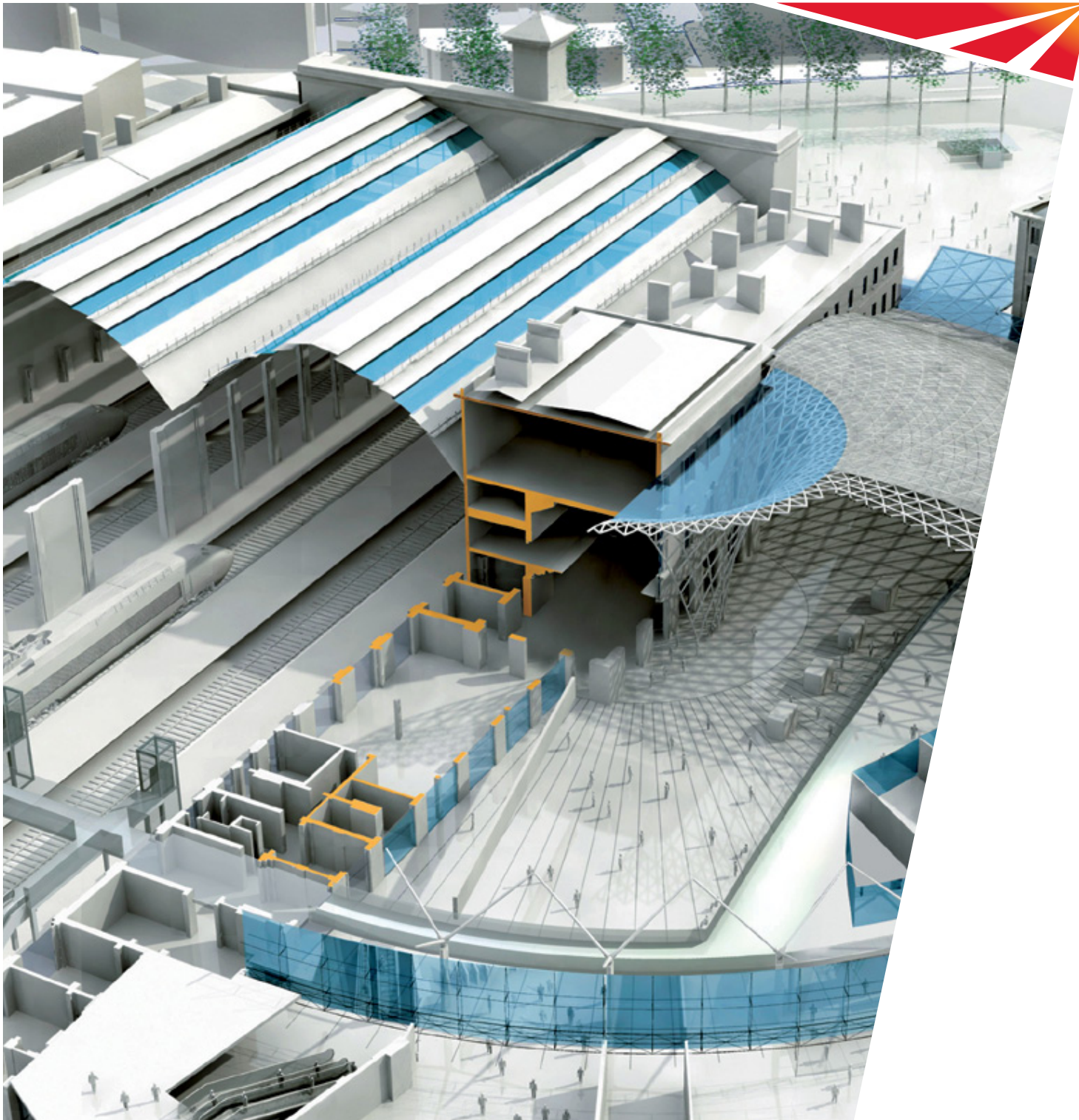


Moving ahead Planning tomorrow's railways

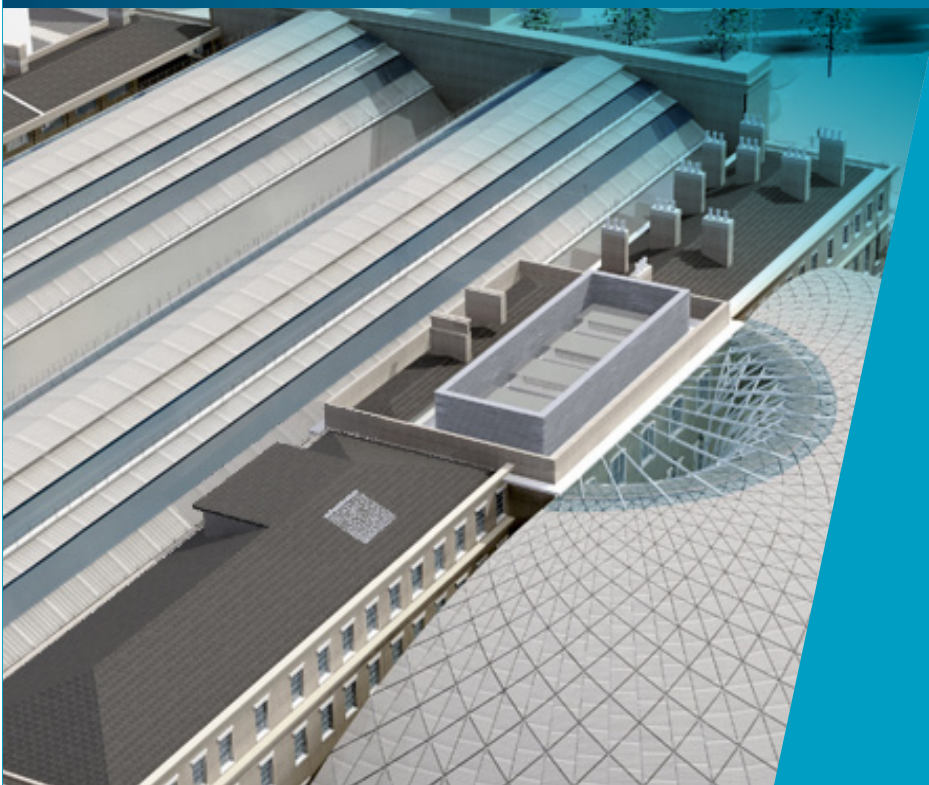
NetworkRail



*Our railways play a vital role
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Our £500 million investment in King's Cross station will transform the experience of passengers using the station. We are delivering hundreds of projects across the network to build a bigger, better railway for passengers, freight and the whole of Britain.

