



Route 24 East of Scotland

Today's route

The principal elements of the East of Scotland Route are described below. The relevant Strategic Route Section is shown in brackets:

- the main line between Glasgow Queen Street and Edinburgh Waverley via Falkirk (24.01);
- the main line between Edinburgh Waverley and Aberdeen via Fife (24.06, 24.08, and 24.09);
- the connecting main line between Greenhill Junction and Dundee (24.04 and 24.07);
- the connecting main line between Ladybank and Hilton Junction (24.08);
- the main line between Haymarket East Junction and Carstairs (24.02);
- the line from Polmont to Carmuir/Larbert Junctions (24.04);
- the line from Winchburgh to Dalmeny Junction (24.06);
- the Bathgate branch (24.03);
- the line from Portobello to Niddrie South Junction (24.05);
- the west side of the Fife Circle (24.06);
- the Edinburgh South Suburban Line (24.10); and
- freight branches to Grangemouth (24.04), Rosyth (24.06), Longannet (24.11), Westfield (24.06) and Methil (24.08).

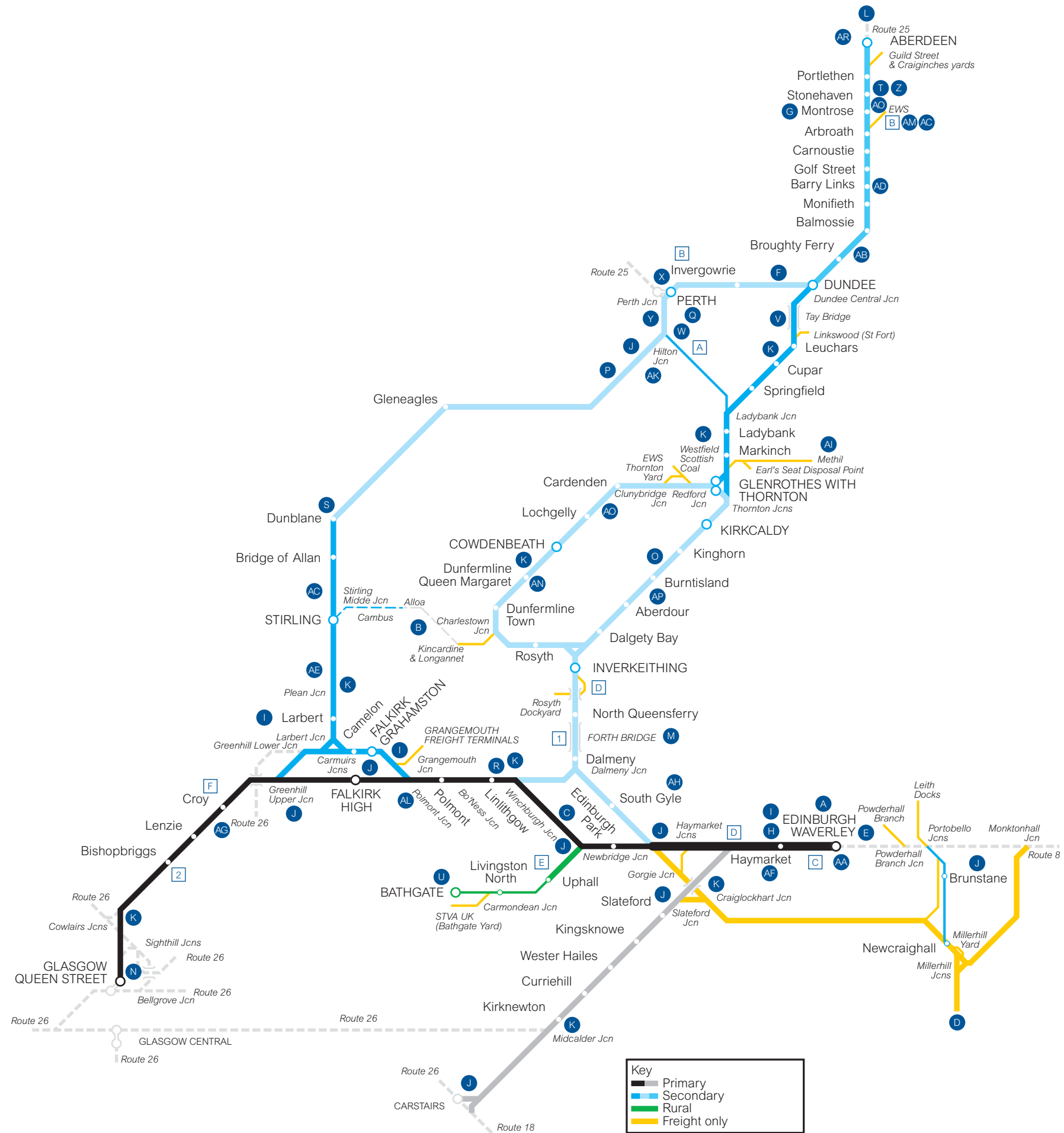
Route context

The East of Scotland route serves two principal passenger markets, fast, frequent inter urban services and commuting. It connects Scotland's principal cities of Glasgow, Edinburgh, Perth, Dundee and Aberdeen 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 being covered by route 26.

The route also serves a number of freight terminals, the most significant of which are Millerhill, to the east of Edinburgh, and the growing hub at Grangemouth.

