

Route Plans 2008
Route 26
Strathclyde and
South West Scotland



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Route 26 Strathclyde and South West Scotland



Section 1: Today's railway

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.

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 terminals, the most significant of which are Mossend and Coatbridge. 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.

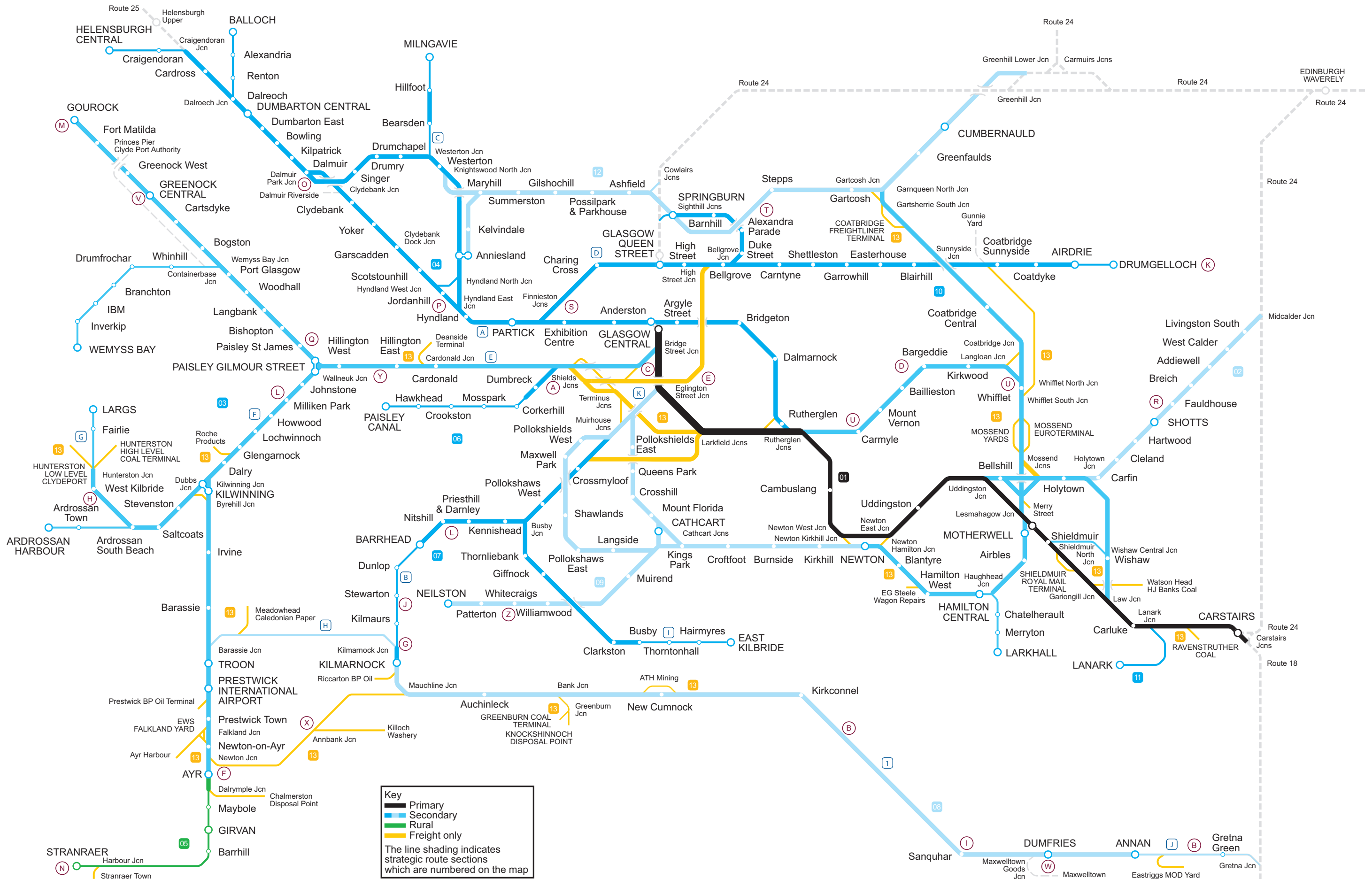
Transport Scotland commissioned its Scottish Planning Assessment (SPA), as one of the inputs to the development of their strategy for rail in Scotland, and Network Rail published the Route Utilisation Strategy (RUS) for Scotland in March 2007. Both of these pieces of work have informed the High Level Output Specification (HLOS), which was published by Scottish Ministers in July 2007. This strategy details Network Rail's response to the outputs detailed in the HLOS.

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 Jn 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 WCML 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 (26.13); and
- freight branches to Watsonhead, Deanside, Chalmerston, Killoch, Knockshinnoch and Greenburn (26.13).

Route 26 Strathclyde and South West Scotland



Current passenger and freight demand

In recent years, Scotland's economy has been restructured 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 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 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.

These numbers were further reviewed in the Scotland Route Utilisation Strategy (RUS) to include accurate inclusion of multi-modal ticket information. For further information, see the published Scotland RUS at www.networkrail.co.uk

The RUS 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, again updated based on the most recently available data.

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 and East Kilbride Line, even though the majority of peak 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.

Figure 1 Current passenger numbers

| Sector | Daily Trips |
|------------------------|-------------|
| Glasgow Central | 66,004 |
| Glasgow Queen Street | 35,214 |
| Partick | 9,758 |
| Paisley Gilmour Street | 8,016 |
| Charing Cross | 6,792 |
| Argyle Street | 5,240 |
| Ayr | 4,427 |
| Motherwell | 2,635 |
| East Kilbride | 2,445 |
| Mount Florida | 2,434 |
| Anderston | 2,219 |
| High Street | 2,209 |
| Milngavie | 2,132 |

Figure 2 Peak loading

| Service | Load Factor |
|------------------------|-------------|
| East Kilbride | 96% |
| Electrics – South West | 94% |
| Barrhead/Kilmarnock | 106% |
| Electrics – South East | 67% |
| Electrics – North West | 69% |
| Paisley Canal | 55% |
| Cumbernauld | 71% |
| Maryhill | 29% |

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&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.

Current services

Figure 3 shows the current level of service at peak and off-peak times.