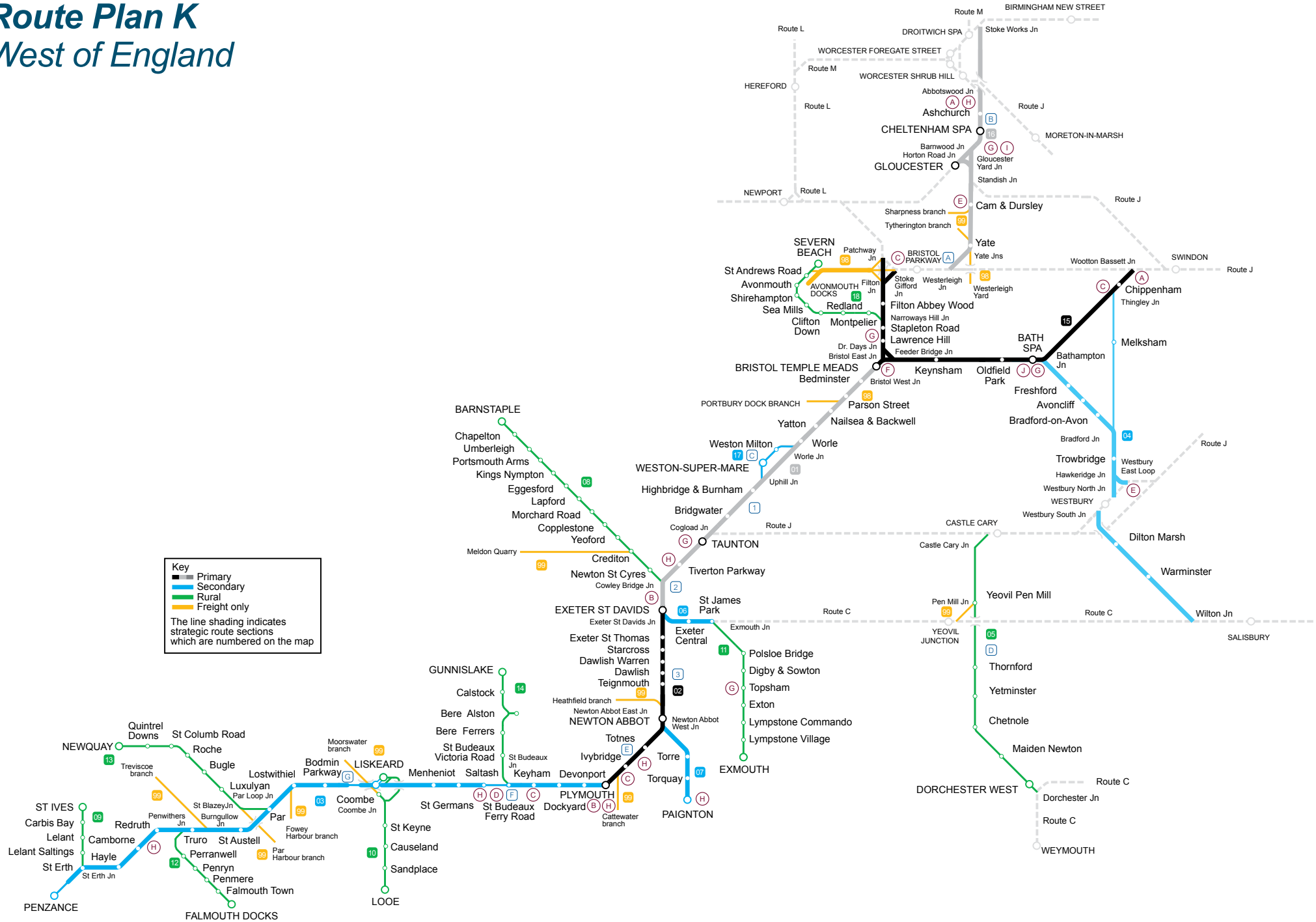


Route Plan K
West of England

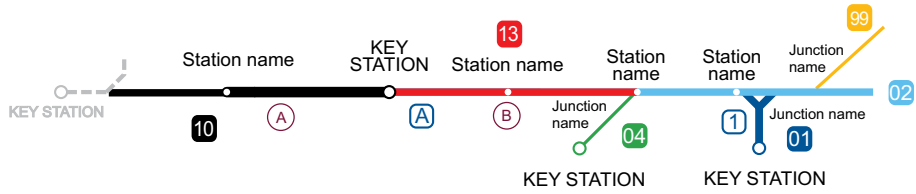


Route Plan K

West of England



Key to route diagrams



A Capacity and operational constraints
Location: capacity or operational constraint

1 Issues on the route
Location: issue on the route

A Key planned projects
Location: planned project on the route

01 Strategic route sections
Listed in the appendix of the route plan

Other symbols

	Key station location
	Key station on this route
	Key station on another route
	Other station location
	Other station on this route
	Junction / other landmark

Track descriptions

	Primary
	London and South East commuter
	Secondary
	Rural
	Freight only

The line shading indicates strategic route sections which are numbered on the map

	The width of the line denotes the number of tracks
	Multiple track
	Double track
	Single track

Other lines are shown as follows:

	Line on other route
	Non Network Rail infrastructure
	Non operational line

Section 1: Today's railway

Route context

The route runs across the whole of the south-western peninsula joining the counties of Cornwall, Devon and Somerset with the greater Bristol conurbation and links these and Gloucestershire with south Wales and the Midlands, and also runs eastwards through Bath and north Wiltshire to join up with the core Great Western Main Line at Wootton Bassett, to the west of Swindon.

A number of branches enable many of the larger west of England coastal resorts on the south and north coasts of Cornwall and Devon to be served by rail, and holiday traffic is a significant element of the overall passenger market.

The route plays a crucial role in the core cross country intercity network, linking the south west region via Taunton and Cheltenham Spa with the Midlands, Manchester, the east Midlands, Yorkshire, the north east and Scotland. Equally this part of the route – between Barnt Green and Gloucester, and Westerleigh Junction – is a vital component of the wider national trunk freight network which links the north west and north east with south Wales and the south west region, for long distance metals and power station coal flows.

The route also provides the majority of the regional cross country corridor on which semi-fast limited stop services link south Wales and the greater Bristol conurbation and Bath through west Wiltshire and Salisbury to the south coast, and through south Somerset for Dorset.

In addition to the intersecting cross country route sections around Bristol and Bath which form the basis for the "cross-Bristol" group of urban local rail services, the branch line from Stapleton Road through Clifton Down to Avonmouth and Severn Beach plays an increasingly important role within local Bristol city services.

Most freight traffic in the west of England is generated around Bristol, at the major logistics complexes at Avonmouth Docks and at the Royal Portbury Dock, on either side of the River Avon. In the far south-west china clay traffic from a range of loading points around St Austell is carried locally within Cornwall for export via the port of Fowey, as well as over longer distances outside the region. Aggregates traffic also flows southwards from Westbury to reach various southern destinations via Salisbury.

Today's route

The principal elements of the route are described below. The relevant Strategic Route Sections are shown in brackets:

- the long main line section across the south-western counties from Penzance to Bristol (K.03, K.02, K.01 & K.15), including the Weston-super-Mare loop (K.17), and through Gloucester and Cheltenham to Stoke Works Junction south of Birmingham (K.16)
- the Great Western Main Line from Bristol Temple Meads through Chippenham to Wootton Bassett Junction (K.15)
- the Wessex route from Bathampton Junction through Trowbridge, and from Thingley Junction through Melksham, to Westbury then Warminster to Salisbury (K.04), and from Castle Cary through Yeovil Pen Mill to Dorchester Junction (K.05).

Branch lines in the west of England serving the Devon and Cornwall coastal resorts include:

- Exeter (Cowley Bridge Junction) to Barnstaple, in north Devon (K.08)
- Exeter St Davids and Exeter Central to Exmouth, in south Devon (K.06 & K.11)
- Newton Abbot West Junction to Paignton in south Devon (K.07)
- Plymouth (St Budeaux Junction) to Bere Alston and Gunnislake (K.14)
- within Cornwall, Liskeard to Looe (K.10)
- Par to Newquay (K.13)
- Truro (Penwithers Junction) to Falmouth (K.12)
- St Erth to St Ives (K.09).

As well as these passenger lines there are freight-only lines from:

- Berkeley Road Junction to Sharpness Docks
- Yate to Tytherington, and to Westerleigh
- Stoke Gifford to Hallen Marsh and the Avonmouth Docks terminals complex
- Parson Street to Portbury Docks
- Newton Abbot to Heathfield
- Plymouth Laira to Cattewater
- Coombe Junction to Moorswater
- Lostwithiel to Fowey
- St Blazey to Par Harbour
- Burngullow Junction to Parkandillack
- The connection from Crediton to Coleford Junction (alongside the Exeter to Barnstaple branch) which leads on to the privately-owned Meldon Quarry freight line through Okehampton)
- (the above are collectively K.98 & K.99).

Current passenger and freight demand

In addition to the main cities and towns served directly by the route with cross country and London services, and its branch feeders, there are large areas of the south-west which are remote from a station, and long distance trains call at smaller stations such as Tiverton Parkway, Totnes and Bodmin Parkway in order to cater for large swathes of north Devon, south Devon and north Cornwall respectively.

The Department for Transport's (DfT) Thames Valley and South West Regional Planning Assessments (RPA) for the railway 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 majority of capacity on the West of England route between Taunton, Plymouth and Cornwall is provided by through, long distance FGW London Paddington services which make only a limited number of calls (on Route J) between Reading and Taunton.

The Great Western Route Utilisation Strategy (RUS) Consultation Draft was published in September 2009, and addressed the whole of the route. The Final version of the Great Western RUS was published in March 2010.

The main markets for rail are identified as; medium and short distance commuting to the main centres such as Bristol, Taunton, Exeter and Plymouth; long distance interurban travel between main centres in the south west and London, the Midlands, Yorkshire, the North East and Scotland; intra-regional interurban travel; access to airports; leisure and tourism, and to provide local journey opportunities, as well as to feed the main line, from rural locations on local branches.

The GW RUS predicts continued growth on the Long Distance High Speed (LDHS) services, by 31 percent between 2008 and 2019 in the peak, and 42 percent for all day services. In key urban centres, such as Bristol, peak demand is predicted to grow by 41 percent between 2008 and 2019 which is equivalent to an annual growth rate of 3.2 percent. Off peak demand is predicted to grow by 37 percent over the same time period which is principally assumed to be for leisure purposes. A similar growth scenario as that for Bristol is envisaged for

the other key urban centres on the route in the south west, at Exeter and Plymouth.

Local passenger traffic handled at Bristol Parkway station has grown in volume reflecting the development of the station facilities for enhanced bus interchange with rail, better cross-Bristol train services on Filton Bank in north Bristol and through to Weston-super-Mare, easy access to increasing nearby employment, and improvements to train services at nearby Filton Abbey Wood.

