

Route Plans 2007  
Route 26  
Strathclyde and  
South West Scotland

**Network Rail**



**Delivering  
for you**





**Network Rail brings the country together. We own, operate, maintain and invest in Britain's rail network. Increasingly we are delivering improved standards of safety, reliability and efficiency. This benefits our customers and society at large.**

**Every day. Everywhere.**



## Route 26 Strathclyde and South West Scotland



### Today's route

The principal elements of the Strathclyde and South West Scotland Route are described below. The relevant Strategic Route Section is shown in brackets:

- the Glasgow North Electric network from Helensburgh, Balloch and Milngavie in the west to Springburn and Drumgelloch in the east via Glasgow Queen Street Low Level (26.04);
- local diesel lines from Glasgow Queen Street High Level to Cumbernauld and Anniesland (26.12);
- the Scottish Central line from Motherwell to Greenhill Lower Jcn via Mossend and Cumbernauld (26.10);
- the Argyle Line network (26.04) from points west of Partick to Motherwell via Bellshill (26.01) and Hamilton, Larkhall (re-opened in 2005), Coatbridge Central (26.10) and Lanark (26.11);
- the Glasgow South Electric network from Glasgow Central High Level to Neilston, Newton and the Cathcart Circle (26.09);
- the section of the West Coast Main Line between Glasgow Central High Level and Carstairs (26.01);
- local diesel lines from Glasgow Central High Level to Paisley Canal (26.06), Kilmarnock, East Kilbride (26.07), Whifflet (26.10) and Edinburgh via Shotts (26.02);
- the Ayrshire network from Glasgow Central High Level to Ayr and Largs (26.03);
- the Inverclyde network from Paisley to Wemyss Bay and Gourock (26.03);
- the South West network from Ayr to Stranraer (26.05) and Kilmarnock to Gretna (26.08) with connecting links between Kilmarnock and Barassie (26.08) and Mauchline and Newton on Ayr; and
- freight branches to Watsonhead (26.01), Deanside (26.03), Chalmerston (26.05), Killoch (26.03), Knockshinnoch and Greenburn (26.08).

### Route context

The Strathclyde and South West Scotland Route predominantly comprises the local Glasgow suburban rail network, the largest local passenger network in the UK outside London. These services operate in a mature market where quality of service and reliability are key to retaining and growing modal share. Reliable performance delivery is therefore of paramount importance to our customers and their passengers.

The South Western lines have an important role for the communities they serve, particularly where interchanges exist with other transport modes including ferry generated passenger traffic to and from Stranraer and Anglo-Scottish passenger traffic to Carlisle and beyond.

Long distance passenger traffic from the West Coast Main line via Carlisle and the East Coast Main Line via Edinburgh also joins the route at Carstairs.

The route also serves a number of freight terminals. The Kilmarnock to Gretna Junction section carries significant volumes of coal traffic from Ayrshire opencast sites and the deep water terminal at Hunterston to English power stations. Transport Scotland commissioned its Scottish Planning Assessment (SPA), as one of the inputs to the development of their strategy for rail in Scotland, and Network Rail recently published the Route Utilisation Strategy (RUS) for Scotland. Both of these pieces of work have informed the development of this route plan.





### Passenger and freight demand

The Strathclyde and South West Scotland route comprises the local Glasgow suburban rail network and the South Western lines to Stranraer and Gretna Junction. Long distance passenger traffic from the West Coast Main Line (WCML) via Carlisle and the East Coast Main Line (ECML) via Edinburgh joins the route at Carstairs.

The route also serves a number of freight facilities, the most significant of which are Mossend and Coatbridge. The Kilmarnock to Gretna Junction sections carries large volumes of coal traffic from Ayrshire opencast sites and the deep water terminal at Hunterston to English power stations.

In recent years Scotland's economy has been re-structured away from the traditional manufacturing base towards a service led economy. As a consequence, Glasgow's population has been in decline since the 1960s although it has now stabilised. Key beneficiaries of this population outflow have been the adjacent council areas where significant additional demand has arisen on commuter services into Glasgow.

The recently completed Scottish Planning Assessment (SPA) and subsequent Scotland Route Utilisation Strategy (RUS) reported on current daily passenger numbers on a number of geographically aggregated sectors. The daily trip data from the SPA for the sectors on this route are shown in Figure 1.

These numbers were further reviewed in the Scotland RUS to ensure accurate inclusion of multi-modal ticket information. For further information, see the published Scotland RUS at [www.networkrail.co.uk](http://www.networkrail.co.uk).

The RUS also reported on current peak 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 Glasgow	42,600
South West Scotland	17,170
North West Strathclyde	14,150
South East Strathclyde	12,150
South Strathclyde	12,070
Shotts and Livingston	3,470
North East Strathclyde	3,300

**Figure 2** Peak loading

Service	Load Factor
East Kilbride	94%
Electrics – South West	84%
Barrhead/Kilmarnock	78%
Electrics – South East	65%
Electrics – North West	65%
Paisley Canal	49%
Cumbernauld	46%
Maryhill	25%

**Figure 3** Current train service level (peak trains per hour)

Route section	Number of trains
Partick – Hyndland	17
Cardonald – Paisley	13
Cambuslang – Newton	12
Crossmyloof – Pollokshaws West	9

31 percent of all commuting trips into Glasgow in the morning peak are made by rail. This is only just below the modal share achieved by rail in London where the problems of road congestion are much more acute. Some overcrowding is experienced on the Ayrshire corridor, even though the majority of services are now worked by six car formations. This is exacerbated by the growth of traffic at Prestwick Airport where rail has the highest modal share of passengers (30 percent) of any UK airport.

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 four 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

currently only be met by the use of imported low sulphur coal, most 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.

In addition to this traffic, there is also a significant flow of imported coal from Hunterston and opencast coal from Ayrshire to English power stations of some four million tonnes per year which is routed via the G and SW line.

In addition to these coal flows, significant volumes of wagonload, bulk cargoes and intermodal traffic are also carried, employing both diesel and electric traction.

