

Route Plans 2007
Route 13
Great Western Main Line



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Route 13 Great Western Main Line

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Strategy (RUS) for the period 2006-2012. The RUS identified the continued growth throughout the GWML with emphasis on the extended Bristol area and the Thames Valley where predicted growth is well above the national average. The Wales Rail Planning Assessment and Regional Planning Assessments for the South West and Thames Valley areas are due to be published during 2007. These will be followed by a Wales RUS to cover all of Wales.

Today's route

The route comprises five distinct sections, which are described below. The relevant Strategic Route Section is shown in brackets:

- GWML, which includes the route from Paddington to Cardiff via Reading, Swindon, Bristol Parkway and the Severn Tunnel, and on to Swansea, and from Swindon to Bristol Temple Meads via Bath (13.01, 13.02, 13.03, 13.04, 13.05 and part of 13.06);
- cross country routes radiating from Birmingham, which includes Oxford to Basingstoke via Didcot (Parkway station or the avoiding line) and Reading (station or west curve) and from south of Birmingham (Stoke Works Junction) to Taunton (Cogload Junction) via Cheltenham, Gloucester, Bristol Parkway and Bristol Temple Meads. (13.07, 13.08, 13.11 and part of 13.06);
- extensions from Old Oak Common West Junction to Northolt towards the Chiltern Line (part of 13.10), from Oxford along the Cotswold line towards Worcester (13.13) and from Swindon to Severn Tunnel Junction via Gloucester (13.12, 13.14 and 13.16);
- branch lines to Greenford (part of 13.10), Heathrow Airport (13.09), Windsor (13.20), Bourne End and Marlow (13.19), Henley on Thames (13.18), Bicester (13.21) and Severn Beach 13.22); and
- freight only branches to Brentford, Colnbrook, Cowley, Sharpness Docks, Tytherington, Avonmouth terminals complex, Portbury Docks, Ebbw Vale (currently closed for conversion to a passenger branch) and Uskmouth (13.17, 13.23 and 13.24).

Route context

The backbone of the Great Western Main Line (GWML) is the high-speed section from London Paddington through Swindon to Cardiff Central and to Bristol Temple Meads. Designated as being of Trans European Network System (TENS) status this key element of the route provides fast inter city links between the English and Welsh capital cities and the west of England regional capital. Beyond Cardiff towards Swansea the lower-speed South Wales Main Line section acts as an integral extension of GWML. The full extent of this core part of the route is replicated by the M4, M32 and M48 motorways.

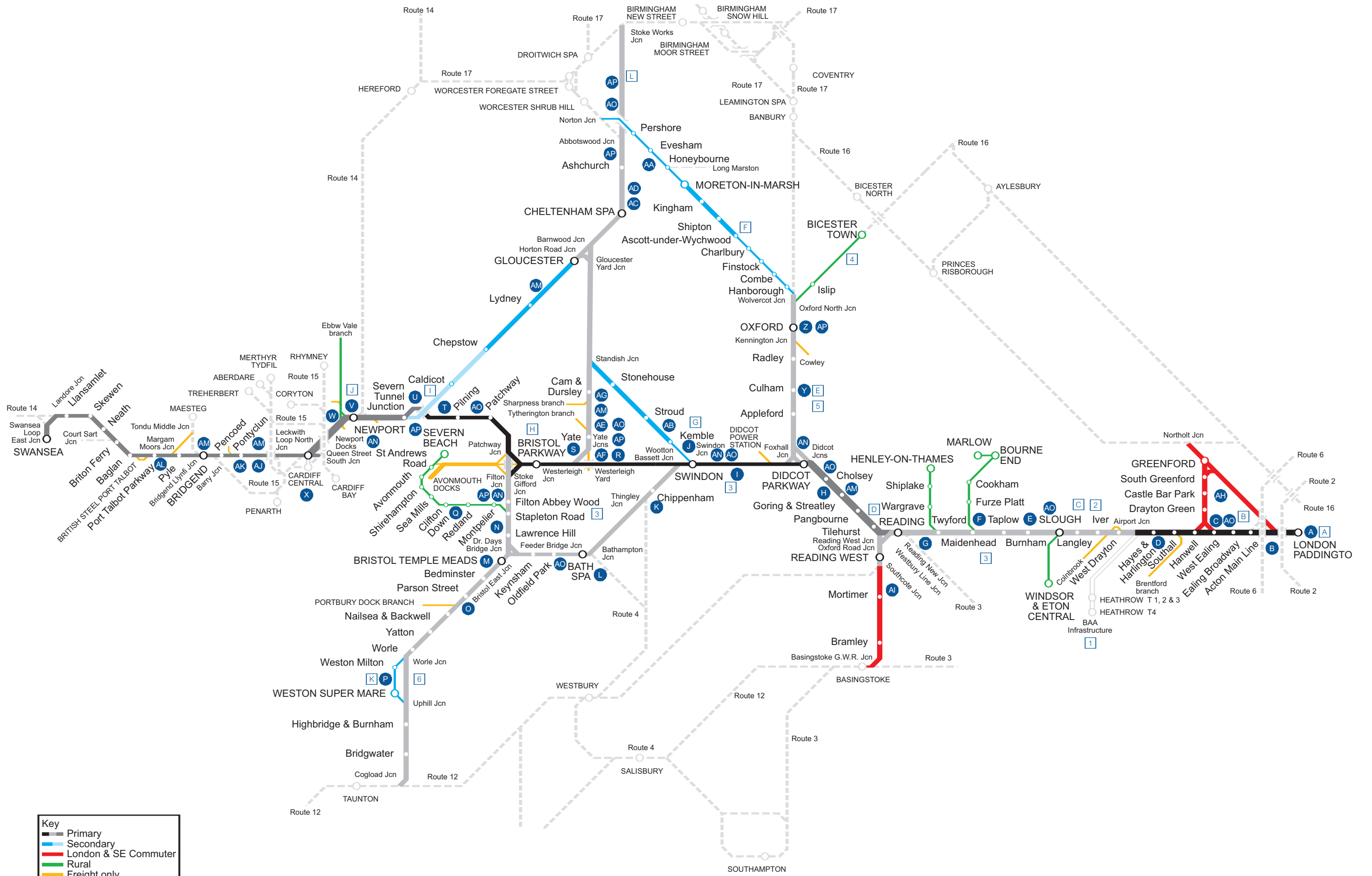
As well as providing the express rail link to Heathrow Airport, the route also links Reading with Basingstoke to the south and extends northwards from Didcot through Oxford taking

in the Cotswold Line towards Worcester and the branch line to Bicester.

From just south of Birmingham the route runs through Gloucestershire towards Bristol and Taunton where it links with Route 12: Reading to Penzance, forming the main artery from the north and Midlands to the far west of England. The route diverges at Gloucester where it skirts the banks of the River Severn towards South Wales and via the Golden Valley towards Swindon for links to London and the South East. These elements of the route are replicated by and compete with the M5 motorway and the A48 and A417/419 trunk roads.

In June 2005 the Strategic Rail Authority published the Great Western Main Line Route Utilisation

Route 13 Great Western Main Line



Key

- Primary
- Secondary
- London & SE Commuter
- Rural
- Freight only

Passenger and freight demand

The GWML Route Utilisation Strategy (RUS) published by the Strategic Rail Authority in 2005 identified that the route serves a wide range of passenger and freight markets with the mix varying on different sections of the route. The key passenger markets include long-distance travel to and from South Wales, Bristol and the South West and the Cotswolds of which half are for leisure, a third for business travel and the remainder for commuting. Shorter and suburban journeys are predominantly into and out of London, with increased commuter journeys into road congested regional centres such as Reading and the cities of Bristol and Cardiff. Heathrow Airport continues to generate significant volumes of passengers.

The Department for Transport's (DfT) emerging Thames Valley and South West Regional Planning Assessments (RPA), identify the role of rail as supporting London's role as a world city and the local economies of other key urban centres by enabling rail commuting linking employers to sources of skilled labour; supporting the growth and integration of the London and South East, and the South West economies through provision of rail services linking London to the key centres, and contributing to the provision of surface access to Heathrow Airport.

The main markets for rail are identified as long and short distance commuting into London and to a lesser extent Reading and Bristol; interurban travel between main centres on the route, such as Bristol towards London and Birmingham, and access to airports.

Between 2000 and 2006 rail passenger demand has grown by 20 percent between the Bristol urban area and London, and by nearly 60 percent between Bristol and Birmingham. Cross Bristol demand has grown by up to 30 percent.

Based on the December 2006 timetable, the RPAs also identify that the demand for seats on main line services to London during the morning peak exceeds provision by as much as 10 percent, from as far west as Swindon and rising to in excess of 45 percent from Reading. However, more than sufficient capacity is available to meet demand on local services between Reading and Paddington.

Significant volumes of freight are carried over the route. Aggregates dominate the route to the east of Reading with flows from the Mendip Hills and the East Midlands to London area terminals at Paddington, Acton, Brentford, Hayes, West Drayton, Thorney Mill, Colnbrook and others to the south and east of London. The south coast port of

Southampton generates significant volumes of container traffic for the West Midlands, the North and Scotland. Avonmouth and Wentloog terminals generate much smaller volumes.

The Port of Bristol's Avonmouth and Portbury terminals handle in the region of 6 million tonnes per year of imported coal destined for power stations at Didcot, Aberthaw and the West Midlands. South Wales, however, remains the focus for metals traffic with major steel production facilities at Llanwern and Port Talbot generating up to 15 trains each way per day, which represents around 40 percent of freight traffic levels in the area. The coal fired Uskmouth power station is mainly supplied locally from Newport docks.

Automotive manufacturing on the route is limited to Swindon (Honda) and Oxford Cowley (BMW) with only the latter currently using rail. However, a new rail terminal has recently come on stream at Swindon Hawksworth to handle imported steel for car manufacture. The import market is mainly based on the Port of Bristol's Portbury and Avonmouth terminals. Daily trains between Dagenham in east London and Bridgend and Swansea cater for Ford traffic. Petroleum traffic is at a minimal level with a daily train from Milford Haven to either Westerleigh or Theale. Daily train loads of containerised waste to landfill sites at Appleford and Calvert originate from Brentford, and Bristol and Bath respectively. Nuclear traffic moves between two locations on the GWML and the North West.