Strong growth has been experienced on Cardiff to Portsmouth regional cross country services where services are now normally formed of three-car trains instead of two-car trains, in response to a trend towards overcrowding within Wales as well as on the route itself across Bristol and Bath. This part of the route with the Severn Tunnel offers a key alternative to both toll motorway Severn Bridges, reflecting house price and employment opportunity differentials between south east Wales and the south west region of England.

Local services around Exeter are arranged so as to ensure that through links are provided between the Barnstaple line and Exeter Central, and similarly between the Exmouth branch and the Paignton branch, so as to cater for demand and maintain connectivity between main line services at Exeter St Davids and the better-located Exeter Central station.

FGW continue to provide a nightly (Saturdays excepted) sleeper service between London Paddington and Penzance serving the principal Cornish stations.

The Port of Bristol's Avonmouth and Portbury terminals handle in the region of six million tonnes per year of imported coal destined for power stations at Didcot, Aberthaw and the West Midlands. The import market is mainly based on the Port of Bristol's Portbury and Avonmouth terminals.

Mendips aggregates traffic is forwarded directly from Westbury via Salisbury to a number of south coast receiving terminals.

Freight traffic generated in Cornwall is predominantly china clay, mostly exported locally through the port of Fowey, but with some longer distance traffic also. Cement traffic from Hope (Peak District) runs to Moorswater on the Looe branch. Aggregates traffic runs from Burngullow to East London. Nuclear traffic moves between two locations on the route in the south west, and the north west.

Current services

First Great Western (FGW) operates the broadly hourly London Paddington to Plymouth/Penzance services. These come together with the hourly north and midlands to Plymouth CrossCountry services at Cogload Junction (east of Taunton), to make traffic volumes greatest between there and Plymouth. Between Plymouth and Penzance passenger train services are mostly operated by FGW. CrossCountry has a limited presence west of Plymouth, although this is stronger in the summer months.

FGW operates a structured cross-Bristol local network incorporating services between Cheltenham/Gloucester (via Yate) and Westbury/Southampton/Weymouth, and between Cardiff and Taunton, and between Bristol Parkway and Weston-super-Mare. FGW's hourly semi-fast services between Cardiff and Portsmouth via Bristol and Bath, and the Severn Beach branch line service add to the cross-Bristol network.

FGW also provide an infrequent service between Swindon and Westbury via Melksham.

CrossCountry services to the north and Midlands provide direct links with the south west via Taunton and Cheltenham. A standard pattern applies in which Plymouth is linked hourly across Birmingham to Newcastle (with some extensions to Scotland) via Bristol and Cheltenham, which are also linked hourly across Birmingham to Manchester, jointly giving a half hourly service between Bristol and Birmingham.

CrossCountry also operates limited-stop services from the east Midlands and Birmingham New Street directly (i.e. omitting Worcester) through Cheltenham and Gloucester to Cardiff. These are complemented by local FGW services from Great Malvern and Worcester to Bristol which call at the

intermediate stations at Ashchurch and Cam and Dursley, and form part of the "cross-Bristol" group. Frequencies between Cheltenham Spa and Gloucester are further augmented by the Cardiff stopping services provided by Arriva Trains Wales. (ATW).

The service between London Waterloo and Exeter St Davids (via Salisbury) operated by Stagecoach South West Trains (SSWT) was enhanced to an hourly, regular interval with effect from the December 2009 timetable, following the completion of infrastructure upgrade works around Axminster (to the east of the Exeter area). As a consequence of the SSWT services now being concentrated solely east of Exeter, FGW provide slightly more local journeys westwards beyond Exeter, to Paignton and Plymouth. In the Exeter district the pairing of Barnstaple journeys with Exmouth, and Exmouth with Paignton, is co-ordinated with the SSWT journeys via Honiton which – taken together – form the basis of a cross-Exeter local network through Exeter Central. SSWT also operate a limited number of services between Salisbury and Bristol Temple Meads, which are integrated with the London Waterloo to Exeter St Davids service.

The most intensively used west of England branches to Exmouth, Falmouth, and St Ives enjoy half hourly frequencies, whilst the other west of England branches have hourly or less frequent interval services. The Paignton and Newquay branches enjoy an element of through working of long distance services, both by FGW and CrossCountry, the latter on a seasonal only basis.

Freight services are operated by DB Schenker, Freightliner Heavy Haul Limited and DRS.

Figure 1 shows the current level of service to major destinations from principal stations.

Figure 1 Current train service level (trains per hour)

Main line services	Trains per hour
Bristol Temple Meads – London Paddington	2
Plymouth – London Paddington	1 (9 trains per day from Penzance)
Plymouth – Birmingham New Street	1 (3 trains per day from Penzance)
Bristol Temple Meads – Cheltenham Spa	5 every 2 hours

Figure 2 Current train service level (trains per hour)

Regional/Rural Service	Trains per hour each way
Bristol Temple Meads – Worcester Shrub Hill	1 every 2 hours
Bristol Temple Meads – Avonmouth	3 every 2 hours
Exmouth – Barnstaple	1
St Erth – St Ives	2

Figure 3 Tonnage

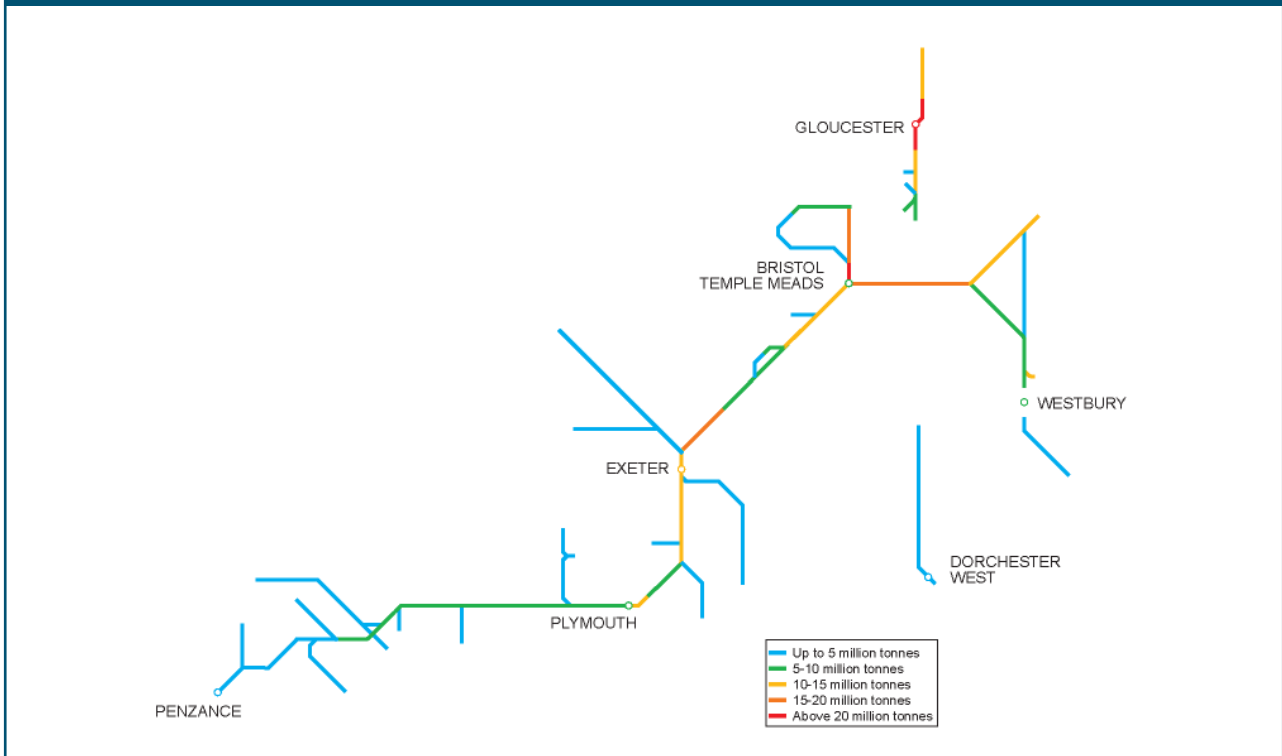


Figure 2 shows the current service level for regional and rural services.

Figure 3 shows the total annual tonnage levels on the route.

Traffic volumes are summarised in Figure 4.

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	19	2	21
Train tonne km per year (millions)	4,504	1,411	5,914

Current infrastructure capability

The following maps provide an indication of the predominant capability on each section of the route.

Current capability is shown in the Network Rail Sectional Appendix.