Transport Scotland commissioned its Scotland Planning Assessment (SPA), as one of the inputs to the development of their strategy for rail in Scotland, and we are currently progressing the Route Utilisation Strategy (RUS) for Scotland. Both of these pieces of work have informed the development of this route plan.

Route 24 East of Scotland



Passenger and freight demand

In common with all of Scotland's major cities, Edinburgh's population has been in decline since the 1960s. Key beneficiaries of this population outflow have been East and West Lothian, Fife and Stirling/Dunblane. This population growth has translated into significant additional demand on commuter services from these areas into Edinburgh. During 2004 a programme of platform extensions was undertaken on the Fife, Bathgate and Dunblane lines to complement the introduction of new 3 car Class 170 units and provide additional capacity to accommodate this increased demand.

A similar, although less pronounced, population pattern has been evidenced in the other major cities on the route. However, the rail network has a much lower market share in these areas due to its poor penetration of their suburbs, therefore the impact on train loadings has not been as pronounced.

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 congestion around the two major conurbations. On the other inter-urban corridors road journey times can be faster than rail journey times as a consequence of major investment that has been carried out on the A9 and A90.

The recently completed SPA reported on current daily passenger numbers on a number of geographically aggregated sectors. The daily trip data for the sectors on this route are in Figure 1.

For further information, see the published Scotland Planning Assessment at <http://www.transportscotland.gov.uk>

The SPA also reported on current peak hour load factors on individual service groups, averaged over the morning peak. The load factors for services that operate on this route are detailed in Figure 2.

Figure 1 Current passenger numbers

Sector	Daily Trips
Central Edinburgh	22,600
Edinburgh Commuter	17,700
North East Scotland	10,300

Figure 2 Peak loading

Service	Load Factor
Edinburgh to Fife (Inter-Urban)	111%
Edinburgh to Glasgow via Falkirk	74%
Edinburgh to Fife (Local)	73%
Edinburgh to Bathgate	69%
Edinburgh to Glasgow via Shotts	65%
Edinburgh to North Berwick	56%
Edinburgh to Dunblane	56%
Edinburgh to Newcraighall	27%

Freight traffic on the route is dominated by the coal traffic from Hunterston deep water port in Ayrshire to Longannet power station which accounts for some 4 million tonnes per year. Following the closure of Scotland's last deep coal mine at Longannet in 2002 and the introduction of limits for sulphur dioxide emissions which can only be met by the use of imported low sulphur coal, all of the power station's coal requirements are now fed by rail. This traffic, which is routed via Glasgow, Falkirk and the Forth Bridge, crosses a number of capacity constrained sections on the route.

Other significant freight flows on the route are open cast coal from Fife to English power stations and petroleum from Grangemouth. Over recent years there has been a significant growth in Anglo-Scottish inter-modal and express parcels traffic, largely in response to road congestion in England, the EU's Working Time Directive and increased fuel costs, all of which have improved rail's competitive position relative to road for these time-sensitive longer distance flows. Grangemouth has now emerged as a significant freight handling location following the construction of three new rail handling facilities.

Current services

The principal passenger train operator on the route is First ScotRail. First ScotRail operate high-speed interurban services between the major cities on the route. With the exception of services from Edinburgh to Perth (and onwards 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.

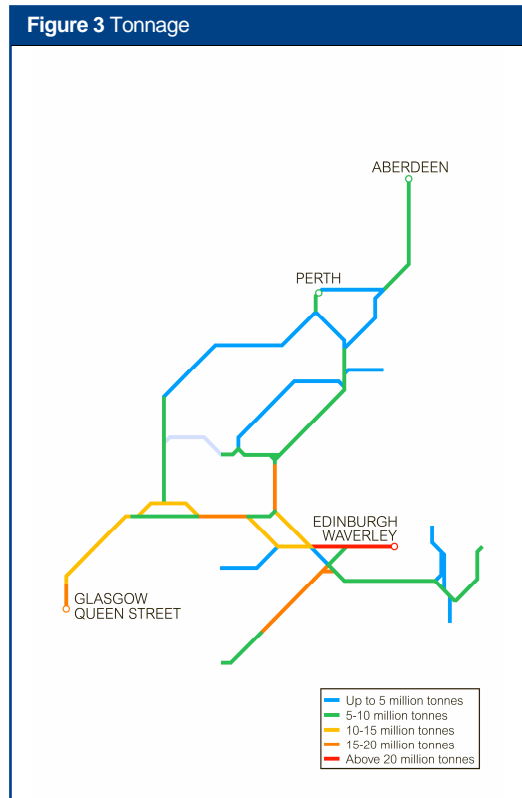
Cross-border services from England are operated by GNER and Virgin Cross Country beyond Edinburgh to Dundee and Aberdeen and Inverness via Perth. Over the Edinburgh to Carstairs section of the route, GNER also operates through services from London Kings Cross to Glasgow Central. Virgin Cross Country services between the WCML and Edinburgh and the ECML and Glasgow and Virgin West Coast services between London Euston and Edinburgh also operate over this section.

The principal freight operator on the route is EWS. DRS also provide services from Grangemouth and have recently introduced additional services from there to Aberdeen and Elderslie. Freightliner Heavy Haul Ltd provide services to Aberdeen and Inverness via Perth. The greatest volume of freight traffic is carried on the sections between Greenhill Lower Junction and Inverkeithing via Falkirk Grahamston, between Haymarket and Inverkeithing and on the Edinburgh South Suburban Line which runs from Slateford and Haymarket Junctions to the freight yard at Millerhill.