Current services

The passenger service structure can be broken down into distinct groups, which integrate at varying locations throughout the route and reflect the different markets served.

First Great Western operates main line services which are evenly divided between Paddington and South Wales and between Paddington and the greater Bristol area and main line services to Oxford and the Cotswold line, Cheltenham and the far west of England.

First Great Western also operates inner suburban services to the east of Slough, outer suburban services to Oxford and the Cotswold line, Bedwyn and between Reading and Basingstoke, branch line services throughout the Thames Valley; and joint operation with Heathrow Express of Heathrow Connect services to Heathrow Airport.

Further west, First Great Western operates local services between Swindon and Cheltenham, local services between Worcester/Cheltenham and Taunton, which integrate with services to Weston

super Mare to provide an ad hoc cross Bristol service, semi fast services between South Wales and the south coast via Bristol and Bath, and the Severn Beach branch line service.

Heathrow Express operates non-stop express services, and the jointly operated Heathrow Connect stopping services, between Paddington and Heathrow Airport.

Virgin Cross Country operates main line services from the north and midlands to the south coast, which traverse the route via Oxford and Reading, and main line services from the midlands, which run to the south west via Cheltenham and Bristol.

Central Trains operates semi fast services from the midlands to Cardiff via Gloucester.

Direct Rail Services, English, Welsh and Scottish Railway, Freightliner Heavy Haul and Freightliner Intermodal operate freight services throughout the route.

Figure 1 shows the service frequencies between principal stations.

Figure 2 shows the current level of service to London from principal stations.

Figure 1 Current train service level (trains per hour)

Regional/Rural Services	Trains per hour each way
Slough – Windsor	3
Marlow – Bourne End – Maidenhead	2 peak/1 off peak
Henley-on-Thames	2 peak/1 off peak
Basingstoke – Reading	2
Bicester – Oxford	7 trains per day
Cheltenham Spa – Swindon	1
Gloucester – Taunton	1
Bristol – Weston super Mare	1 includes some through Paddington services
Bristol – Avonmouth	1
Cardiff – Swansea	1
Cardiff – Birmingham	1
Cardiff – Portsmouth	1
Bristol – Southampton/Weymouth	1

Figure 2 Current train service level (trains per hour)

Originating traffic	Trains per hour to Paddington
Greenford	2 peak/2 off peak
Heathrow Airport	6 peak/6 off peak
Bourne End	1 peak/0 off peak
Henley-on-Thames	1 peak/0 off peak
Reading	2 peak/2 off peak
Newbury	1 peak/1 off peak
Bedwyn	2 peak/1 off peak
Exeter St Davids	1 peak/0 off peak
Plymouth	1 peak/1 off peak (9 trains per day from Penzance)
Oxford	4 peak (1 Banbury)/2 off peak
Cotswold line	2 peak/1 off peak
Cheltenham Spa	1 peak/1 every 2 hours off peak
Bristol Temple Meads	2 peak/2 off peak
Cardiff Central	0 peak/1 off peak
Swansea	2 peak/1 off peak

Figure 3 Tonnage

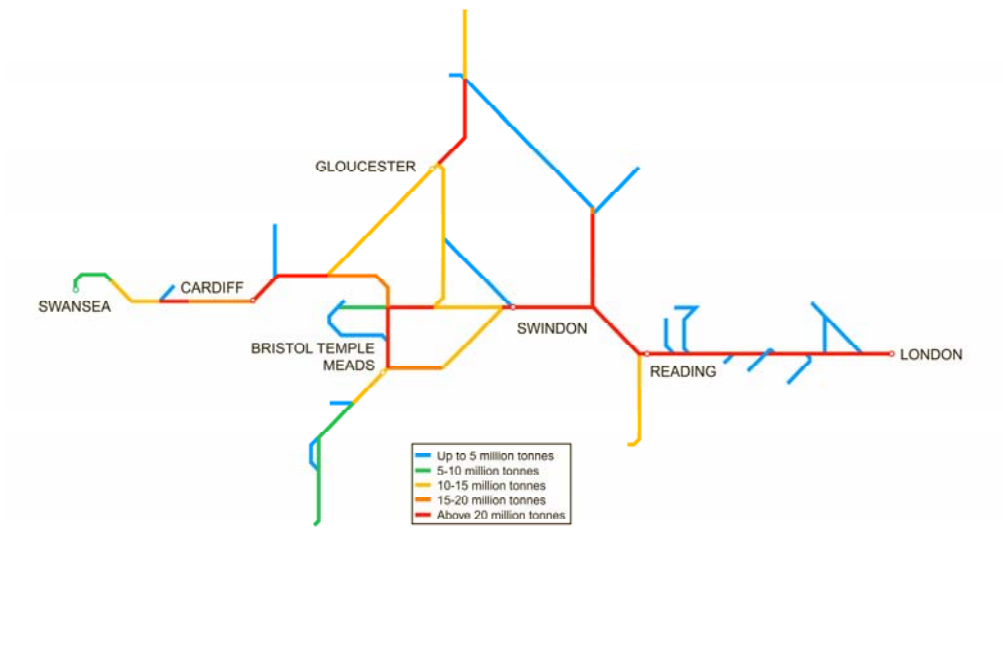


Figure 3 shows the tonnage levels on the route.

Figure 4 summarises traffic volumes on the route

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	36	6	42
Train tonne km per year (millions)	9,357	5,582	14,939