As part of the Infrastructure Capability Programme a number of Network Changes to Route Availability and Gauge, which may affect some of the detail of these maps, have been issued for consultation. Details of the Network Changes being consulted can be found on the [Network Rail](#) website and details of Network Changes established can be found on the [Network Rail](#) website.

Figure 5 Linespeed

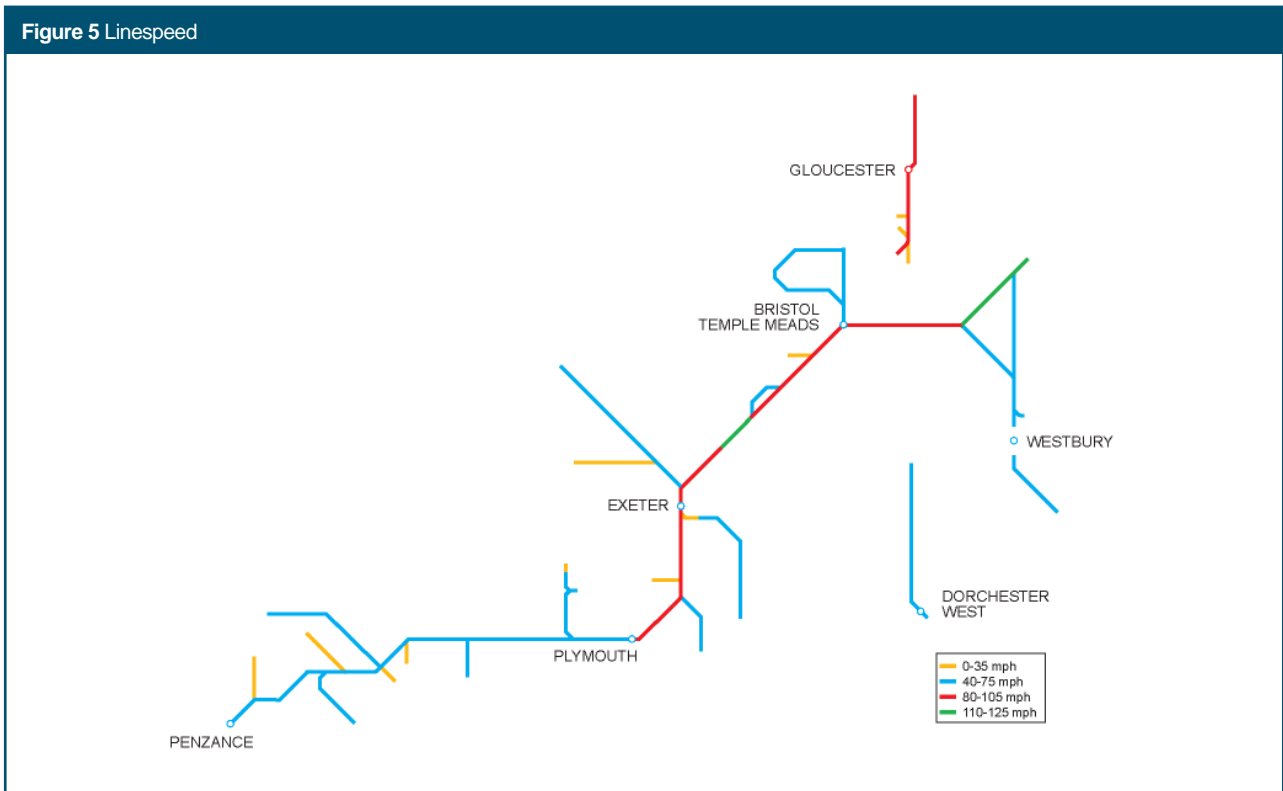


Figure 6 Electrification

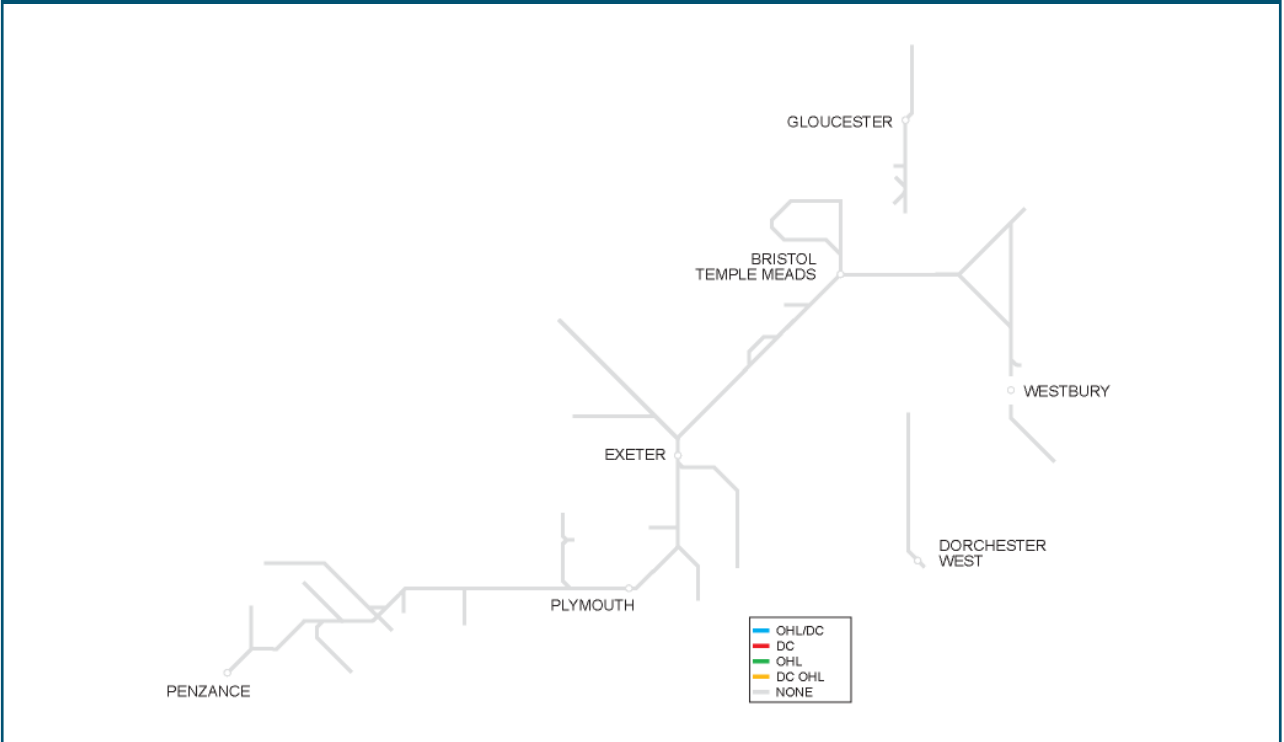


Figure 7 Route availability

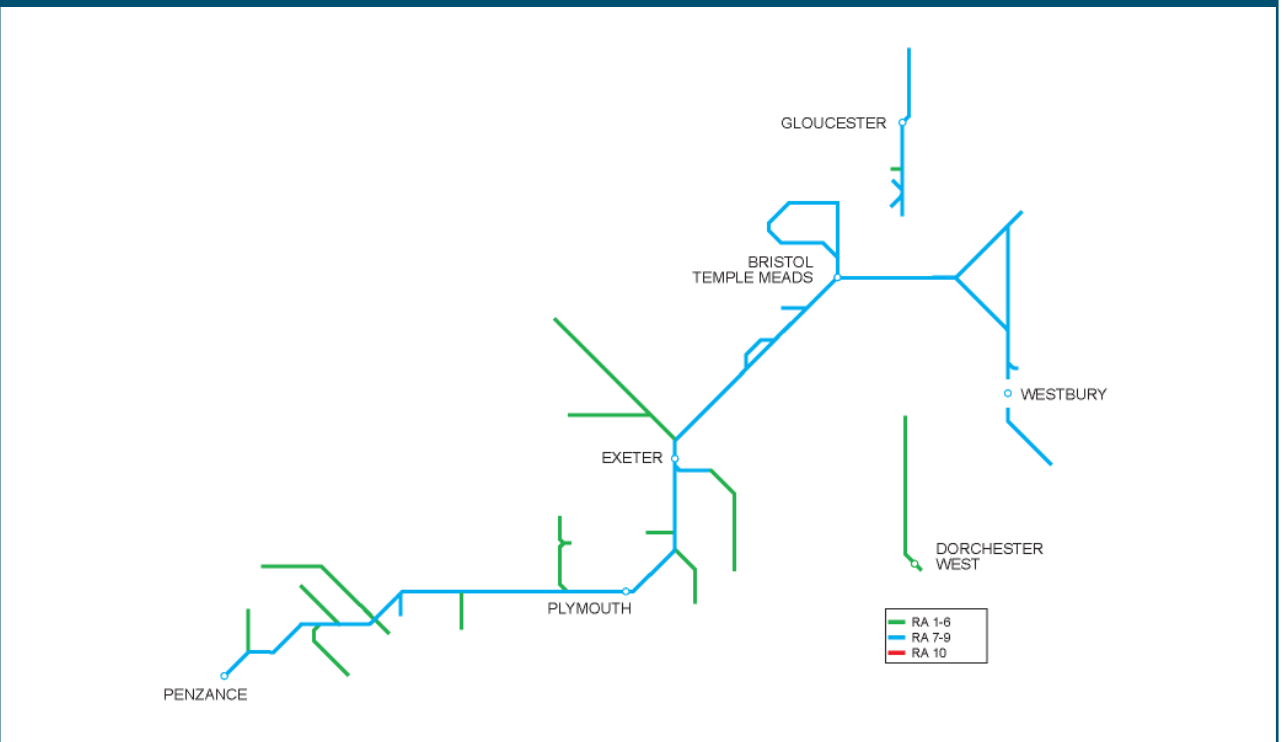
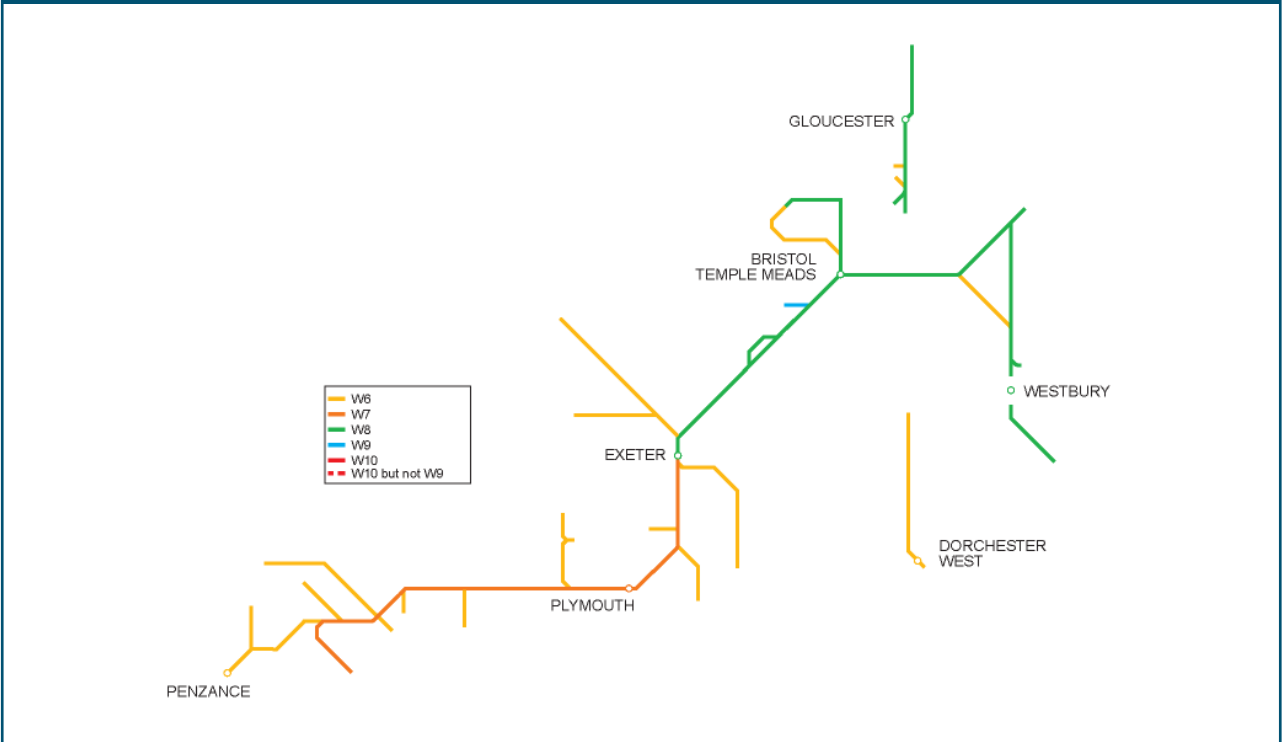


Figure 8 Gauge



Current capacity

Practically all of the main line part of the route from the boundary with the West Midlands to Penzance is double track which offers adequate capacity. The most highly utilised part is that between Bristol Parkway (on Route J) and Bristol Temple Meads on Filton Bank where long distance services mesh with regional cross country and suburban services.

The single track loop line through Weston-super-Mare station slightly restricts pathing opportunities, which are further exacerbated when peak hour turnrounds of London to Bristol services (a few of which are extended to Weston-super-Mare) take place in the station passing loop.

The recently-completed upgrading of the tracks west of Taunton station, together with the earlier restoration of the two island platform faces, has materially eased this former pinch point.

The single track Devon branches run at or close to capacity, as dictated by passing loop provision, whilst the Cornish branches, except those to St Ives and to Falmouth, operate somewhat less intensely. In the case of the St Ives branch, utilisation has been increased to the maximum possible level as a result of the Community Rail initiative. More recently the construction of a new passing loop at Penryn enabled frequencies between Truro and Falmouth to be doubled.

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 cannot be maximised due to the mix of non-stop passenger and freight services with local services that call at lightly used stations.

Service improvements on the Severn Beach branch line, with the introduction of more frequent trains to Avonmouth during 2009, have significantly intensified capacity utilisation of the Clifton Down line.

The variance in linespeeds on the route between Barnstaple and Westerleigh Junction is due to age related condition of the permanent way and track curvature, which restricts the ability to improve service provision on this key passenger and freight corridor.

Figure 9 shows the current train service level in key sections of the route.

Current performance

The last two years have seen a solid improvement in performance on the route, with reductions in delays and improvements in punctuality for all operators. As a result of the Temporary Speed Restriction reduction strategy and continuing volumes of track renewals, track delays in particular have been significantly improved.

Challenges remain in terms of the volume of reactionary delay, due to incoming late-running services onto a largely two track railway with little opportunity to regulate services, although the spring 2009 creation of a new Integrated Control Centre in Swindon, designed around optimising communications flows, has helped to improve incident management.

