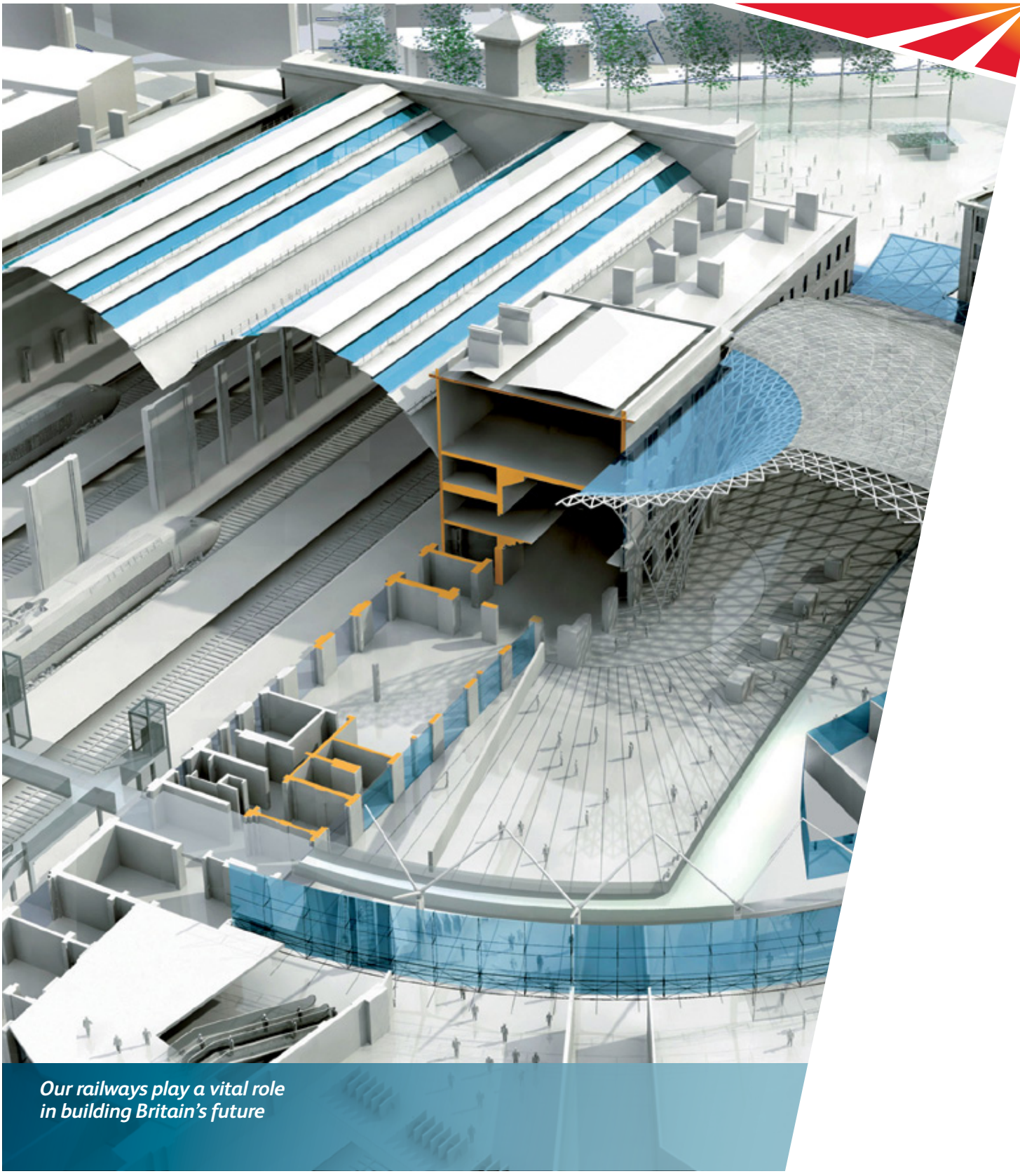
Moving ahead
Planning tomorrow's railways

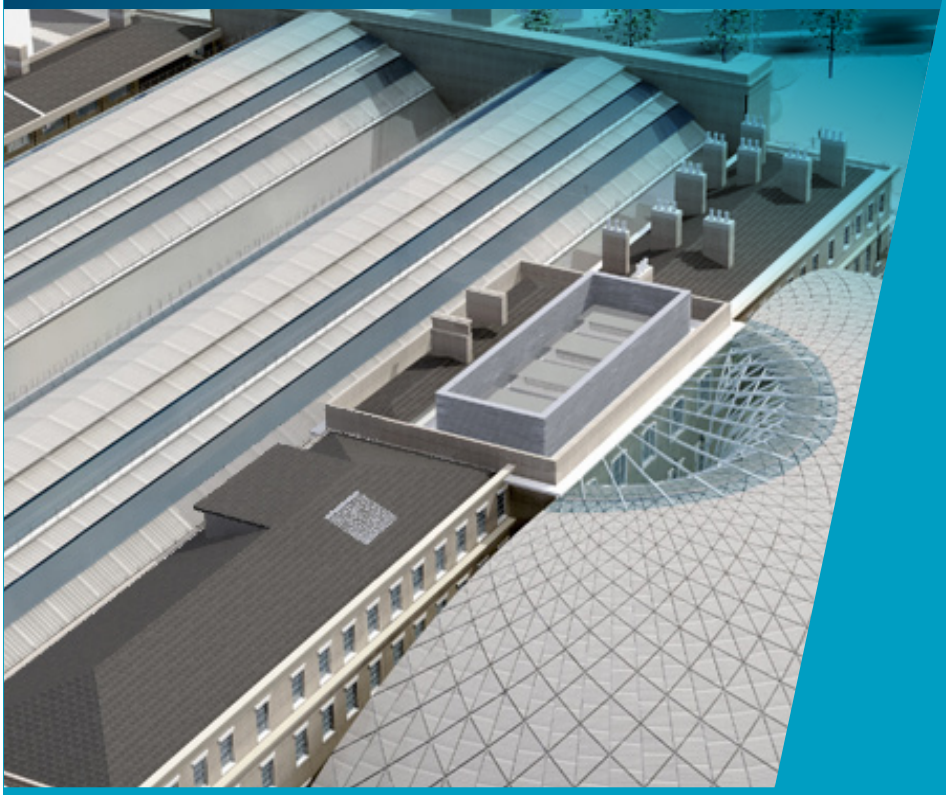
NetworkRail



Our railways play a vital role in building Britain's future

Planning tomorrow's railways

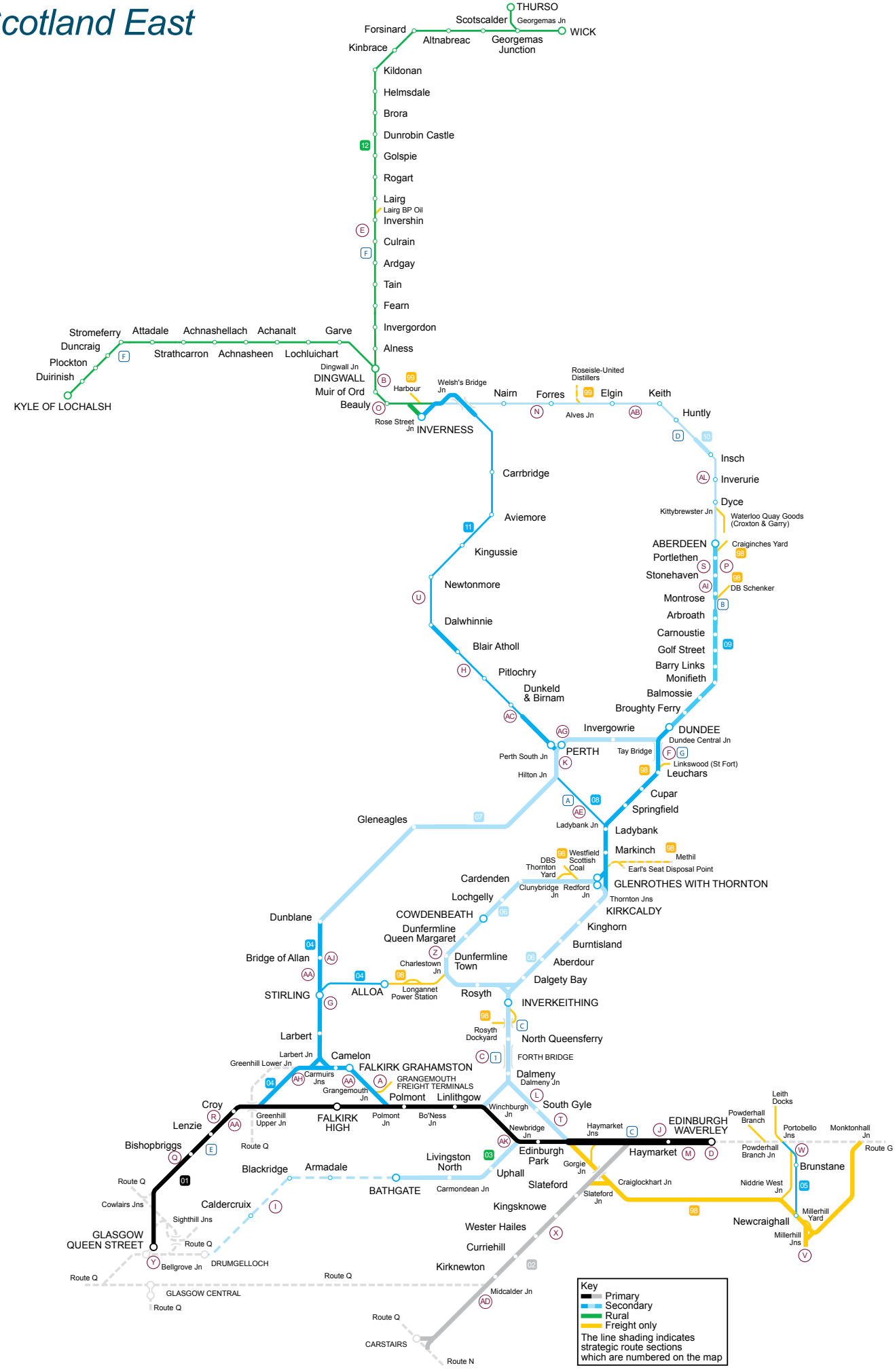
Our £500 million investment in King's Cross station will transform the experience of passengers using the station. We are delivering hundreds of projects across the network to build a bigger, better railway for passengers, freight and the whole of Britain.