Current infrastructure capability

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

Figure 5 Linespeed

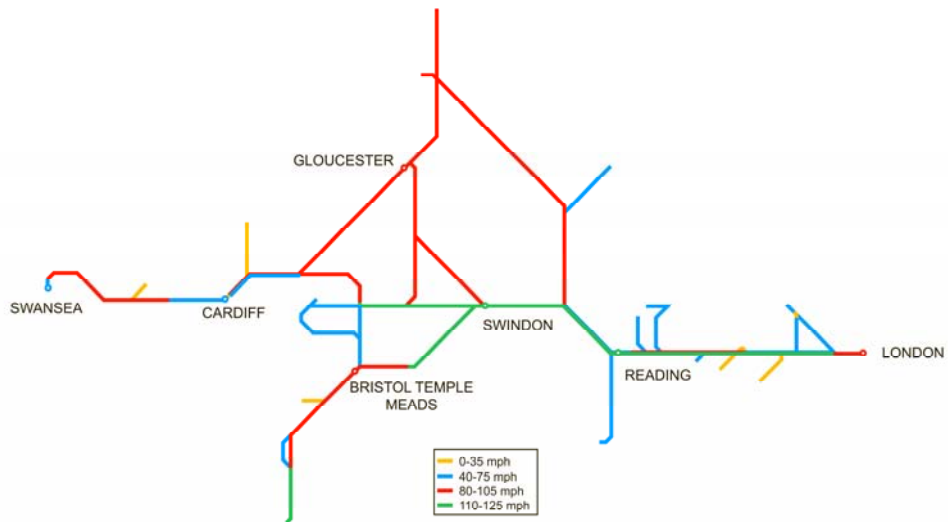


Figure 6 Electrification

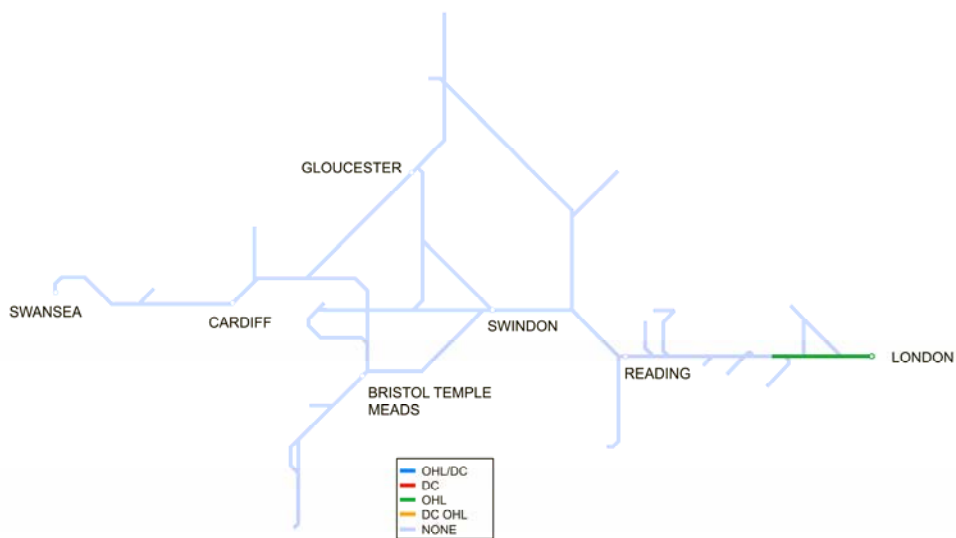


Figure 7 Route availability

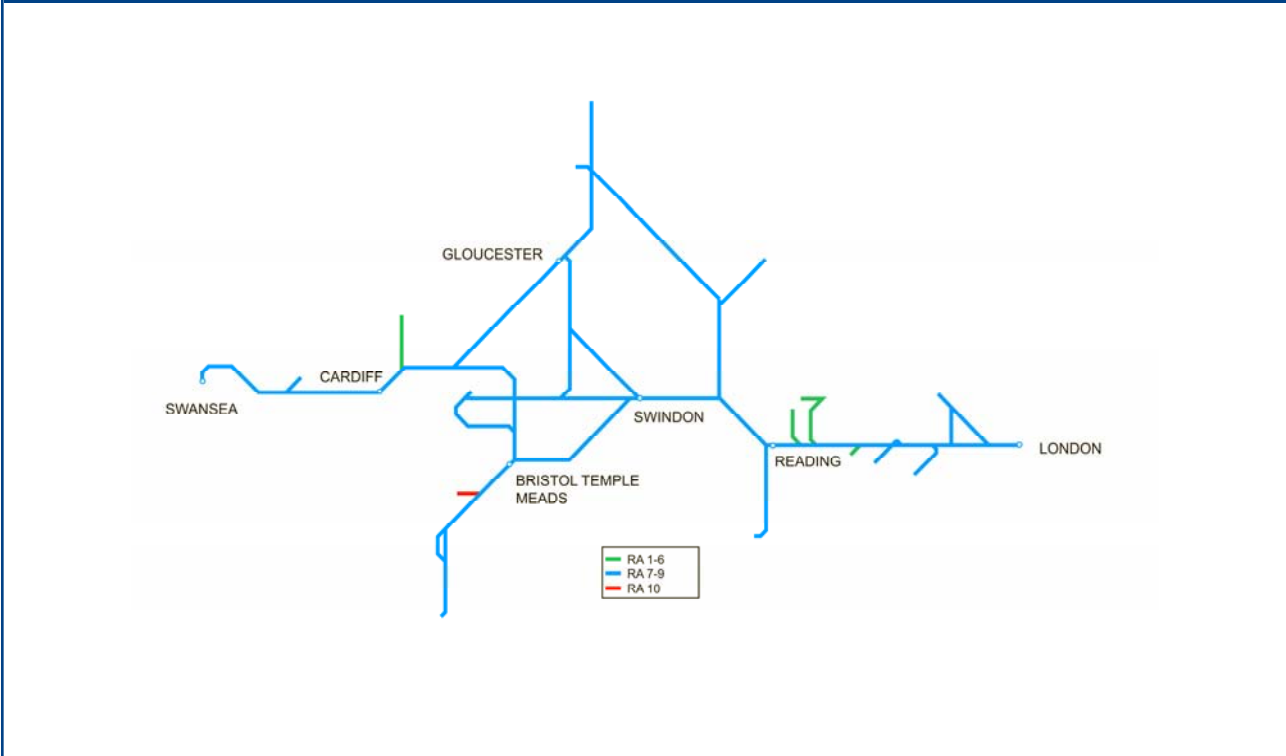
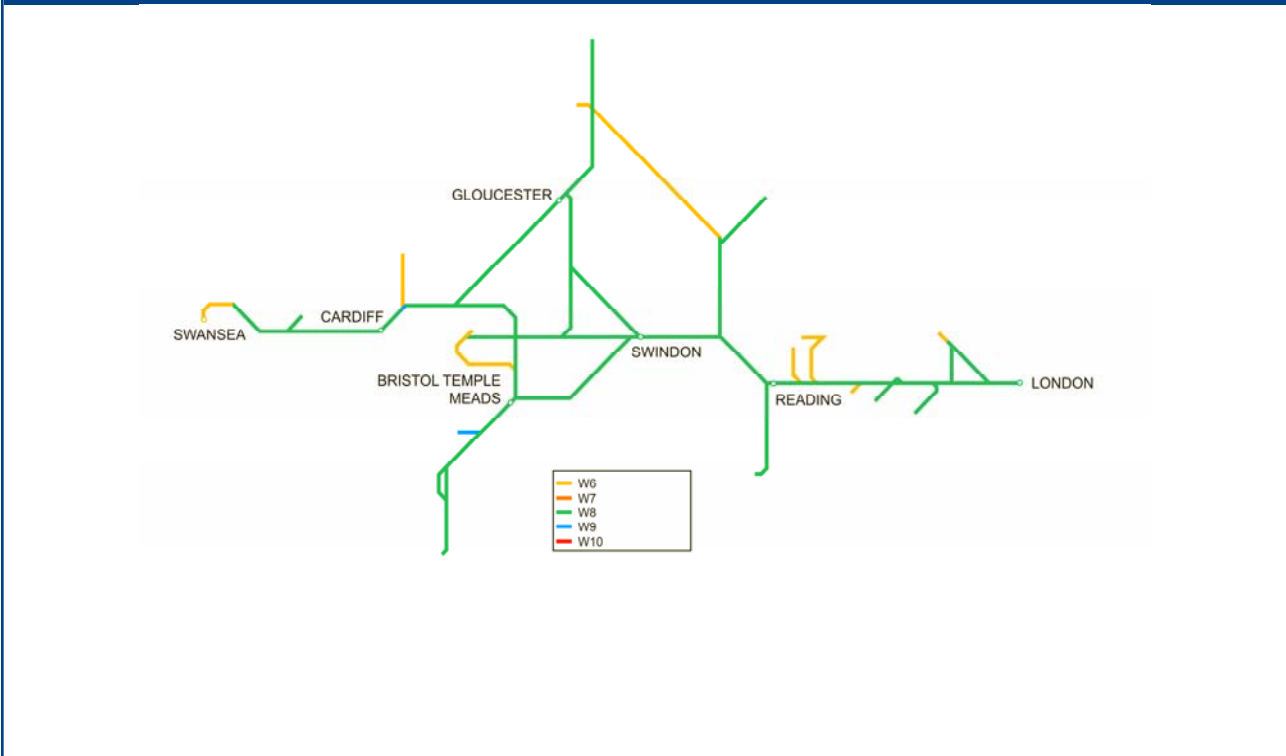


Figure 8 Gauge



Current capacity

Paddington station operates to near capacity throughout the day and to full capacity at peak times with accessibility for long inter city style trains restricted by a number of shorter platforms on the north side of the station and the dedication of two platforms for the electric Heathrow Express service. The introduction of the electric Heathrow Connect service in June 2005, whilst replacing a diesel service, further reduced available capacity due to the limited number of electrified platforms.

Between Paddington and Reading the route is operating at near capacity for large parts of the day with a Capacity Utilisation Index (CUI) of about 80 percent. Whilst the GWML RUS confirms that the number of train services that weave between the main and relief lines has significantly reduced in recent years, further segregation of the main and relief lines will be needed to deliver main line capacity improvements. The GWML RUS also reaffirms that operation of rolling stock of varying speed capabilities, and station calls on the main lines, inhibit the provision of additional train paths to meet current and future demand. Relief Line capacity is constrained by a number of factors including the close proximity of some stations, the variable stopping patterns of local passenger trains and the mix with freight trains. Nearly all freight through the inner London area of the route requires access to and from the Acton Yard complex via a single lead connection crossing the Relief Lines. This severely restricts the ability to provide additional paths to meet forecast growth.

The Reading station area is a critical 'crossroads' on the east-west and north-south axes for both passenger and freight flows and the lack of available platforms and through-capacity, allied with the aforementioned Paddington constraints, prevent train service growth to meet current and future passenger demand. The area is further restricted at Reading West Junction where long north-south axis freight services have to cross the GWML at grade.

Between Didcot and Oxford the mix of non stop passenger and freight services with local services calling at lightly used stations reduces the ability to maximise capacity (CUI about 87 percent). The current layout at Oxford station necessitates empty stock movements to cross at the north end of the station between arrival and departure, which restricts flexibility of operation.

The intermittent four tracking between Didcot and Swindon is insufficient to meet the forecast mix and volume of passenger and freight traffic over the route.

Inadequate signal spacing in the Bath to Bristol corridor impacts on the ability to improve the operation of the approaches to both Bristol Temple Meads and Bath Spa stations. Capacity in the cross Bristol area can not be maximised due to the mix of non stop passenger and freight services with local services that call at lightly used stations.

A number of lengthy single line sections, notably, on the Cotswold Line and between Swindon and Kemble and the Weston super Mare loop constrain the ability to improve service provision. The Swindon to Gloucester line is also the main diversionary route to and from South Wales when the Severn Tunnel is closed.

With the increasing number of freight services emanating from the Avonmouth terminal complex the GWML's other 'crossroads', Bristol Parkway station to Westerleigh Junction, can become severely congested due to the limited number of platforms and track sharing with two distinct main line passenger flows. This also impacts on the route further east towards Didcot.

The 7 minute headway through the 4 mile 628 yards long Severn Tunnel severely reduces the ability to enhance services to and from South Wales and in particular the growth in imported coal traffic from the Avonmouth port complex.

Variable main line and relief line speeds between the Severn Tunnel and Cardiff restrict capacity and the ability to reduce journey times

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

Route Section	Main Lines	Relief Lines
Paddington – Heathrow Airport Junction	17	13
Heathrow Airport Junction – Reading	12	9
Reading – Didcot	10	4
Didcot – Oxford	9	–
Didcot – Swindon	6	–
Swindon – Gloucester	3	–
Gloucester – Severn Tunnel Junction	2	–
Swindon – Bristol Parkway	4	–
Bristol Parkway – Cardiff	8	5
Cardiff – Swansea	6	–
Swindon – Bristol Temple Meads	4	–
Stoke Works Junction – Bristol Temple Meads	10	–
Bristol Temple Meads – Taunton	7	–

Figure 9 shows the current peak hour train service levels on the route.

Current performance

The GWML continues to suffer from a number of performance issues. A prime cause of delay is the increasing number of temporary speed restrictions imposed throughout the route due to the poor condition of track, which is age related.

The lack of spare capacity on the route, particularly in the Severn Tunnel/Bristol Parkway and Thames Valley areas, is evident at times of perturbation making service recovery difficult and resulting in greatly extended journey times over restrictive diversionary routes.

In 2005 the Network Rail Route Director, in conjunction with the Territory Maintenance Director, set up the Performance Improvement Programme (PIP) to target poor performing assets and implement 'quick win' remedial action.

The Great Western Joint Board generally meets at three-monthly intervals and comprises representatives of Network Rail, all TOCs and FOCs using Western route infrastructure, Department for Transport and Office of Rail Regulation, and focuses particularly on performance issues at a strategic level.

Network Rail has developed a major three-phase investment programme to improve performance on the Western route.

Phase One includes the continuation of the Performance Improvement Programme, which targets poor-performing assets and implements 'quick win' remedial action, with over £29 million being spent on 126 selected schemes, of which 56 have been delivered to date. Also, to improve

operational management Integrated Control Centres at Swindon and Cardiff have been introduced.