Figure 10 shows the forecast 2009/10 Public Performance Measure (PPM) for the main operators on the route.

All operators continue to build on the improvements of previous years to reach improved levels of

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

Route Section	Number of trains
Stoke Works Junction – Gloucester	8
Bristol Temple Meads – Taunton	6
Exmouth branch (Devon)	2
Totnes to Plymouth	3
Falmouth branch (Cornwall)	2

Figure 10 2009/10 PPM

TOC	Forecast MAA	As at period
First Great Western	92.2%	11
CrossCountry	90.4%	11
South West Trains	92.6%	11
Arriva Trains Wales	94.7%	11

performance. Arriva Trains Wales forecast PPM is 94.7 percent, ahead of their target of 93.0 percent PPM MAA, in spite of service disruption due to cable theft in the South Wales area.

First Great Western's PPM MAA is forecast to be 92.2 percent, ahead of the target of 92.0 percent. In two years, FGW's PPM has improved by almost nine percentage points, reflecting the benefits of improvements in Network Rail's infrastructure and operations, and a reduction in delay caused to themselves.

CrossCountry's PPM also continues to improve, despite the challenges of operating across the country, and the capacity constraints and pinch-points encountered.

Section 2: Tomorrow's railway: requirements

HLOS output requirements

Figure 11 below shows the HLOS output requirement for the total demand to be accommodated on the former strategic routes which make up Route K: West of England.

Figure 11 Total demand to be accommodated by Strategic Route		
Routes	Annual passenger km (millions) in 2008/09	Additional passenger km (millions) to be accommodated by 2013/14
GWML	4,327	637
Reading – Penzance	1,178	158
Wessex Routes	431	58

Future demand in CP4

Demand for passenger traffic from the south west to London and to the Midlands and beyond is forecast to grow, as is holiday traffic to Devon and Cornwall. Key to this is the business need for connectivity to London and the south east, including Heathrow Airport, with journey times from key centres such as Taunton in under two hours, Exeter under two and a half hours and under three hours from Plymouth.

Demand for cross country travel from the south west to the Midlands and North is also on the increase and is expected to continue. Demand has been particularly strong in the evening peak, on Fridays and throughout the weekend, with Sundays being CrossCountry's second busiest day of the week.

Recent growth in demand on the Cardiff to Bristol and Portsmouth regional cross country services has necessitated the strengthening of two-car trains to become three-car trains. The GW RUS predicts continuing growth and recommends the provision of further additional vehicles on these and certain Bristol – Weymouth services in order to make more seating capacity available between Bristol, Bath, Bradford-on-Avon and Trowbridge. Some alterations to stopping patterns are also envisaged, so as to speed up longer journeys, by the addition of extra stopping trains in peak hours for the intermediate stations.