Current traffic

The East of Scotland 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 interurban 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.

Figure 3 shows the tonnage levels on the route.



Traffic volumes are summarised in Figure 4.

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	17	2	19
Train tonne km per year (millions)	2,935	1,263	4,198

Current infrastructure capability

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

Figure 5 Linespeed

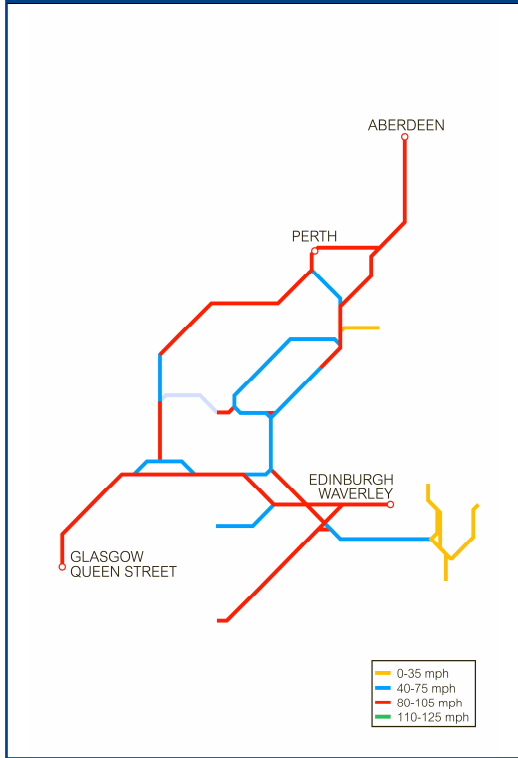


Figure 6 Electrification

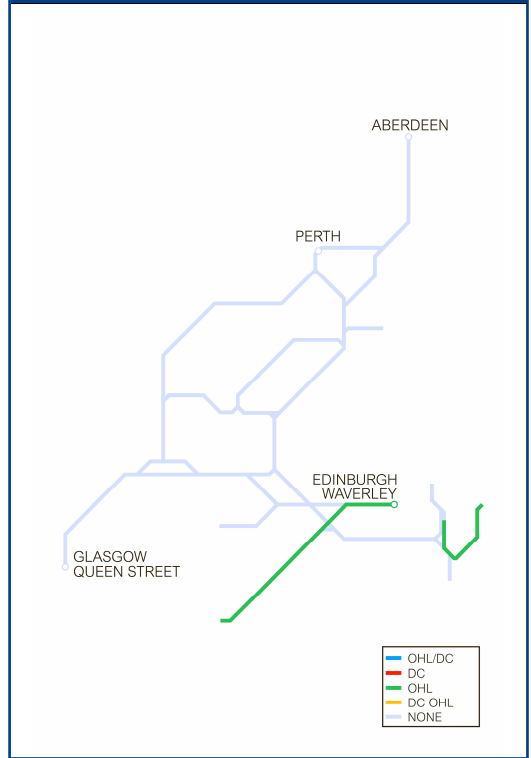


Figure 7 Route availability

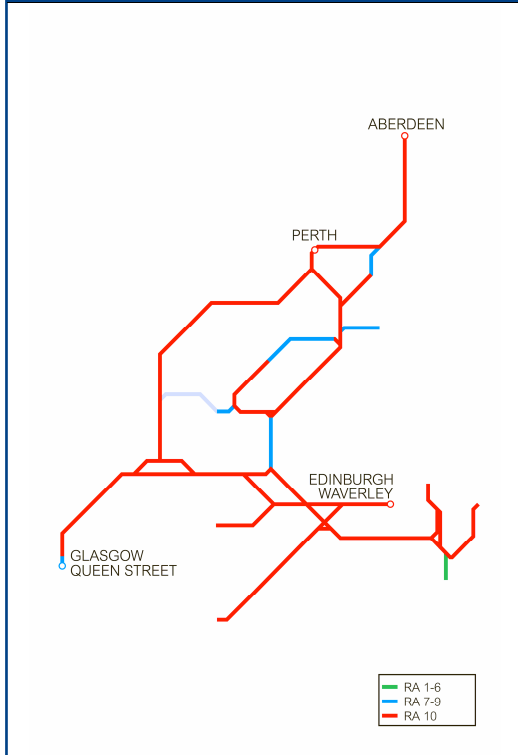


Figure 8 Gauge

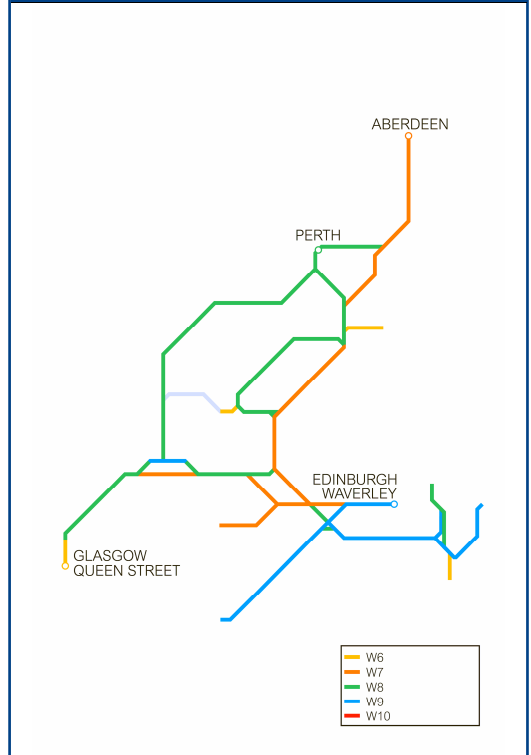


Figure 9 Current train service level (trains per hour)