Phase Two includes the Temporary Speed Restriction (TSR) reduction strategy, which aims to reduce the number of TSRs on the route by 50 percent to 36 TSRs by 31 March 2007, with a further reduction to 10 TSRs by 31 March 2009. We intend to increase handback speeds post engineering possessions, for example, handback at 80 mph delivers 65 percent reduction in delays compared to a 50 mph TSR. We are also embarking on a sustained High Output track renewal programme throughout the route.

Phase Three includes the Port Talbot Area Signalling Renewal, additional platforms at Bristol Parkway and Newport, and linespeed enhancements between Reading and Paddington, to be delivered in 2007. From 2008, further enhancements throughout the Thames Valley, Worle Junction and between Severn Tunnel Junction and Cardiff are planned.

The challenge for 2007/08 will be focused on First Great Western and Arriva Trains Wales PPM delivery targets, and will require improvements such as a 58 percent reduction in TSR minutes, 32 percent reduction in signalling failure minutes, 20 percent reduction in track defect minutes, and 19 percent reduction in track circuit failure minutes.

Figure 10 shows the current PPM for the main TOCs running along the route.

Figure 10 Current PPM MAA (2006/07)

TOC	MAA	As at period
Arriva Trains Wales	87.2%	11
Central Trains	84.2%	11
First Great Western	83.4%	11
South West Trains	89.7%	11
Virgin Cross Country	83.7%	11

Future requirements Strategic direction

The GWML RUS demonstrates that the Thames Valley and the greater Bristol areas are the key growth areas on the route and that demand on the routes to and from London are expected to grow between 2.6 percent and 3.3 percent year on year over until 2012. Although the RUS was developed without any infrastructure enhancement, it is our judgement that capacity enhancement will be required to meet the DfT's more recent forecast of 103% unconstrained growth over the next 20 years. This includes the enhancement of Paddington station, additional track capacity between Paddington and Reading, the development of the Reading and Oxford station areas, additional track capacity between Didcot and Swindon and additional capacity across the wider Bristol area.

The South West Regional Assembly's (SWRA) emerging Regional Spatial Strategy (RSS) covering the period until 2026, focuses on the implementation of an integrated Transport Corridor approach where local authorities will work with the rail industry to develop opportunities to facilitate modal shift, address overcrowding, improve strategic interchanges and improve use of the network to deliver spatial growth and congestion targets. The RSS also recommends that commercial developments which generate high volumes of freight movements should be located close to appropriate rail freight facilities to support more sustainable distribution.

The Greater Bristol Strategic Transport Study, published in 2005 by a partnership of the Department for Transport, Government Office for the South West, South West of England Regional Development Agency and South Gloucestershire, Bath & North East Somerset, Bristol City and North Somerset Councils, reviewed the area's long term transport needs as far ahead as 2031, and recommends that the heavy rail network should be developed as part of the solution for reducing car usage across the heavily congested greater Bristol area road network and to meet the forecast commuter growth for areas to the north and south of the city.

The DfT's emerging Thames Valley and South West RPAs assess rail traffic and infrastructure needs for the next twenty years. They identify that there will be significant crowding problems on inter city services between both Bristol and Cardiff and London; Crossrail (which has not yet received a funding commitment) would alleviate but not eliminate crowding on suburban services; demand will increase significantly into Reading by 2026 with load factors well above 100 percent on inter city and Oxford services; and that car parks throughout the route will be unable to accommodate growth.

The RPAs will inform the Network Rail GWML RUS for which work will commence in early 2008.

The DfT and Welsh Assembly Government (WAG) jointly commissioned Wales Rail Planning Assessment (WRPA) recognised growth in traffic levels in South Wales and endorsed the need for development of schemes to enhance capacity in Cardiff Central station to cater for longer term projected growth. The WRPA will inform Network Rail's Wales RUS for which baseline work began in January 2007. The Wales RUS will be published in May 2008.

Sewta (the South East Wales Transport Alliance) is a consortium of ten unitary authorities, which works in partnership with the Welsh Assembly Government, Network Rail and transport operators towards the development of transportation strategies for the region. During 2005 a strategic review of Sewta rail policy commenced in order to create a framework for future investment over the period 2009-2018. New stations at Magor with Undy, Llanwern, Coedkernew and St Mellons are proposed. A new station at Llanharan is under construction, and is due for completion in time for the start of the December 2007 timetable.

The construction and implementation of Crossrail will have a dramatic effect on the GWML and all other routes that are linked to it. Similarly, Airtrack will impact on the GWML, but only in the Reading station area.

Future demand

We previously anticipated that demand for rail travel throughout the Thames Valley area would exceed that forecast in the GWML RUS. Traffic levels on the GWML have grown faster than the national average and early indications from the Department for Transport Regional Planning Assessments show forecast growth of 85 percent (from 17,500 to 32,500) on weekday morning peak arrivals at Paddington by 2016 with a further increase to 36,000 by 2026. For example inter city growth on the Bristol to Paddington route is forecast to be in excess of seating capacity by as much as 18 percent, from as far west as Chippenham by 2026.

Access to London within a two hour journey time is seen as extremely important within the business community and this is achievable from most stations on the route. Demand for cross country travel is also on the increase and the re mapping of the Central Trains and Virgin Cross Country franchises will influence those passenger markets. Between Bristol and Birmingham 40 percent growth in unconstrained demand is forecast by 2026.

Other key drivers for growth include the Office of the Deputy Prime Minister's South East Plan housing allocation of about 100,000 houses for the Basingstoke – Reading – Oxford corridor over the next twenty years and planned regeneration of commercial and residential property around the Paddington, Reading, Didcot, Oxford, Bicester, Bristol and Cardiff station areas are forecast to increase demand for commuting into these centres.

Road congestion in the major towns and cities on the route is forcing local authorities to seek alternative modes of transport to provide a solution, of which rail service enhancement is considered a key option.

With the Olympics being held in London in 2012 demand will manifest itself on two fronts. Firstly the demand for construction materials from the Mendips will see an increase in freight tonnage during the construction phase and secondly, passenger demand is likely to increase during and after the events.

The introduction of Crossrail, as far as Maidenhead, will provide through services to and from the City of London and will impact on travelling patterns along the route and at the Ealing Broadway and Paddington interchanges.

Growth in freight services between the Southampton ports, across the route, to the Midlands, the north of England and Scotland is expected to continue with a predicted 74 percent increase in volume from the Port of Southampton, equating to an additional 6 trains per day in each direction.

Future services

Heathrow Express aspires to operate additional services between Heathrow Airport and Paddington to meet the forecast demand resulting from the increased capacity provided by the opening of Terminal 5 at Heathrow, as well as the upgrading of other terminals at the airport. Airline passenger numbers are forecast to grow from 67 million per annum today to 87 million by 2016. An additional 11,000 new jobs will also be created of which a large percentage will commute by public transport.

The Greater Western franchise runs until 2016 and during its lifetime additional services will be required to meet forecast growth.

It is anticipated that the minimum service requirement for the route by 2016 will be: five trains per hour (tph) between London and Bristol/South Wales/ Cheltenham; two tph on the Oxford/Cotswolds route; three tph to the West of England and a half-hourly Paddington to Reading shuttle. By 2026 a further two trains per hour will be required between London and Bristol/South Wales.

Network Rail's Freight RUS, published in March 2007, indicates that by 2014/15 there will be up to three additional trains per day on the route required for construction traffic. It also estimates that for metals traffic an additional two trains per day will be required, and one additional train per day will be needed for petroleum traffic.

The Freight RUS also highlights the potential development at the Port of Bristol allied to a predicted 62 percent increase in import coal trains from the port for the electricity supply industry. Other potential freight developments listed include Bristol Cabot Park, Swindon Keypoint and Steventon.

Figure 11 Tonnage growth

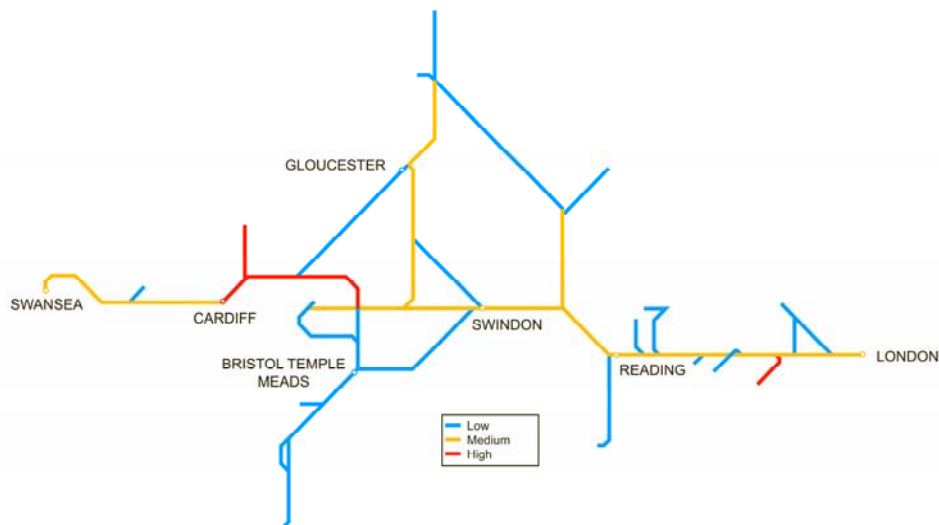


Figure 11 indicates the forecast percentage change in tonnage to 2016

Future capability

Our strategy to improve the capability and performance of the route is to develop core high speed routes between London and Cardiff and Bristol, which will also facilitate the introduction of the High Speed Train replacement around 2015. This will be achieved by implementing a number of smaller enhancements to complement the major enhancement of the Reading and Paddington station areas.

A similar strategy is proposed for the route between Taunton and Birmingham to reduce journey times by raising the target line speed to 125mph.

Network Rail is developing a national programme for station improvements and car park expansion, which includes a number of stations on the route.

Network Rail's Freight RUS sets out a proposed intermodal freight network cleared for the transportation of 9' 6" high ISO containers. The route between Basingstoke and Oxford and beyond is identified as the highest priority core W10 route and major infrastructure investment will be necessary to accommodate both the increased gauge and longer trains.

Fragile routes

Network Rail engineers have identified a set of 'Fragile routes' across the country where the addition of any further loco hauled traffic would have a significant impact on the residual life of track and/or structures.

