pontypridd and Cardiff and thereby seeking to actively increase rail market share.

Future train service proposals

The current Arriva Trains Wales franchise specification does not provide for additional services within the term of the franchise. However, to meet forecast growth provision the need for longer trains will continue.

Arriva Trains Wales is exploring further opportunities for developing services on the Vale of Glamorgan line, in line with the emerging employment opportunities at locations on the route.

The works to deliver the HLOS objective for Cardiff will enable enhanced service frequencies to be offered through the Cardiff Queen Street bottleneck by means of additional infrastructure capacity so as to move beyond the currently saturated position. In the short to medium term demand is expected to be catered for by adjusting train length within existing frequencies. As well as catering for this passenger growth there is recognition of the need to also accommodate longer-term freight requirements.

Figure 16 indicates the forecast percentage change in tonnage to 2018.

Future capability and capacity

In order to meet any proposal for an increase of train paths, from 12 per hour currently to 16 per hour through the Cardiff Queen Street – Cardiff Central corridor, remodelling of both stations would be necessary. This is likely to involve the reinstatement of the upside disused platform, increased bi-directional signalling through the station area and the reconfiguration of Queen Street North Junction. Separation of Cardiff Bay shuttle services by the provision of an additional bay platform at Cardiff Queen Street may provide further capacity gains through the station by freeing up the existing platform 3 for through services only.

These works will also enable more efficient freight train pathing in the off-peak hours and will overcome the necessity to take out passenger paths to allow freight trains (mainly from the Rhymney valley through to Barry and Aberthaw) to run, by judicious platforming of the four future through platforms.

We believe that the provision of an additional platform and connection to a main line platform at Cardiff Central would act as a pressure release for Queen Street and provide the capacity and operational flexibility required to accommodate the forecast number of trains required.

Remodelling of Cardiff Queen Street station platform buildings will improve passenger comfort during peak hours.

The reinstatement of a west-facing bay platform at Cardiff Central between existing platforms three and four will be required to accommodate additional services from Maesteg.

Provision for these works will be made in the Cardiff Area Signalling Renewal planned for 2012.

Network Rail is developing a national programme for station improvements and car park expansion, which includes a number of stations on the route. Working in conjunction with our customers we have shortlisted a number of stations on the route for modernisation as part of the Government's £150m funding initiative. These are Cardiff Central and Pontypridd.

Additional vehicles will be required to strengthen services to meet future demand. This is likely to further impact on the capability of the restrictive Cardiff Canton depot to maintain a greatly increased fleet.

Future performance

Figure 17 sets out the planned PPM for the train operator. These are lower than planned given the need for flexibility in achieving the HLOS targets and to reflect the greater uncertainty and risk associated with projecting performance at a disaggregated level. Reasonable requirements will finally be established for CP4 in our 2009 Business Plan.

In addition to continued improvement in asset reliability, a major focus of attention will be the work necessary to devise more robust train timetables. Network Rail is working closely with Arriva Trains Wales to gain operational experience of its Standard Pattern Timetable and to support and improve its performance. Resource plans that are robust in terms of recovery from incidents are being developed.

The introduction of a new signalling control centre for South Wales in 2009 is expected to deliver greater operational and performance management benefits for all our customers.

Arriva Trains Wales

The performance of the ATW franchise is currently 92.7 percent PPM MAA. The improved PPM is an outcome of Network Rail and Arriva Trains Wales working together to improve the PPM performance

across the whole franchise, and with the Standard Pattern Timetable benefiting performance. Route Improvement Groups are focused on individual service groups, particularly the Cambrian, to sustain PPM improvements. The 2009/10 Joint Performance Plan targets a PPM of 92.7 percent by April 2010.

The key performance issues and opportunities for this route have been identified as:

- construction works risk due to the resignalling works in South Wales
- reduction in the impact of trespass, vandalism and fatalities
- Autumn management.

The Network Rail route plan is being developed around these key points and currently suggests that performance on ATW by April 2014 will be around 93.5 percent. This includes an allowance for passenger/traffic growth and an increase in engineering work. ATW is willing to work closely with Network Rail to develop detailed year-by-year plans for delivery of a higher level of sustained performance.

The steps we are taking to achieve these performance improvements are detailed in the Performance section of the Strategic Business Plan.