Route section	Daytime	Evening
Glasgow Queen Street to Edinburgh	4	2
Glasgow Queen Street to Aberdeen	1	1
Edinburgh to Aberdeen	1	1
Edinburgh to Fife (local)	4	2
Edinburgh to Stirling/Dunblane	2	1
Edinburgh to Bathgate	2	1

Current capacity

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

- the congested western approaches to Edinburgh Waverley station (24.01);
- restrictive platform lengths at a number of stations, most significantly Glasgow Queen Street and Edinburgh Waverley (24.01);
- the single line section from Usan to Montrose (24.09);
- the single line sections of the Bathgate branch (24.03);
- other single line sections between Portobello and Newcraighall (24.05), on the north side of the Fife Circle (24.06) and between Ladybank and Hilton Junction. (24.08);
- key single lead junctions at Newbridge, Winchburgh (24.01) and Dalmeny (24.06) and;
- restrictive signalling headways across the Forth Bridge (24.06), in the Stirling/Larbert/Falkirk areas (24.04) and between Haymarket and Carstairs. (24.02).

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

- the single line approaches to Millerhill Yard and their existing control arrangements;
- restrictive loading gauge and route availability at various locations and;
- lack of passing loops of adequate size to accommodate current maximum train lengths. This is particularly acute between Larbert and Perth and between Dundee and Aberdeen.

Figure 10 shows the number of trains in the peak hour

Current performance

Figure 11 shows the current PPM for the TOCs running along the route.

Figure 10 Current train service level (peak trains per hour)

Route Section	Number of trains
Edinburgh – Haymarket	23
Dalmeny – Inverkeithing	10
Larbet – Stirling	8
Uphall – Bathgate*	5

* Total trains in both directions over single line

Figure 11 Current PPM MAA (2005/06)

TOC	MAA	As at period
First ScotRail	84.5%	10
GNER	81.5%	10
Virgin Cross Country	80.2%	10
Virgin West Coast	80.3%	10

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. Enhanced maintenance regimes for strategic points and signalling equipment at these key nodes have therefore been implemented.

The Network Rail and First ScotRail controls are co-located within the same office in Glasgow to ensure prompt and effective response to any incidents in order to mitigate subsequent delays.

We are enhancing the contingency plans for individual service groups in partnership with our train operating customers to ensure that overall delay is minimised in the event of any incident and allow normal services to be resumed as soon as possible. During 2005/06 these enhanced plans were introduced for Edinburgh to Glasgow Queen St (24.01) and Edinburgh to Bathgate (24.03) services. We are also undertaking reviews of the timetable on individual parts of the network to identify where adjustments would result in an improvement in service reliability. The Fife Circle (24.06) has been identified as an area where such changes would deliver performance benefits. We are also reviewing our regulating policies to ensure that overall delays are minimised in the event of any out of course running.

A number of specific 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;
- signalling circuit alterations at Edinburgh Park and;
- enhanced bridge bashing contingency plans.

Future requirements **Strategic direction**

Scottish Ministers are developing a rail strategy for Scotland and this will feed into the Scottish High Level Output Statement (HLOS) which will determine the future direction of the route. We expect that the route will continue to see high levels of growth, as forecast by the SPA. The main drivers of this will continue to be growth in central Edinburgh, especially employment and leisure/retail activities, increasing road congestion and service improvements. City of Edinburgh Council's road pricing proposals were rejected in a referendum in 2005. However, the proposals may be re-introduced in the future, and rail growth would accelerate as a consequence if they were implemented.

There are two major enhancement projects that are currently being implemented on the East of Scotland Route, as detailed below:

- work has commenced on the re-opening of the Stirling/Alloa/Kincardine line to freight traffic throughout and to passenger traffic between Stirling and Alloa. This will enable diversion of the coal traffic from Hunterston to Longannet power station away from the congested Edinburgh to Glasgow and Edinburgh to Fife routes onto the shorter alternative route via Stirling. Transport Scotland is funding the project which is planned for completion in late 2007; and
- work has also now commenced on the Edinburgh Waverley project, planned for completion by November 2007. The project, which is being funded by Transport Scotland, will enable the introduction of additional services at the west end of the station through the provision of a more flexible station throat and additional platforms. Discussions are currently in hand with wider industry stakeholders on the optimum content of future Phases of the re-development of the station.