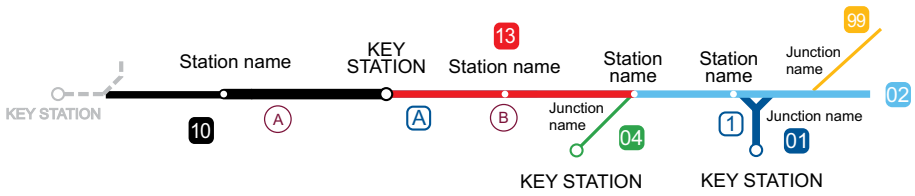
Route Plan P

Scotland East

Route Plan P
Scotland East



Key to route diagrams



Capacity and operational constraints

Location: capacity or operational constraint

Issues on the route

Location: issue on the route

Key planned projects

Location: planned project on the route

Strategic route sections

Listed in the appendix of the route plan

Other symbols

Key station location

KEY STATION — Key station on this route

KEY STATION — Key station on another route

Other station location

Station name — Other station on this route

Junction name — Junction / other landmark

Track descriptions

The colour of the line denotes the route classification

- 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 Scotland East Route serves three principal passenger markets; fast, frequent inter-urban services, commuting and rural. It connects Scotland's principal cities of Glasgow, Edinburgh, Perth, Dundee, Aberdeen and Inverness and includes the link between Edinburgh and the east of Scotland to the West Coast Main Line at Carstairs. It also encompasses the significant suburban networks that radiate around Edinburgh and around the north-east of Glasgow, the remainder of the Glasgow suburban network and the West Highland network being covered by Route Q.

The Highlands area serves a large number of rural communities across the North of Scotland, providing access to the social and commercial facilities of the major towns of Inverness, Wick and Thurso. These towns also serve as significant transport interchanges with buses and, in some cases, shipping services to the Scottish island communities. Tourism plays a major role in the Highland economy, and these scenic rail lines are well patronised in the summer months by domestic and foreign tourists.

The route also serves a number of freight terminals, the most significant of which are Longannet Power Station, the growing hub at Grangemouth and a Marshalling Yard at Millerhill together with various locations in the Aberdeen and Inverness areas.

The Route Utilisation Strategy (RUS) was published in 2007 and it is currently being updated based on subsequent changes. This will be published in 2010 as a Second Generation RUS and will be based on the most up to date information available.

Today's route

The principal elements of the Scotland East Route are described below. The relevant Strategic Route Sections are in brackets. The lines are between:

- Glasgow Queen Street and Edinburgh Waverley via Falkirk (P.01)
- Haymarket East Junction and Carstairs (P.02)
- Edinburgh and Drumgelloch (P.03)
- Dunblane / Alloa and Polmont Jn / Greenhill Upper Jn (P.04)
- Newcraighall and Portobello Jn (P.05)
- Fife Loop (P.06)
- Dundee and Dunblane (P.07)
- Dundee / Perth and Thornton Jcns (P.08)
- Dundee and Aberdeen (P.09)
- Aberdeen and Inverness (P.10)
- Perth and Inverness (P.11)
- Far North & Kyle (P.12)
- Freight Trunk Routes (P.98)
- other Freight Lines (P.99).

Current passenger and freight demand

Analysis was undertaken for the Scotland Route Utilisation Strategy (RUS) which reported on current daily passenger numbers on a number of geographically aggregated sectors. The information has been updated based on the most recently available data to give current daily passenger numbers using principal stations as shown in Figure 1.

For further information, see the published Scotland Route Utilisation Strategy at www.networkrail.co.uk.

The current peak hour load factors identified in the RUS on individual service groups have been reviewed as part of the Second Generation RUS work averaged over the three hour morning peak. The load factors for services that operate on this route are detailed in Figure 2, again updated based on the most recently available data.

There is significant and growing demand for commuter services from the surrounding areas into Edinburgh.

The economies of Edinburgh and Glasgow, Scotland's two major cities, are becoming increasingly interlinked. The fast, frequent inter-urban service between Edinburgh and Glasgow Queen St plays an important role in connecting these centres. Rail journey times on this corridor are extremely competitive due to the increasing levels of road congestion around the two major conurbations. On the other inter-urban corridors road journey times can be as fast or faster than rail journey times as a consequence of major investment that has been carried out on the A9 and A90.

The rail network has a much lower market share for commuter services in the cities on this route away from the Central Belt due to its poor penetration of their suburbs with consequently less impact on train loadings.

Outwith the central belt the major population centres on the route have experienced modest population growth in recent years. The exception to this is Inverness where significant growth has occurred. This has been assisted by the relocation of several public bodies, principally Scottish Natural Heritage and Forest Enterprise Scotland. However, this growth has been achieved partly at the expense of the hinterlands where there has been a steady

Figure 1 Current passenger numbers

Station	Daily trips
Aberdeen	8,229
Bathgate	2,063
Edinburgh & Haymarket	61,983
Glasgow Queen Street	51,285
Inverkeithing	3,168
Perth	2,671
Inverness	3,342
Stirling	6,819

Figure 2 Peak loading

Service	Load Factor
Stirling to Glasgow	68%
Glasgow to Edinburgh via Falkirk	57%
Fife (Local) to Edinburgh	70%
Stirling to Edinburgh	82%
Fife (Inter-Urban) to Edinburgh	68%
Edinburgh to Glasgow via Falkirk	56%
Glasgow to Edinburgh via Shotts	**
Bathgate to Edinburgh	63%
North Berwick to Edinburgh	85%
Newcraighall to Edinburgh	37%

** Updated information not available due to introduction of new service in Dec '09

structural trend of de-population from the rural areas in the Highlands.

There are wide seasonal variances in traffic volumes on the Highland lines. This is addressed by strengthening of train formations in the peak summer months.

Freight traffic on the route is dominated by the coal traffic from Ayrshire, particularly Hunterston Deep Water Port, to Longannet and Cockenzie power stations which accounts for around four million tonnes per year. Following the introduction of limits for sulphur dioxide emissions which can only be met by the use of imported and indigenous low sulphur coal, most of the Longannet power station's coal requirements are now fed by rail. This traffic, routed via Glasgow, Stirling and Alloa, crosses some capacity constrained sections on the route.

Other significant freight flows on the route are the Intermodal and Cement traffic to Aberdeen and Inverness, and fuel products from Grangemouth. The EU's Working Time Directive and increased fuel costs have improved rail's competitive position relative to road particularly for time-sensitive longer distance intermodal flows. Grangemouth has emerged as a significant freight handling location, with growing Anglo-Scottish and domestic traffic.

The section of the route from Inverness to Perth continues to see healthy levels of freight, and the industry has seen increases in rail borne freight between Inverness and the central belt of Scotland making use of the freight terminal recently opened in Inverness at Needlefield Yard.

Current services

Figure 3 shows the number of trains per day on various sample sections of the route.

Figure 3 Current train service level (trains per day)

Route section	No. of trains per day
Glasgow Queen Street to Edinburgh	62
Glasgow Queen Street to Dundee	15
Glasgow Queen Street to Stirling (Local)	34
Edinburgh to Dundee	33
Edinburgh to Perth	20
Edinburgh to Fife (local)	58
Edinburgh to Stirling (Local)	33
Edinburgh to Bathgate	31
Edinburgh to Inverness	7
Inverness to Dingwall	11
Inverness to Perth	10
Inverness to Elgin	11
Aberdeen to Inverness	11
Aberdeen to Inverurie	10

The Scotland East network carries mixed traffic, with a significant range of speed, acceleration and train stopping patterns. On many corridors this involves a complex mix of freight, urban, and inter-urban services with speeds up to 100 mph. There is little traffic segregation on the main corridors. As the route is predominantly two track, this leads to high levels of utilisation, imposing constraints on the timetable. Several sections of the route particularly around Edinburgh, are operating at or close to capacity.