Network availability

For engineering access purposes the Cardiff Valleys route divides broadly into two sections, north and south of the Great Western Main Line at Cardiff Central. On the northern sections, from Cardiff up the Rhymney, Taff, Cynon and Rhondda valleys, midweek night access can generally be granted. The main route from Cardiff Queen Street to Radyr (via Llandaff) is not generally closed at the same time as the City Line (via Fairwater) between Penarth Curve North and Radyr, which offers a diversionary capability. On that part of the South Wales Valleys route between Cardiff, Barry and Bridgend (via the Vale of Glamorgan line) closure is not permitted when diversions from the GWML between Cardiff and Bridgend via Pontyclun are planned, although midweek nights access can also generally be granted on the branches to Cardiff Bay, Penarth and Barry Island, as well as on the detached Bridgend to Maesteg section. In any event access to Aberthaw Power station, on the

Figure 17 Forecast PPM MAA – CP4 plan

	2009/10	2010/11	2011/12	2012/13	2013/14
Arriva Trains Wales	92.7%	92.9%	93.2%	93.4%	93.5%

Vale of Glamorgan line, must be maintained either from the east or the west.

Long term opportunities and challenges

To address future growth beyond 2014 the introduction of replacement rolling stock with high density seating may be considered to provide additional capacity. Selective door operation may also reduce the need for further major infrastructure enhancement.

Towards the end of the current franchise existing rolling stock will be near to life expiry and the opportunity will arise to consider electrification of the network.

Infrastructure investment in CP4

Figure 18 Infrastructure investment in CP4 (formerly Proposed enhancements in CP4)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010 – 13	Ⓐ Cardiff Area Signalling Renewal (CASR)	Signalling renewal of Cardiff PSB area	Improved reliability, additional capacity and capability throughout the Cardiff area – facilitates additional platforms at Cardiff Central and Queen Street – signalling controls migrate to new South Wales signalling centre – signal box closures	Network Rail Renewals	3
2010 – 13	Ⓑ Cardiff Queen Street – Cardiff Central corridor	Additional platforms at Cardiff Queen Street and Cardiff Central and bi-directional signalling	Improved reliability and additional capacity	Periodic Review 2008	3
2010/11	Ⓒ Cogan Junction	Remodelled junction	Improved reliability and additional capacity	Periodic Review 2008	3
2010/11	Ⓓ Pontypridd	Buildings renewals at Pontypridd station	Renewal	Network Rail	3
2011/12	Ⓔ Track renewals	S&C renewals at Cogan loops	Renewal	Network Rail	
2012/13	Ⓕ Ninian Park – Radyr (City line)	Linespeed improvements	Reduced journey times – additional capacity	Periodic Review 2008	3
2012/13	Ⓖ Barry station additional platform	Additional platform	Improved reliability and additional capacity for Vale of Glamorgan line	Welsh Assembly Government (subject to agreement)	3
2012/13	Ⓗ Caerphilly station additional platform	Additional turnback bay platform	Additional capacity for Rhymney Valley line	Welsh Assembly Government (subject to agreement)	3
2012/13	Ⓙ Pontypridd station additional platform	Additional turnback bay platform	Additional capacity for Taff Vale line	Welsh Assembly Government (subject to agreement)	3

Figure 18 Infrastructure investment in CP4 (formerly Proposed enhancements in CP4)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2012/13	Ⓧ Trefforest Curve	Doubling of single line	Improved reliability and additional capacity	Periodic Review 2008	3
2012/13	Ⓚ Maesteg branch capacity	New passing loop at Tondu	Additional capacity for half hourly frequencies	Welsh Assembly Government (subject to agreement)	3
2012/13	Ⓛ Rhymney Valley capacity	New passing loop at Tir-phil	Additional capacity for half hourly frequencies north of Bargoed	Welsh Assembly Government (subject to agreement)	3
2012/13	Ⓜ Rhymney Valley line	New station at Energlyn	Improved access to the railway in the area north of Caerphilly	Welsh Assembly Government (subject to agreement)	3

Renewals activity

Figure 19 shows the estimated renewals costs and activity volumes.

The precise timing and scope of renewals will remain subject to review to enable us to meet our overall obligations as efficiently as possible consistent with the reasonable requirements of operators and other stakeholders.

It should be noted that in order to manage the deliverability of our Civils, Signalling and Electrification plans we have included an element of over planning in our work banks. As a consequence the sum of our route plans exceeds our plan for the network as a whole. It is likely that a proportion of the activities in these areas will slip to subsequent years.