A number of further projects are being developed that are currently planned for implementation over the next few years. These are summarised below:

- The proposals to re-instate the former Waverley Railway route from Newcraighall (terminus of the current Edinburgh CrossRail service) to Galashiels and Tweedbank are currently being considered by a Private Bill Committee of the Scottish Parliament. If the Parliamentary Powers being sought are granted, construction could commence in 2006 with completion planned for 2009.
- We are lodging the Parliamentary Bill seeking powers to re-instate the Airdrie to Bathgate rail line in early 2006 on behalf of Transport Scotland. Once complete (currently planned for 2009), the project will allow four trains per hour to operate between Edinburgh and Glasgow on this corridor and provide some relief to the current main Edinburgh to Glasgow route via Falkirk. This represents a doubling of the existing half hourly frequency of services between Edinburgh and Bathgate. This line would also give a new direct connection between principal communities in North Lanarkshire and Edinburgh and West Lothian and Glasgow.
- The proposals to provide a heavy rail link to Edinburgh Airport are also at an advanced stage. This will be achieved by constructing a new line to permit the diversion of Edinburgh to Glasgow services via the Airport. Additional chord lines will also be provided that will allow access for services to and from Fife and the north of Scotland.

The proper co-ordination of the above major infrastructure enhancements is currently being

addressed through an integrated timetable study that we are carrying out on behalf of Transport Scotland. This will develop an optimum timetable structure that will apply once all of the initiatives are complete and consider the intermediate steps to achieve this as individual projects come on stream.

Following the implementation of the Government's Rail Review proposals, Network Rail is now responsible for the strategic development of the network in partnership with our key industry stakeholders. A Discretionary Fund has been established to allow enhancements to be progressed where an industry business case can be made. Potential schemes on this route that are being considered for funding by this route are Grangemouth Junction and Larbert Junction re-modellings and Larbert to Stirling signalling enhancements.

Future demand

Increased passenger demand will occur on services on this route from the following politically committed major rail enhancement schemes detailed in the preceding section between 2007 and 2011:

- Stirling/Alloa (24.04);
- Additional Fife services post Edinburgh Waverley Phase 1 (24.06);
- Edinburgh Airport Rail Link (24.01/24.06);
- Airdrie to Bathgate (26.04/24.03); and
- Waverley Railway (24.05)

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

In addition to the above additional demand generated by specific major projects, the recently completed SPA forecast that the Edinburgh and South East region would enjoy Scotland's strongest economic growth over the next 20 years. Significant population growth is predicted in Edinburgh and small and medium sized towns in Fife, the Lothians and the 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 SPA reported on projected daily passenger numbers on a number of geographically aggregated sectors during the morning peak period over the next 20 years. The trip data for the sectors on this route are detailed in Figure 12.

For further information, see the published Scotland Planning Assessment at <http://www.transportscotland.gov.uk>

Future freight demand on the route is fundamentally linked to the future of Longannet power station. Scottish Power has recently decided to equip the station with the necessary Flue Gas De-sulphurisation equipment required to meet the requirements of the emissions control directive.

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.

We are currently carrying out a national Freight Utilisation Strategy that will provide a robust forecast for future freight growth on the route.

Figure 12 Projected passenger numbers

Sector	Morning Peak Trips			Change relative to 2003	
	2003/04	2016	2026	2016	2026
Central Edinburgh	11450	14800	16510	+ 29%	+44 %
Edinburgh Commuter	3970	4690	5080	+ 18%	+ 28%
North East Scotland	3040	3070	3300	+ 1%	+ 8%
Central Belt (South)	643	709	770	+ 10%	+ 20%

Figure 13 indicates the forecast percentage change in tonnage to 2015.



Future capacity

Traffic levels on the route have increased incrementally over recent years without any significant investment in additional capacity. For example, the current layout at Edinburgh Waverley handles 580 trains per day compared to the 380 trains per day it handled when it was installed some 30 years ago. As a consequence, the route is now operating at maximum capacity over a number of sections. The following measures are planned to address this:

- the Edinburgh Waverley (24.01) project will deliver 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;
- 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. The first such initiatives to be progressed on this route will be the capacity and speed improvements that are planned to be provided in conjunction with the planned switch and crossing renewals at Grangemouth Junction and Larbert Junction (24.04); and

- the Scotland Route Utilisation Strategy is considering how current pinch points could be eased and performance enhanced through timetable re-structuring and minor infrastructure enhancements.

Several further measures are envisaged as being necessary to accommodate the predicted growth. The most significant of these are considered to be:

- progression of further phases of the Edinburgh Waverley project to provide further operating flexibility and address the lack of long platforms and ;
- relieving the single lead junction bottlenecks at Newbridge Junction (24.01) and Midcalder Junction (24.02).

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 2010. Transport Scotland is currently funding a study that will evaluate the options for re-developing the site to address this issue and create an enhanced facility that will permit proper integration of all transport modes;

- passenger congestion at Waverley station will reach the point over the next 5 to 10 years where road traffic will have to be taken out of the station. Options for achieving this are currently being assessed;
- 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;
- although most station platforms on the route 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. Key affected stations are Bishopbriggs, Markinch, Ladybank and Springfield. The latter has particular issues due to its very low usage; and
- congestion is also becoming an issue at Glasgow Queen Street High Level station where only four of the seven platforms can handle a six coach train. Options for expansion of the station to address this are currently being considered.

Future capability

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

- the Mossend to Elgin gauge enhancement project to provide clearance for a wider range of freight vehicles on the route;
- speed improvements as part of planned S&C renewals; and
- signalling improvements as part of planned S&C renewals.

Fragile routes

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

The rail freight industry has recently provided to Network Rail a set of 10 year traffic forecasts, and we are presently assessing their implications. The key route section within this route that has been identified as a fragile route and has clearly defined additional tonnage/train numbers projected by the industry is Larbert – Stirling.