**Figure 4** Current train service level (trains per hour)

	Peak	Off Peak
Glasgow Queen Street LL to Helensburgh	3	2
Glasgow Queen Street LL to Airdrie	6	4
Glasgow Queen Street HL to Cumbernauld	2	2
Glasgow Queen Street HL to Anniesland	2	2
Glasgow Central LL to Larkhall	3	2
Glasgow Central LL to Lanark	3	2
Glasgow Central HL to Neilston	3	2
Glasgow Central HL to Newton	2	2
Glasgow Central HL to Paisley Canal	2	2
Glasgow Central HL to Kilmarnock	2	1
Glasgow Central HL to East Kilbride	4	2
Glasgow Central HL to Edinburgh via Shotts	1	1
Glasgow Central HL to Whifflet	2	2
Glasgow Central HL to Wemyss Bay	2	1
Glasgow Central HL to Gourrock	4	3
Glasgow Central HL to Ayr	3	2
Glasgow Central HL to Largs	2	1

**Figure 5** Current use

	Passenger	Freight	Total
Train km per year (millions)	19	3	22
Train tonne km per year (millions)	3,002	3,224	6,226

### Current services

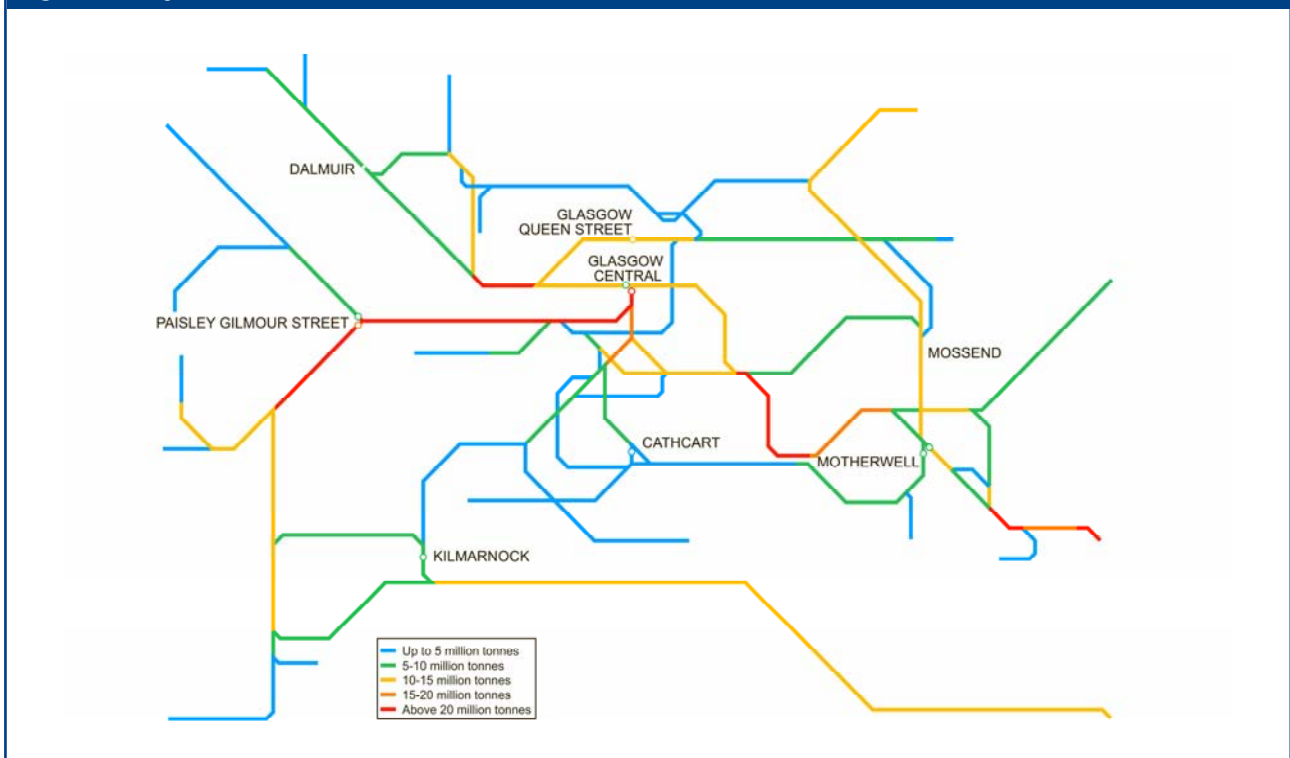
The Strathclyde and South West Scotland network carries mixed traffic, with a significant range of speed, acceleration and stopping patterns of trains. On many corridors this involves a complex mix of freight, urban, and interurban services with speeds up to 100 mph. There is little traffic segregation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

First ScotRail operates local passenger services in the Glasgow suburban area using a mix of electric and diesel trains. They also operate the South Western services as well as overnight sleeper services from Glasgow and Fort William to London Euston. Virgin West Coast, Virgin Cross Country and GNER provide Anglo Scottish daytime services from Glasgow Central.

English, Welsh and Scottish Railway Limited (EWS), Freightliner Ltd, Freightliner Heavy Haul Ltd, Direct Rail Service (DRS) and GB Railfreight provide freight services over the route.

Traffic volumes are summarised in Figure 5.

Figure 6 shows the tonnage levels on the route.