Figure 19 Summary of estimated renewals costs and activity volumes

£m (2009/10 prices)	2009/10	2010/11	2011/12	2012/13	2013/14	CP4 total
Renewals						
Track	9	12	6	8	9	43
Signalling	2	2	2	2	1	8
Civils	0	6	3	3	3	16
Operational property	3	4	4	3	3	17
Electrification	0	0	0	0	0	0
Telecoms	0	1	0	0	0	2
Plant and machinery	0	0	0	0	0	0
Total	15	25	15	16	16	87
Renewals volumes						
Track						
Rail (km)	2					
Sleeper (km)	3					
Ballast (km)	3					
S&C (equivalent units)	4					
Signalling						
SEUs (conventional)	0	0	1	0	0	1
SEUs (ERTMS)	0	0	0	0	0	0
Level crossings (no.)	0	0	0	0	0	1

Appendix

Figure 20 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets) ELR is Engineers Line Reference and RA is Route Availability

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
15.01	Maesteg – Bridgend	BAL	Rural	DfT	No	W6A	6	40	none	TCB/OTW	(AB)	1
15.02	Freight Lines			DfT	No				none			
15.03	South Wales Valleys	(Multiple)	Secondary	DfT	No	W6A		50	none	TCB/mech	3 – 6	1 / 2

Capacity and operational constraints

- A Capacity constraint at Cardiff Queen Street station
- B Capacity constraint at Cogan Junction
- C Single line between Porth and Treherbert
- D Single line between Abercynon and Aberdare
- E Single line between Abercynon and Merthyr Tydfil
- F Single line between Bargoed and Rhymney
- G Single line between Heath Junction and Coryton
- H Single line between Cardiff Queen Street and Cardiff Bay
- I Single line between Cogan Junction and Penarth
- J Single line between Barry and Barry Island
- K Single line between Bridgend, Tondy and Maesteg

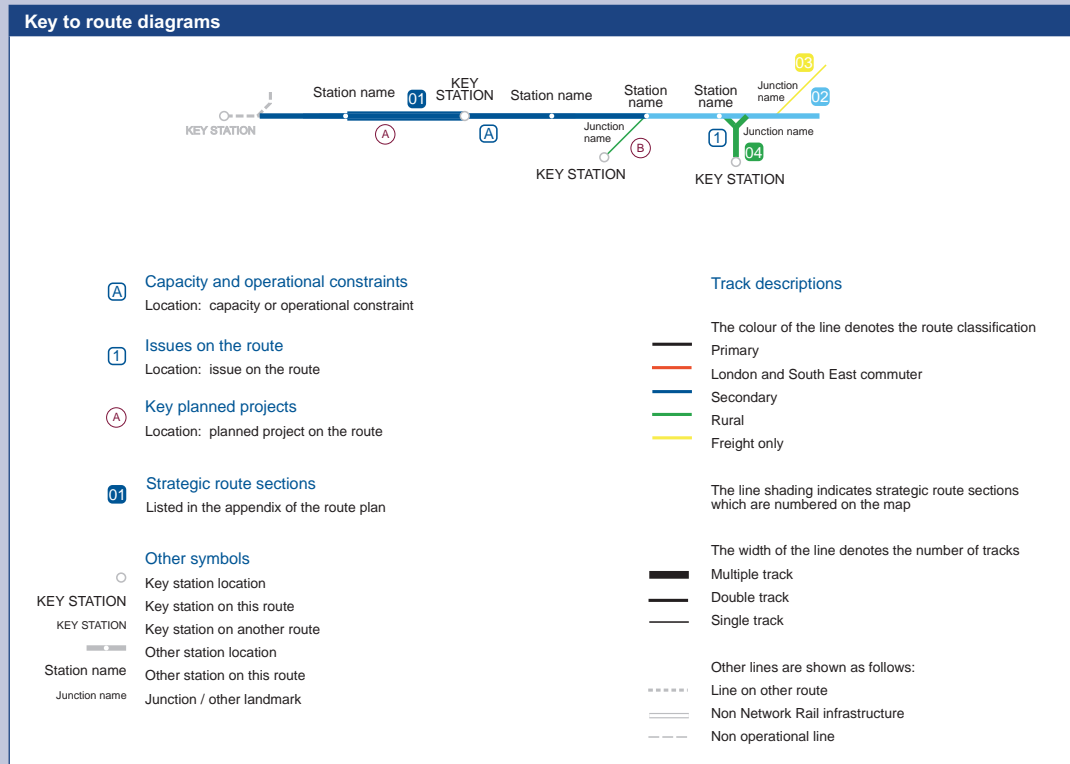
Other issues on the route

- 1 City of Cardiff expansion and road congestion
- 2 Employment profile changes throughout the south Wales valleys
- 3 Expansion of Cardiff Airport

Note

This Route Plan forms part of the Control Period 4 (CP4) Delivery Plan and supersedes the version published in April 2008.

Other documents in the Delivery Plan can be found on the Network Rail website www.networkrail.co.uk



GRIP stages

- 1 Output definition
- 2 Pre-feasibility
- 3 Option selection
- 4 Single option selection
- 5 Detailed design
- 6 Construction, test and commission
- 7 Scheme hand back
- 8 Project close out

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