10 year traffic forecasts have been provided to Network Rail by the freight industry. The key route section that has been identified as a fragile route and has clearly defined additional tonnage/train numbers projected by the industry is the Clifton Extension Line (Narrowways Hill Junction – Filton West Junction via Avonmouth).

Future capacity

The GWML, particularly through the Thames Valley operates at capacity at peak times and to near capacity off peak.

In line with the GWML RUS, the Greater Western franchise introduces revised train formations on key sections of the route, such as the relief line services to relieve overcrowding and accommodate growth in the inner suburban areas. However, passenger overcrowding on peak time main line services, particularly from Reading with its short journey time to London Paddington will remain unless additional capacity is provided.

As a first step First Great Western has started a programme of modernising its High Speed Train carriages to provide additional seating capacity, an

example of which will be an increase of 22 percent seating capacity on services between Oxford and Paddington where the existing allocation of Adelante trains will be replaced. The first set of carriages entered service in January 2007 and the remainder of the fleet will follow over the next year.

In order to deliver our strategy of developing the capability of the GWML core high speed routes it will be necessary to provide additional capacity for slower moving traffic. This would be achieved by expanding the relief line network by linking existing goods and relief lines and upgrading them to passenger status, freeing up the main lines for uninterrupted high speed service provision.

At Paddington station the upgrade of Span 4 in 2009, will facilitate platform realignment with fourteen long electrified platforms of which twelve would be capable of accommodating the future replacement High Speed Train, as well as longer suburban trains. Heathrow Express is agreeable in principle to a transfer to platforms 2 and 3 to free up the central core of the station for long distance high speed service operation, provided accessibility and ticketing facilities are adequately provided. Platform 1 would also be available for a potential fast Paddington – Reading shuttle service.

We plan to increase relief line speeds between Paddington and Reading to 90 mph on 86% of the route.

In addition to the north-side third platform at Bristol Parkway due to open in early 2007, we propose an additional south-side platform and loop to facilitate parallel running towards Bristol Temple Meads and South Wales to be delivered in 2009. This, with the doubling of Worle Junction and the single line towards Weston Milton in 2009 (funded by Network Rail), and provision for a turnback facility at Yate (unfunded) will facilitate a standard pattern cross Bristol shuttle service to encourage modal shift to alleviate chronic road congestion across the city of Bristol.

The area signalling renewal programme in South Wales provides for track layout improvements and strategic enhancements for the route with capacity and performance benefits.

As well as upgrading Piling goods loops to passenger status with increased linespeeds and greater operational flexibility for routes through the Severn Tunnel, we plan to raise line speeds between the Severn Tunnel and Cardiff. This will create additional capacity on the relief lines for both freight and local passenger service use, freeing up capacity and improving performance on the main lines for higher speed services. This also facilitates the development of new stations on the relief lines proposed by the Sewta rail strategy.

We are extending the very short and rarely used platform 4 at Newport station to accommodate existing or future 10 car train sets. This will also provide extra capacity and operational flexibility through the station area and reduce the number of conflicting movements that are currently necessary to a minimum. The station will be further developed to a high modern standard in time for the 2010 Ryder Cup to be hosted at the Celtic Manor resort.

Cardiff Central station will be upgraded with additional platform capacity and capability improvements to benefit east-west flows. This is also linked to the Welsh Assembly Government funded Cardiff Queen St – Barry corridor upgrade (Route 15).

Also funded by Welsh Assembly Government, the former Ebbw Vale freight only line is being converted to passenger use with six new stations to facilitate a new train service between Cardiff and Ebbw Vale.

Future performance

In addition to continued improvement in asset reliability, a major focus of attention going forward is the work necessary to devise more robust train timetables. The creation of the new Greater Western franchise, from three separate TOCs, provided the opportunity for Network Rail to work more closely with one train operator to encourage the development of timetables and resource plans that are more robust in terms of recovery from incidents.

First Great Western has started a programme of overhauling its High Speed Train power car fleet with new quieter and more environmentally friendly engines which will provide greater efficiency and reliability. To date approximately 20 percent of the fleet has been overhauled with a target for completion by the end of 2007. On the Paddington to Bristol and Paddington to Oxford routes High Speed Train sets will be reduced in formation by the removal of the buffet coach. This reduction in train weight will improve performance. However, seating reconfiguration will provide additional seating capacity.

The introduction of two new signalling control centres for the Thames Valley (mid-2009) and South Wales (mid-2008) will deliver greater operational and performance management benefits for all our customers.

Our strategy of developing core high speed routes will deliver improved performance for both passenger and freight customers.

Figure 12 shows the forecast reduction in delay minutes compared with 2006/07.

Figure 13 shows the forecast PPM for the main TOCs running along the route.

Engineering access

Engineering access on this route varies from heavily restricted by franchise commitments and Heathrow Express contract requirements on the mainline, to a reasonable match to requirements on the branches. In the four track section between Didcot and London a permanent timetable solution has been agreed whereby access to two track sections is provided overnight for up to eight hours with standardised weave patterns between main and relief lines. Access at Airport Junction is reduced to five hours only and weekend access is essential for the maintenance of this heavily used junction. The remainder of the route relies upon a cyclical maintenance strategy, which involves weeknight diversions on some of the key sections.

The vast majority of renewals and enhancement work is undertaken at weekends and the track possession plan is constructed on a territory wide basis to ensure that on most weekends at least one route is available from London to Bristol and South Wales, and North – South coast Virgin Cross Country and freight services can continue to operate. This possession strategy also needs to intertwine with other key routes throughout the rest of the country, particularly Didcot North and Reading to Basingstoke.

The section from Didcot to Swindon requires extended journey times (predominantly through rail replacement bus services). For this reason, work is concentrated into non-summer periods when critical maintenance and renewals work takes place.

A key asset on the route is the Severn Tunnel in which the extreme and aggressive environment necessitates a specific cyclical renewal programme to maintain performance and safety. A six-year cycle requires that a full renewal of the track and a detailed civils inspection takes place. In any one year a quarter of the track in the tunnel is renewed using weekend access.

Figure 12 Forecast reduction in delay minutes

	2007/08	2008/09
% reduction in delay minutes	20%	28%

Figure 13 Forecast PPM MAA

TOC	2007/08	2008/09
Arriva Trains Wales	87.9%	88.5%
Central Trains	85.7%	
First Great Western	86.2%	86.7%
South West Trains	91.2%	91.8%
Virgin Cross Country	85.1%	

This puts additional strain on the diversionary routes via Gloucester – these add at least one hour to the journey time. The Severn Tunnel is maintained on a cyclical midweek night frequency.

In 2008/09, there will be additional and continuous engineering work taking place in the Severn Tunnel area as part of the Newport Area Signalling Renewal (NASR). This will require diversions of freight and passenger services on either side of the tunnel as a feature of the timetable.

Works will commence in 2009 for the remodelling and rebuilding of Reading station area. This is likely to involve weekend journey disruption and diversions continuing over two to three years.

Opportunities and challenges

We have developed a strategy for the route to become a World Class railway for the 21st century, performing to the highest standards demanded by our customers.

The strategy is to develop existing main lines as core high speed routes for uninterrupted high speed service provision. For slower moving traffic additional capacity will be provided by expanding and increasing the relief line network. This will be achieved by linking and upgrading existing relief and goods lines to passenger status with higher speeds.

We shall continue to maximise the opportunities presented by area signalling renewal schemes, either conventional or in-cab, to reduce areas of conflict and signalling headways to improve capacity and performance.

In addition to the planned linespeed increase between Paddington and Reading we are evaluating options for the provision of a fifth track between Paddington and Slough at least. It is envisaged that this would be bi-directional to provide additional capacity for both through freight movements and maintaining access to freight terminals, as well as local and semi fast passenger services freeing up the main lines for sole use by high speed non-stop services, including a future Paddington to Reading shuttle. This would also involve linking existing freight loops and link lines, doubling of the Old Oak Common flyover and upgrading them to passenger status.

Construction of a West Ealing bay platform would facilitate the introduction of a Greenford shuttle from there and free up relief line capacity for performance improvement to and from Paddington.

We propose to reduce headways between Heathrow Airport Junction and Reading, and on the main lines between Reading and Didcot as part of the area signalling renewal programme.

Increasing platform capacity and remodelling the approaches to Reading station will unlock this well documented 'bottleneck' on the GWML and north – south axes to deliver improved performance and meet longer term growth forecasts. Options being evaluated include the reopening of the Reading East underpass for potential use by Airtrack or diversion of the current diesel services from the Waterloo lines, and grade separation at Reading West Junction. This will be the cornerstone for future developments.

To meet the challenge of increased growth in freight from the Southampton ports to the Midlands, the north of England and Scotland, we shall be re-evaluating elements of the former SRA Southampton – West Coast freight upgrade – capacity study, which included W10 gauge provision and revised layout options for Reading West Junction, including grade separation, upgrading and linking existing freight loops and providing additional loops between Didcot and Oxford. We are also evaluating the potential for an alternative route via Salisbury and Melksham to accommodate forecast growth.

At Oxford, upgrade of freight loops to passenger status, provision of an additional south facing bay platform, an enhanced Wolvercot Junction and the realignment of the Bicester line connection would provide additional capacity and performance benefits.

Development of the East–West Rail project would facilitate a major freight and passenger route from the Thames Valley (Oxford) to the West Coast Main Line (Milton Keynes).

Options for doubling single line sections of the Cotswold line between Oxford and Worcester in 2009/10 are being developed to increase capacity and improve performance by reducing the importation of delays onto the core high speed route.

Four tracking between Didcot and Swindon by linking existing four track sections would provide main lines for uninterrupted high speed service provision and additional capacity for existing and future freight requirements on the proposed continuous passenger status relief lines. An

underpass from the Milton Freight Depot line would provide a conflict free transfer of west bound trains from existing relief lines to the north of the GWML to the south side.