The principal passenger train operator on the route is First ScotRail. First ScotRail operate fast interurban services between the major cities on the route. With the exception of services from Edinburgh/Glasgow to Inverness, these operate on a minimum hourly frequency for most of the day. Services on the key Edinburgh to Glasgow corridor have operated on a 15 minute frequency since 1999.

Passenger traffic on the Edinburgh suburban network is predominantly commuter based, although there are also significant off-peak leisure flows into Edinburgh. The growing and dynamic economy in the east of Scotland and the establishment of the Scottish Parliament in Edinburgh, have resulted in a significant growth in demand.

The Highland section of the route carries mixed traffic between Perth, Inverness and Georgemas. Elsewhere in the Highlands the route carries mainly passenger services with occasional charters and f freight services. As many of the lines in this area are predominantly single track, certain sections have relatively high utilisation imposing constraints on the timetable. First ScotRail also operate an overnight sleeper service from London Euston to Inverness and Aberdeen which forms part of the Caledonian Sleeper network.

Following RUS recommendations, improved services were introduced on the Edinburgh to Fife, Perth, Dundee and Aberdeen routes. Other RUS recommendations recently implemented include the new semi-fast Glasgow – Shotts – Edinburgh service to increase the number of services and provide faster journey times between the main cities and platform extensions at Bishopbriggs to enable 6 car running introduced in December 2009. An enhanced service on the lines radiating from Inverness (referred to as 'Invernet') was introduced from December 2005. This is aimed at providing peak hour services on corridors where they were not previously provided and closing some of the significant timetable gaps at other times. Additional Aberdeen – Inverness, Aberdeen – Inverurie and Blair Atholl – Edinburgh services were also introduced in 2008 together with further improvements north of Inverness.

CrossCountry run services via the East Coast Main Line through Edinburgh to Dundee, Aberdeen and Glasgow, providing additional capacity for the Edinburgh peak. First Keolis Transpennine Express run services via the WCML between Manchester Airport and Edinburgh. East Coast Trains run services to/from Kings Cross to Glasgow via

Carstairs and to Aberdeen and Inverness. Virgin Trains run services from Edinburgh to Birmingham.

DB Schenker operate coal traffic to Longannet and Cockenzie, petroleum from Grangemouth to Inverness, Aberdeen and beyond, as well as intermodal traffic to Inverness. DRS provide services from Grangemouth to Daventry, Aberdeen and Elderslie. Freightliner Heavy Haul Ltd provides services to Longannet, Aberdeen and Inverness. GB Railfreight also operate over this route to Aberdeen. The greatest volume of freight traffic is carried on the sections between Greenhill Lower Junction and Longannet via Stirling, and on the Edinburgh South Suburban Line which runs from Slateford and Haymarket Junctions to the ECML via the freight yard at Millerhill.

Figure 4 shows the total annual tonnage levels on the route.

Traffic volumes are summarised in Figure 5.

Figure 4 Tonnage

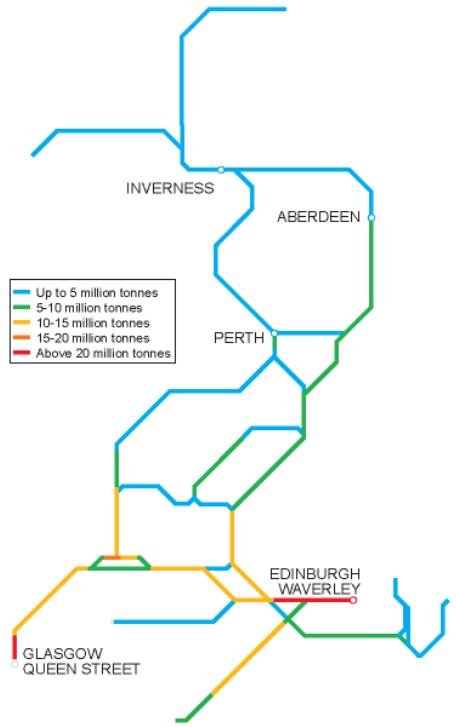


Figure 5 Current use

	Passenger	Freight	Total
Train km per year (millions)	21	1	22
Train tonne km per year (millions)	3,859	816	4,675

Current infrastructure capability

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

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.
Current capability is shown in the Network Rail Sectional Appendix.

Figure 6 Linespeed

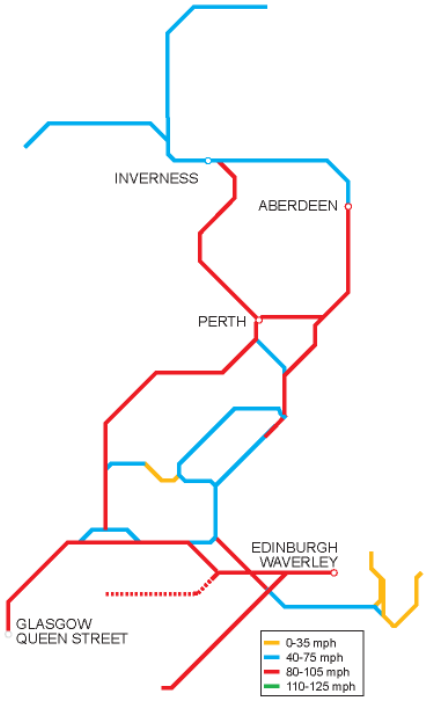


Figure 7 Electrification

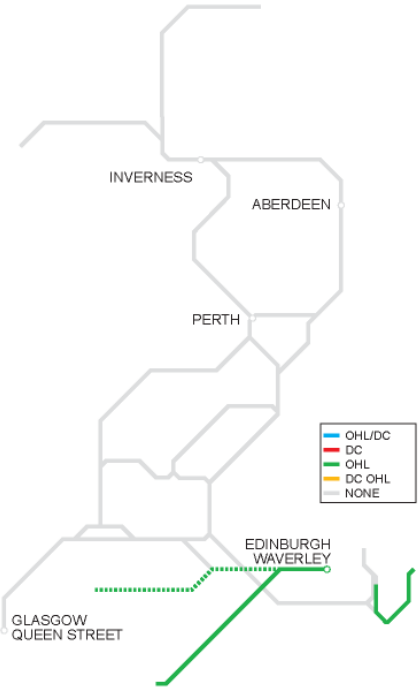


Figure 8 Route availability

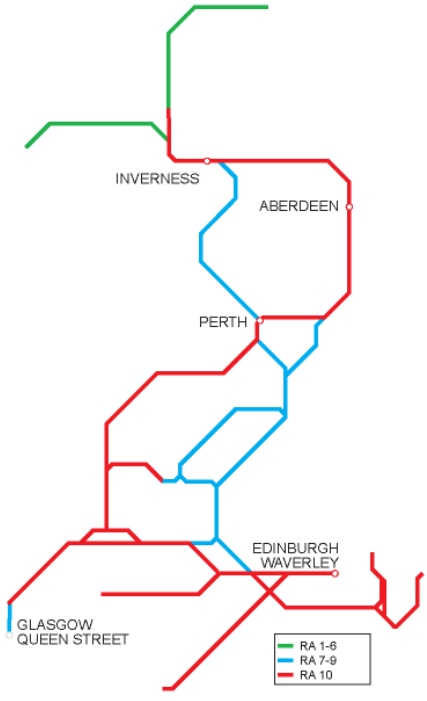
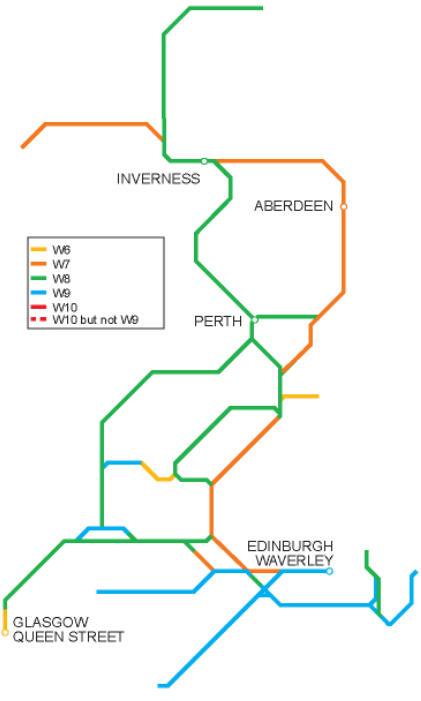


Figure 9 Gauge



Current capacity

The baselining carried out as part of our Scotland RUS work has confirmed that there are a number of capacity constraints on the existing network. The most significant of these constraints for passenger services on this route are:

- the congested two track approach to Glasgow Queen Street
- restrictive platform lengths at a number of stations, most significantly Glasgow Queen Street and Edinburgh Waverley
- the single line section from Usan to Montrose
- other single line sections between Portobello and Newcraighall, on the north side of the Fife Circle and between Ladybank and Hilton Junction
- key single lead junctions at Winchburgh, Midcalder, Portobello and Dalmeny
- restrictive signalling headways across the Forth & Tay Bridges, around Stirling and between Haymarket and Carstairs.