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 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 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. Anglo Scottish daytime services from Glasgow Central are provided by Virgin Trains to Manchester, Birmingham and London, National Express East Coast (NEXC) to London Kings Cross via Carlisle and Edinburgh, CrossCountry to Birmingham and the South of England via Edinburgh and First Keolis TransPennine Express to Manchester.

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

Figure 3 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 | 3 | 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 Gourock | 4 | 3 |
| Glasgow Central HL to Ayr | 3 | 2 |
| Glasgow Central HL to Largs | 2 | 1 |

Figure 4 Tonnage



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

Traffic volumes are summarised in Figure 5.

Figure 5 Current use

| | Passenger | Freight | Total |
|------------------------------------|-----------|---------|-------|
| Train km per year (millions) | 19 | 3 | 21 |
| Train tonne km per year (millions) | 2,919 | 2,863 | 5,781 |

Current infrastructure capability

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

Figure 6 Linespeed

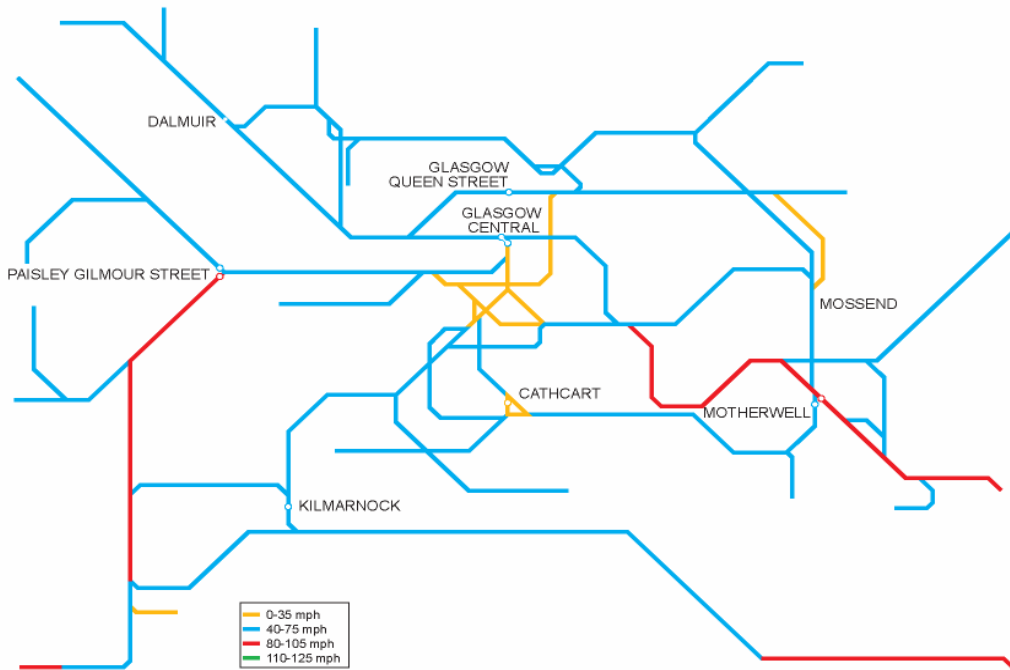


Figure 7 Electrification

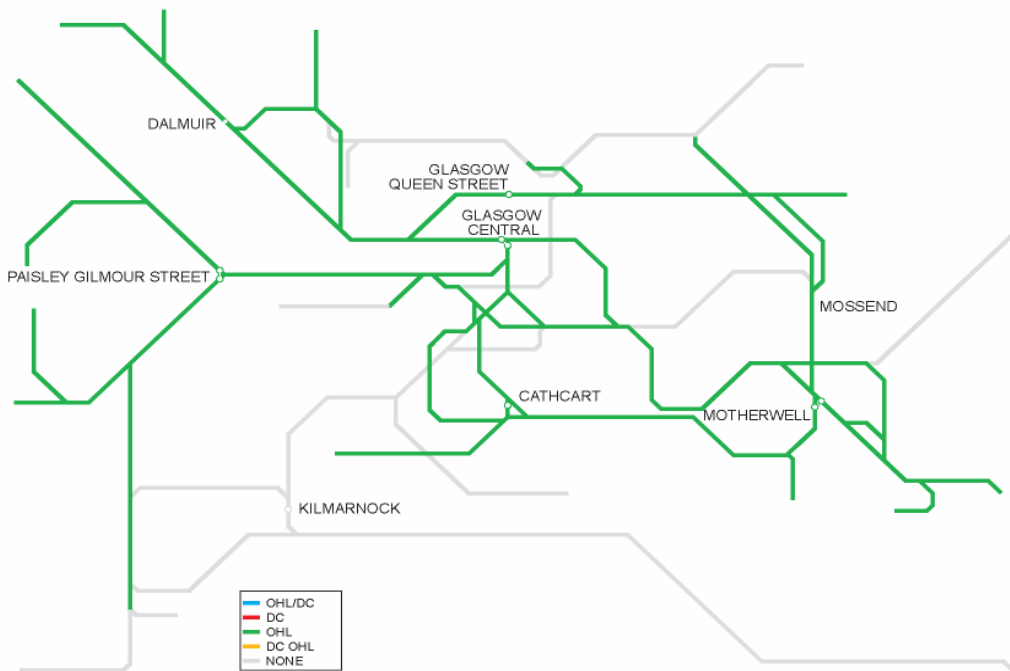


Figure 8 Route availability

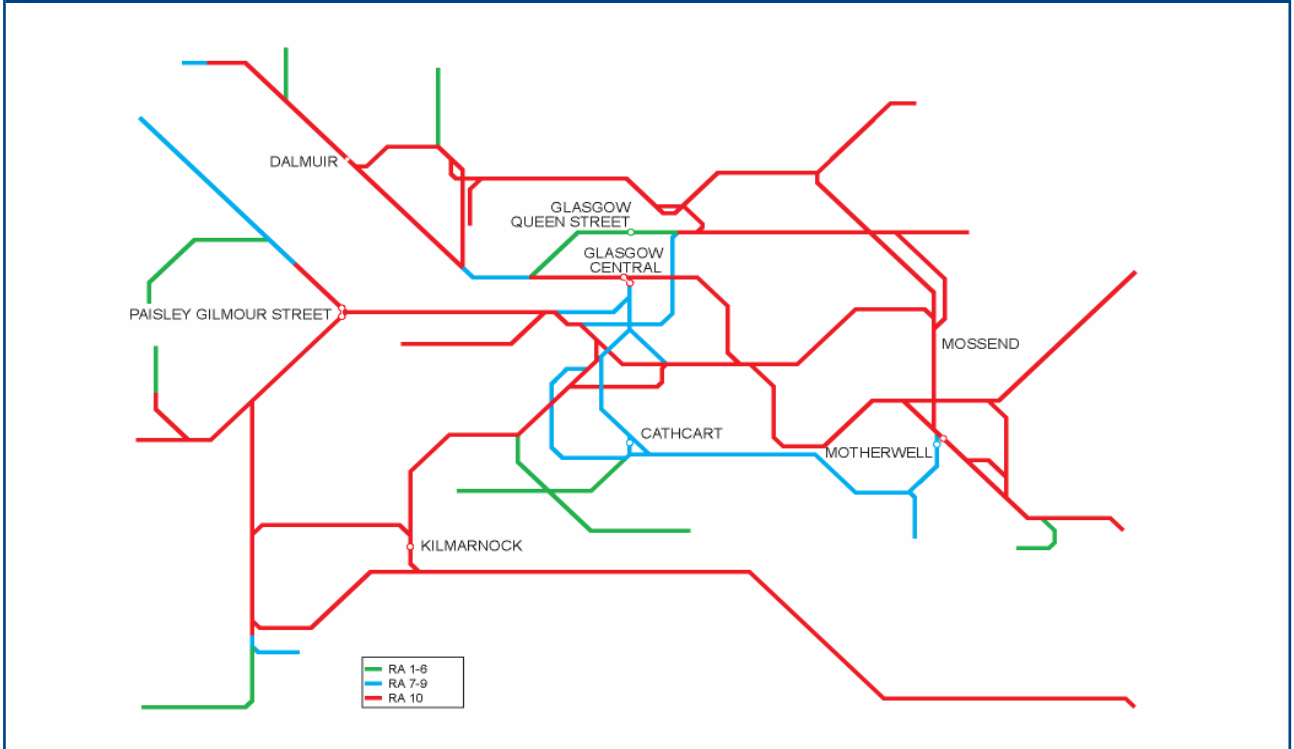
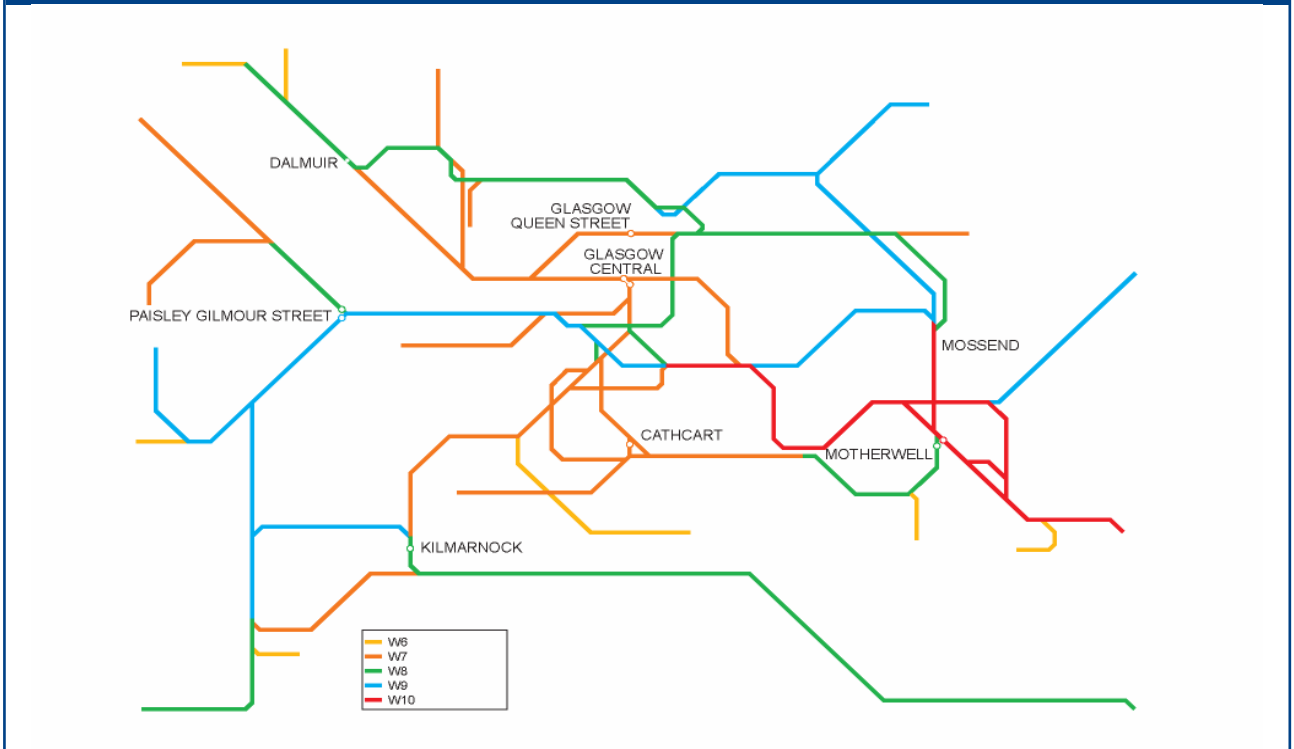


Figure 9 Gauge



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), particularly the Muirhouse – Bridge Street section;
- 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).

Figure 10 Current PPM MAA (2007/08)

| TOC | MAA | As at period |
|-----------------------------------|-------|--------------|
| CrossCountry | 86.9% | 12 |
| First Keolis Transpennine Express | 91.7% | 12 |
| First ScotRail | 90.3% | 12 |
| National Express East Coast | 82.5% | 12 |
| Virgin Trains | 86.3% | 12 |

Current performance

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

Performance across Scotland has improved dramatically over the last three years with a circa 35 percent reduction in delay minutes leading to an improvement in First ScotRail's PPM from 83.1 percent to over 90 percent. 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. Continued efforts in 2007 resulted in a stabilisation of the seasonal delays at a level similar to 2006, but substantially better than 2005.

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 have been 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 make certain 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&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.

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 have recently completed the integration of the maintenance and operations controls in Scotland. 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.

The control centre delivers effective real time management of planned and un-planned disruptive events, to minimise the impact on passengers.

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 lines (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; and
- ground position signals being replaced with LED signals.