**Figure 6** Tonnage

### Current infrastructure capability

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

Figure 7 Linespeed

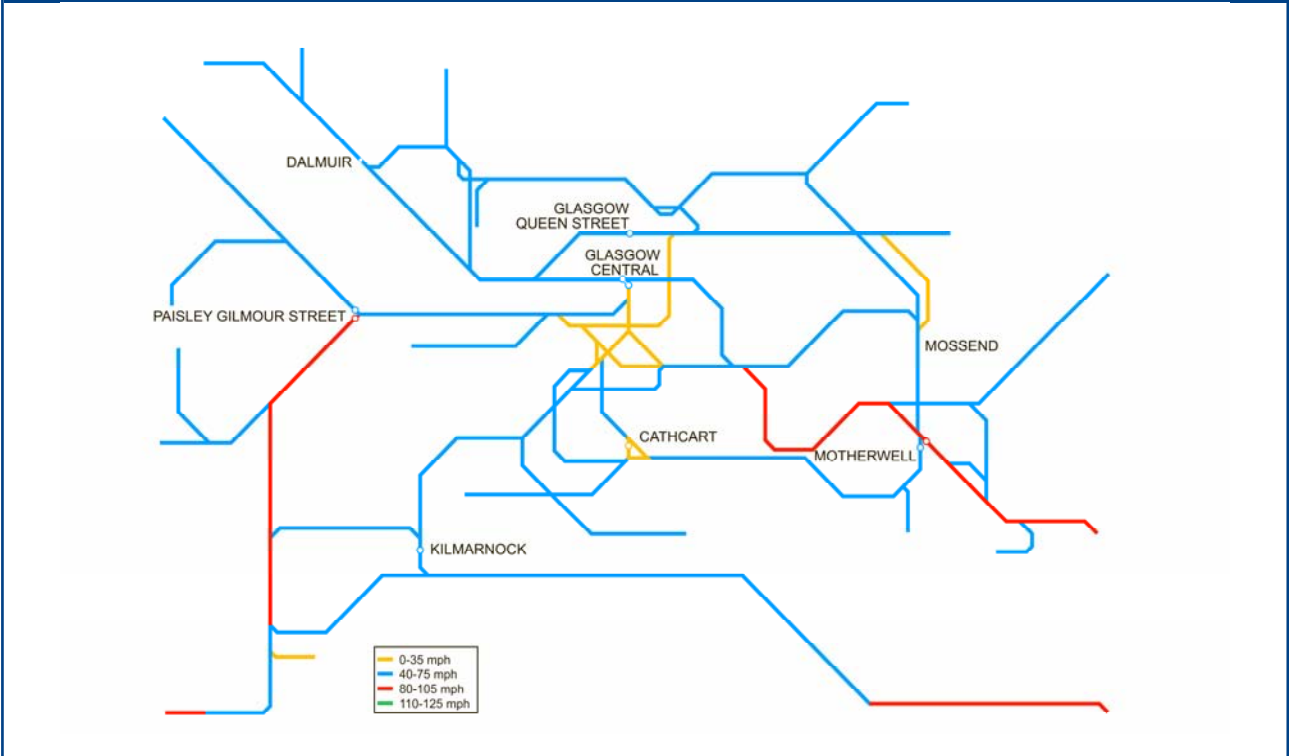


Figure 8 Electrification

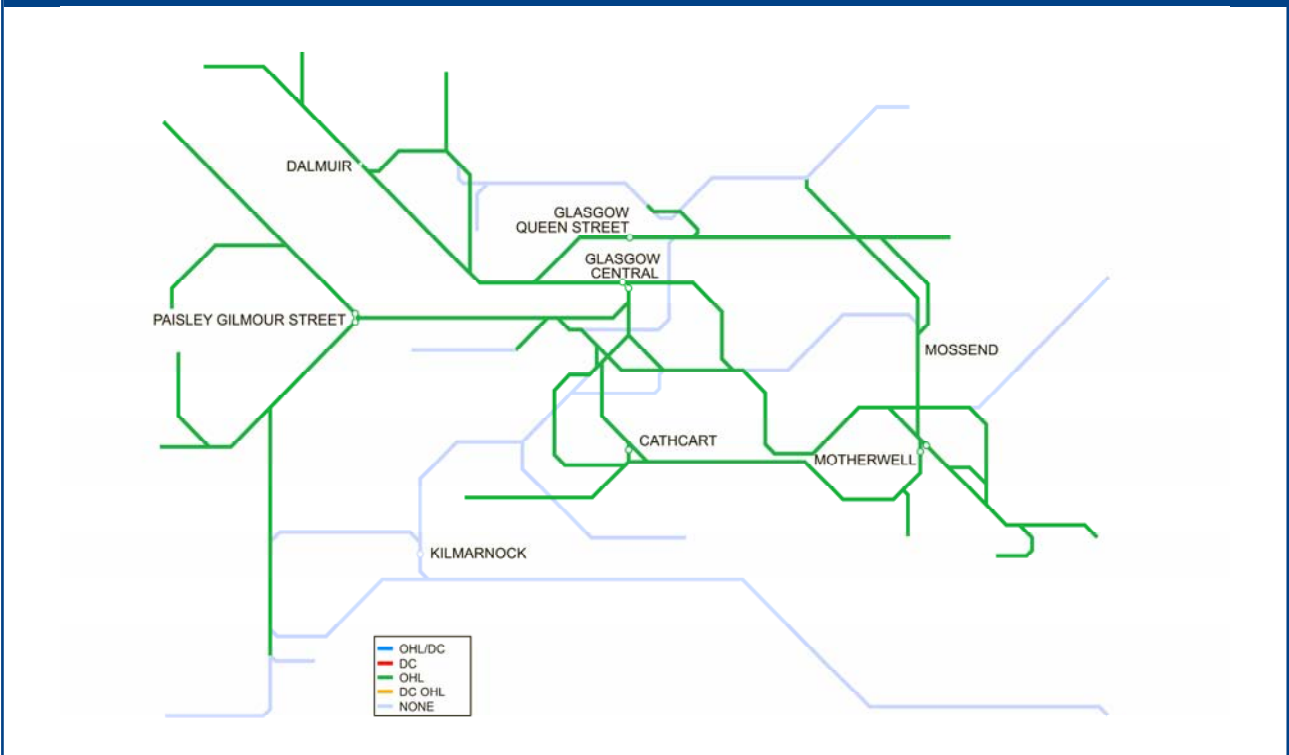




Figure 9 Route availability

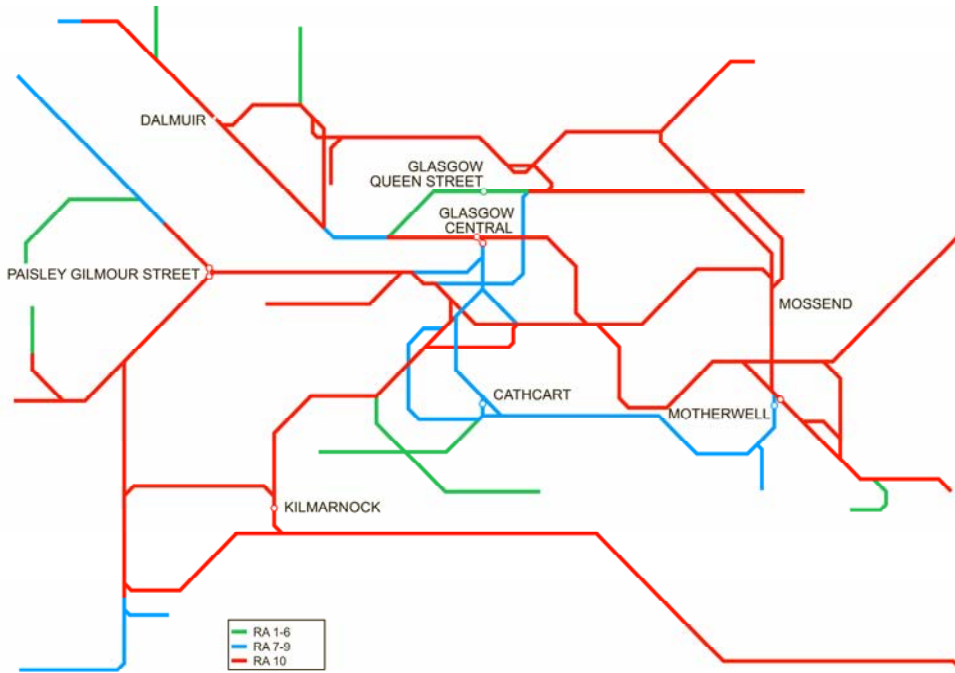
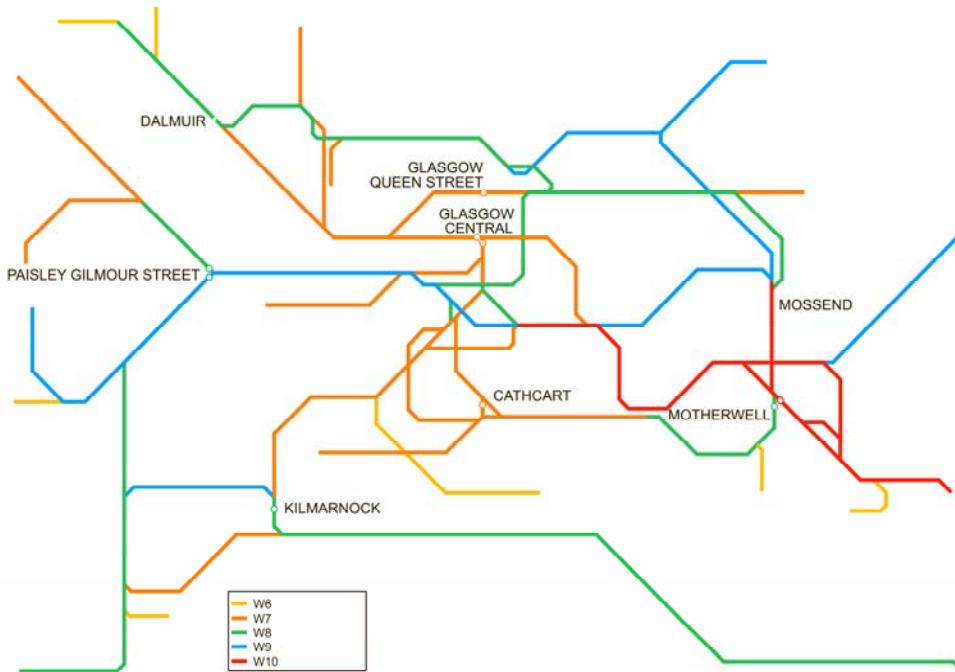