Future performance

Figure 14 shows the forecast reduction in Network Rail delay minutes compared with 2005/06.

Figure 15 shows the forecast PPM for the main TOCs running along the route.

Engineering access

A number of extended blockades are planned on this route over the next few years. These will permit switch and crossing renewals at Larbert and Hilton Junctions, bridge renewal work and work within Kippenross Tunnel to be undertaken.

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

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, Edinburgh Airport Rail Link and Waverley Railway projects. The second is the background growth on existing services that arises as a consequence of the growth in the Edinburgh economy and the continued migration of population from the city to the adjoining hinterland.

Modest freight growth is forecast, now that Scottish Power has agreed to fit the necessary Flue Gas De-sulphurisation equipment at Longannet power station.

The key challenge to the rail industry in the coming years will be to deliver the planned increased service levels and maintain performance.

Delivering future requirements

Summary

We believe that the solution to passenger growth and future capacity requirements on this route will be met by a combination of several separate initiatives:

- a review of existing service patterns to optimise the efficient balance between longer distance and local services;
- a programme of incremental capacity enhancement (which can be delivered as improvements to planned renewals); and
- limited stand alone capacity enhancements at critical locations.

Figure 14 Forecast reduction in delay minutes

	2006/07	2007/08	2008/09
% reduction in delay minutes	4%	12%	18%

Figure 15 Forecast PPM MAA

TOC	2006/07	2007/08	2008/09
First ScotRail	87.3%	88.7%	90.0%
GNER	83.6%	85.5%	87.7%
Virgin Cross Country	81.6%	83.5%	84.3%
Virgin West Coast	85.5%	87.8%	88.6%

The Edinburgh Waverley works that are currently being implemented will provide short to medium term relief at this key location. However this will not be sufficient to accommodate all of the growth over the next 20 years projected in the Scottish planning Assessment. Development work therefore needs to continue on Edinburgh Waverley to identify the optimum long term arrangement.

Certain infrastructure constraints on this route do not lend themselves to a solution in the foreseeable future. These factors therefore form an upper limit to the route's ability to cope with future growth. The most significant of these are detailed below:

- there are a number of single line sections where the railway line was originally built as a single line and the costs of doubling would be prohibitive;
- there are several flat junctions on the route, but there is insufficient space available for grade separation at many of the locations that would benefit from it; and
- the twin track approach to Queen Street High Level station (through a deep cutting and a 1,000 yard long tunnel).

Expenditure

Figure 16 shows the planned level of expenditure on renewals on this route over the next three years. However, the precise timing and scope of renewals remains subject to review to enable us to meet our overall obligations as efficiently as possible consistent with the reasonable requirements of operators and other stakeholders.

Figure 16 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Renewals			
Track			
Plain line	16	14	13
S&C	15	15	14
Drainage	1	1	1
Track Total	32	30	28
Civils			
Underbridges	9	4	3
Overbridges	–	0	0
Bridgeguard 3	1	0	0
Footbridges	0	–	–
Earthworks	1	3	3
Tunnels	0	1	0
Culverts	–	–	0
Coastal & estuary defence	0	0	1
Retaining walls	0	–	–
Major structures	19	18	17
Other	1	0	0
Civils Total	31	26	24
Signalling			
Resignalling	0	0	0
Minor works/other	2	4	7

Signalling Total	2	4	7
Electrification			
AC Systems			
HV switchgear	0	–	–
Other	1	3	0
DC Systems			
Other	–	0	0
Electrification Total	1	3	0
Telecoms			
CIS systems	0	1	0
Telecoms cables	1	0	0
Other	0	2	1
Telecoms Total	1	2	1
Plant and machinery			
Fixed plant	0	0	0
Mobile plant/vehicles	0	0	0
Point heating	0	0	0
Plant and machinery Total	0	0	0
Operational property			
Stations	4	4	4
Light maintenance depots	–	–	0
Lineside buildings	0	0	0
Operational property Total	4	5	5
Total Renewals	73	71	65
Enhancements (funded by)			
Network Rail			
West Coast Route Modernisation	1	1	0
Network Rail Total	1	1	0
Network Rail (RAB)			
Fife freight RA/gauge enhancements	1	2	3
Other	1	2	0
Network Rail (RAB) Total	2	4	3
Transport Scotland			
Borders new rail link	1	1	2
Edinburgh Airport link	0	1	7
Dalmuir new station	1	5	–
Edinburgh Waverley redevelopment	57	42	14

Other	0	–	–
Transport Scotland Total	58	49	23
Other Third Party			
Edinburgh tram enabling works	5	10	10
Raith's Farm	1	1	–
Montrose Station – Access for All	1	–	–
Moss Road level crossing upgrade	1	1	–
Perth & Tayside new stations	–	0	3
West Coast Route Modernisation	1	–	–
Other	2	1	0
Other Third Party Total	11	13	13
Total Enhancements	71	66	38

The planned volume of renewals is detailed in Figure 17.