Section 2: Tomorrow's railway

Future demand

Rail passenger demand has increased significantly in the last few years, reflecting increased employment, especially in Glasgow, and as a consequence of increased road congestion.

The Scotland RUS forecast an annual growth rate across Scotland averaging three percent per annum in passenger miles and this has been reflected in the Scotland HLOS. Our analysis indicates that this will not be evenly spread but that growth will be greater on the Ayrshire and Argyle lines and less on other lines on this Route.

Increased passenger demand will also occur on services on this route from the following major rail enhancement schemes between 2010 and 2012:

- Glasgow Airport Rail Link (26.03); and
- Airdrie to Bathgate (26.04/24.03).

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 regeneration works planned for the inner areas of Glasgow combined with the associated forecast employment growth. Significant population growth is therefore predicted in 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, including longer trains on the Ayrshire services.

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. For further information, see the published Scotland RUS at 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.

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, the construction of the associated waste transfer stations and the availability of grants towards the creation of new freight terminals.

Section 3: Proposed 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 2008 ² | WCML 2009 timetable | Nil on Route 26 (See Route 18) | Enhanced frequency and reduced journey time to London/Birmingham |
| Oct 2009 | G&SW enhancements | Redoubling of Gretna/Annan and signalling improvements Annan/Mauchline | Performance and capacity improvements |
| Oct 2009 ² | South Electrics recast | Nil | Improved reliability of Glasgow South electric services |
| Oct 2009 | G&SW/Stranraer Recast | Nil but facilitated by G&SW enhancements above. | Stranraer services separated from Glasgow/Carlisle/Newcastle services to better match passenger demand and improve reliability |
| Oct 2009 ² | Glasgow/Kilmarnock | Construction of extended loop from Lugton to Stewarton and extension of platforms to six-car | Half hourly Glasgow to Kilmarnock service with some peak services six-car |
| Dec 2009 ^{1, 2} | Edinburgh/Glasgow via Carstairs or Shotts | | Hourly Semi Fast Glasgow Central/Edinburgh Waverley via Carstairs or Shotts |
| Dec 2010 ² | New Rolling Stock (Ayrshire) | Platform extensions Additional Stabling/Maintenance Capacity | Reduced journey times and longer trains to increase seating capacity |

¹ Priority for provision of enhanced services between Glasgow Central and Edinburgh Waverley still to be finalised. Provision of additional services via Carstairs **and** Shotts will require significant infrastructure improvements on the common sections of route.

² Impacts on Glasgow Central capacity (See Section on Current Capacity)

| Figure 11 Summary of proposed strategy milestones | | | |
|---|---|---|--|
| Implementation date | Service enhancement | Infrastructure enhancement | Expected output change |
| Dec 2010 | Airdrie/Bathgate | Construction of new line | Four trains per hour Glasgow Queen Street Low Level to Edinburgh via Airdrie and Bathgate |
| Jan 2012 ² | Glasgow Airport Rail Link | New branch line between Paisley and the airport, together with enhancements between Glasgow Central and Paisley | Four trains per hour Glasgow Central to Glasgow Airport |
| Dec 2013 ^{1, 2} | Edinburgh/Glasgow via Carstairs or Shotts | See Note 1 | Two trains per hour Semi Fast Glasgow Central/Edinburgh Waverley via Carstairs or Shotts |
| Dec 2013 | Cumbernauld Electrification | Construction of "Garngad" chord and electrification of Alexandra Parade to Cumbernauld line Additional City Centre Turnback Facility | Diversion of Glasgow to Cumbernauld service to Glasgow Queen Street Low Level and integration with North Electric services |
| Dec 2014 ² | Whifflet Electrification | Electrification and upgrading of Rutherglen to Whifflet | Diversion of Glasgow to Whifflet services to Glasgow Central Low Level and integration with existing Argyle Line services |
| Dec 2015 ² | Paisley Canal Electrification | Electrification of Corkerhill to Paisley Canal | Integration of the Paisley Canal Branch into the wider Glasgow South electric network. |
| Dec 2016 ² | East Kilbride Electrification | Electrification of Muirhouse to East Kilbride | Integration of the East Kilbride Branch into the wider Glasgow South electric network. |
| Dec 2016 ² | Barrhead Electrification | Electrification of Muirhouse to Barrhead | Integration of the Barrhead Line into the wider Glasgow South electric network. |

¹ Priority for provision of enhanced services between Glasgow Central and Edinburgh Waverley still to be finalised. Provision of additional services via Carstairs and Shotts will require significant infrastructure improvements on the common sections of route.

² Impacts on Glasgow Central capacity (See Section on Current Capacity)

Strategic direction

Improved use of the rail network is a central element of Scottish Ministers' plans for effective delivery of its rail objectives. Scottish Ministers published Scotland's Railways in December 2006, which promotes sustainable economic growth and sets the context for the development of sustainable 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 as well as reducing emissions.

From this strategy, Scottish Ministers' published a High Level Output Specification (HLOS) in July 2007. The HLOS details Scottish Ministers' aspirations for the rail network between March 2009-2014 which include:

- the delivery of services that minimise the impact on the environment and make sure that rail is a real alternative to road and air travel for passenger and freight travel and environmentally superior both within Scotland and for cross-border journeys;
- partnership working between Network Rail, First ScotRail, Transport Scotland, Regional Transport Partnerships, local authorities and other key stakeholders;
- the promotion of integrated, innovative and efficient working practices both in respect of current operations and network planning
- the promotion of integration between transport modes and the provision of effective, secure interchange facilities;
- a reduction in the time taken to progress projects from feasibility to delivery; and
- continued improvements to operational and financial performance, including improved resilience.

The HLOS specifies outputs in three 'Tiers.' Tier 1 requires the existing network to be retained with the ability to cope with known growth and performance improved. Tier 2 specifies specific major projects for development and delivery while Tier 3 includes the development of further enhancements. Tier 1 includes a Small Projects Fund to support growth through measures to improve capacity or capability or performance. Table 17 includes schemes currently identified which appear to fit within this category. Tables 16 and 17 indicate within which tier each project falls.

On behalf of the rail industry, Network Rail published the Scotland and Freight Route Utilisation Strategies (RUS) in March 2007. 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 longer trains, platform extensions and/or selective door opening and increased freight capacity on the G&SW route between Scotland and England.