Figure 10 Gauge



## Current capacity

The baselining work carried out as part of our 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 approaches to Glasgow Central High Level station (26.01/26.03);
- the congested section between Finnieston and Hyndland (26.04);
- the congested section between Paisley Gilmour St and Glasgow Central High Level (26.03);
- restrictive platform lengths at a number of stations, most significantly Glasgow Central High Level and stations on the line to Kilmarnock (26.01/26.07);
- 13 single line sections across the route; and
- key single lead junctions at Westerton (26.04), Bellgrove (26.04), Newton (26.01) and Busby Junctions (26.07).

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

- the single line section between Mauchline and Newton on Ayr (26.08);
- a lack of stabling capacity at Mossend (26.10) and Falkland Yards (26.03);
- restrictive loading gauge and route availability; and
- lack of passing loops of adequate size to accommodate current maximum train lengths. This is particularly acute between Kilwinning and Hunterston (26.03) and Gretna and Kilmarnock. (26.08).

## Current performance

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

Performance across Scotland has improved dramatically over the last two years with an approximately 35 percent reduction in delay minutes leading to an improvement in First ScotRail's PPM from 83.1 percent to 88.9 percent. To achieve this, the focus has been on attention to detail particularly to ensure the

reliability of strategic points and signalling equipment at key nodes.

Traditionally the Autumn period has resulted in a significant dip in performance. Great efforts, (for example, targeting lineside vegetation at high risk sites) have been made to minimise these seasonal delays which resulted in the Autumn of 2006 showing a great reduction in delay across the route.

The route is characterised by a large number of flat junctions and single line branches. For example a train between Milngavie and Lanark, a distance of 37 miles, traverses nine flat junctions with a single line branch at each end of the journey. Thus any delay can have serious knock-on effects across the network. To minimise this, enhanced maintenance regimes for strategic points and signalling equipment at these key nodes are being implemented.

Long distance high speed and slower local stopping passenger services jointly operate over a number of sections of this route. This mix of traffic can lead to performance problems during times of perturbation. We are therefore 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. These enhanced plans have recently been introduced for North Electric and South Electric 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 Paisley Canal line has been identified as an area where such changes would deliver performance benefits.

On the G and SW and East Kilbride lines some alterations have been made to the timetable to improve the reliable operation of the train service. There has been a significant reduction in delays associated with the coal trains from Hunterston and the Ayrshire coal loading points as a result of some hard work by the Freight Operating Companies to reduce their terminal delays.

Figure 11 Current PPM MAA (2006/07)

TOC	MAA	As at period
First ScotRail	88.9%	11
GNER	83.6%	11
Virgin Cross Country	83.7%	11
Virgin West Coast	86.4%	11

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. During 2007, we will work towards integration of the control centre to combine maintenance and operations into one control. We will continue to work with First ScotRail, the principal train operator in Scotland, to ensure rapid decision making during perturbed working to enable normal working to be resumed as quickly as possible.

The control centre will deliver effective real time management of planned and un-planned disruptive events, to minimise the impact on passengers by better anticipation and avoidance of foreseeable disruptions.

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

- enhanced possession availability in the Glasgow Central (26.01) area to improve maintenance access opportunities;
- renewal of hydraulic point motor hoses on the North Electric routes (26.04);
- flood mitigation works at a number of locations
- anti-vandal measures at feeder stations and track section cabins;
- enhanced vegetation management regimes.
- improved maintenance plans with specialised teams to target repeat failures
- improved operations planning to remove conflicts in the timetable
- ground position signals being replaced with LEDs

### Future requirements Strategic direction

Improved use of the rail network is a central element of the Scottish Executive's plans for effective delivery of its rail objectives. Scottish Ministers published 'Scotland's Railways' in November 2006, which promotes sustainable economic growth and sets the context for the development of transport solutions for Scotland over the next 20-25 years. This strategy promotes connectivity between major towns and cities, supports faster journey times on key routes and aims to improve quality, accessibility and affordability of Scotland's railways. This strategy will feed into the Scottish High Level Output Specification (HLOS) which will determine the rail services which Scottish Ministers wish to purchase from Network Rail. With the exception of the Ayrshire corridor the growth predictions in

the Route Utilisation Strategy would not significantly worsen capacity issues.