In addition to the above, key constraints for freight services are:

- the single line approaches to Millerhill Yard and their existing control arrangements
- the capacity of Fouldubs and access to terminals around Grangemouth
- restrictive loading gauge and route availability at various locations
- lack of passing loops of adequate size to accommodate current maximum train lengths. This is particularly acute between Mossend, Grangemouth and Stirling and between Dundee and Aberdeen.
- Keith/Elgin, Dunkeld/Pitlochry and Dalwhinnie/ Kingussie single line sections.

Work to redouble the Bathgate branch was completed in October 2008 and will be fully commissioned when the Airdrie/Bathgate Project completes in December 2010.

We have recently completed the extension of Bishopbriggs platforms to permit 6 car trains to call which has permitted increased passenger capacity on the Dunblane/Alloa to Glasgow route.

The Edinburgh Waverley project was completed in December 2007 delivering additional capacity that can accommodate the operation of an additional four trains per hour during the peak period at equivalent performance levels to those currently achieved. However, this capacity has now been utilised/allocated with the introduction of:

- One additional Fife services introduced in December 2008
- One new semi-fast Edinburgh to Glasgow services via Shotts introduced in December 2009
- and two additional services from Airdrie to Bathgate/ Edinburgh services when this new route is opened in December 2010.

Figure 10 2009/10 PPM

TOC	Forecast MAA	As at period
CrossCountry	90.4%	11
First ScotRail	90.5%	11
East Coast Trains	87.7%	11
Virgin Trains	84.4%	11
First Keolis Transpennine Express	91.9%	11

Current performance

Figure 10 shows the current PPM as at Period 11 for the Train Operating Companies (TOCs) running along the route.

Performance across Scotland has improved significantly over the last five years with a circa 35 percent reduction in delay minutes leading to an improvement in First ScotRail's PPM from 83.1 percent to a moving annual average of 90.5 percent today. To achieve this, the focus has been on attention to detail particularly the reliability of strategic points and signalling equipment at key nodes.

Traditionally the Autumn period has resulted in a significant dip in performance, however during 2009 Scotland enjoyed the best performance in several years and most routes returned a good result. However the coldest winter in Scotland since records began have contributed to a worsening performance during 2009/10. Therefore it is currently forecast that despite some improvements in other aspects of performance the overall performance will be lower than during the same period in 2008.

The Highland section of the route consists mostly of long single line sections with passing loops. On such routes any perturbations can have a significant impact. Despite that, performance remains generally satisfactory. Recent timetable revisions have taken account of performance risks to ensure delivery of a robust timetable.

Long distance high speed and slower local passenger services operate over a number of sections of this route. This mix of traffic can lead to performance problems during times of perturbation, particularly at junction locations.

The Network Rail and First ScotRail controls are co-located within the same office in Glasgow to enable prompt and effective response to any incidents in order to mitigate subsequent delays. We will continue to work with First ScotRail, the principal train operator in Scotland, to provide rapid decision making during perturbed working to enable a return to normal working as quickly as possible.

We are undertaking reviews of the timetable on individual parts of the network to identify where adjustments would result in an improvement in service reliability. Improved timetables have been introduced in Fife and on services from Glasgow Queen Street. We are also reviewing our contingency plans to ensure that overall delays are minimised in the event of any out of course running.

A number of initiatives are being progressed on this route to effect performance improvements. Examples of these are:

- weatherproofing initiatives at key locations
- targeted renewal of power and multi-core signalling cables
- enhanced management of strategic spares
- enhanced maintenance regime for under–track cable routes
- improved renewals handback processes
- enhanced bridge strike contingency plans
- renewal and rationalisation of signal cables on the Highland Main Line
- targeted track renewals at remote locations
- understanding and mitigating the impact of more frequent severe weather
- reducing the level of unexplained delay through 'S' class messaging which will allow signal aspects to be displayed to allow root causes of delays to be identified.

Section 2: Tomorrow's railway: requirements

Future demand in CP4

Rail passenger demand has increased significantly in the last few years, partly as a result of increased road traffic congestion but also reflecting increased employment in the Edinburgh area and enhanced leisure opportunities in the major cities.

The delivery plan for CP4 was developed based on the Scottish government's strategy and the work done for the Scotland RUS. The Scotland RUS predicted an annual growth rate across Scotland of 3 percent per annum in passenger miles. Our analysis indicates that this will not be evenly spread but that growth will be greater on the Edinburgh to Glasgow and Fife lines and less on other lines on this Route.

In addition increased passenger demand will occur on services on this route from the following major rail enhancement schemes between 2010 and 2014:

- Airdrie to Bathgate
- Scottish Borders Railway

We are currently discussing the level of additional demand that each of these will generate with the individual scheme promoters.

There are several on going work streams dedicated to improving journey times in conjunction with First ScotRail and Transport Scotland.

Network Rail is working with Transport Scotland to improve frequency and journey times on the Highland Main Line.

In addition Transport Scotland, supported by First ScotRail and Network Rail, has reviewed the long term future of the routes between Edinburgh and Glasgow on behalf of Scottish Ministers. In late 2007 Transport Scotland announced the development of a package of improvements to electrify and enhance the routes to deliver additional capacity and reduce journey times by 2016. Based on this the Edinburgh Glasgow Improvement Programme (EGIP) has developed 21 packages of work to GRIP Stage 3. Network Rail, First ScotRail and Transport Scotland are currently reviewing the outputs of this work to optimise the EGIP scope and packages of work will be progressed forward to GRIP Stage 4 in the near future. Some packages of work can be phased and could be delivered earlier than 2016.

Examples of packages of work included as part of EGIP are:

- Electrification
- Dalmeny Chord
- Gogar Station (proposed new Tram interchange to Edinburgh Airport).

The Freight RUS was published by Network Rail in March 2007 and established by the Office of the Rail Regulator. 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.

It is anticipated that the new Coal Terminal at Earls Seat on the Methil branch in Fife will now open in 2010.

Future demand beyond CP4

Sustainability is at the heart of the improvements we are delivering between now and 2014, and it is integral to the Government's long-term rail strategy. Sustainability demands a broader look at priorities for the railway alongside other modes, to find the best balance between the needs of the economy, society and the environment. Our ambitions are for a railway that:

- contributes to the economic success of the nation by enabling more people and freight to travel in a way that minimises the environmental impact
- is flexible enough to adapt and respond to social changes, protecting the network and improving its ability to operate for longer in the day and more consistently over the working week
- is easy and accessible to use.

Transport Scotland published the Strategic Transport Projects Review (STPR) in December 2008 considering options for improvement to the Transport infrastructure in Scotland beyond 2012. The proposals include 11 major packages of work targeted at improvements in rail infrastructure. Of these, eight affect Scotland East Route – they are:

- Edinburgh to Glasgow Rail Improvements
- Grangemouth road and rail access upgrades
- rail improvements between Aberdeen and the Central Belt
- Inverkeithing to Halbeath new railway line
- East of Scotland Rail Improvements
- Edinburgh Haymarket Station Upgrade
- capacity and speed improvements on the Inverness to Perth line
- capacity and speed improvements on the Inverness to Aberdeen line.

Network Rail and Transport Scotland will continue to work together to develop these options to increase capacity and improve capability on the network.

Section 3: Tomorrow's railway: strategy

Figure 11 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.

Figure 11 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
Dec 2010	Airdrie/Bathgate	New line complete	Four trains per hour Glasgow Queen Street Low Level to Edinburgh via Airdrie and Bathgate
2012	Stirling Middle	Remodelling of Stirling Middle Junction	Will enable extended passenger journey times to be removed from Glasgow to Alloa trains and improve freight opportunities
Early 2012	Additional calls at Gogar	New station at Gogar Completion of Edinburgh Tram Phase 1 (tie responsibility)	Additional calls in some Edinburgh/Fife and beyond services to provide link to Edinburgh Airport once the tram line opens
Dec 2011/12	Improved Inverness/Central Belt	Infrastructure Enhancements between Perth and Inverness	More frequent service with reduced journey time between Inverness and Perth to Edinburgh/Glasgow
Dec 2014	Borders Railway	New line complete (being progressed by Transport Scotland)	Edinburgh/Newcraighall services extended to Tweedbank every half hour
CP5	Aberdeen – Central Belt	Additional loops to allow passing of freight trains, and upgraded signalling	Recasting of the passenger timetable on the Aberdeen – Dundee – Edinburgh / Glasgow corridors to provide faster/stopping services
Dec 2014 –16	Edinburgh to Glasgow Journey Time & Capacity	Electrification of Edinburgh to Glasgow, Cumbernauld, Alloa and Dunblane complete Dalmeny Chord complete Garngad Chord complete Finnieston / Hyndland Turnback complete Various Jn & Signalling Enhancements	Six trains per hour Glasgow Queen Street High Level to Edinburgh with reduced journey times and improved interchange with Edinburgh Airport via Edinburgh Tram network. Reduced journey times Glasgow/Edinburgh to Dunblane/Alloa. Queen Street/Cumbernauld diverted to Queen Street Low Level
2016	Aberdeen – Inverness	Infrastructure enhancements including new loops at locations such as Kittybrewster, Dalcross and Kintore	Additional local services and a more frequent service between Inverness & Aberdeen

Strategic direction

Improved use of the rail network is a central element of Scottish Ministers' plans for effective delivery of its rail objectives. The Scottish Government's National Transport Strategy published in 2007 looked at the next 20 years and beyond with three key objectives; improving journey times and connections; reducing emissions and improving quality, accessibility and affordability.