We are currently delivering improvements to the G&SW route consisting of the redoubling of the eight miles between Gretna and Annan and four additional signal sections which collectively will reduce the current circa 30 minute headway on the route to 15 minutes. We expect to complete this during 2008/9.

On behalf of Transport Scotland we are developing the upgrade of the line between Barrhead and Kilmarnock to provide sufficient capacity to operate a half hourly service in each direction with the ability to use six-car formations at peak periods by December 2009.

Scottish Ministers are committed to the following further projects (included within Tier 2 of the HLOS) which are being developed: re-instatement and electrification of the Airdrie – Bathgate line and construction of the Glasgow Airport Rail Link (GARL). This consists of a new line between Paisley and Glasgow Airport with the upgrading of the existing line between Glasgow and Paisley and improvements at Glasgow Central. Network Rail is contracted to undertake the development of the Airdrie to Bathgate line and delivery of the advanced works has already started with a target completion of December 2010.

As far as GARL is concerned, Network Rail is currently expected to develop the improvements to the existing network and to provide the rail infrastructure on the branch from Paisley to the airport. This aligns closely with the renewal of the signalling in the Paisley area and considerable synergies are being achieved by integrating these two pieces of work. We are also working closely with Transport Scotland, which is responsible for the construction of the viaducts etc on the new branch. The target completion date for this is December 2012. Similarly, advanced works have now commenced.

Following the recommendations included in the Scotland RUS we have been working with

Transport Scotland and First ScotRail on plans for the provision of improved services between Glasgow Central and Edinburgh Waverley. It is anticipated this will move towards providing two trains per hour with a journey time of around 65 minutes. Full implementation of this will require considerable infrastructure upgrade particularly between Rutherglen and Newton and additional rolling stock, but it is anticipated that some improvements to this service can be delivered by 2009. This will help to provide extra capacity between the two cities as well as improving the link between North Lanarkshire (particularly the development area of Ravenscraig) and Edinburgh. This is part of the Edinburgh to Glasgow Improvement Programme (E.G.I.P.) described in more detail in Route 24.

Much of the Glasgow suburban network is already electrified but it is anticipated that over time the proportion of electrified railway will continue to grow. The line between Rutherglen and Whifflet is targeted as a useful in-fill scheme. This will permit the better integration of the Glasgow to Whifflet service with the remaining Lanarkshire services (possibly including a major recast of existing services) and, by diverting the trains to Glasgow Central Low Level, will free up some capacity at Glasgow Central High Level. Taking account of the planned enhancements, the long-term strategy, mentioned in the Scotland RUS to increase capacity at Glasgow Central needs to be developed in more detail. For further information, see the published Scotland RUS at www.networkrail.co.uk.

Similarly north of the Clyde, we plan to continue the development work on the option to electrify the Cumbernauld line which, together with the construction of a short piece of new railway known as the Garngad chord, would allow the Glasgow to Cumbernauld service to be diverted to Glasgow Queen Street Low Level, freeing up capacity at the High Level station.

A Discretionary Fund has been established in CP3 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, including Shields Junction and to the overhead line supply to Polmadie Depot (now complete). In addition to projects currently being developed, those which are likely to receive funding from this source include a number of freight related schemes in Ayrshire. It is anticipated that a similar fund will be available in CP4.

Schemes which we consider could benefit from this to improve capacity and capability include the provision of a new turnback siding west of Charing Cross (known as "Finnieston Turnback"). As an alternative to this, an option has been identified to re-instate a third platform at Glasgow Queen Street Low Level. A key feature of this funding provision is the ability to provide minor enhancements at the same time as major renewals are undertaken. In CP4 we anticipate this will include signalling improvements in the Cathcart area when we renew the signalling in 2013, improvements to the crossovers on the Inverclyde lines, signalling enhancements to the Shields to Paisley Corridor and additional signalling at Dumfries. Other enhancements will be identified as the renewal programme is developed in more detail.

There are 62 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. Moss Road Level Crossing (26.04) is scheduled for upgrade from a user worked crossing to automatic half barrier. In addition to this there are two level crossings scheduled to be renewed on a like for like basis at Gales (26.03) and Ardmore East (26.04). Work at all three crossings is scheduled to take place 2008 / 09.

There are a number of potential developments (e.g. housing) on the route, where there could be an opportunity to upgrade, or close level crossings subject to suitable funding and planning constraints. One such crossing is the automatic open crossing, which is locally monitored, at Ardrossan. The combined rail and road traffic movement determines the maximum line speed at this type of crossing and will have to be monitored as the development progresses. Network Rail is also involved in raising awareness of the dangers of level crossings particularly in rural areas by making regular safety presentations at the Royal Highland Show.

Figure 12 Tonnage growth



Future train service proposals

Improved use of the rail network is a central element of the Scottish Government's plans for effective delivery of its rail objectives. The Scottish Government has committed to delivering a number of enhancement projects on this route which will assist the rail network. 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.

In addition to the service enhancements included above, the opening of GARL will facilitate a four trains per hour service between Glasgow Central and Glasgow Airport calling at Paisley Gilmour Street. As well as providing a fast and frequent connection to the airport, this will also provide additional capacity between Glasgow and Paisley, freeing up space on the Ayrshire and Inverclyde services for longer distance passengers.

The opening of the line between Airdrie and Bathgate will permit the extension of four North Electric trains per hour from Airdrie to Edinburgh providing a new connection from North Lanarkshire to West Lothian and Edinburgh.

Following the enhancements to the Glasgow and South Western route and between Barrhead and Kilmarnock mentioned above, it is anticipated that there will be a recast of services using the line between Glasgow Central and Muirhouse Junction. This is expected to deliver a better

Glasgow/Dumfries/Carlisle service and a more robust Glasgow South Electrics and East Kilbride service as well as the half-hourly service between Glasgow and Kilmarnock. In accordance with the Scotland RUS recommendations, services to/from Stranraer would be focussed on a shuttle between Stranraer and Kilmarnock with through services to Glasgow largely provided by linkage with the enhanced Glasgow/Kilmarnock service.

Figure 12 indicates the forecast percentage change in tonnage to 2017.

Future capability

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

- speed improvements as part of planned S&C renewals; and
- signalling improvements associated with planned renewals.