Journey time aspirations will be focused on faster journey times between Edinburgh and Glasgow, on a number of key corridors, to provide greater passenger flexibility. In addition we will also consider options for journey time reductions on other routes in line with Scottish Ministers aspirations outlined in "Scotland's Railways"

Scottish Ministers are committed to the following further projects which are being developed:

- we are progressing the Parliamentary Bill seeking powers to re-instate the Airdrie to Bathgate rail line on behalf of Transport Scotland (financially included within Route 24). In November 2006 the Bill received Parliamentary support and proceeded to the consideration stage. Providing the Bill is successfully passed in Parliament, services could be running in 2010. Once complete, the project will allow four trains per hour to operate between Edinburgh and Glasgow on this corridor which will provide some relief to the current main Edinburgh to Glasgow route via Falkirk High. In addition this line would give a new direct connection between principal communities in North Lanarkshire and Edinburgh and West Lothian and Glasgow; and
- the proposal to provide a heavy rail link to Glasgow Airport has recently received Royal Assent. This link will be achieved by building a single track branch from Paisley St James, on the Paisley Gilmour St to Gourrock line, into the Airport. A dedicated 4 train per hour service will operate from Glasgow Central High Level. These additional services drive a requirement to enhance the existing network at Glasgow Central High Level station and between Shields Junction and Paisley to provide additional capacity on this corridor

On behalf of the rail industry, Network Rail has recently published the Scotland and Freight Route Utilisation Strategies (RUS). These documents summarise the current operating restrictions on the network and analyse future growth and the impact on rail. A number of options have been proposed, which will address the current and predicted restrictions on the network. These options set out the strategic direction for the rail infrastructure over the next 10 years. Within Route 26 these options predominately focus on additional capacity on the approach to and within Glasgow Central High Level Station, additional capacity on the Ayrshire corridor by operating

**Figure 12** Projected passenger numbers

Sector	Morning peak trips		Change relative to 2004 2016
	2004/5	2016	
Electrics – South West	5920	6860	+15%
Barrhead/Kilmarnock	1240	1430	+15%
East Kilbride	2040	2180	+7%
Electrics – South East	3650	3900	+7%
Electrics – North West	6480	6800	+5%
Paisley Canal	710	730	+3%
Cumbernauld	480	500	+3%
Maryhill	180	185	+3%

longer trains, with the aid of platform extensions and/or selective door opening and increased freight capacity on the G and SW route between Scotland and England.

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. Contributions from this fund have been agreed for minor improvements in the Glasgow Central area and to the overhead line supply to Polmadie Depot. In addition projects currently being developed, which are likely to receive funding from this source include improvements at Shields Junction, additional signalling at Dumfries and enhancements to the Shields to Paisley Corridor.

We have also developed a scheme to re-double the Gretna to Annan section of the South West route which together with enhanced signalling between Annan and Mauchline will provide a significant increase in capacity. This scheme has recently been approved for implementation during 2007 and completion in 2008. This will be funded from the Out Performance Fund created by Network Rail from the efficiencies delivered during this Control Period.

### Future demand

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

- Glasgow Airport Rail Link; and
- Airdrie to Bathgate.

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 RUS forecasts that the services that operate over the route will enjoy passenger growth as the economy expands. This arises largely as a result of the significant re-generation works planned for the inner areas of Glasgow combined with the associated forecast employment growth. Significant population growth is therefore predicted in the city centre and the small and medium sized towns in the adjoining areas. 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 Glasgow.

The RUS 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 RUS at [www.networkrail.co.uk](http://www.networkrail.co.uk).



Future freight demand on the route is forecast to grow now that Scottish Power has agreed to fit the necessary Flue Gas De-sulphurisation equipment at Longannet power station to meet the requirements of the emissions control directive. This will guarantee its future beyond 2015, although the equipment is unlikely to be fitted at Cockenzie power station. 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 and the construction of the associated waste transfer stations and the availability of grants towards the creation of new freight terminals. If the proposed container development at Hunterston comes to fruition, there will also be significant further pressure on the route towards Glasgow

### Future services

Improved use of the rail network is a central element of the Scottish Executive's plans for effective delivery of its rail objectives. Scottish Ministers have committed to delivering a number of enhancement projects on this route which will assist the rail network. Increased passenger capacity on the Ayrshire and Kilmarnock corridors are key aspirations which funders and operators are keen to progress, and for which we are currently investigating a number of options. Development in the utilisation of all routes between Glasgow and Edinburgh, through the

reduction in journey time and increased frequency are key aspirations of Scottish Ministers' to meet passenger expectations.

Figure 13 indicates the forecast percentage change in tonnage to 2016.

### Future capability

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

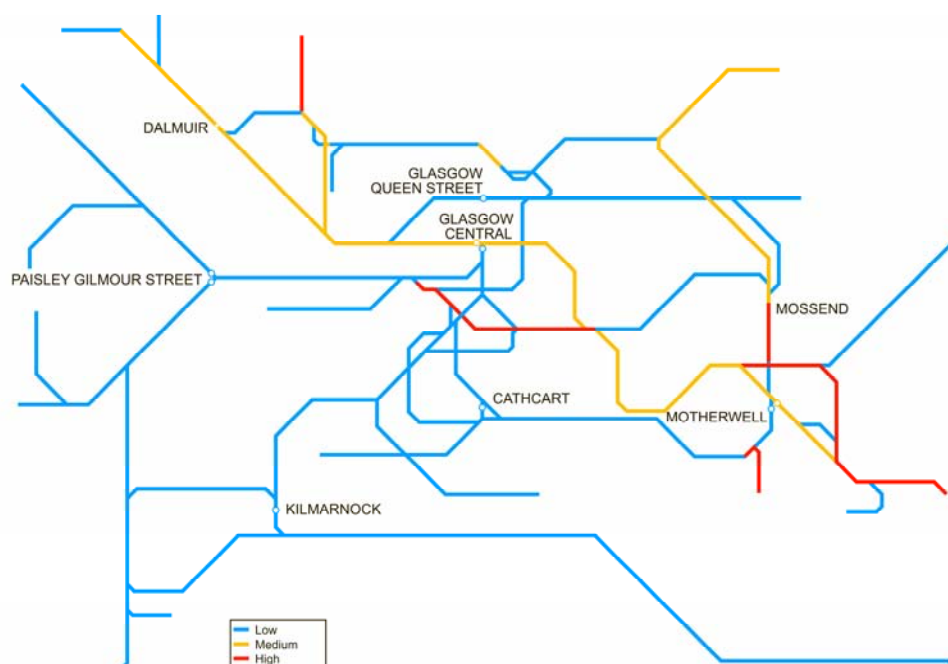
- the Mossend to Elgin gauge enhancement project is being implemented to provide clearance for a wider range of freight vehicles on the route;
- speed improvements as part of planned switch and crossings renewals; and
- signalling improvements as part of planned switch and crossings renewals.

Future capabilities of the network will be progressed in-line with Scottish Ministers' aspirations to reduce journey time between the major conurbations.