The Government's White Paper 'Delivering a Sustainable Railway' published in July 2007 proposes a continuation of the Community Rail Development Strategy. This aims to improve long-term sustainability on local and rural lines by encouraging demand growth and managing costs down. With the exception of the Exmouth and Paignton branches, all branch lines in Devon and Cornwall have either a line or service designation, therefore demand on these lines will be strongly influenced by their respective local rail partnerships.

The Freight RUS was published in March 2007 and established by the Office of Rail Regulation in May 2007. A key input to the strategy was a set of ten-year demand forecasts that were developed and agreed by the industry through the RUS Stakeholder Management Group.

The forecasts indicate that the majority of freight growth will be likely to be in the movement of power station coal from the Port of Bristol, of which a substantial proportion is destined for destinations such as Rugeley, and further north.

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.

Capacity analysis carried out by the GW RUS shows sufficient supply to cater for forecasted growth on the current Long Distance High Speed (LDHS) services with introduction of higher-capacity Super Express Trains running to an enhanced timetable structure from 2016/17 onwards.

Significant growth is predicted to 2019 on flows between the Great Western RUS area and south Wales and between the Great Western RUS area and the west midlands. All day passenger demand in this market is predicted to grow by over 30 percent between 2008 and 2019. The greatest growth is expected between Bristol and south Wales at 35 percent, followed by a 32 percent growth predicted between Bristol and the west midlands.

Major residential and commercial developments to the north and south of Bristol, at Yate/Stoke Gifford and Weston-super-Mare/Worle, along with substantial city centre development within walking distance of Bristol Temple Meads station have increased commuting by rail across the city.

Demand for cross country travel is also on the increase. Between Bristol and Birmingham 36 percent growth in unconstrained demand is forecast by 2016 and 63 percent by 2026.

Looking further ahead the Network RUS considered demand forecasts to 2036, under a number of different scenarios. Between Bristol and Plymouth a minimum of 67 percent growth is predicted, and 65 percent between London and Plymouth.

Locally within Cornwall continued growth is expected to accompany the greatly improved services between Truro and Falmouth, and the announcement of an eco-town development around St Austell is expected to proactively stimulate rail demand if substantial new housing is linked to a new station near Burngullow.

The Governments' 2007 Rail White Paper predicts a doubling of freight demand over the next thirty years. Forecasts of freight demand in the longer term have been agreed with the industry. These continue growth beyond the period of the Freight RUS. In the west of England this is mainly expected to materialise as long distance flows of power station coal, from either the Royal Portbury Dock or through the Avonmouth bulk-handling terminal.

Section 3: Tomorrow's railway: strategy

Figure 12 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 current capacity of the route will allow the total additional passenger KM to be accommodated.

Figure 12 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
2010/11	Introduction of additional vehicles for cross-Bristol peak services		Additional seats for cross-Bristol services in three hour peak to meet forecast demand, with the load factor reduced to 49 percent
2013/14		Bart Green to Westerleigh Junction linespeed increase	Improved reliability and additional capacity and journey time savings between the South West and the Midlands

Strategic direction

The South West Regional Assembly's draft revised Regional Spatial Strategy (RSS) covers the period up to 2026. This focuses on the development of a corridor management approach for corridors of both national and regional importance. Along these corridors, measures will be taken to improve the reliability and resilience of journey times, develop opportunities to facilitate modal shift, and support the growth of key cities and towns.

The Department for Transport's South West and Thames Valley RPAs evaluate rail traffic and infrastructure needs for the next twenty years. The RPAs identify that maintaining and improving connectivity within the 'Western Corridor' of the South East, within the South West region and as well as to the rest of the UK from both regions is important for each region's future economic vitality. They also recognise that increasing road congestion will raise rail competitiveness, and that limited car parking capacity creates access issues.

The Government's White Paper 'Delivering a Sustainable Railway', published in July 2007, proposes a hierarchy of solutions for each route to seek ways of increasing capacity:

- maximise the efficient use of existing rail assets by increasing service frequency
- lengthening existing train services
- enhance infrastructure to improve both frequency and capacity
- simplify service patterns
- make step-changes in infrastructure.

Further interventions on the GWML, such as Intercity Express Programme (IEP) and European Rail Traffic Management System (ERTMS) towards the end of CP4 (2009 – 2014) and in CP5 (2014 – 2019) will have a major impact on the development of the route during their construction and implementation. The challenge will be to minimise disruption to our customers during this period.

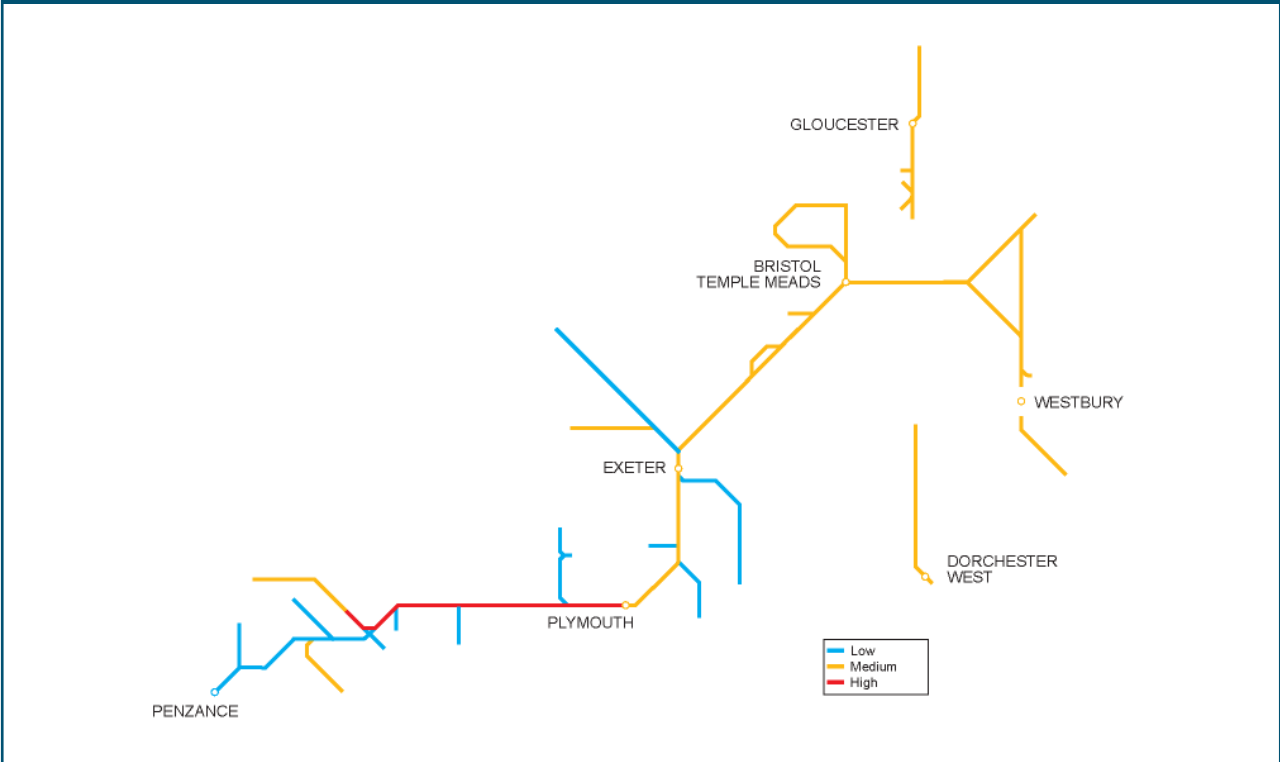
Introduction of the Intercity Express Programme (IEP), replacing the current fleet of High Speed Trains in 2016/17 will bring a substantial increase in passenger carrying capacity through the proposed longer formations. Infrastructure enhancement, such as platform extensions and realignment, will be required at certain locations to accommodate these much longer wheel-base vehicles. However, selective door operation is an option for certain key locations where platform extensions may not be viable. Diesel operation is expected to continue for the CP4 period.

The phased implementation of European Rail Traffic Management System (ERTMS), an in-cab system supported by the GSM-R radio network replaces the need for fixed lineside equipment. ERTMS will be a key enabler for the future railway by supporting capacity enhancement schemes, providing greater operational and maintenance flexibility, less-invasive renewals and enhancements, and cross-industry cost savings.