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

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:

Figure 13 Forecast PPM MAA - CP4 plan

| | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 |
|-----------------------------------|---------|---------|---------|---------|---------|
| Cross Country | 87.9% | 88.7% | 89.7% | 90.4% | 90.9% |
| First Keolis Transpennine Express | 92.8% | 93.3% | 93.7% | 94.0% | 94.2% |
| First ScotRail | 90.9% | 91.3% | 91.7% | 91.9% | 92.0% |
| National Express East Coast | 86.8% | 88.4% | 89.5% | 90.5% | 91.1% |
| Virgin Trains | 88.1% | 89.6% | 90.8% | 91.5% | 92.0% |

Figure 14 Forecast PPM MAA - proposed local commitments

| | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 |
|-----------------------------------|---------|---------|---------|---------|---------|
| Cross Country | 86.7% | 87.4% | 88.4% | 89.1% | 89.7% |
| First Keolis Transpennine Express | 92.2% | 92.6% | 93.1% | 93.4% | 93.6% |
| First ScotRail | 90.9% | 91.3% | 91.7% | 91.9% | 92.0% |
| National Express East Coast | 85.2% | 86.7% | 87.9% | 88.9% | 89.5% |
| Virgin Trains | 85.8% | 87.3% | 88.5% | 89.2% | 89.7% |

- the Scotland RUS has proposed a number of options which address how constraints could be eased and performance enhanced through timetable restructuring; and
- a number of opportunities have been identified where 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. (As detailed in enhancement tables)

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 (currently being delivered as described above);
- relieving the identified single line and single lead junction bottlenecks as major renewals fall due; and
- provision of additional capacity at Glasgow Central Station including low level.

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-car 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 and are being progressed.

Future performance

Figure 13 sets out the planned PPM for each train operator. Figure 14 sets out the trajectory we propose as local commitments with each operator. Other than First ScotRail, these are lower than planned given the need for flexibility in achieving the HLOS targets in England and Wales and to reflect the greater uncertainty and risk associated with projecting performance at a disaggregated level. Reasonable requirements will finally be established for CP4 in our 2009 Business Plan. In some cases the services covered by the franchises will change; this means that the forecast PPM figures are not directly comparable with the current PPM figures.

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

We have recently completed Shields Junction (delivered Jan 2008) and will be renewing a number of other junctions such as Hyndland East. The renewal of the signalling interlocking at Glasgow Central will also take place on a like for like basis. Where appropriate we will take the opportunity to improve the layout when carrying out renewal works to enhance performance.

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

First ScotRail

The performance of the First ScotRail franchise is currently 90.3 percent PPM and this is planned to rise to 90.6 percent by the end of March 2009 as an outcome of the 2008/09 J-PIP which is supported by the local delivery groups.

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;
- timetable reviews for South Electrics likely to be implemented in December 2009.;
- understanding and mitigating the impact of climate change;
- minimising the disruption and capturing the benefit of planned renewal and enhancement work throughout the Scottish network;
- reducing the level of unexplained delay through 'S' class messaging which will allow signal aspects to be displayed;
- focussing on improving asset reliability with particular focus on preventing repetitive failures;
- joint work to ensure a successful implementation of the Kilmarnock and GARL schemes minimising impact on existing network; and
- 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. This figure was reached through working with the TOC and although the initial expiry date of the First ScotRail franchise is prior to April 2014 the PPM figure is in line with the operator aspirations. First ScotRail has an aspiration for PPM to be above this figure by April 2014.

Further work is required in Scotland to assess the potential impact of tier 3 enhancement schemes and no account of these has been included within this plan to date.

The future performance section for the other operators in this route can be found in the following Route Plans.

| Operator | Route |
|-----------------------------------|-------|
| Virgin Trains | 18 |
| National Express East Coast | 8 |
| First Keolis Transpennine Express | 9 |
| CrossCountry | 17 |

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 line from Glasgow to Carstairs limits access except at weekends. A cyclical maintenance strategy has been agreed for the G&SW route with the night time freight services diverted via other routes every twelfth week.

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

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 2008 include various locations between Gretna and Kilmarnock and on the West Highland Line. We anticipate a major blockade at Christmas 2008 at Glasgow Central to permit the completion of new signalling and in 2010/11 between Glasgow and Paisley in connection with Glasgow Airport Rail Link.

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

Long term opportunities and challenges

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 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.

The key challenge to the rail industry in the coming years will be to deliver the planned increased service levels and maintain performance. Particular issues for this route will include coping with growth on the routes with single line sections such as the East Kilbride line which is already approaching capacity and the number of closely spaced flat junctions. The approaches to Glasgow Central as well as the actual Station platforms are also becoming increasingly congested and in the long term it is likely that increased capacity will be required between Muirhouse Jn and Glasgow Central and within Glasgow Central Station. In discussion with Transport Scotland, various long term options are being considered to enhance the infrastructure and improve services around Glasgow which they have included as part of the Strategic Transport Projects Review. This is likely to include further electrification (for example to East Kilbride, Barrhead/Kilmarnock and/or Paisley Canal) and possibly conversion of some lines to LRT.

Enhancements to be completed by end of CP3

Figure 15 CP3 enhancements

| Implementation date | Project | Project description | Output change | Funding | GRIP stage |
|---------------------|---|--|---|---------------------------------|------------|
| 2007 | Ⓐ Shields Jn S&C Renewal Enhancement Content (2007/08 Programme – Complete) | Electrification of existing Burma Road through siding at Shields Jn. Speed increase and gauge enhancement incorporated to provide proper grade separated facility. Upgrading works at Ayr Townhead Depot | Improved Performance. Additional Capacity. Delivered Jan 2008 | Network Rail | 8 |
| 2008 | Ⓑ G&SW Improvements | Redoubling of Gretna to Annan and provision of additional signalling between Annan and Mauchline | Improved capacity | Network Rail | 6 |
| 2008 | Ⓒ Glasgow Central Re-interlocking: Enhancement Content | Upgrading of signalling on existing Smithy Lye Through Siding to passenger standards | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 6 |
| 2008 | Ⓓ R&C Line Freight Differentials | Easement of current differential speed restrictions for freight traffic | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 7 |
| 2008 | Ⓔ Eglinton St Feeder Stn Renewal | Enhancement to core renewal to realise short term performance benefits and make appropriate provision for the GARL project | Performance Enhancement | Network Rail Discretionary Fund | 8 |
| 2009 | Ⓕ G&SW / Ayrshire Coal Route Initiatives: Relocation of Signal PA335 | Relocation of signal to permit standage of longer trains awaiting acceptance to Killoch and Mauchline | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 3 |
| 2009 | Ⓖ G&SW / Ayrshire Coal Route Initiatives: Kilmarnock Rounding Facility | Creation of new rounding facility at Kilmarnock Long Lyes to avoid current unproductive mileage from running via Falkland for rounding moves | Performance/Capacity/Journey Time Reduction | Network Rail Discretionary Fund | 1 |