### 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.

Figure 13 Tonnage growth



**Figure 14** Forecast reduction in delay minutes

	2007/08	2008/09
% reduction in delay minutes	4%	6%

**Figure 15** Forecast PPM MMA

TOC	2007/08	2008/09
First ScotRail	90.0%	90.4%
GNER	85.0%	87.2%
Virgin Cross Country	85.1%	
Virgin West Coast	87.7%	87.6%

The rail freight industry provided to Network Rail a set of 10 year traffic forecasts, which we have used in developing the Freight RUS. The key route sections within this route that have been identified as fragile routes and have clearly defined additional tonnage/train numbers projected by the industry are Glasgow and South Western and Dalrymple – Stranraer. The additional traffic proposed for the latter route is timber in Freight Multiple Units which are lightweight. Our assessment is that the route is capable of conveying this traffic.

Network Rail has planned sufficient renewals on the G and SW to cope with current traffic levels.

### Future capacity

Traffic levels on the route have increased incrementally over recent years without any significant investment in additional capacity. 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 Scotland RUS has proposed a number of options which address how constraints could be eased and performance enhanced through timetable re-structuring; and
- a number of opportunities have been identified where modest infrastructure enhancement would yield significant improvement in the outputs that the network can deliver. Typically the optimum time to undertake these works is as an add-on to a planned renewal. In such cases the incremental enhancement cost is significantly lower than the cost of delivery as a stand alone project.

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

- provision of additional capacity on the Kilmarnock to Gretna line as highlighted above; and

- relieving the identified single line and single lead junction bottlenecks as major renewals fall due.

Certain stations will require works to enable them to cope with the predicted growth in passenger numbers. Partick station is currently being re-constructed to improve the interchange between trains, the subway, buses and taxis. The design also includes additional passenger circulating areas to relieve the current congestion that is experienced.

Platform extensions were carried out at a number of stations in 2004 to permit six coach trains to operate on the East Kilbride line. Current growth predictions suggest that platform extensions will also be required to permit longer trains to operate on the Glasgow to Kilmarnock and Glasgow to Ayr and Largs lines. Options for delivering these extensions were included in the Scotland RUS.

### Future performance

To achieve the targeted 90 percent PPM for First ScotRail (and to support the achievement of the targets for other TOCs) a further reduction in delay minutes across the industry is required. To deliver this we will continue to focus on ensuring the reliability of points and signalling. We will also be renewing a number of junctions across the route at critical locations such as Shields together with the signalling interlocking at Glasgow Central.

On the busy G and SW route we are progressing various capacity enhancements such as redoubling the route between Gretna and Annan which will also deliver a more robust timetable.

Figure 14 shows the forecast reduction in Network Rail delay minutes compared with 2006/07.

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

## Engineering access

Engineering access on the route can largely be accommodated overnight. On a number of Glasgow suburban routes, access to run later trains has recently been agreed on certain nights and discussions are ongoing on the possibility of extending this. Such access needs to be balanced with the need to maintain the reliability of the railway. In addition, the mix of services on the Anglo-Scottish routes limits access except at weekends. A cyclical maintenance strategy has been agreed for the G and SW route with the night time freight services diverted via other routes every twelfth week.

A number of extended blockades are planned on this route over the next few years. These will permit switch and crossing, track and bridge renewal and enhancement work to be undertaken in the most efficient manner. Significant blockades planned for 2007 are at Shields Junction, at various locations between Gretna and Kilmarnock and on the West Highland Line. In 2008 we anticipate a major blockade between Glasgow and Paisley in connection with signalling and the construction of the Glasgow Airport Rail Link and at Glasgow Central to permit the completion of new signalling.

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

## Opportunities and challenges

Growth in passenger numbers is forecast on this route as a consequence of two factors. The first of these is Scottish Ministers programme of major enhancement projects, in particular the Airdrie to Bathgate and Glasgow Airport Rail Link projects. The second is the background growth on existing services that arises as a consequence of the growth in the Glasgow economy and the continued migration of population from the city to the adjoining hinterland.

Modest freight growth is forecast, now that the long term future of Longannet power station has been assured.

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. The most significant of these are:

- 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.

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 approaches to Glasgow Central High Level station which are on viaduct, including a major bridge across the River Clyde.

## Expenditure

Figure 16 shows the planned level of expenditure on renewals on this route over the next two years. The precise timing and scope of these 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 (2006/07 prices)	2007/08	2008/09
<b>Renewals</b>		
<b>Track</b>		
Plain line	12	11
Switches and crossings	13	9
Other	0	–
<b>Track total</b>	<b>26</b>	<b>20</b>
<b>Civils</b>		
Underbridges	8	7
Overbridges	1	–
Bridgeguard 3	0	–
Footbridges	0	0
Earthworks	2	–
Tunnels	2	1
Culverts	0	0
Coast and estuary defence	0	1
Other	(0)	–
<b>Civils total</b>	<b>13</b>	<b>9</b>
<b>Signalling</b>		
Resignalling	36	29
Minor works/other	20	15
Over-planning	(1)	–
<b>Signalling total</b>	<b>55</b>	<b>43</b>
<b>Electrification</b>		
<b>AC systems</b>		
HV switchgear	–	2
HV cables	0	0
Booster transformers	0	0
OLE re-wiring	4	0
OLE campaign change/refurbishment	1	0
OLE structures	0	0
Other	0	0
<b>Electrification total</b>	<b>5</b>	<b>3</b>
<b>Telecoms</b>		
DOO CCTV	1	1
Customer information systems (CIS)	0	0
Long line public address (LLPA)	1	2
Clocks	–	0
Other	1	1
<b>Telecoms total</b>	<b>3</b>	<b>5</b>



<b>Operational property</b>		
<b>Stations</b>		
Managed	0	0
Franchised	7	1
<b>Depots</b>		
Light maintenance	–	0
<b>Operational property total</b>	<b>8</b>	<b>2</b>
<b>Plant and machinery</b>		
<b>Fixed plant</b>		
Point heating	0	0
Signal supply points	0	0
Depot Plant	–	0
Other	0	0
<b>Plant and machinery total</b>	<b>1</b>	<b>1</b>
<b>Total Renewals</b>	<b>109</b>	<b>83</b>

<b>Enhancements (funded by)</b>		
<b>Network Rail</b>		
Planned		
Gretna-Annan track doubling (Anglo-Scottish coal)	25	5
Power supply to feeder stations (ESI)	2	1
Other	0	0
<b>Total</b>	<b>27</b>	<b>6</b>
<b>Network Rail (RAB)</b>		
Planned		
Glasgow Airport rail link	-	13
Ayrshire / Gourock platform extensions	1	4
Stevenson loop extension	0	2
Shields Junction S&C renewal	1	-
Other	2	1
<b>Total</b>	<b>4</b>	<b>20</b>
Potential schemes	1	-
<b>Total</b>	<b>5</b>	<b>20</b>
<b>Scottish Executive</b>		
Planned		
Glasgow Airport rail link	1	17
Glasgow to Kilmarnock service enhancement	1	16
Other	1	1
<b>Total</b>	<b>3</b>	<b>34</b>
Potential schemes	0	-
<b>Total</b>	<b>3</b>	<b>34</b>
<b>Other third party</b>		
Planned		
Gourock interchange - Inverclyde council	1	8
Glasgow city council	1	-
Other	1	0
<b>Total</b>	<b>2</b>	<b>8</b>
Potential schemes	0	0
<b>Total</b>	<b>3</b>	<b>8</b>
<b>Total Enhancements</b>	<b>38</b>	<b>68</b>

The exact funding mechanism to be used for Ayrshire to Gourock and Glasgow Airport Rail Link is yet to be confirmed. For the purpose of this business plan we have assumed a split between RAB funding and direct funding as shown above.