Figure 17 Forecast volumes

	2006/07	2007/08	2008/09
Track			
Rail (km)	31	30	30
Sleepers (km)	26	24	24
Ballast (km)	27	26	26
Switches & crossings (no)			
Complete renewal	32	37	37
Abandonment	4	5	5
Fencing (km)	0	0	0
Drainage (km)	3	3	3
Civils			
Underbridges (square metres)	12003	1333	1214
Overbridges (square metres)	166	239	4
Footbridge (square metres)	2	–	–
Embankments (square metres)	7031	9376	28927
Tunnels (square metres)	993	1823	29
Culverts (square metres)	–	–	20
Coastal & estuary defence (linear metres)	117	62	287
Retaining walls (square metres)	280	–	–
Major structures (square metres)	44619	43631	44262
Electrification			
AC Systems			
HV switchgear (CBs)	–	–	–
HV cables (km)	16	4	–
Booster transformers (no)	–	3	–
Grid supply points (CBs)	1	–	–
OHL spanwires (no)	–	–	–

Telecoms			
CIS systems (stations)	-	1	1
Other –			
Long line PA systems (stations)	-	17	20
Plant			
Point heating (point end)	36	-	8

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

Maintenance

Figure 18 shows the planned level of expenditure on maintenance on this route over the next three years.

Figure 18 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Maintenance	19	18	16

Infrastructure investment

Figure 19 highlights committed schemes that are planned for completion in the financial year shown.

Figure 19 Planned infrastructure investment							
Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year	
A Edinburgh Waverley (24.01)	Station Redevelopment	Provision of additional capacity	All	Transport Scotland	5	2007/08	
B Stirling/Alloa/Kinross (24.04)	Reopening of line	Alternative and shorter freight route away from the E&G/Fife route	All	Clackmananshire Council/Transport Scotland	4	2006/07	
C Edinburgh Airport (24.01)	New Rail Link	New route diverting existing Edinburgh/Glasgow/Fife services via the airport	All	TIE/Transport Scotland	2	2008/09	
D Borders Rail (24.05)	New Rail Link	New passenger railway to Galashiels & Tweedbank	All	Scottish Borders Council/Transport Scotland	2	2008/09	
E Edinburgh Tram	Enabling Works	Works to manage interface between Tram and Railway	All	TIE/Transport Scotland	1	2008/09	
F Perth & Tayside (24.07)	New Station Programme	Proposed new stations at Bridge of Earn, Auchterarder	All	Perth and Kinross Council	1	2008/09	
G Montrose Station (24.09)	New DDA Access	Improved accessibility	All	Angus Council	1	2006/07	
H Haymarket (24.01)	Station Redevelopment	Enhanced facility to improve integration of all transport modes.	All	City of Edinburgh Council/Transport Scotland	1	2007/08	
I Track Renewals, S&C	S&C Renewals at Innerwick, Reston, Haymarket, Montrose, Cowlairs West, Grangemouth, Larbert	Renewals	Track	None	4	2006/07	

Figure 19 Planned infrastructure investment							
Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year	
Ⓜ Track Renewals, S&C	S&C Renewals at Hilton Jn, Carstairs East, Slateford, Inverkeithing, Greenhill Upper, Newbridge, Carmuiris East.	Renewals	Track	None	2	2007/08	
Ⓚ Track Renewals, S&C.	S&C Renewals at Halbeath, Midcalder, Cupar, Markinch, Cadder, Cowliars West, Linlithgow, Larbert, Stirling Middle, Craiglockhart	Renewals	Track	None	2	2008/09	
Ⓛ Raiths Farm, Dyce/ Aberdeen Craiginchies (24.09)	New Freight Terminal	New freight facility	All	Stannifer Developments	4	2007/08	
Ⓜ Forth Bridge (24.06)	Painting and corrosion repairs	Long term maintenance	Civils	None	6	2008/09	
Ⓝ Cathedral Street, Nr Glasgow Queen Street. (24.01)	Bridgeguard programme	Bridge strengthening	Civils	Glasgow City Council	3	2008/09	
Ⓞ Lammerlaws Road, Burntisland (24.06)	Bridgeguard programme	Complete overbridge renewal	Civils	None	3	2008/09	
Ⓟ Eam Viaduct, Nr Perth. (24.07)	Strengthening work	Strengthening of 4 river spans	Civils	None	3	2007/08	
Ⓞ Tay Viaduct, Perth (24.07)	Waterproofing and strengthening	Timber re-decking and track renewal	Civils	None	3	2008/09	

Figure 19 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
R Craighton (Nr Linlithgow) (24.01)	Rockfall Protection Works	Slope stabilisation and de-vegetation	Civils	None	3	2008/09
S Barbush Viaduct Nr Dunblane (24.07)	General Repairs	Waterproofing/painting of existing decking	Civils	None	3	2007/08
T Glenury/Den of Cowie Viaducts Nr Stonehaven (24.09)	Strengthening work	Major steelwork strengthening and painting	Civils	None	2	2008/09
U Airdrie/Bathgate (26.04/24.03)	New Rail Link	Reinstatement of disused line	All	Transport Scotland	4	2008/09
V Tay Bridge (24.08)	Painting and corrosion repairs	Long term maintenance	Civils	None	6	2008/09
W Auchtermuchty, Nr Perth (24.08)	Underbridge Repairs	Timber deck replacement	Civils	None	1	2008/09
X Kinfauns, Nr Perth (24.07)	Estuarial defence work	Rock armour repairs	Civils	None	1	2008/09
Y Kirktonhill, Nr Perth (24.07)	Drainage improvement work	Rock armour repairs	Civils	None	1	2008/09
Z Carmont, Stonehaven (24.09)	Devegetation	Undergrowth clearance and removal	Civils	None	1	2008/09
Edinburgh Signal Centre (24.01)	Edinburgh Concentrator Renewals	Renewals	Telecoms	None	1	2008/09