Based on this strategy, on behalf of the rail industry, Network Rail published the Scotland and Freight Route Utilisation Strategies (RUS) in March 2007. These documents made a number of recommendations which are now being progressed. Scottish Ministers' published a High Level Output Specification (HLOS) in July 2007, which covered the 2009 until 2014 period the requirements of which were reflected in the CP4 Delivery Plan.

In December 2008 Transport Scotland published its Strategic Transport Projects Review (STPR) spanning the next 20 years, which insofar as rail is concerned, proposed a number of recommendations, which are Transport Scotland's priority schemes for capital investment expenditure.

Since the establishment of the Scotland RUS the economic situation nationally has changed significantly. Whilst the economy is expected to recover, the Scotland RUS second generation presents a timely opportunity to re-examine the demand forecasts used in the established RUS.

The RUS will consider as baseline all schemes to be implemented as part of the CP4 Delivery Plan and any other schemes specifically agreed with Transport Scotland as planned and funded.

The outputs and recommendations of this RUS will be used to assist Ministers with the development of the Scottish HLOS for Control Period 5, which will cover the period 2014 – 2019 and subsequent control periods. In the longer term it will help to inform Transport Scotland's franchise specifications when Scottish services are re-franchised at various times during the period covered by the RUS.

In addition to the above publications this RUS will also take cognisance of the recommendations of other studies which include:

- Long distance services and scenarios*
- Stations*
- Rolling Stock and Depots*
- Electrification*
- The Inter City Express Project (IEP)
- High Speed 2
- Freight RUS

* Part of the Network RUS

The second generation RUS will cover a 30-year time horizon from 2009 and we presently expect to publish the draft conclusions by the end of 2010 with final conclusions and establishment by ORR in 2011.

Scottish Ministers are committed to the following projects (included within the CP4 Delivery Plan) which are being progressed: re-instatement and electrification of the Airdrie-Bathgate line and re-instatement of part of the former Waverley Route from Newcraighall to Tweedbank (Scottish Borders Railway). Network Rail are contracted to undertake the delivery of the first of these (financially included in Route Q Scotland West) and expect to work closely with the developers of the other. In addition the STPR Projects being developed by Network Rail on behalf of Transport Scotland are:

- Grangemouth road and rail access upgrades. This scheme being considered would improve rail access to/from the port of Grangemouth to the East, and options are currently being reviewed by Transport Scotland and Network Rail. Other options are still to be developed as part of this STPR scheme
- Capacity and speed improvements on the Inverness to Aberdeen line. Scheme proposes to increase service frequency and reduce journey time and provide a new station at Dalcross with interchange facilities
- Capacity and speed improvements on the Inverness to Perth line
- Rail improvements between Aberdeen and the Central Belt. Reduction in journey times for passenger services and possible capacity improvements.

Within this Route the medium term strategy predominately focuses on increased capacity at and between Edinburgh Waverley and Glasgow Queen St, including enhanced passenger access and station facilities; line speed enhancements between Edinburgh and Perth to Inverness; additional services between Fife and Edinburgh; and additional/improved infrastructure between Aberdeen and Dundee and between Larbert and Stirling to improve capacity, particularly for freight.

Edinburgh and the South East region is expected to enjoy Scotland's strongest economic growth over the next 20 years. Significant population growth is predicted in Edinburgh and in Fife, Lothians and Borders. These changes are supported by Local Structure Plan policies which seek to deliver plan-led expansion in many of these areas. A key component of these policies is the provision of high quality rail links into Edinburgh.

The RUS reported on projected daily passenger numbers on a number of geographically aggregated sectors during the three hour morning peak period over the next 20 years.

For further information, see the published Scotland Route Utilisation Strategy at www.networkrail.co.uk.

Network Rail identified the Glasgow to Edinburgh via Falkirk line as a key route and carried out a number of initiatives including:

- delivery unit and operational building improvements along with significant levels of lineside scrap and graffiti clearance
- targeted training and development of Delivery Managers on the route to provide smarter and more efficient working
- the introduction of Intelligent Infrastructure across the route with 256 assets fitted with remote condition monitoring that will enable a 'predict and prevent' approach to infrastructure faults.

In addition Junction lighting has been installed at Cowlairs, Greenhill, Polmont and Winchburgh as part of a National initiative together with the trialling of a new polymer troughing on the Airdrie – Bathgate route that could also serve as a safe walking route. The product is made from recycled plastic and is environmentally friendly.

Development in the utilisation of all routes between Glasgow and Edinburgh, through the reduction in journey time and increased frequency, are also key aspirations of Scottish Ministers' to meet passenger expectations. Network Rail has been working closely with Transport Scotland and First ScotRail to develop a package of incremental enhancements to services between Glasgow and Edinburgh and from those cities to Stirling, Alloa and Dunblane to increase capacity and reduce journey time over the next ten years. This is known as the Edinburgh to Glasgow Improvement Programme (EGIP) and is expected to increase the passenger capacity on the main Edinburgh/Glasgow route by up to 50 percent with fastest journey times reduced by c 10 –12 minutes by 2016. EGIP also includes improvements between Glasgow Central and Edinburgh included in Route Q initially the recently introduced (December 2009) Edinburgh to Glasgow via Shotts semi-fast service.

Similarly, improvements will be delivered on the routes towards Stirling, Dunblane and Alloa.

The majority of Schemes proposed as part of EGIP have completed GRIP Stage 3, and will move into GRIP stage 4 shortly targeted at a phased implementation from 2012.

The Freight Route Utilisation Strategy (RUS) published in March 2007, provides a robust forecast for freight growth on the route, which is principally linked to the future of Longannet power station. Scottish Power has equipped the station with the necessary Flue Gas De-sulphurisation equipment required to meet the requirements of the emissions control directive. This will guarantee its future beyond 2015. The equipment is not currently planned to be fitted at Cockenzie, Scotland's second major coal fired power station which is expected to close by 2012.

Other factors that will affect future freight demand on the route are the increased use of rail on trunk flows within the logistics chain, the national recycling strategy with the potential construction of associated waste transfer stations and the availability of grants towards the creation of new freight terminals. Feasibility work has been undertaken on options to provide W10/W12 clearance from the North East of England to Mossend near Glasgow which would provide a second route between England and Scotland for intermodal traffic. On Route P this will affect the line between Monktonhall Junction on the East Coast Main Line via the Edinburgh Suburban line to Carstairs Jn on the West Coast Main Line.

Freight Operators have aspirations to improve resource utilisation by reducing journey times.

Project Development Fund

This fund is available in CP4 with the primary purpose being the initial development of projects as detailed within the Strategic Transport Projects Review (STPR) and other improvements proposed for implementation in CP5.

Current Projects (mentioned previously) being developed in CP4 on this Route are:

- Grangemouth road and rail access upgrades
- capacity and speed improvements on the Inverness to Aberdeen line
- capacity and speed improvements on the Inverness to Perth line
- rail improvements between Aberdeen and the Central Belt.

At Carstairs Jn, which is currently a constraint on the WCML (Route N & Q) bordering Route P the renewal of the S&C is planned early in CP5. The initial development work to provide enhanced speed over this junction (particularly to/from Edinburgh) has commenced. Synergies with other works affecting the surrounding routes are being considered to produce a clear strategy that can be presented to industry stakeholders.

Level Crossings

The term level crossing (LC) describes an intersection at the same elevation of a road, footpath or bridleway and one or more rail tracks. The Office of Rail Regulation (ORR) classifies LCs as either active or passive, depending on whether warning is given of a train's approach. There are over seven thousand crossings on Network Rail infrastructure and seventeen different classification types, ranging from full road width barriers to footpath. There are 468 level crossings of various types on this route. Our general policy is to close level crossings where practicable to enhance safety but a secondary benefit of this is that it may assist in our ability to increase line speeds thereby reducing journey times.

We are researching a conversion of AOCL's with half barriers overlaid. Whilst this initiative is still in its infancy, we are expecting that Scotland will be one of the trial sites. There are also plans to upgrade all our existing halogen lamps at our AOCL's to LED "wigwags" in a rolling programme commencing in 2010.

We continue to develop the closure of Inchyra LC although progress has been slower than we planned largely due to issues with land ownership. We are also trialling a new red and green warning light system called the Westex Level Crossing Predictor at Lower Cullernie and Haugh of Tullymet LC's.

Network Rail has undertaken a User Worked Crossing (UWC) National Closure Programme. A total of 74 candidate user-worked crossings have been nominated by Scotland for the User Worked Crossing National Closure Programme, of which 56 are in Route P.

Network Rail is also involved in raising awareness of the dangers of Level Crossings particularly in rural areas. We regularly visit local farmers' markets and livestock auctions in the Highlands to educate drivers on the proper way to use railway level crossings.