Figure 17 Forecast volumes

	2007/08	2008/09
<b>Track</b>		
Plain line (km)		
Rail	32	20
Sleepers	16	18
Ballast	17	24
<b>Total</b>	<b>65</b>	<b>61</b>
<b>Switches &amp; crossings (no.)</b>		
Complete renewal	30	19
Partial renewal/reballasting	2	4
<b>S&amp;C (equivalent units)</b>	<b>31</b>	<b>20</b>
<b>Other (km)</b>		
Drainage	2	–
<b>Civils</b>		
Underbridges (m <sup>2</sup> )	4,237	1,606
Overbridges (m <sup>2</sup> )	282	–
Bridgeguard 3 (m <sup>2</sup> )	14	–
Earthworks (m <sup>2</sup> slope surface)	8,080	–
Tunnels (m <sup>2</sup> )	1,540	1,100
Culverts (m <sup>2</sup> )	–	31
Coast and estuary defence (lm)	30	500
<b>Signalling</b>		
Resignalling (SEUs)	60	302
<b>Electrification</b>		
<b>AC systems</b>		
HV switchgear (cb)	–	20
HV cables (km)	–	1
Booster transformers (no.)	–	10
OLE re-wiring (t. length)	5	–
OLE campaign change/refurbishment (t. length)	16	1
OLE structures (no.)	1	1
<b>Telecoms</b>		
<b>Concentrators</b>		
DOO CCTV (systems)	40	12
LLPA (stations)	34	59

The planned volume of renewals is detailed in Figure 17.

It should be noted that in order to manage the deliverability of our Civils, Signalling and 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 two years.

Figure 18 Forecast expenditure		
£m (2006/07 prices)	2007/08	2008/09
Maintenance	32	31



## Infrastructure investment

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

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
<b>A</b> Airdrie/Bathgate (26.04)	New Rail Link	Reinstatement of disused line	All	Transport Scotland/Network Rail Discretionary Fund	4	2009/10
<b>B</b> New Glasgow Signal Centre	New Signal Centre	Renewal	Signals	Network Rail	5	2008/09
<b>C</b> Mossend/Eigin Corridor (26.12)	Gauge Enhancement Programme	Facilitate additional freight traffic	All	Transport Scotland	6	2007/08
<b>D</b> Drumlanrig Tunnel (26.08)	Tunnel Lining Repairs	Lining and air shaft excavations	Structures	Network Rail	5	2007/08
<b>E</b> Colgrain, Nr Cardross (26.04)	Coastal Defence Works	Rock armour placement	Earthworks	Network Rail	2	2008/09
<b>F</b> Stranraer (26.05)	Station Relocation	Relocation of station nearer to town centre	All	Dumfries and Galloway Council	2	2008/09
<b>G</b> Enterkine Viaduct, Ayrshire (26.08)	Timber Decking Replacement	Viaduct remedial works	Structures	Network Rail	3	2007/08
<b>H</b> Benston Burn, Nr Auchinleck (26.08)	Underbridge Repairs	Bridge strengthening work	Civils	Network Rail	4	2007/08
<b>I</b> Cook Street, Glasgow (26.03)	Underbridge Repairs	Bridge strengthening work	Civils	Network Rail	3	2008/09
<b>J</b> Partick Station (26.04) Reconstruction	Creation of new transport interchange	Enhancement.	Stations	SPT	5	2007/08

Figure 19 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
<b>K</b> Dunlop Road, Lugton (26.07)	Underbridge Repairs	Structure renewal	Structures	Network Rail	4	2007/08
<b>L</b> Shields/Gourock and other Glasgow suburban routes (26.03)	OHL Renewals	Renewal	Electrification	Network Rail	5	2007/08
<b>M</b> Glasgow Central (26.01/26.03)	Renewal of Signalling Interlocking	Renewal	Signals	Network Rail	5	2009/10
<b>N</b> Glasgow to Paisley Corridor (26.03)	Renewal of Signalling Interlocking	Renewal	Signals	Network Rail	1	2011/12
<b>O</b> Cathcart SC (26.09)	Renewal of Signalling Interlocking including enhancements	Renewal and improved signalling	Signals	Network Rail Discretionary Fund	1	2012/13
<b>P</b> Paisley to Gourock/Wemyss Bay Corridor (26.03)	Signal Life Extension Programme	Renewal	Signals	Network Rail	1	2009/10
<b>Q</b> Ardmore East Level Crossings (26.03)	AHB Renewals	Renewal	Signals	Network Rail	1	2009/10
<b>R</b> Gailes Crossings (26.03)	AHB Renewals	Renewal	Signals	Network Rail	1	2009/10
<b>S</b> G and SW (Various Sites including Dumfries, Dumfries Turnback and Stevenston Loop) (26.08)	Renewals and Rewiring	Renewal and improved signalling	Signals	Network Rail Discretionary Fund	1	2007/08
<b>T</b> Barhead/Lugton (Various sites)	Renewal of Signalling Interlocking	Renewal	Signals	Network Rail	2	2008/09
<b>U</b> Strathclyde	Renewal of DDO Station Equipment	Renewal	Telecoms	Network Rail	6	2007/08