Figure 19 Planned infrastructure investment							
Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year	
AE	Various Locations	CIS Renewals	Renewals	Telecoms	None	1	2008/09
AC	Whitemoss, Cornton, Kingsknowe, Muirie Level Crossings	AHB Renewal	Renewal	Signals	None	1/3	2008/09
AD	North East Corridor (24.09)	Signalling Renewal Works	Renewals	Signals	None	1	2009/10
AD	Mossend/Elgin Corridor (24.09)	Gauge Enhancement Programme	Facilitate additional freight traffic	All	Transport Scotland	4	2007/08
AF	Haymarket Tunnel (24.01)	Axle Counter Installation	Renewals	Signals	None	1	2008/09
AG	Central Scotland (24.01)	Track Circuit Renewal Programme	Renewals	Signals	None	1	2008/09
AG	Scotland East Area	Signal Structure Renewals Programme	Renewals	Signals	None	1	2007/08
AI	Markinch	New DDA access and transport interchange	Improved accessibility	All	Fife Council/Transport Scotland	4	2007
AI	Grangemouth Tillyflats	New freight terminal connection	New freight facility	All	None	2	2006/07

The following table highlights uncommitted schemes under development

Figure 20 Infrastructure investment under consideration

Project	Scope	Enhancement or output change	Main asset type(s)	Status
AT Hilton Jn, Nr Perth 24.07/24.08	S&C Renewal with improved track lay-out	Increased capacity, line speed and performance	Track	Potential NRDF scheme
AL Polmont (24.01)	Signalling improvements	Improved performance	Signals	Potential NRDF scheme
AT Montrose (24.09)	S&C and signalling renewals including remodelling	Capacity and performance improvements including improved freight looping facility	Track	
AT Fife Freight Enhancements (24.06)	Improve gauge and route availability for routes in Fife	Ability to run larger/heavier freight vehicles in Fife	Track	Potential NRDF scheme
AT Easement of Permanent Speed Restrictions in Fife (24.06)	Higher speeds on specific route sections	Improved performance and reduced journey times	Track	Potential NRDF scheme
AT Burntisland Station (24.06)	General accessibility improvements	DDA compliant access to station plus transport interchange and car park	Property	Potential Third Party Scheme
AT Laurencekirk Nr Montrose (24.09)	Proposed new station	Potential for additional passenger volumes in the Dundee/Aberdeen corridor	Signals & Property	Potential Third Party Scheme
AT Aberdeen Crossrail	Additional passenger services in N.E. Scotland	Increased service frequency	Track & Signals	Feasibility Stage

Non infrastructure developments

The following significant timetable scheme for the route is under development

Figure 21 Timetable development

Description	Key issues	Actions or options being developed	Benefits	Target timetable implementation
Resilient Timetables	Rules of the Plan update	Headways and Running Times being reviewed	Performance improvements	2007

Appendix

Figure 22 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference and RA is Route Availability												
SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
24.01	Glasgow QS – Edinburgh Waverley	EGM	Primary	Transport Scotland	No	W9(W8)	10	90	AC (Partial)	CL	4"(3")	2(4)
24.02	Carstairs – Haymarket West Jn	ECA	Primary	Transport Scotland	No	W9	10	95	AC	CL	8"(5")	2
24.03	Bathgate – Branch	NBE	Rural	Transport Scotland	No	W7	10	75	none	CL	15"	2(1)
24.04	Dunblane/All oa – Polmont Jn/Greenhill Upper Jn	SCM (PMT)	Secondary (Rural)	Transport Scotland	No	W8	10	100(60)	none	AB	15"	2
24.05	Newcraighall – Portobello Jn	NDE	Rural	Transport Scotland	No	W9	10	30	AC	CL	15"	1
24.06	Fife Loop	ECN (CWH)	Secondary	Transport Scotland	No	W8 (W7)	10(8)	80(75)	none	CL	5"	2
24.07	Dundee – Dunblane	SCM	Secondary	Transport Scotland	No	W8	10	100(60)	none	AB	15"	2

Figure 22 Strategic route sections

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

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
24.08	Dundee/Hilto n Jn – Markinch	SCM (CDC)	Secondary	Transport Scotland	No	W8 (W7)	10(8)	80(55)	none	CL	15"(10")	2(1)
24.09	Dundee – Aberdeen	ECN	Secondary	Transport Scotland	No	W7	10	80	none	AB	15"	2
24.10	Edinburgh Suburban Lines	SUB (NDE)	Freight	Transport Scotland	No	W9	10	40	none	CL	5"	2
24.11	Other freight	LHS (CPH)	Freight	Transport Scotland	No	W8	10	30(20)	none	CL	OTW	1

Capacity and operational constraints

- A Ladybank – Hilton Junction: single line section
- B Usan – Montrose: single line section
- C Edinburgh Waverley – Haymarket: limited track and platform capacity
- D Haymarket – Inverkeithing: three aspect signalling
- E Cawburn Junction – Bathgate passenger station: single line section
- F Glasgow Queen Street – Greenhill Upper Junction: line close to capacity

Other issues on the route

- 1 Forth Bridge: limited freight tonnage permitted
- 2 Bishopbriggs: limited platform length