The Network RUS for Electrification was published in October 2009, and confirmed that electrification of the Great Western Main Line was to be introduced by 2016 – 2017. For the west of England route this will involve wiring the route from Wootton Bassett (west of Swindon on the GWML between London Paddington and south Wales, routes J and L) to Bath and Bristol Temple Meads, and between Bristol Parkway and Bristol Temple Meads, such that electrically-powered Super Express Trains will replace the existing diesel units operating between London Paddington and Bristol.

For the remainder of the west of England, bi-mode Super Express Trains will replace the existing diesel units operating between London Paddington and Plymouth and Penzance, running under electric power between London and Newbury and under diesel power west thereof. Similarly bi-mode Super Express Trains will replace the existing diesel units operating between London Paddington and Weston-super-Mare, Taunton, Exeter and Plymouth via Swindon, running under electric power between London and Bristol.

Figure 13 Tonnage growth



Future train service proposals

Figure 13 indicates the forecast percentage change in tonnage to 2019.

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

The Freight RUS highlights the potential development at the Port of Bristol allied to a predicted 60 percent increase in import coal trains from the port for the electricity supply industry. Other potential freight developments include Bristol Cabot Park.

The GW RUS recommends continued development of cross-Bristol services, to provide more seats on the Avonmouth branch in combination with a linkage between this corridor and Bath, subject to completion of a minor signalling upgrade to reduce headways on eastbound trains between Bristol and Bath.

The GW RUS further recommends development of cross-Exeter services operated by FGW, to provide clockface frequencies at increased intervals between Exeter St Davids and Paignton, in combination with linking these to Exeter St James Park, whilst retaining half hourly Exmouth branch line operation and providing connectivity within Exeter focussed on Exeter Central station. Within such a revised structure the hourly linkage between

Exmouth and Barnstaple would be retained alongside the newly-established SWT hourly London Waterloo to Exeter St Davids service. This is envisaged as possibly starting up by 2016.

The GW RUS also recommends development of the proposal to introduce a West Wiltshire shuttle operation, to run between Westbury and Swindon directly so as to serve Melksham more frequently, and establish a regular rail link between the county town of Trowbridge and Chippenham on the Great Western Main Line. The GW RUS notes that further demand forecasting work on this proposal is necessary.

Future capability

Our strategy to improve the capability and performance of the route is to develop it as a core route to facilitate the introduction of Intercity Express Programme (IEP) on London to west of England services from 2016/17.

Network Rail has developed the National Stations Improvement Programme (NSIP); a national programme for station improvements and car park expansion, for enhancements and improvements of stations in CP4. Stations on the route identified for modernisation as part of the Government's £150m funding initiative are Cheltenham Spa, Gloucester, Chippenham, Exeter St Davids, Truro and Penzance.

The Department for Transport's Access for All programme also targets improvements to station access at a number of locations. St Erth is included in the current programme.

The trial of a prototype low cost platform height extension is currently taking place at various locations on the national rail network. Depending on the outcome of these trials, it may be possible to apply this to some of the platforms on the route with very low platform heights.

We are developing options to reduce journey times and improve performance between the key business centres of Bristol and Birmingham. This will be achieved by increasing the linespeed to a more uniform 100mph, where feasible, between Westerleigh Junction and Barnt Green. This would also reduce acceleration and braking requirements. We shall be exploiting the benefits from High Output equipment to deliver elements of the track improvements, which are planned between 2010 and 2012.

To the south of Bristol the GW RUS recommends linespeed raising on the main line to Bridgwater, to 125mph.

A joint aspiration of the North Somerset and Bristol City Councils is for the introduction of passenger services between Portishead and Bristol Temple Meads using the existing freight-only line between Parson Street Junction and the Royal Portbury Dock, and sharing the main lines between Bristol Temple Meads and Parson Street Junction. A short piece of the former route from Portbury into the town of Portishead would need to be reconstructed, and a new junction created. Funding for this scheme is sought for possible CP5 implementation.

Consideration is being given to gauge enhancement over the section between Salisbury, Westbury and Melksham, for Southampton – West Coast Main Line traffic as a diversionary route in addition to the Eastleigh and Laverstock (east of Salisbury) alternative to the South Western main line route through Winchester.

Future capacity

On the route itself we believe that the solution to passenger growth and future capacity requirements could be achieved by a combination of initiatives. These include train lengthening on some CrossCountry services supported by platform lengthening where appropriate; changes to the timetable structure to reduce the mix of different train types and the number of conflicting moves; and upgrading linespeeds where appropriate to deliver improved journey times. The GW RUS recommends lengthening of some Newcastle to Plymouth and Manchester to Paignton services over the period until 2019, subject to rolling stock availability.

In order to improve reliability and capacity between Swindon and Bristol Temple Meads we plan to shorten the signal spacing through the Bath Spa station area.

The reinstatement of the four track railway between Bristol Dr Day's Junction and Filton Abbey Wood would increase capacity by better separation of traffic flows between Bristol and South Wales and Bristol and the north/London via Bristol Parkway. This would also further enhance cross-Bristol capacity, and provide valuable Seven Day Railway benefits to both passenger and freight services. In addition this would permit alterations to stopping patterns at the intermediate stations closer to the city centre, at Lawrence Hill and Stapleton Road generally served by Avonmouth line services. This is a recommendation of the GW RUS.

Future performance

Network Rail's CP4 Delivery Plan set out the high-level performance aspirations for each operator, as summarised in Figure 14.

In planning to achieve these targets, Network Rail is implementing a multi-tiered approach to performance improvement, combining high-level strategic initiatives with local, tactical improvements to performance. Freight operators also require improved access.

The key strategic action for 2010 is the widespread installation of remote condition monitoring to points. This technology is a key enabler to the delivery of an intelligent infrastructure and will deliver both performance improvements and maintenance efficiencies through moving away from "fix on failure" to "predict and prevent". The remote condition monitoring equipment will automatically alert control teams and technicians of adverse conditions, enabling asset response staff to attend to equipment without delay to trains. Rollout will be throughout 2010/11, and is being carried out on a priority basis according to the potential performance impact of failure at key sets of points.

This is the main strategic thrust towards an increased focus on core asset reliability, which will also include a number of local improvements, both in terms of physical changes to assets and also in terms of enhanced staff training and sharing of best practice.

The long signalling section between Warminster and Salisbury hinders effective regulation at Wilton Junction, and in the absence of any signalling renewal works we are seeking alternative methods of giving better visibility to assist with presentation of trains to the Wessex route between Exeter and Salisbury.

In addition, the following key improvements will deliver a benefit to operators on the route:

- anti-cable theft mitigations at high-risk locations on the route
- installation of additional points heating, and upgrades to existing points heating in locations in Devon, Bristol and Gloucestershire
- reliability improvements to critical points in Gloucestershire and Somerset
- a series of actions to reduce both the impact and number of railway suicides, through a range of physical initiatives at stations, and work with the Samaritans to train station staff to engage with vulnerable individuals
- implementation of a comprehensive vegetation management strategy to improve performance during the autumn leaf-fall season
- a targeted programme of drainage improvements at key vulnerable locations.

Figure 14 Forecast PPM MAA – CP4 plan

	2010/11	2011/12	2012/13	2013/14
First Great Western	91.3%	92.2%	92.7%	93.0%
CrossCountry	90.2%	90.6%	90.9%	91.3%
South West Trains	92.5%	92.8%	93.1%	93.3%
Arriva Trains Wales	92.9%	93.2%	93.4%	93.5%

Network availability

Engineering access on this route varies from being fairly restrictive on the main line to reasonably available on the branches. In many areas access is available on overnight possessions with consent from affected operators. Wherever possible, possessions are managed to ensure that a route is available to the west. The main considerations include no concurrent possessions from Southcote Junction to Exeter, or Bristol to Cogload Junction and Bathampton Junction to Bristol, or Bathampton Junction to Westbury. In addition there are restrictions on Friday night possessions throughout the summer to cater for the holiday market.

A different approach to heavy maintenance of the numerous West of England branches has been developed where workload requirements are such as to warrant extended midweek possessions (blockades) and bus substitution by agreement with the operator First Great Western. This current policy will continue in Devon and Cornwall timed mainly to meet school holiday periods when loading is reduced. On the Torbay line work is mainly carried out during school half term holidays. On the Gunnislake line work is mainly carried out during the Easter holiday period when commuter numbers are low.

Track renewals will continue on the Bristol to Exeter route, primarily to the south of Taunton, and on the Berks and Hants route. This will be achieved through a combination of weekend and midweek possessions and continuous use of the High Output Track Renewals system in order to achieve the outputs required for renewal of the ballast and track. The system will require overnight single line working of sections of route with diversions of overnight services and stock moves. Conventional renewal will apply where operational restrictions (e.g. level crossings, stations and junctions) prevent the use of High Output Track Renewals.