To target our level crossing abuse hotspots, Network Rail along with BTP are holding level crossing days of action which involve both education and enforcement. There have already been 3 such days and it is anticipated that more will be scheduled for the coming year. Network Rail also attended a 2 day Road Safety Event hosted by North Ayrshire Council ("Y" Drive) which was attended by 730 school pupils (16/17yrs). We have committed to attend next year's "Y" Drive Event and the sister seminar "West Drive" in West Lothian. The type of level crossing will reflect the traffic on a particular route. Where there is a substantial increase in frequency or speed over a level crossing the risk assessment will have to be revisited and some crossings may require to be upgraded.

Network Rail is currently reviewing options for Kirknewton Level Crossing.

Listed below is a breakdown of the level crossings on Scotland East Route detailing the types and where they appear on the route.

Figure 13 Level Crossings by type on Route

Description	Number
Automatic Half Barriers	22
Automatic Barrier Crossing, Locally Monitored	3
Automatic Open Crossing, Locally Monitored	19
Automatic Open Crossing, Remotely Monitored	1
Manually Controlled Gates or Barriers	11
Manually Controlled Barriers Monitored by CCTV	9
Miniature Warning Lights or Stop Lights	9
Open Crossing	2
Pedestrian only Crossing (Public)	55
TrainMan Operated Crossing	1
User Worked Crossing (Private)	334
Station Crossing	2

Figure 12 Crossings by geographical spread

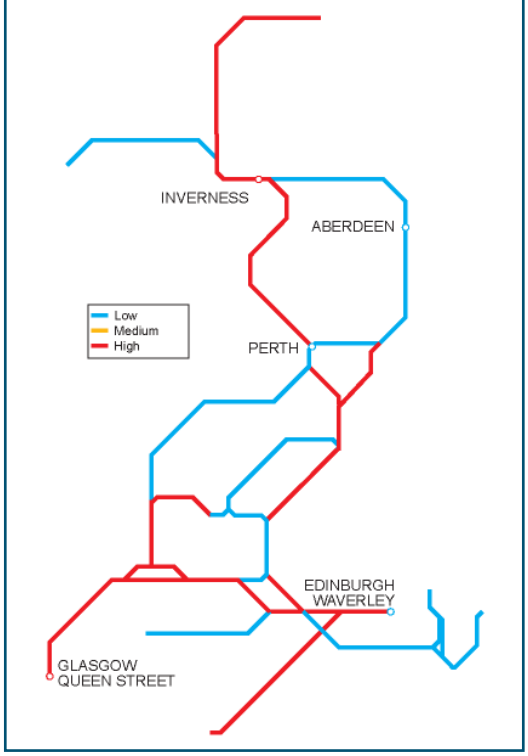
	Number
Carstairs - Edinburgh	7
Dunblane / Alloa –Polmont Jn / Greenhill Upper Jn	9
Fife Loop	6
Dunblane - Dundee	15
Dundee / Perth – Thornton Jns	22
Dundee – Aberdeen	20
Aberdeen – Inverness inc. Branches	76
Perth - Inverness	54
Dingwall - Kyle of Lochalsh	46
Inverness – Wick/Thurso	198
Freight Lines (Secondary)	6
Freight Lines (Tertiary)	9

Future train service proposals

Figure 14 indicates the forecast percentage change in tonnage to 2019.

Within Scotland East Route reduced journey time, particularly on the inter-urban routes is a key aspiration for Scottish Ministers' in the delivery of future services in Scotland. The identified growth in passenger numbers on the route will require additional peak capacity particularly between Edinburgh and Glasgow, and between Edinburgh and Fife. Reduced journey times and increased frequency from the Central Belt to Inverness and Aberdeen and between Inverness and Aberdeen are also key aspirations as determined in the STPR.

Figure 14 Tonnage growth



To facilitate the expected growth on this route additional rolling stock will be required. In the short term this is likely to consist of additional vehicles for the Fife and Aberdeen routes and Electric Multiple Units (EMUs) for the re-opened line from Glasgow to Edinburgh via Bathgate (replacing the current DMUs in use east of Bathgate). In the longer term assuming electrification of other routes detailed in the STPR is progressed as currently anticipated further additional EMUs will be required. The effect of this on rolling stock depot facilites needs to be considered.

In order to stable, clean and maintain these additional trains a new electrified carriage servicing depot has been built at Bathgate and improvements to the facilities at Perth are proposed. Longer term additional facilities are likely to be required to cater for this growth in rolling stock volume.

If future electrification schemes occur as proposed in the STPR, there will be a need for a new electrified maintenance depot as currently the only EMU maintenance facility in Scotland is at Shields near Glasgow which is virtually at capacity. In addition further stabling, and cleaning facilities will be required, possibly in the Stirling area and this is being reviewed as part of the EGIP Programme.

Following the opening of the Raiths Farm freight facility near Dyce in October 2009, it is anticipated that there will be new mixed-traffic freight flows on the line between Aberdeen and Inverness.

Future capability

A number of initiatives are being progressed to enhance the capability of the route. The most significant of these are summarised below:

Within Scotland East Route Newbridge Junction was renewed as a double junction in October 2008.

At the same time the single line section of the Bathgate branch between Cawburn Jn and Bathgate Station (exclusive) was converted to a double track formation. This will facilitate the operation of the proposed four trains an hour on this section when the Airdrie/Bathgate line is re-opened in 2010.

Speed and signalling improvements are being included in planned S&C renewals where appropriate. At Midcalder Junction the existing single lead junction is proposed to be converted to a double junction to improve capacity.

The future capability of the network will be designed to deliver reduced journey times, to meet the key aspiration of Scottish Ministers. Current development work is focussed on the Edinburgh to Glasgow line with a short term aspiration to increase the line speed for passenger trains to 100 mph on the sections which are not already at that level. Longer term the focus is likely to include junction improvements at Greenhill and Winchburgh, and the creation of a new chord at Dalmeny towards Edinburgh as well as electrification to permit the operation of additional and faster trains on the Edinburgh/Glasgow line.

Options to improve the gauge for freight services between Edinburgh and Carstairs are being developed.

The proposed new southbound loop at Laurencekirk will provide a much needed facility for recessing freight trains on a busy section of line.

Future capacity

Passenger numbers on Scotland East Route are projected to grow by up to 30 percent over the next 10 years.

Traffic levels on the route have increased incrementally over recent years. For example, Edinburgh Waverley now handles over 600 trains per day compared to the 380 trains per day it handled 30 years ago.

As a consequence, the route is now operating at maximum capacity over a number of sections.

The Edinburgh Waverley project was completed in December 2007 but the additional capacity provided by that work has now been allocated and further additional capacity is being developed as part of EGIP (see above).

On the Aberdeen to Inverness and Perth to Inverness lines there are stakeholder aspirations for regular hourly passenger services with reduced journey time. These could only be accommodated with the provision of additional and improved infrastructure as a result of the following constraints:

- the single line sections on the Aberdeen to Inverness line, the most significant of which are the 18 mile section between Keith and Elgin and the 15 mile section between Inverness and Nairn and
- the single line sections on the Perth to Inverness line, the most significant of which are the 13 mile sections between Dunkeld and Pitlochry and Dalwhinnie and Kingussie.

Freight operators have an aspiration to operate longer trains in the Central Belt and to Inverness/ Aberdeen which would require extensions to passing loops.

On the Aberdeen/Inverness line there has been significant growth in commuting flows to both cities from intermediate towns. The STPR scheme to review capacity and speed improvements between Inverness and Aberdeen will address the growth issues along the A96 corridor including the proposed new station at Dalcross and potential new station at Kintore. Both of these stations would require additional passing loops.

On the Far North lines, the finite capacity of the Radio Electric Token Block (RETB) equipment limits the number of additional trains that could be handled on this part of the network but it is unlikely that this can be improved significantly before the system is replaced. Minor improvements may be feasible following the recent completion of the life extension work.

The Room for Growth Study considered how current constraints could be eased and performance enhanced through timetable restructuring particularly on the Far North lines. Some improvements were introduced in Dec 2008 on the Far North and the Kyle of Lochalsh lines.

Traffic levels across the remainder of the Highlands can generally be accommodated without recourse to the provision of additional infrastructure.

Beyond that a number of opportunities have been identified where modest infrastructure enhancement would yield significant improvement in the outputs that the network can deliver. The optimum method of undertaking these works is normally by extending the scope of a planned renewal when the incremental enhancement cost is significantly lower than the cost of delivery as a stand alone project. Some of these have been completed recently or are

being progressed currently. These include the capacity and speed improvements associated with the switch and crossing renewals at Larbert Junction, Hilton Jn, Keith and Montrose and linespeed improvements between Ladybank Jn and Hilton Jn. Improved headways have being delivered between Larbert and Stirling. Further work is required in the Stirling Area between Stirling and Dunblane which is currently being developed. There are aspirations for additional stations on this route to Perth and if progressed these proposals would require a further review of the Timetable.

In addition the Scotland Route Utilisation Strategy considered how current constraints could be eased and performance enhanced through timetable restructuring and minor infrastructure enhancements.

The most significant of these options are considered to be:

- relieving the single lead junction bottlenecks at Portobello Jn and Midcalder Jn
- improvements at Glasgow Queen Street High Level station where only four of the seven platforms can handle a six-car train; this has been developed to GRIP Stage 3 as part of the EGIP programme of work
- progression of further work in the longer term at Edinburgh Waverley to provide further operating flexibility and address the lack of long platforms. This may require the removal of road vehicles from the station level to ease passenger congestion. Again as part of EGIP programme, further capacity at Edinburgh Waverley has been developed to GRIP Stage 3.