Figure 19 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
V	Gourock Station (26.03) New Interchange	Relocation of existing station	All	Inverclyde Council	4	2008/09
W	Glasgow/Kilmarnock (26.07) Service Enhancements	Half hourly service over route	All	Transport Scotland	2	2008/09
X	Glasgow Area (26.04/26.01) M74 Enabling Works	Works to manage interface between motorway and railway	Civils	Glasgow City Council/Transport Scotland	1	2010/11
Y	Track Renewals, S&C S&C Renewals at Barassie, Annan, Hunterston, Glasgow Central, Mauchline, Garnqueen North, Shields Jn	Renewal	Track	Network Rail	Various	2007/08
Z	Track Renewals, S&C S&C Renewals at Bank Jn, Kirkconnel, Thornhill, Dubbs, Falkland, New Cumnock, Gartcosh, Whifflet North, Ravenstruther, Carstairs North, Law	Renewal	Track	Network Rail	Various	2008/09
AA	Track Renewals, S&C S&C Renewals at Smithy Lye, Langloan, Dumfries, Airdrie, Bellgrove, Busby Jn, Larkfield, Annbank, Brownhill, Mossend East	Renewal	Track	Network Rail	Various	2009/10
AB	Track Renewals, S&C Hyndland East Jn, Cumbernauld, Ross Jn, Burnhouse	Renewal	Track	Network Rail Discretionary Fund	Various	2010/11
AC	Hamilton Central (26.10) Covered Walkway	Covered walkway from station to car park	Stations	South Lanarkshire Council	2	2009/10
AD	GARL (26.03) New Link to Glasgow Airport	Provision of a rail link between Glasgow Central and Glasgow Airport	All	SPT/Transport Scotland	3	2010/11
AE	G&SW Enhancements (26.08) Anglo Scottish coal route works	Greater capacity for Anglo Scottish coal	All	Network Rail Outperformance Fund	5	2008/09

Figure 19 Planned infrastructure investment

Project	Project description	Output change	Main asset type(s)	Funding	GRIP stage	Completion year
AF Polmadie Depot (26.01)	Provision of independent 25kv feed train servicing depot	Improved reliability and performance	Electrification	Network Rail Discretionary Fund	5	2007/08
AG Shields Jn Enhancement (26.03)	Increased speed	Improved performance	Electrification/ track	Network Rail Discretionary Fund	4	2007/08
AH Ayrshire LLPA	Renewal		Stations	Network Rail	4	2007/08

Figure 20 highlights other schemes under consideration.

Figure 20 Infrastructure investment under consideration

Project	Project description	Output change	Main asset type(s)	Funding	Grip status
AI Ravenscraig (26.10)	New Station	Enhancement	All	To be Determined	1
AJ South Ayr (26.05)	New station	Enhancement	Stations	To be Determined	1
AK Barrhill (26.05)	New timber loading terminal	Enhancement	All	To be Determined	1
AL Kilwinning (26.03)	New transport interchange	Enhancement	Stations	SPT	2
AM Finnieston/Hyndland Corridor (including Hyndland Station) (26.04)	Renew and Possible Upgrade	Renewal, station and capacity improvements	All	To be Determined	1
AN Glasgow Crossrail (26.07 and 26.04)	New cross-Glasgow link	Greater connectivity	All	SPT	2

Figure 21 highlights route enhancement aspirations.

Figure 21 Route enhancement aspirations						
Project	Project description	Output change	Main asset type(s)	Funding	Status	
AP	Rutherglen East/Whiffet (26.10)	Electrification	Electrification	To be Determined	Under Consideration	
AQ	Ayrshire/Inverclyde (26.03)	Platform extensions	Stations/signals	To be Determined	Under Consideration	
AR	Finnieston (26.04)	Tumback facility	Track/signals	Network Rail Discretionary Fund		
AS	Glasgow Central (26.01)	Station enhancements	Stations	To be Determined	Under Consideration	

### Non-infrastructure developments

The following significant timetable scheme for the route are under development.

Figure 22 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
G&SW/Stranraer Timetable Review	Meeting passenger demands	Review of origins and destinations	Performance meets passenger needs/capacity	2009

## Appendix

Figure 23 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
26.01	WCML: Glasgow Central – Carstairs	WCM	Primary	Transport Scotland	No	W10	10	100(60)	AC	CL	4"(3")	2(4)
26.02	Midcalder Jn – Holytown Jn	EGS	Secondary	Transport Scotland	No	W9	10	70	none	CL	8"	2
26.03	Ayr lines, Wemyss Bay and Gourrock	AYR (GOU)	Secondary	Transport Scotland	No	W9 (W7)	10(7)	90(70)	AC	CL	4"(2")	2(1)
26.04	Glasgow North electric routes	NEM (YKR)	Secondary	Transport Scotland	No	W8 (W7)	10(7)	60(50)	AC	CL	4"(3")	2(1)
26.05	Stranraer – Ayr	STR	Rural	Transport Scotland	No	W8	8	65(20)	none	TB (ETB)	15"	1(2)
26.06	Paisley Canal Branch	CNL	Secondary	Transport Scotland	No	W7	10	50	AC (partial)	CL	5"	1
26.07	Muirhouse Jn – East Kilbride/Kilmarnock	GBK (EKE)	Secondary	Transport Scotland	No	W7 (W6)	10(5)	70(40)	none	TB (AB)	15"	2(1)
26.08	Gretna Jn – Kilmarnock – Barassie Jn	GSW (BAK)	Secondary	Transport Scotland	No	W9 (W8)	10	80(70)	none	AB (TB)	20"	2(1)
26.09	Eglington Street Jn – Neilston/Newton including Cathcart Circle	KHL (NINH)	Secondary	Transport Scotland	No	W7	7(5)	50(40)	AC	CL	4"(2")	2
26.10	Newton – Gartsherrie South/Rutherglen Jn	RCB (SCM)	Secondary	Transport Scotland	No	W9	10	75(70)	AC	CL	6"(4")	2



Figure 23 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
26.11	Lanark Branch	LNK	Secondary	Transport Scotland	No	W6	5	60	AC	OTW	10"	1
26.12	Knightswood North Jn – Cowlairs Jn plus Cowlairs Jn – Greenhill Jn	MRL (CBD)	Secondary	Transport Scotland	No	W9 (W8)	10	70(60)	none	CL	8'(5")	2
26.13	Freight Lines	CND (LGS)	Freight	Transport Scotland	No	W9	9	20(5)	none	OTW	20"	1

#### Capacity and operational constraints

- A Finnieston – Hyndland: double track at capacity
- B Barrhead – Kilmarnock: single line section
- C Milngavie branch: single line section
- D Bellgrove – Finnieston: signalling headways and limited track capacity
- E Glasgow Central – Paisley Gilmour Street: double track at capacity
- F Paisley Gilmour Street – Kilwinning: signalling headways
- G Ardrossan – Largs: single line passenger section
- H Barassie – Kilmarnock: single line section
- I Busby – East Kilbride: single line with limited crossing facility
- J Gretna – Annan: single line section
- K Glasgow Central High Level Station - Muirhouse Junction: limited track and platform capacity

#### Other issues on the route

- L Mauchline Junction – Annan: high freight usage

## Note

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

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

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

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

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

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

The other documents in the business plan suite can be found on the Network Rail website [www.networkrail.co.uk](http://www.networkrail.co.uk)



This Route Plan is part of a set.  
To view or download the others  
visit [www.networkrail.co.uk](http://www.networkrail.co.uk)