Redoubling the single track between Swindon and Kemble is being evaluated as the first phase of the Swindon – Gloucester – South Wales line upgrade for delivery in 2008/09. Phase two will reduce 14" headways to 4" between Swindon and Standish Junction as part of the area signalling renewal programme. The line is also a key diversionary route for South Wales, when the Severn Tunnel is closed.

At Chippenham, we are evaluating the restoration of the former platform line to increase capacity.

We are evaluating a scheme to shorten signal spacing for the approaches to Bath Spa station to reduce platform re-occupation times.

A linespeed upgrade of the Bristol – Birmingham route is also being evaluated with a target speed of 125mph. However, five automatic half barrier level crossings to the north of Cheltenham currently restrict linespeed to 100 mph through that area and will have to be either upgraded or replaced by other crossing methods. We shall be exploiting the benefits from High Output equipment to deliver the necessary track improvements, which are planned between 2010 and 2012.

The construction of Crossrail and its operation will present the greatest challenge on the route since the upgrade for 125 mph running in the 1970s. Crossrail will have a major impact not only within its boundaries but throughout the route. However, the project will potentially deliver many station facility and infrastructure improvements. Future capacity requirements at and between Paddington and Reading stations would be strongly influenced by any plan to make Reading rather than Maidenhead the most westerly terminus on the route.

Capacity improvement schemes currently undergoing evaluation are catalogued in the Infrastructure Investment appendices.

Delivering future requirements Expenditure

The age of rail and sleepers on the route is amongst the highest on the national network and varies between 30 and 40 years old. To address this we are implementing a track renewals strategy which matches the traffic usage of the route.

This will include the deployment of Network Rail's High Output equipment on the most intensely used parts of the route between London and Bristol (via Bath Spa and via Bristol Parkway) and between Bromsgrove and Taunton to deliver a higher track quality, with absolute minimum rail failures, for higher speeds; more conventional targeted renewals will be carried out on other less intensely used sections, with patch repairs and renewals to maintain stable infrastructure on the branch lines.

Figure 14 shows the planned level of expenditure on renewals on this route over the next two years. However, the precise timing and scope of renewals remains 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.

Figure 14 Forecast expenditure

£m (2006/07 prices)	2007/08	2008/09
Renewals		
Track		
Plain line	53	25
Switches and crossings	31	35
Other	1	–
Track total	85	60
Civils		
Underbridges	2	3
Overbridges	0	1
Bridgeguard 3	1	–
Footbridges	1	1
Earthworks	15	15
Tunnels	0	–
Culverts	0	–
Coast and estuary defence	0	1
Retaining walls	0	–
Civils total	20	21
Signalling		
Resignalling	20	67
Minor works/other	9	13
Over-planning	(2)	–
Signalling total	27	80
Telecoms		
Concentrators		
Large	2	1
Customer information systems (CIS)	0	2
Other	–	0
Telecoms total	2	2
Operational property		
Stations		
Managed	2	4
Franchised	1	5
Depots		
Light maintenance	0	5
Lineside buildings	0	1
Operational property total	4	14

Plant and machinery		
Fixed plant		
Point heating	2	0
Signal supply points	1	1
Depot Plant	0	0
Other	3	1
Plant and machinery total	6	3
Total Renewals		
	143	181
Enhancements (funded by)		
Network Rail		
Potential schemes	0	–
Total	0	–
Network Rail (RAB)		
Planned		
Reading Station re-development	8	37
Yate turnback facility	0	5
Newport Station regeneration	1	4
Swindon, up reception line, conversion to up relief line	2	2
Reading–Paddington line speed enhancements	3	–
West Ealing bay platform	0	3
Worle junction – Weston Super Mare upgrade	1	2
Pilning, down and up goods loop conversion to passenger status	0	2
Bristol St Phillip Marsh depot	2	–
Newport IDS	2	–
Other	2	0
Total	21	54
Potential schemes	3	62
Total	25	115
Welsh Assembly		
Planned		
Newport Station regeneration	4	4
Total	4	4
Potential schemes	1	15
Total	5	19
Other third party		
Planned		
Shipton on Cherwell new station	0	3
Other	0	0
Total	0	3
Potential schemes	3	5
Total	3	8
Total Enhancements		
	33	142

Figure 15 Forecast volumes

	2007/08	2008/09
Track		
Plain line (km)		
Rail	82	36
Sleepers	84	35
Ballast	75	38
Total	240	109
Switches & crossings (no.)		
Complete renewal	60	69
Partial renewal/reballasting	9	–
Abandonment	24	31
S&C (equivalent units)	75	85
Other (km)		
Drainage	4	–
Civils		
Underbridges (m ²)	226	1,768
Overbridges (m ²)	–	380
Bridgeguard 3 (m ²)	665	–
Footbridges (m ² decking area)	134	76
Earthworks (m ² slope surface)	151,103	151,711
Tunnels (m ²)	644	–
Culverts (m ²)	20	–
Coast and estuary defence (lm)	–	1,005
Retaining walls (m ²)	60	–
Signalling		
Resignalling (SEUs)	208	128
Telecoms		
Concentrators		
Large (no.)	3	1
CIS (stations)	–	45

The planned volume of renewals is detailed in Figure 15.

It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning 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 small proportion of the activities in these areas will slip to subsequent years.

Maintenance

Figure 16 shows the planned level of expenditure on maintenance on this route over the next two years.

Figure 16 Forecast expenditure

£m (2006/07 prices)	2007/08	2008/09
Maintenance	62	57

Infrastructure investment

Figure 17 highlights schemes that are planned for completion in the financial year shown.

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
A	Paddington station (13.01) Additional OHL for platform 12	Improved station operational flexibility and performance	Electrification	Network Rail	8	December 2006
A	Paddington station (13.01) Span 4 roof and platform drainage works	Renewal	Property	Network Rail	6	2006-08
B	Old Oak Common – Heathrow Express Depot (13.01) Depot enhancement	Accommodation for 5 car Desiro units	Telecoms, property, plant	Heathrow Express	8	December 2006
E	Slough PSB & IECC (13.02) Concentrator renewals	Renewal	Telecoms	Network Rail	8	March 2007
H	Goring (13.03) Wallingford Road, over bridge repairs	Renewal	Structures	Network Rail	8	Christmas 2006
J	Swindon Up Goods (13.04) Conversion to passenger status with linespeed increase	Improved station approach speed and performance	Track, signals	Network Rail	8	August 2006
AA	Evesham (13.13) Relocation of signalling token machine from the signal box to the station platform	Improved performance by removing the need to stop outside Evesham signal box to pick up/set down the single line token	Signals	Network Rail	8	October 2006
A	Paddington station (13.01) High voltage equipment renewals	Renewal	Plant	Network Rail	2	2007/08
B	Kensal Green (13.01) Carriage Washing Plant relocation to Old Oak Common Depot	Relocated asset	Property	First Great Western	2	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year	
C	Paddington – Reading Relief Lines (13.01 & 13.02)	Linespeed increase	Up to 86% of the route increased up to 90 mph	Track, signals	First Great Western franchise commitment	3	2007/08
B	Acton (13.01)	Cutting stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
D	Hayes & Harlington (13.01)	Station enhancements	Refurbishment of northern station building Relocation of sub-station	Property, plant	Network Rail	4	2007/08
F	Maidenhead station (13.02)	Extension of down main line platform	Platform to accommodate 2+8 HST during two-track railway operation for engineering work only	Stations	First Great Western franchise commitment	3	2007/08
G	Reading East (13.02)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
AN	Track Renewals (13.03, 13.05, 13.08, 13.14 & 13.24)	Plain line renewals are planned at Goring (down relief lines), Miskin, Pontyclun, Wickwar, Naas and Pyle	Renewal	Track	Network Rail		2007/08
AN	Track Renewals (13.04, 13.05 & 13.06)	S&C renewals are planned at Foxhall Junction, Swindon West, East & Transfer Bridges, Narrowways Hill, Llanwern East, Newport West and Gaer Junction	Renewal	Track	Network Rail		2007/08
I	Uffington (13.04)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year	
I	Marston West (13.04)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
J	Swindon station area (13.04)	Track layout modernisation for the Swindon station area and east Swindon approaches and sidings	Improved station approaches and modernised siding facilities	Track, signals	Network Rail	3	2007/08
J	Swindon PSB (13.04)	SPT concentrator renewal	Renewal	Telecoms	Network Rail	4	2007/08
R	Chipping Sodbury West (13.04)	Cutting stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
S	Bristol Parkway station (13.04)	Provision of a 3 rd platform	Improved station operation and performance	Stations	Network Rail Discretionary Fund	6	2007/08
T	Severn Tunnel East (13.05)	Cutting stabilisation	Renewal	Earthworks	Network Rail	4	2007/08
V	Newport station (13.05)	Platform 4 extension	Accommodate 10 car trains and improve capacity and operation of the station area	Stations	Network Rail	6	2007/08
V	Newport PSB (13.05)	SPT concentrator renewal	Renewal	Telecoms	Network Rail	6	2007/08
AJ	Llanharan (13.05)	New station	New station with parking facilities	Stations	Welsh Assembly Government	4	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year	
AL	Port Talbot East Area Signalling Renewal (PASR) (13.05)	Resignalling scheme with track layout modernisation	Renewal	Signals, track	Network Rail	5	2007/08
AL	Port Talbot PSB (13.05)	SPT concentrator renewal	Renewal	Telecoms	Network Rail	6	2007/08
K	Dautsey Bank (13.06)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
K	Christian Malford (13.06)	Embankment stabilisation	Renewal and removal of speed restriction	Earthworks	Network Rail	3	2007/08
L	Salford Tunnel East (13.06)	Cutting stabilisation	Renewal	Earthworks	Network Rail	4	2007/08
M	Bristol PSB (13.06)	SPT concentrator renewal	Renewal	Telecoms	Network Rail	4	2007/08
M	Marsh Junction Depot (13.06)	Development of the former DMU depot	New servicing facility for First Great Western DMUs	Structures	First Great Western franchise commitment	6	2007/08
O	Flax Bourton (13.06)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
AD	Tredington (13.08) Embankment stabilisation	Renewal	Earthworks	Network Rail	5	2007/08
AE	Charfield Loop (13.08) Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
AF	Westerleigh North (13.08) Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
AI	Reading Green Park station (13.11) New station	New station adjacent to the M4 motorway Junction 11 commercial area	Stations	Developer	4	2007/08
AA	Honeybourne (13.13) Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
T	Tutshill (13.14) Cutting stabilisation	Renewal	Earthworks	Network Rail	3	2007/08
T	Sudbrook (13.16) Pumping station	Decommissioning of water treatment plant	Property	Network Rail	4	2007/08
V	Ebbw Valley railway (13.17) Convert former freight only line to passenger status	Provision of 6 new stations on 18 miles of single line with a 3 mile long passing loop	Earthworks, stations, structures, track, signals	Welsh Assembly Government	5	2007/08