Figure 15 CP3 enhancements

| Implementation date | Project | Project description | Output change | Funding | GRIP stage |
|---------------------|--|---|---|---------------------------------|------------|
| 2009 | ⊕ Ardrossan to Largs Additional Signal Section | Provision of additional Down direction signal to close up signalling headways | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 4 |
| 2009 | ⊖ G&SW / Ayrshire Coal Route Initiatives: Sanquhar PSR Removal | Grouting of old mine workings to allow removal of long standing PSR | Performance/ capacity/Journey Time Reductions | Network Rail Discretionary Fund | 1 |

Proposed enhancements in CP4

Figure 16 Proposed enhancements in CP4

| Implementation date | Project | Project description | Output change | Funding | GRIP stage |
|---------------------|--|--|---|----------------------------|------------|
| 2009 | ⓐ Glasgow/Kilmarnock Upgrade | Extension of Lugton Loop to south of Stewarton, including 2 nd platforms at Dunlop and Stewarton and platform extensions to the existing platforms at Dunlop and Kilmaurs | Capacity Enhancement | Transport Scotland / (RAB) | 5 |
| 2010 | ⓑ Re-instatement of Airdrie/Bathgate Line (Tier 2) | Re-instatement of disused line between Drumgelloch and Bathgate and electrifying line to Edinburgh | Four trains per hour Glasgow Queen Street Low Level to Edinburgh via Airdrie and Bathgate | Periodic Review 2008 | 5 |
| 2010 | ⓒ Ayrshire Platform Extensions (Tier 3) | Platform lengthening at selected stations to accommodate longer trains | Increase in seating capacity | Transport Scotland | 1 |
| 2010 | ⓓ Gourock Station | Provision of improved interchange | Better access for foot and car passengers using station | Third Party | 3 |
| 2010 | ⓔ Stranraer Station | Relocation of station to improve interchange | Improved station and interchange facilities | Third Party | 2 |
| 2010 | ⓕ Dalmuir Station | Provision of new station buildings | Enhanced station facilities | Third Party | 3 |
| 2012 | ⓖ Hyndland Junction Remodelling (Tier 3) | Improvements to Hyndland East Junction and Station in conjunction with the junction renewal | Performance improvements and better access to Gartnaval Hospital | Transport Scotland | 1 |
| 2012 | ⓗ Glasgow Airport Rail Link (Tier 2) | New branch line between Paisley and the airport, together with enhancements between Glasgow Central and Paisley | Four trains per hour Glasgow Central to Glasgow Airport | Periodic Review 2008 | 3 |
| 2013 | ⓓ Gauge Improvements (Tier 3) | Gauge clearance of the line from Midcalder Junction to Mossend | To accommodate the carriage of deep sea container traffic from East Coast Ports to Scotland (Mossend) | Transport Scotland | – |

Figure 16 Proposed enhancements in CP4

| Implementation date | Project | Project description | Output change | Funding | GRIP stage |
|---------------------|---|--|--|--------------------|------------|
| 2013 | ⑤ Finnieston Turnback (Tier 3) ³ | Provision of facility to permit turnback of trains from Queen Street Low Level direction before congested Finnieston to Hyndland section | Improved Performance. Additional Capacity. | Transport Scotland | – |
| 2013 | ① Garngad Chord & Cumbernauld Electrification (Tier 3) ³ | Construction of “Garngad” chord, electrification of Alexandra Parade to Cumbernauld line and upgrade of Bellgrove Junction/Station | Diversion of Glasgow to Cumbernauld service to Glasgow Queen Street Low Level and integration with North Electric services | Transport Scotland | – |
| 2014 | ④ Whifflet Electrification (Tier 3) ³ | Electrification and upgrading of Rutherglen to Whifflet | Diversion of Glasgow to Whifflet services to Glasgow Central Low Level and integration with existing Argyle Line services | Transport Scotland | 1 |

³ These schemes are part of the Edinburgh to Glasgow Improvement Programme (E.G.I.P.)

Small Projects Fund (SPF) Tier 1 candidate schemes in CP4

Figure 17 Candidate Small Project Fund Tier 1 schemes in CP4 (<£5m)

| Implementation date | Project | Project description | Output change | Small Projects Fund | Grip Stage |
|---------------------|---|---|--|---------------------------------|------------|
| 2009 | Ⓥ Greenock Central Turnback Facility | Provision of additional signalled routes to provide enhanced turnback facilities. Relocation of existing crossovers | Improved Performance. | Network Rail | – |
| 2009 | Ⓦ Dumfries improved turnback | Improvements to provide a southbound turnback move from northbound platform | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 1 |
| 2011 | ⓧ Mauchline/Ayr Resignalling | Replacement of existing Key Token signalling with Track Circuit Block signalling including replacing Annbank G/F with control from Mauchline SB | Additional Capacity | Network Rail Discretionary Fund | 1 |
| 2012 | Ⓨ Shields/Paisley Bi-Directional Signalling | Additional bi-directional facilities between Shields and Paisley to provide enhanced maintenance access opportunities | Improved Performance. Additional Capacity. | Network Rail Discretionary Fund | 2 |
| 2013 | Ⓩ Glasgow South Suburban Resignalling (Enhancement element) | Provision of new turnback facility at Whitecraigs | Additional capacity/Improved Performance | Network Rail | – |

Maintenance and renewals activity

Figure 18 shows the estimated maintenance and renewal costs and activity volumes.