Certain stations will also require works to enable them to cope with the predicted growth in passenger numbers:

- Haymarket station is currently one of the most congested stations on the Scottish rail network and passenger numbers are forecast to increase further on completion of the Edinburgh Tram project in 2012. Transport Scotland has completed a study to evaluate the options for redeveloping the site to address this issue and create an enhanced facility that will permit proper integration of all transport modes. As part of First ScotRail's Franchise commitment, they are reviewing the capacity constraints at the station in addition to the installation of 2 new lifts to improve access to Platforms 2/3 & 4
- passenger congestion is experienced in the peak hours at South Gyle station, principally due to the lack of passenger circulating space as a result of narrow platforms. This may be eased by the proposals for a new Gogar Station mentioned below.

Following the decision of Scottish ministers not to proceed with the Edinburgh Airport Rail Link, it was agreed to progress a new station at Gogar between South Gyle and Dalmeny with an interchange to the new Edinburgh tram giving a link to Edinburgh Airport. This is likely to worsen the capacity issues between Haymarket and Inverkeithing; again options to relieve this have been developed as part of EGIP.

Although most station platforms on the Route outwith the Highlands area can accommodate six coach train formations, a small number still have platform lengths that are only capable of handling five or less vehicles. Consideration needs to be given to extending these for operational consistency, particularly during perturbation when additional stops may be introduced. We recently completed the extension of Bishopbriggs station to six-car length. Other key affected stations on this Route are Ladybank, Invergowrie and Springfield. The latter two have particular issues due to their very low usage and it may therefore be more appropriate to fit the rolling stock on these routes with Selective Door Opening (SDO) equipment.

Figure 15 Forecast PPM MAA – CP4 plan

	2010/11	2011/12	2012/13	2013/14
East Coast Trains	88.2%	89.5%	90.5%	91.1%
First ScotRail	91.3%	91.7%	91.9%	92.0%
CrossCountry	90.2%	90.6%	90.9%	91.3%
Virgin Trains	87.8%	90.3%	90.6%	90.9%
First Keolis TransPennine Express	92.2%	93.2%	93.8%	94.0%

Future performance

Figure 15 sets out the planned PPM for each train operator. The PPM figure quoted represents the expected contribution of the TOC to the sector-level regulatory outputs in the CP4 delivery plan.

The steps we are taking to achieve these performance improvements are described in the Performance section of the Delivery Plan. Specific enhancements to improve performance on this route are included in the project list below.

On this route specific performance driven enhancements proposed include the remodelling of Portobello Junction to provide a double junction and the electrification of the North lines between Haymarket Central Junction and Princes Street Gardens. Both of these would be desirable to support the enhancement projects specified by Scottish Ministers.

There have been a number of severe weather events over the last few years affecting the North East, the Highlands and Far North in particular. It appears these '1 in 100 year' events are becoming more frequent and we are examining options to further protect the network particularly against flooding. In the longer term we need to work with stakeholders and funders to determine the value of this increased resilience particularly on key strategic route sections. The flooding of the the River Tay between Dalguise and Pitlochry on occasion had been targeted as high priority and has benefited from some repair with the remaining work taking place in 2010.

First ScotRail

The performance of the First ScotRail franchise is expected to be 90.5 percent by the end of March 2010. Local delivery groups are in place to ensure that J-PIP commitments are delivered.

The key performance issues and opportunities for the TOC have been identified as:

- requirement to have a continued joint focus on the day to day performance risk, including a focus on the delivery of right time performance
- minimising the disruption and capturing the benefit of planned renewal and enhancement work throughout the Scottish network
- focusing on improving asset reliability with particular focus on preventing repeat failures
- joint work to ensure a successful implementation of the A2B scheme minimising impact on existing network
- improvements in TOC/FOC on TOC delays.

The Long Term Performance plan is being developed around these key points and performance by 2013/14 will reach 92.0 percent (the Scottish HLOS requirement). This includes an allowance for traffic growth and includes the impact of the opening of the Airdrie to Bathgate line. This figure was reached through working with the TOC and is in line with the operator aspirations.

Further work is required in Scotland to assess the potential impact of enhancement schemes and no account of these being included within this plan to date.

The future performance section for the other operators in this route can be found as detailed in Figure 16.

Figure 16 Train operators

Operator	Route
Virgin Trains	N
East Coast Trains	G
First Keolis Transpennine Express	G
CrossCountry	M

Network availability

Engineering access on the route can largely be accommodated overnight with most lines having periods with no trains. Exceptions to this include Edinburgh to Haymarket and Haymarket to Carstairs where access is largely limited to weekends.

There are aspirations for both passenger and freight to operate over longer periods of the day particularly on the suburban and interurban routes for passenger and a 24 hour operation was introduced for the Hunterston to Longannet freight flow. Consideration is being given as to how this requirement can be balanced on further routes with the need for infrastructure maintenance.

A number of extended blockades are likely to be required on this route over the next few years. These will permit major renewals and enhancements in future years, such as S&C renewals and enhancements such as EGIP and junction improvements as well as the Electrification of Haymarket North Tunnels in the short term.

Details of these are being discussed with the affected train operators.

The significant enhancements planned for the Edinburgh/Glasgow line are likely to require major blockades although we are committed to reducing the disruption involved to Operators as part of Network Rail's Delivery Plan obligations.

Long term opportunities and challenges

Significant growth in passenger numbers is forecast on this route as a consequence of two factors. The first of these is Transport Scotland's programme of major enhancement projects, in particular the Airdrie to Bathgate, and Borders Rail Link projects as well as the improvements to the Edinburgh to Glasgow line. The second is the background growth on existing services that arises as a consequence of the growth particularly in the Edinburgh economy and the continued migration of population from the city to the adjoining hinterland. In the longer term the Projects proposed by the Strategic Transport Projects Review (STPR) will improve and enhance the capacity on this route.

The future passenger growth and capacity requirements across the Highlands can largely be met without further significant infrastructure investment, other than the Perth/Aberdeen to Inverness schemes already mentioned.

On the Far North Line, however, further traffic growth will be limited by the capacity of the existing Radio Electronic Token Block (RETB) signalling system. It is anticipated that additional capacity will be created when the signalling system is replaced. The train operated points provided at all crossing loops would be reviewed at the same time to provide an increased line speed.

The volume of additional housing in Fife and West Lothian proposed in the respective Council's structure plans will require to be considered to ensure sufficient capacity is provided particularly to/from Edinburgh if the economy of that city continues to grow as forecast.

The key challenge to the rail industry in the coming years will be to deliver the planned increased service levels, maintain performance and deliver a reduced journey time to meet passenger demands between the major conurbations. In addition there are aspirations (currently unfunded) to increase key routes to W10/12 gauge and reduce where possible the need, to loop freight services.

The output from the Second Generation RUS work will inform the HLOS for CP5, including the further development of the Projects proposed by the STPR. The longer term STPR Schemes will be reviewed in turn for development and affordability.

Infrastructure investment in CP4

Figure 17 Infrastructure investment in CP4 (and CP5)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010	(A) Grangemouth Fouldubs Remodelling	Remodelling of track in Fouldubs area to provide increased freight capacity and allow longer trains to be accommodated	Performance/Capacity/Potential for Freight Growth	Small Projects Fund	5
2011/12	(B) Conon Bridge Station	New Station	Additional local services	Third Party	4
2009 to 2012	(C) Forth Bridge	Annual maintenance programme	Annual maintenance	NR	6
2010	(D) Edinburgh Waverley PAVA	Public Address	Renewal	NR	3
2010	(E) RETB Control Rack	Control Rack	Renewal	NR	6
2010/11	(F) Tay Bridge Dundee	Re-Painting with steelwork repairs	Repainting with steelwork repairs	NR	6
2012/13	(G) Stirling Middle S&C Renewal: Enhancement Content	Renewal and Enhancements	Performance and Capacity improvements	Small Projects Fund	3
2010/11	(H) Dalguise Embankment Protection	Dalguise flood plain protection works	Embankment Protection	NR	3
2010	(I) Reinstatement of Airdrie/Bathgate Line	New Rail Link	Reinstatement of disused line	NR	6
2011	(J) Redevelopment of Edinburgh Haymarket station[1]	Station Redevelopment	Enhanced facility to improve accessibility and integration with other transport modes	Third Party	3
2011	(K) Improvements at Perth Station for stabling and servicing	Improved servicing and stabling facility at Perth Station	Increased capacity for diesel trains on the network	Third Party	2
2012	(L) Gogar Station	Opening of new station between South Gyle and Dalmeny	New station with interchange with Edinburgh tram providing linkage with Edinburgh Airport	Transport Scotland	4

[1] In addition City of Edinburgh Council are developing a major 'Public Realm' scheme to improve the area around the station in conjunction with developers