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
I	Bourton (13.04) Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2008/09
J	Little Somerford (13.04) Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2008/09
T	Piling DGL & UGL (13.04) Conversion to passenger status	Renewal with capacity, capability and performance improvements	Track, signals	Network Rail	4	2008/09
AP	Track Renewals (13.04, 13.05, 13.07, 13.08 & 13.22) Plain line renewals are planned at Chipping Sodbury, Severn Tunnel Junction, Hinksey, Wolvercot Junction, Defford, Oddingley & Montpellier	Renewal	Track	Network Rail		2008/09
AO	Track Renewals (13.01, 13.02, 13.03, 13.04, 13.06, 13.08 & 13.20) S&C renewals are planned at Old Oak Common, Friars Junction, Hayes & Harlington, Airport Junction, Slough Station East & West, Slough – Windsor, Didcot East, Swindon East & Transfer Bridges, Bathampton UPL, Bath Goods, Pining DGL & UGL, Stoke Works Junction, Yate South & Middle and Charfield Loops	Renewal	Track	Network Rail		2008/09
U	Severn Tunnel (13.05) Cable hanger route renewal	Renewal	Telecoms	Network Rail	3	2008/09
U	Severn Tunnel (13.05) Communication system renewal	Renewal	Telecoms	Network Rail	1	2008/09

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
U	Severn Tunnel (13.05)	Telephone concentrator renewal	Telecoms	Network Rail	1	2008/09
K	Chippenham (13.06)	Embankment stabilisation	Earthworks	Network Rail	3	2008/09
L	St Annes Park (13.06)	Cutting stabilisation	Earthworks	Network Rail	3	2008/09
K	Patterdown Farm (Thingley) (13.06)	Embankment stabilisation	Earthworks	Network Rail	3	2008/09
P	Worle Junction (13.06)	Upgrade from single lead to double lead junction and part redoubling of branch towards Weston Milton	Track, signals	Network Rail Discretionary Fund	2	2008/09
AE	Tumpey Green (13.08)	Embankment stabilisation	Earthworks	Network Rail	3	2008/09
AE	Berkeley South (13.08)	Embankment stabilisation	Earthworks	Network Rail	3	2008/09

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
AE Charfield Loops (13.08)	Increase entrance and loop speeds	Improved performance Renewal	Track	n/a	n/a	No longer under consideration due to loss of loop length
AH Perivale (13.10)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2008/09
AI Pound Green (13.11)	Embankment stabilisation	Renewal and performance	Earthworks	Network Rail	2	2008/09
AB Rodbourne (13.12)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2008/09
AB Purton (13.12)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2008/09
AB Sapperton (13.12)	Tunnel repairs	Renewal	Structures	Network Rail	2	2008/09
AF Westerleigh East (13.04)	Embankment stabilisation	Renewal	Earthworks	Network Rail	3	2009/10

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
V Newport Area Signalling Renewal (NASR) Phase 1 (13.05)	Resignalling scheme with provision for track and station modernisation	Modernised track layout throughout the Severn Tunnel Junction – Newport area and towards Llantarnam with increased bi-directional signalling Renewal Improved performance	Signals	Network Rail	4	2009/10
V Newport station (13.05)	Station regeneration	Major station upgrade in time for the 2010 Ryder Cup Contribution to Newport regeneration	Stations	Welsh Assembly Government/Third party	4	2009/10
X Cardiff PSB (13.05)	SPT concentrator renewal	Renewal	Telecoms	Network Rail	1	2009/10
AD Eckington (13.08)	Embankment stabilisation	Renewal	Earthworks	Network Rail	2	2009/10
VI Severn Tunnel Junction – Cardiff (13.05)	Relief Line speed increases up to 75mph Main Line speed increases up to 110mph	Improved main line and relief line capacity and Renewal Improved performance	Track	Network Rail	1	2010/11

Figure 17 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
X Cardiff Area Signalling Renewal (CASR) (13.05)	Resignalling scheme with provision for track layout and station modernisation	Modernised track layout providing improved operation flexibility throughout the Cardiff Central and Queen Street station areas with increased bi-directional signalling and improved station approaches Provision for additional Valley Lines platform 8 Enable Cardiff Central platform 0 to be used for loaded trains from the west Relief line speed increases Improved asset condition and performance	Signals	Network Rail	3	2012
G Reading Area Signalling Renewal (RASR) (13.02 & 13.03)	Resignalling scheme: complementing track layout and station modernisation	Improved asset condition and performance	Signals	Network Rail	1	2013
V Newport Area Signalling Renewal (NASR) Phase 2 (13.05)	Resignalling scheme with provision for track layout and station modernisation	Modernised track layout to the east of Severn Tunnel Junction to towards Chepstow and Gloucester, and north of Llantarnam towards Little Mill and the southern end of the Ebbw Valley lines at Park Junction Provision for new stations Improved asset condition and performance	Signals	Network Rail	3	2013
Z Oxford Area Signalling Renewal (OASR) (13.07)	Resignalling scheme: complementing track layout and station modernisation	Improved asset condition and performance	Signals	Network Rail	1	2014

Figure 18 highlights other schemes under consideration.

Figure 18 Infrastructure investment under consideration						
Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	
C West Ealing (13.01)	Construct west end bay platform	Facilitate Greenford shuttle service	Stations, track, signals	Network Rail Discretionary Fund	1	
G Reading station area (13.02 & 13.03)	Capacity and performance enhancement	Additional north side platforms with revised station approaches track layout Provision for Crossrail Reinstatement of the former Reading East underpass facilitating the diversion of diesel services from platforms 4a and 4b and provision for Alltrack. Development of platform 4c Westbury Line Junction to Reading West Junction grade separation	Stations, structures, track, signals	Third party and Network Rail	3	
G Reading station (13.02 & 13.03)	Capacity and performance enhancement	Connect platforms 4a and 4b to GWML	Structures, track, signals	n/a	Option discontinued	
AI Basingstoke – Oxford gauge enhancement (13.02, 13.03, 13.07 & 13.11)	Works to allow W10 gauge trains to run from Southampton to the West Coast Main Line	The line would be cleared to W10 gauge to allow larger freight services to run without the requirement for specialist wagons	Structures, track	Under consideration by Transport Innovation Fund	4	
J Swindon East (13.04)	Conversion of Up Reception Line to Up Relief Line with option to join up with Stratton Up Goods Loop	Improved capacity and performance 1.5 miles of additional passenger status running line Complements Core High Speed Line strategy	Track, signals	Network Rail Discretionary Fund	1	
AF Westerleigh Junction (13.04)	Reinstate the east curve	Diversionary route for South Wales, and Birmingham to GWML	Track, signals	n/a	No longer under consideration due to poor stability of proposed site	

Figure 18 Infrastructure investment under consideration

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage
S Bristol Parkway (13.04)	Provision of 4 th platform and Stoke Gifford West avoiding loop	Improved capacity and performance Facilitates parallel moves towards Bristol & South Wales	Track, signals, telecoms, stations, plant	Network Rail Discretionary Fund	1
X Cardiff station area (13.05)	Capacity and performance enhancement	Simplified track layout for the approaches to the station to provide improved operational flexibility and additional capacity Provision for an additional Valley Lines platform Enable Cardiff Central platform 0 to be used for loaded trains from the west Turn back facility for trains arriving and departing via the east end	Stations, track, signals	Welsh Assembly Government and Network Rail	3
L Bath Spa station (13.06)	Additional signals	Improved capacity and performance	Signals	Network Rail	1
Y Didcot – Oxford (13.07)	Linking and upgrading of freight loops to passenger status	Capacity and capability improvement Improved engineering access	Track, signals	Network Rail	1
Z Oxford station (13.07)	Capacity and performance enhancement	Additional platform at the south end of the current station to accommodate trains turning round from the south. Simplified track layout for the northern approaches to the station to facilitate improved operation of the Bicester branch, and upgrade of the Up Goods Loop and Down Goods Loop to passenger status	Stations, structures, track, signals	Third party and Network Rail Discretionary Fund	1
AB Swindon – Kemble (13.12)	Redoubling of the single line (Phase 1 of Swindon – Gloucester upgrade	Improved capacity and performance Facilitates new North Swindon station Core High Speed Line diversionary route for south Wales	Earthworks, structures, track, signals	Network Rail	1
AW Cotswold Line (13.13)	Partial redoubling of single line sections	Capacity and capability improvement Performance improvement	Earthworks, structures, track, signals	Network Rail	2

Figure 19 highlights route enhancement aspirations.