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

It should be noted that in order to manage the deliverability of our Civils, Signalling & 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 18 Summary of estimated maintenance & renewals costs and activity volumes

| £m (2006/07 prices) | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | Control Period Totals | | | |
|--------------------------------|------------|------------|------------|------------|-----------|-----------------------|------------|------------|------------|
| | | | | | | CP4 | CP5 | CP6 | CP7 |
| Maintenance expenditure | | | | | | | | | |
| Track | 16 | 15 | 14 | 14 | 14 | 73 | 63 | 60 | 60 |
| Signalling | 5 | 5 | 5 | 5 | 5 | 24 | 22 | 21 | 21 |
| Electrification | 3 | 3 | 3 | 3 | 3 | 15 | 13 | 13 | 13 |
| Telecoms | 3 | 3 | 2 | 2 | 2 | 12 | 10 | 10 | 10 |
| Plant and Machinery | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 |
| Other (overheads / indirect) | 11 | 10 | 10 | 10 | 10 | 50 | 45 | 43 | 43 |
| Total | 38 | 37 | 35 | 34 | 34 | 178 | 156 | 150 | 150 |
| Renewals | | | | | | | | | |
| Track | 30 | 30 | 30 | 31 | 30 | 151 | 141 | 140 | 125 |
| Signalling | 10 | 17 | 19 | 22 | 14 | 81 | 157 | 39 | 200 |
| Civils | 25 | 25 | 24 | 25 | 23 | 122 | 116 | 112 | 112 |
| Operational Property | 10 | 13 | 13 | 14 | 14 | 64 | 48 | 47 | 47 |
| Electrification | 6 | 5 | 6 | 4 | 5 | 27 | 14 | 19 | 13 |
| Telecoms | 14 | 10 | 11 | 8 | 2 | 45 | 28 | 18 | 32 |
| Plant and Machinery | 5 | 3 | 2 | 2 | 2 | 14 | 17 | 16 | 18 |
| Total | 101 | 104 | 104 | 105 | 90 | 503 | 520 | 392 | 547 |
| Renewals Volumes | | | | | | | | | |
| Rail (KM) | 43 | 43 | 42 | 41 | 42 | 211 | 163 | 104 | 95 |
| Sleepers (KM) | 32 | 32 | 32 | 32 | 32 | 159 | 179 | 226 | 227 |
| Ballast (KM) | 32 | 32 | 32 | 32 | 32 | 159 | 185 | 238 | 239 |
| S&C Units | 8 | 14 | 20 | 27 | 27 | 96 | 122 | 106 | 83 |
| SEUs commissioned | 0 | 0 | 29 | 0 | 142 | 171 | 664 | 256 | 853 |

Appendix

Figure 19 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 (mins) | No of Tracks |
|-------|--|-----------|----------------|--------------------|----------------|---------------|-------|---------|-----------------|-----------------|---------------------------|--------------|
| 26.01 | WCML: Glasgow Central – Carstairs | WCM | Primary | Transport Scotland | No | W10 | 10 | 100(60) | AC | CL | 4 (3) | 4 (2) |
| 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 Gourock | 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 | 5 | 65(20) | none | TB (ETB) | 15 | 2 (1) |
| 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 | CL(TB) | 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 | Eglinton Street Jn – Neilston/Newton including Cathcart Circle | KHL (NNH) | Secondary | Transport Scotland | No | W7 | 7(5) | 50(40) | AC | CL | 4 (2) | 2 |

Figure 19 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 (mins) | No of Tracks |
|-------|---|-----------|----------------|--------------------|----------------|---------------|-------|--------|-----------------|-----------------|---------------------------|--------------|
| 26.10 | Newton – Gartsherrie South/Rutherglen Jn | RCB (SCM) | Secondary | Transport Scotland | No | W9 | 10(7) | 75(70) | AC | CL | 6 (4) | 2 |
| 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 – Carmuir Jns | 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

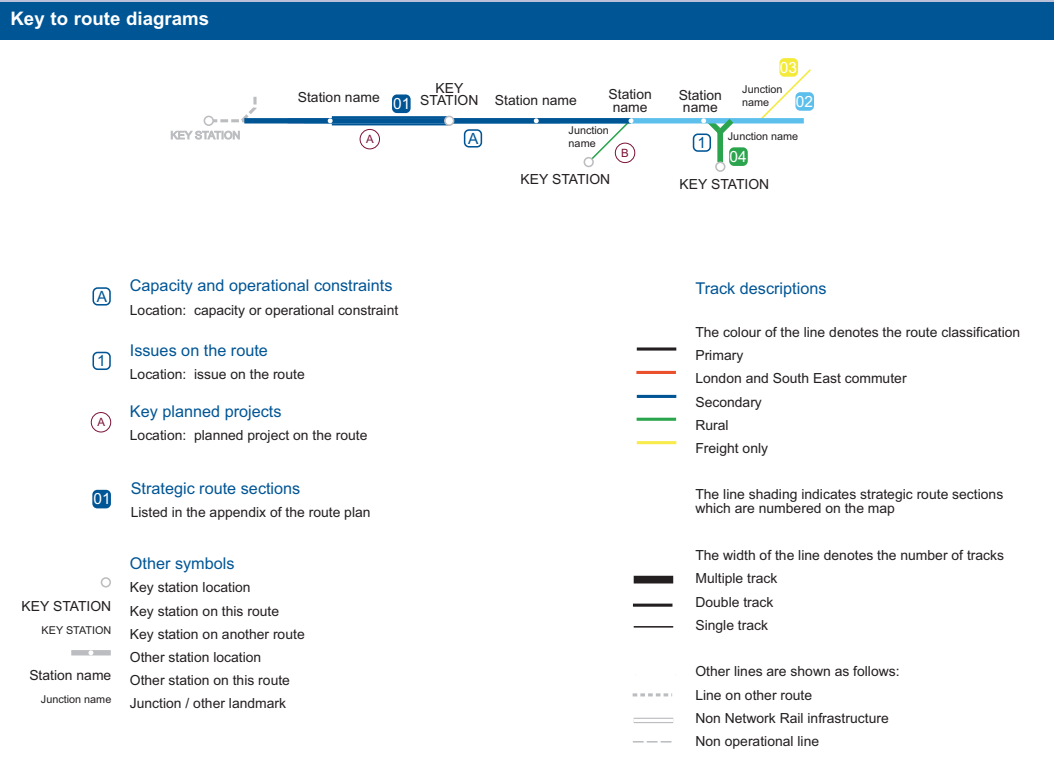
Other issues on the route

- L Mauchline Junction – Annan: high freight usage

Note

This Route Plan forms part of the April 2008 update of Network Rail's Strategic Business Plan. The Route Plan supersedes the version published on 1 November 2007.

Other documents in the Strategic Business Plan can be found on the Network Rail website www.networkrail.co.uk



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 |

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

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CDS001/April 2008