When a closure is necessitated between Taunton and Exeter diversions of trains between Bristol and the west of England may be arranged via Bath, Westbury and Yeovil although the long stretches of single track south of Castle Cary restrict pathing flexibility.

Network Rail's High Output equipment is currently based at Taunton Fairwater Yard to allow rapid and frequent transit to the renewal sites on the route.

Freight operators wish to maintain their existing level of operation on weekdays, and improve the scope to operate services at weekends.

Long term opportunities and challenges

The phased introduction of IEP from 2016 will provide additional seating capacity through the proposed longer formations. Selective door operation is an option for certain key locations where platform extensions may not be viable.

The phased implementation of ERTMS will deliver reliability, capacity and capability improvement opportunities throughout the route.

Future expansion of electrification over the route would deliver significant performance and environmental improvements.

DaSTS

The Department for Transport published its formal consultation document Delivering a Sustainable Transport System (DaSTS) in November 2008. It sets out long term transport priorities for the period to 2019 and beyond and reflects conclusions from the Eddington Study and the Stern review. The document sets out five clear transport goals for the network these are:

- to support national economic competitiveness and growth by delivering reliable and efficient transport networks
- to reduce transports emissions of carbon dioxide (CO₂) and other greenhouse gasses, with the desired outcome of tackling climate change
- to contribute to better safety and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health
- to promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society
- to improve quality of life for transport users and non transport users, and to promote a healthy natural environment.

Rail has potential to help meet these objectives and Network Rail will continue to engage with the Regions and Local Authorities at all levels of the process. In stage one each Region was invited to propose a number of strategically relevant studies to take forward which they believe will meet the DaSTS objectives. The DfT then selected the studies that would progress into stage two to generate options for appropriate interventions. All studies are currently in stage two and need to produce a long list of options by the end of March 2010 for further review. Stage three will involve the sifting and packaging of options, while stage four

will see the completion of an overall programme, with all studies complete by 2012.

As part of the DaSTS programme there are both National and Regional studies, the national studies are led by the DfT and the local studies are led by the Regions. There are a number of joint studies with the involvement of both the DfT and the Regions.

There is a national **Freight Modal Choice** study looking to confirm the economic, social and environmental benefits of current freight movements by non-road modes on national network corridors and to identify where changes in future modal choice, from road to rail or water, could address issues on the network and deliver against the five DaSTS goals. This includes consideration of the capacity and capability of the national infrastructure to accommodate these changes in modal choice.

On this route the studies that may affect long term opportunities and challenges are:

- Gloucester and Cheltenham Transport Links
- South Bristol Accessibility and Regeneration Study
- West of England Transport Carbon Emissions Study
- West of England Motorway and local network interaction study
- Taunton Gateway Study
- Exeter and Far South West Gateway.

Infrastructure investment in CP4

Figure 15 Infrastructure investment in CP4 (formerly Proposed enhancements in CP4)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010/11	(A) Earthworks renewals	Embankments renewals at Dauntsey Bowds Farm and Eckington	Renewal	Network Rail	Various
2010/11	(B) Telecoms renewals	CIS, PA and CCTV renewals at Exeter St Davids and Plymouth	Renewal	Network Rail	Various
2010/11	(C) Track renewals	S&C renewals at Thingley Junction, Stoke Gifford Junction, Tavistock Junction and Keyham	Renewal	Network Rail	Various
2010 – 13	(D) Structures renewal	Structures renewal at Royal Albert Bridge	Renewal	Network Rail	5
2011/12	(E) Earthworks renewals	Embankments renewals at Westbury East and Berkeley South	Renewal	Network Rail	Various
2011/12	(F) Telecoms renewals	CIS, PA and CCTV renewals at Bristol Temple Meads	Renewal	Network Rail	2
2011/12	(G) Track renewals	S&C renewals at Bathampton crossover, Dr Days Junction, Barnwood Junction, Taunton and Topsham	Renewal	Network Rail	Various
2012/13	(H) Track renewals	S&C renewals at Ashchurch, Tiverton, Paignton carriage, Aish, Hemerdon, Plymouth East, Saltash and Roskear Junction	Renewal	Network Rail	Various
2013/14	(I) Westerleigh Junction – Barnt Green line upgrade	Options for linespeed increases up to 100mph	Improved reliability and additional capacity and journey time savings between Bristol and Birmingham	Periodic Review 2008	3

NRDF candidate schemes in CP4

Figure 16 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010/11	Ⓧ Bath Spa capacity enhancement	Repositioning of signals	Improved reliability, additional capacity and reduced platform reoccupation times. Facilitates enhanced cross-Bristol service	Network Rail Discretionary Fund	4

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

Renewals activity

Figure 17 shows the estimated renewal 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 17 Summary of estimated renewals costs and activity volumes

£m (2010/11 prices)	2010/11	2011/12	2012/13	2013/14
Renewals				
Track	109	80	64	68
Signalling	19	16	32	52
Civils	18	24	18	9
Operational property	13	11	8	7
Electrification	-	-	-	-
Telecoms	-	0	-	-
Total renewals	160	130	123	136
Renewals volumes				
Track				
Rail (km)	135	80	100	101
Sleepers (km)	110	75	87	88
Ballast (km)	88	96	78	79
S&C (equivalent units)	11	25	12	12
Signalling				
Conventional (SEU)	0	0	0	0
ERTMS (SEU)	0	0	0	0
Level crossings (no)	2	6	0	7

Appendix

Figure 18 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, 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
K.01	Bristol Temple Meads – Exeter St Davids	MLN1	Primary	DfT	No	W8	8	100	none	TCB	4	2
K.02	Exeter St Davids – Plymouth	MLN1	Primary	DfT	No	W7	8	60	none	TCB	4,6	2
K.03	Plymouth – Penzance	MLN2, MLN3, MLN4	Secondary	DfT	No	W7, W6A	8,7	65	none	Mech.	(AB)	2
K.04	Salisbury – Bathampton/Thingley Junction	SAL,WEY, WYL,BFB	Secondary	DfT	No	W8 (W7)	8	60-70	None	TCB	5-6	1 and 2
K.05	Castle Cary – Dorchester	WEY	Rural	DfT	Yes	W6	6 (8)	75	None	Various	14	1
K.06	Exeter – Exmouth Junction	BAE	Secondary	DfT	No	W6A	6	70	none	TCB	3	2
K.07	Paignton Branch	TOR	Secondary	DfT	No	W6A	6	40	none	TCB	7	2
K.08	Barnstaple Branch	DAC, NDN	Rural	DfT	Yes	W6A	6,5	55	none	OTW	(AB)	1
K.09	St Ives Branch	SIV	Rural	DfT	Yes	W6A	5	30	none	OTW	(AB)	1
K.10	Looe Branch	LIL, LOO	Rural	DfT	Yes	W6A	4	25	none	OTW	(AB)	1
K.11	Exmouth Branch	EMT	Rural	DfT	No	W6A	6	50	none	OTW	(AB)	1
K.12	Falmouth Docks Branch	FAL	Rural	DfT	Yes	W7	6	50	none	OTW	(AB)	1

Figure 18 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, 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
K.13	Newquay Branch	NEW	Rural	DfT	Yes	W6A	6	50	none	OTW	(AB)	1
K.14	Gunnislake Branch	DAC, CAL	Rural	DfT	Yes	W6A	4	55	none	OTW	(AB)	1
K.15	Swindon (via Bath Spa) – Bristol Temple Meads	MLN1	Primary	DfT	No	W8	8	100	none	TCB	4	2
K.16	Bristol – Birmingham Line	BSW, FEC, YAT, BGL2, CHL, BAG2	Primary	DfT	No	W8	8	100	none	TCB	4	2
K.17	Weston-super-Mare Loop	WSM	Secondary	DfT	No	W8	8	90	none	TCB	4	1
K.18	Severn Beach Branch	CNX, AMB	Rural	DfT	Yes	W6A	7	60	none	OTW	(AB)	1
K.98	Freight trunk routes			DfT	No				none			
K.99	Other freight lines			DfT	No				none			

Capacity and operational constraints

- A Westerleigh Junction – Bristol Parkway: two track section on highly utilised converging route

- B 5 AHB level crossings north of Cheltenham restrict linespeed to 100mph

- C Weston-super-Mare loop: single line restricts capacity and flexibility

- D Dorchester West – Castle Cary: single line sections prevent significant increases in train service frequency

- E Signalling headways between Newton Abbot and Plymouth

- F Royal Albert Bridge: single line section linking Devon and Cornwall

- G St Pinnock and East Largin viaducts: single line sections

Other Issues on Route

- 1 Somerset Levels – flooding

- 2 Flood plain to the north of Exeter requires constant monitoring

- 3 Dawlish Sea Wall defences require constant monitoring and enhanced maintenance

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