Figure 19 Route enhancement aspirations						
Project	Project description	Output change	Main asset type(s)	Funding	Status	
A	Paddington station (13.01) Platforms 1 & 2 electrification	Capacity and capability improvement Facilitates Heathrow Express move to Platforms 2 & 3 Central platforms for inter city operation	Stations, plant	Network Rail	Network Rail strategic development	
A	Paddington station (13.01) Platform reconfiguration and extension	14 long platforms for future longer inter city trains	Stations, track, signals, plant	Network Rail	Network Rail strategic development	
C	Paddington – Slough (13.01 & 13.02) 5 th track	Improved capacity and performance Core High Speed Line	Earthworks, stations, structures, track, signals	Network Rail	Network Rail strategic development	
D	West Drayton (13.01) Reinstatement of platform abutting the Up Goods line	Increased station capacity and capability	Stations, track, signals	Network Rail	First Great Western proposal	
D	Heathrow Airport Junction (13.01) Junction upgrade to cater for additional services	Capacity improvement	Track, signals	Third party	Heathrow Express proposal	
F	Heathrow Airport Junction – Reading (13.02) Reduced headways	Capacity improvement Core High Speed Line	Signals	Network Rail	Network Rail strategic development	
E	Slough (13.02) All platform lines to be converted to bi-directional operation	Increased station capability	Signals	Third party	First Great Western proposal	
H	Reading – Didcot (13.03) Reduced main line headways	Capacity improvement Core High Speed Line	Signals	Network Rail	Network Rail strategic development	
J	Didcot – Swindon (13.04) Extension of four track railway	Improved capacity and performance Core High Speed Line	Earthworks, structures, track, signals	Network Rail	Network Rail strategic development	

Figure 19 Route enhancement aspirations

Project	Project description	Output change	Main asset type(s)	Funding	Status
U Severn Tunnel (13.05)	Introduction of intermediate signals in both directions in the Severn Tunnel	Improved capacity	Signals	Third party	First Great Western proposal
U Severn Tunnel Junction (13.05)	Station enhancement (option)	Additional platform and car park expansion	Stations	Third party	Network Rail strategic development
U Severn Tunnel Junction (13.05)	Station relocation (option)	Relocated at new site at Magor with Undy with parking facilities	Stations	Third party	Proposed under Sewfa rail strategy.
U Magor with Undy (13.05)	New station	New station with parking facilities	Stations	Third party	Proposed under Sewfa rail strategy.
U Llanwern (13.05)	New station	New station with parking facilities	Stations	Third party	Proposed under Sewfa rail strategy.
V Coedkernew (13.05)	New station	New station with parking facilities	Stations	Third party	Proposed under Sewfa rail strategy.
X St Mellons (13.05)	New station on the relief lines	New station with parking facilities	Stations	Third party	Proposed under Sewfa rail strategy.
AG Stoke Works – Taunton (13.04, 13.06 & 13.08)	Linespeed upgrade to 125mph	Improved performance and journey times Core High Speed Route	Track	Third party and Network Rail	Network Rail strategic development
K Chippenham (13.06)	Platform line reinstatement	Capacity improvement	Track, signals	Network Rail	Network Rail strategic development
M Bristol Temple Meads (13.06)	Reinstatement of bay platform 2 & extend platform	Capacity improvement	Stations, track, signals	Third party	First Great Western proposal

Figure 19 Route enhancement aspirations

Project	Project description	Output change	Main asset type(s)	Funding	Status
N Bristol Temple Meads – Filton Abbey Wood (13.08)	Extension of four-track railway	Improved capacity and performance	Earthworks, structures, track, signals	Network Rail	Network Rail strategic development
AC Cheltenham Alston Siding (13.08)	Reinstatement of the second siding	Facilitate additional turnback capability	Track, signals	Third party	First Great Western proposal
AB Swindon – Standish (13.12)	Reduced signalling headways (Phase 2 of Swindon – Gloucester upgrade)	Capacity improvement and linespeed increase	Signals	Network Rail	Network Rail strategic development
AB Stroud (13.12)	Turnback facility for engineering work	Capacity improvement	Track, signals	Third party	First Great Western proposal
P Weston super Mare (13.15)	Reinstate the bay platform	Facilitate growth for enhanced cross Bristol service	Track, signals	Third party	Under consideration
Q Clifton Down (13.22)	Turnback signal	Capacity and performance improvement	Signals	Third party	First Great Western proposal
AK Llantrisant – Beddau (13.24)	Re-instatement of former freight line	New passenger line with four new stations	Earthworks, structures, stations, track, signals	Third party	Proposed under Sewfa rail strategy

Non infrastructure developments

Figure 20 shows potential developments which do not involve changes to the infrastructure.

Figure 20 Timetable development

Description	Key issues	Actions or options being developed	Benefits	Target timetable implementation
Central Remapping and re-specification	Remapping of Central and Cross Country franchises.	Timetable specification review	Improved pattern of service	December 2007 & December 2008

Figure 21 Other projects

Description	Key issues	Actions or options being developed	Benefits	Start Date
Smartcard introduction	Revenue protection and flexible ticketing	Under discussion between TfL & affected operators	Simplified ticket purchases	Under consideration

Appendix

Figure 22 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	No of Tracks
13.01	Paddington – Airport Junction	MLN1	Primary	DfT	No	W8	8	125(90)	25kV	TCB	2.5	4
13.02	Airport Junction – Southcote Junction	MLN1, BKE	Primary	DfT	No	W8	8	125(75)	none	TCB	3	4
13.03	Reading – Didcot	MLN1	Primary	DfT	No	W8	8	125(100)	none	TCB	4	4
13.04	Didcot – Border (nr Pilling)	MLN1, SWB	Primary	DfT	No	W8	8	125	none	TCB	4	2
13.05	Border (nr Pilling) – Swansea	SWB,BSW, SWM2,SWA	Primary	DfT	No	W8, W6A	8	90(60)	none	TCB	7,4	2
13.06	Wotton Bassett Junction – Cogload Junction (via Bristol Temple Meads) – Filton Junction	MLN1, BSW	Primary	DfT	No	W8	8	100	none	TCB	4	2
13.07	Didcot Junction – Wolvercot Junction	DEC, DCL	Primary	DfT	No	W8	8	90	none	TCB	4	2
13.08	Bristol – Birmingham Line	YAT,BGL2,C HL,BAG2	Primary	DfT	No	W8	8	100	none	TCB	4	2
13.09	Heathrow Airport	HAL	(owned by BAA)	DfT	No	W6A	8	80	25kV	TCB	2.5	2
13.10	Greenford Lines	WEL1,GEC, HAN	LSE	DfT	No	W8	8	40	none	TCB	6	2

Figure 22 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	No of Tracks
13.11	Southcote Junction – Basingstoke Junction	BKE	LSE	DfT	No	W8	8	90	none	TCB	4 – 4.5	2
13.12	Swindon Junction – Standish Junction	SWM1	Secondary	DfT	No	W8	8	90	none	TCB	(AB)	single/2
13.13	Cotswolds Line	OWW	Secondary	DfT	No	W6A	7	90	none	Mech.	(AB)	single/2
13.14	Border (Chepstow) – Gloucester	SWM2	Secondary	DfT	No	W8	8	90	none	TCB	4	2
13.15	Weston Super Mare Loop	WSM	Secondary	DfT	No	W8	8	90	none	TCB	4	single
13.16	Severn Tunnel Junction – Border (Chepstow)	SWM2	Secondary	DfT	No	W8	8	90	none	TCB	4	2
13.17	Ebbw Vale Line	GAE, VWL	FOL	DfT	Yes	W8	8	tba	none	OTW	(AB)	1
13.18	Henley-on-Thames Branch	HEN	Rural	DfT	No	W6A	6	50	none	OTW	(AB)	1
13.19	Marlow Branch	WBB, MWB	Rural	DfT	No	W6A	6	50	none	OTW	(AB)	1
13.20	Windsor and Eton Branch	WIN	Rural	DfT	No	W6A	6	50	none	OTW	(AB)	1
13.21	Bicester Town Branch	OXD	Rural	DfT	No	W8	7	40	none	OTW	(TB)	1
13.22	Avonmouth Branch	CNX, AMB	Rural	DfT	Yes	W6A	7	60	none	OTW	(AB)	1

Figure 22 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	No of Tracks
13.23	Freight Lines (England)			DfT	No				none			
13.24	Freight Lines (Wales)			DfT	No				none			

Capacity and operational constraints

- A Paddington station: platform configuration and OHL
- B Acton West Junction: single lead junction
- C Variable relief line speeds between Paddington and Reading
- D Reading station: flat junctions and restricted platform capacity
- E Reading West Curve and Junction: Short length curve and junction crossing main and relief lines at grade
- F Didcot – Oxford: two track section capacity limitations with lightly used stations
- G Oxford – Worcester: single track sections limit capacity and flexibility
- H Swindon – Kemble: 12 miles of single line limit capacity and flexibility
- I Kemble – Standish Junction: 14 minute headways limit capacity
- J Westerleigh Junction – Bristol Parkway: two track section on highly utilised converging route
- K Severn Tunnel: 7 minute headways limit capacity
- L Severn Tunnel Junction – Cardiff: variable relief line speeds restrict capacity
- M Weston Super Mare loop: single line restricts capacity and flexibility
- N 5 AHB level crossings north of Cheltenham restrict linespeed to 100 mph

Other issues on the route

- 1 Heathrow terminal 5 and 3rd runway
- 2 Crossrail: construction and decision on final destination (Maidenhead or Reading)
- 3 In-cab signalling pilot scheme on the GWML
- 4 East – West Railway
- 5 Southampton – West Coast freight upgrade to W10 gauge
- 6 Somerset Levels–flooding

Note

This Route Plan forms part of the business plan suite of documents which is produced annually and in accordance with our network licence condition 7. Our plans and the way in which we intend to achieve those plans are summarised in the Business Plan itself. This document provides further detail on the specific plans for this Strategic Route including the expenditure over the next two years to the end of Control Period 3.

This year our business plan focuses on the remainder of Control Period 3 (to March 2009). We shall provide a submission to the Office of Rail Regulation in October 2007, which will set out our view of the expenditure and activities that will be required in Control Period 4 (2009/10 to 2013/14).

The Route Plan shows in more detail how the strategies set out in the Business Plan will be delivered at a route level across the network, and how we are working with our customers and other stakeholders to improve the

performance and utilisation of the network. It presents a portfolio of activities to develop the network.

The expenditure section contains tables showing the planned level of expenditure and volumes on renewals on the route over the next two years, split by asset category. Expenditure figures are shown in 2006/07 prices, and are rounded to the nearest £1 million. An entry of £0 indicates spend of less than £0.5 million. It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning 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 small proportion of the activities in these areas will slip to subsequent years.

Please note that figures in tables may not sum to the totals shown, because of rounding.

The other documents in the business plan suite can be found on the Network Rail website www.networkrail.co.uk



This Route Plan is part of a set.
To view or download the others
visit www.networkrail.co.uk