Figure 17 Infrastructure investment in CP4 (and CP5)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010	(M) North Lines Electrification[2]	Electrification of North Lines between Haymarket and Princes Street Gardens	Enhanced performance	Transport Scotland	4
2010/11	(N) Findhorn Viaduct, Forres – Repainting	Repainting	Repainting	NR	5
2010/11	(N) Findhorn Viaduct, Forres – Steelwork Repairs	Steelwork repairs	Strengthening and Repairs	NR	5
2010/11	(O) Beauly Viaduct – Painting	Full blast and repaint of superstructure. In conjunction with other strengthening and repairs	Strengthening, Repairs and Repainting	NR	5
2010/11	(O) Beauly Viaduct – Strengthening	Strengthening of main lattice girders and associated steelwork repairs (In conjunction with viaduct painting)	Strengthening and Repairs and Repainting	NR	5
2010/11	(P) Den of Cowie – Repainting	Steelwork strengthening and Repainting works	Repainting	NR	5
2011	(E) RETB Base Station Renewal	Base Station Renewal	Renewal	NR	4
2011/12	(Q) Bishopbriggs Rockfall Protection	Scale, devegetation, rockfall protection measures	protection measures and drainage	NR	2
2011/12	(R) Croy Rockfall Protection & Drainage	Scale, devegetation, rockfall protection measures and drainage	protection measures and drainage	NR	2
2010	(J) Haymarket North Tunnel	Brickwork repairs, shot-creting and repointing open joints	Repairs	NR	5
2014/15	(S) Glenury Viaduct Repainting	Repainting works	Repainting	NR	3
2012	(T) Edinburgh – Inverkeithing signalling headways[3]	Provision of additional signals to reduce existing long signal sections	Performance and Capacity improvements. Part Network Rail Discretionary Funds	Transport Scotland	3

[2] These schemes are part of the Edinburgh to Glasgow Improvement Programme (EGIP)

Figure 17 Infrastructure investment in CP4 (and CP5)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011/12	(U) Improvements between Perth and Inverness	Infrastructure works to facilitate increased frequency and reduced journey time between Perth and Inverness including possible additional/reinstated loops	Increases service frequency and performance improvements	Transport Scotland	3
2014	(V) Borders Rail Link[3]	New rail link	New passenger railway from Newcraighall to Galashiels & Tweedbank	Periodic Review 2008	4
2013	(W) Redoubling Portobello Junction	Double junction onto the Newcraighall branch including second platform at Brunstane	Performance and capacity improvements	TBA	1
2013	(X) Gauge Improvements	Gauge clearance of the route from Edinburgh to Midcalder Junction	To accommodate the carriage of deep sea container traffic from East Coast Ports to Scotland (Mossend)	TBA	0
2014	(Y) Glasgow Queen Street Capacity Enhancement[2]	Remodelling of Glasgow Queen Street to deliver more six-car platforms and increased circulating space	Ability to operate more six-car trains to/from Glasgow Queen Street and cope with increased passenger numbers	Transport Scotland	2
2011/12	(Z) Dunfermline LLPA	Long Line Public Address	Renewal	NR	3
2016	(AA) Edinburgh – Glasgow electrification and enhancements[4]	Electrification of the line between Edinburgh Waverley and Glasgow Queen Street including extensions to Dunblane/Alloa and appropriate diversionary routes. Construction of 'Dalmeny Chord' and other associated works	Ability to operate electric trains on the route with reduced journey times and increased frequency	Transport Scotland	4
2016	(AB) Improvements between Aberdeen and Inverness	Infrastructure works to facilitate increased frequency and reduced journey time between Aberdeen and Inverness including potential new stations (with loops) at Kintore and Dalcross	Additional local services and increases service frequency and journey time reductions	Transport Scotland/ Third Party	1
2013/14	(AC) Stanley Junction remodelling	Resiting/resignalling of Stanley Junction in connection with the S & C renewal	Higher line speed	Small Projects Fund	2

[3] Network Rail is only responsible for interface with the Borders Link Project
[4] These schemes are part of the Edinburgh to Glasgow Improvement Programme (EGIP)

Small Projects Fund (SPF) candidate schemes in CP4

Figure 18 Candidate SPF schemes in CP4 (<£5m)

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2012/13	(AD) Midcalder Jn Enhancements	Remodelling of track at Midcalder Jn in connection with junction renewal	Capacity improvement	Small Projects Fund	3
2011/12	(AE) Ladybank/Hilton Line Speed Enhancements Phase 2	Increase in line speed to reduce journey time between Edinburgh and Perth	Capacity improvement and journey time reduction	Small Projects Fund	1
2011/12	(AG) Barnhill Signalling and S & C Enhancements	Remodelling of Barnhill (nr Perth) to increase linespeeds	Reduced journey time/Performance improvement	Small Projects Fund	3
2010	(AH) Greenhill Area Signalling Renewals	Provision for additional southbound Signal section between Carmuirs West and Greenhill Lower	Capacity Improvement	Small Projects Fund	3
2011	(AI) Laurencekirk Up loop	Conversion of existing siding at Laurencekirk into a loop facility	Increase capacity by permitting freight trains to be overtaken where appropriate.	Small Projects Fund	3
2010/11	(AJ) Bridge of Allan Signalling Renewal	Additional signal section between Stirling & Bridge of Allan	Increased capacity	Small Projects Fund	0
2010/11	(AK) Newbridge West Jn S&C Renewal	Removal of Up Loop connection	Increase in Up line speed	Small Projects Fund	3
2010/11	(AL) Aberdeen/Inverness Linespeed review	Introduction of differential linespeeds to permit light weight stock to operate at higher speeds	Journey time reductions	Small Projects Fund	0

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 19 shows the estimated renewals costs and activity volumes.

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

It should be noted that in order to manage the deliverability of our Civils, Signalling & 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 small proportion of the activities in these areas will slip to subsequent years.

Figure 19 Summary of estimated renewals costs and activity volumes

£m (2010/11 prices)	2010/11	2011/12	2012/13	2013/14
Renewals				
Track	31	22	34	23
Signalling	13	14	10	11
Civils	70	56	50	69
Operational property	39	45	36	13
Electrification	0	0	0	0
Telecoms	5	5	5	4
Total renewals	**158**	**143**	**136**	**120**
Renewals volumes				
Track				
Rail (km)	29	21	29	30
Sleepers (km)	25	10	20	20
Ballast (km)	18	10	16	17
S&C (equivalent units)	14	20	23	24
Signalling				
Conventional (SEU)	0	0	0	0
ERTMS (SEU)	0	0	0	0
Level crossings (no)	3	1	4	0

Appendix

Figure 20 Strategic route sections

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

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge[1]	RA[1]	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
P.01	Glasgow QS – Edinburgh Waverley	EGM	Primary	Transport Scotland	No	W9(W8)	10	90	AC (Partial)	CL	4 (3)	2(4)
P.02	Carstairs – Haymarket West Jn	ECA	Primary	Transport Scotland	No	W9	10	95	AC	CL	8 (5)	2
P.03	Edinburgh – Drumgelloch	EGM / NBE / NEM	Secondary	Transport Scotland	No	W7	10	75	none	CL	15	2
P.04	Dunblane/ Alloa – Polmont Jn /Greenhill Up Jn	SCM / SAA (PMT)	Secondary (Rural)	Transport Scotland	No	W8	10	100(60)	none	AB	4	2
P.05	Newcraighall – Portobello Jn	NDE	Secondary	Transport Scotland	No	W9	10	30	AC	CL	5	1
P.06	Fife Loop	ECN (CWH)	Secondary	Transport Scotland	No	W8 (W7)	10 (8)	80(75)	none	CL	5	2
P.07	Dundee – Dunblane	SCM	Secondary	Transport Scotland	No	W8	10	100(60)	none	AB	10	2
P.08	Dundee/Perth – Thornton Jcns	SCM / ECN (CDC)	Secondary	Transport Scotland	No	W8 (W7)	10 (8)	80(55)	none	CL	15 (10)	2(1)
P.09	Dundee – Aberdeen	ECN	Secondary	Transport Scotland	No	W7	10	80	none	AB	10 (15)	2
P.10	Aberdeen – Inverness	AN1	Secondary	Transport Scotland	No	W7	10	75	none	TB (AB)	20	1(2)
P.11	Perth – Inverness	HGL	Secondary	Transport Scotland	No	W8	8	80	none	TB (AB)	15	1(2)
P.12	Far North & Kyle Line	WCK (KYL)	Rural	Transport Scotland	No	W8 (W7)	10 (5)	75 (60)	none	RETB	15	1
P.98	Freight Trunk Routes	–	Freight	–	–	–	–	–	–	–	–	–
P.99	Other Freight Lines	–	Freight	–	–	–	–	–	–	–	–	–

[1] Please see the note in the Current Infrastructure Capability section.

Capacity and operational constraints
A Ladybank – Hilton Junction: single line section
B Usan – Montrose: single line section
C Haymarket – Inverkeithing: three aspect signalling
D Aberdeen – Inverness: single line close to capacity
E Glasgow Queen Street – Greenhill Upper Junction: line close to capacity
F Inverness – Wick/Kyle: RETB signalling approaching capacity
G Tay Bridge: weight restrictions inhibiting freight traffic

Other issues on the route
1 Forth Bridge: limited freight tonnage permitted

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