

*Delivering a better railway
for a better Britain
Network Specification 2017
Scotland*



Incorporating Strategic Routes: Route P – Scotland East; Route Q – Scotland West; part of the Strategic Route G – East Coast Main Line, and Strategic Route N – West Coast Main Line.

This Network Specification describes the Scotland route in its geographical context, outlining train service provision to meet current/future key markets and traffic flows for passenger/freight business. It also identifies infrastructure changes to meet future growth over the next thirty years.

The document refers to Route Specifications, of which there is one for each Strategic Route Section (SRS). Route Specifications cover specific sections of the route and are published as appendices to this document. They describe in greater detail the current and future requirements of each SRS to inform both internal and external stakeholders of future strategic plans.

Each Network Specification draws upon the supporting evidence and recommendations from geographical Route Utilisation Strategies (RUSs) which have been completed for each part of the national rail network, relevant sections of national RUSs, and second generation RUSs where appropriate.

For the Scotland Route, the following RUSs provide a high level industry strategy which has helped to influence the overall specification:

- Scotland RUS - 2007
- Freight RUS - 2007
- East Coast Main Line (ECML) RUS - 2008
- ECML Capacity Review - 2016, published in 2010
- Scotland RUS Generation Two - 2011
- West Coast Main Line RUS - 2011

This document also interfaces with the Network RUS. The strategies that form the Network RUS have a nationwide perspective and cross geographical boundaries. The Network RUS consists of -

- Scenarios and Long Distance Forecasts – published in June 2009. The document considers how demand for long distance rail services, both passenger and freight, might be impacted by four alternative future scenarios
- Electrification Strategy – published in October 2009. The document sets out a strategy for further electrification of the

network. This strategy is currently being ‘refreshed’ to reflect the electrification schemes that are currently progressing or are committed and will consider the options for additional electrification over the next 30 years. The draft for Consultation is expected to be published in mid 2016

- Stations – published in September 2011. This strategy considered the pedestrian capacity of stations on the network. It sets out a process for considering congestion at stations and proactively reviewing congestion across the network
- Passenger Rolling Stock – published in September 2011. This strategy takes a long term view of future passenger rolling stock and infrastructure to establish whether there may be opportunities to plan the railway more efficiently
- Passenger Rolling Stock Depot Planning Guidance - published in December 2011. The document was produced as best practice guidance particularly focusing on the depot-network interface
- Alternative Solutions - published in July 2013. The document considers a number of alternative solutions to accommodate the future demand for rail passengers on some parts of the network more cost effectively, including non rail options.

In 2012, in line with its licence obligation to establish and maintain RUSs, Network Rail, in agreement with the Office of Rail and Road Regulation (ORR), introduced a Long Term Planning Process (LTPP) which looks at the long-term capability of the network up to 30 years into the future so that we can promote efficient use of network capability and capacity. It is more flexible and it looks further ahead which means that the industry can develop potential infrastructure interventions and explore important strategic issues. The LTPP strategy includes the views of stakeholders on how the rail industry can drive and support economic growth, and gives passenger and freight train operating companies the confidence to take their own strategic decisions in planning the future of their services.

A number of studies help to inform the LTPP process:

- Market Studies, which identify the strategic goals for each market sector of the rail industry over the next 30 years. They forecast the level of demand and the opportunities that higher

levels may bring, and calculate what would be needed in order to meet these strategic goals

- Local studies, which bring together the suggested outputs for all the market sectors for a particular part of the network. They evaluate the trade-offs between these suggested outputs for the different sectors and between the outputs and costs (including the cost of changes to capability). The local studies then form a view of the likely long-term allocation of capacity between sectors in order to inform decisions on the appropriate capability of the network. Services that operate across one or more local study boundaries are considered by a cross-boundary analysis working group to provide input to individual local studies
- Network -wide studies, which identify strategic choices and appraise solutions to network-wide issues, including the benefits and challenges of technological change across the network.

The following studies are relevant to the LTPP process in Scotland:

- Long Distance Market Study - published 2013
- Freight Market Study - published 2013
- Scotland Route Study - published 2016
- Freight Network Study (Draft for Consultation) - published 2016

Through the LTPP we inform (and are informed by) funders' decisions on industry outputs, although the way in which we do this may vary according to whether those decisions are made through the High Level Output Specification process, the franchising process or the enhancement framework.

Network Rail is continuing to identify opportunities to reduce operating costs in Scotland. The National Operating Strategy seeks to improve the efficiency of frontline operations by migrating operational management from disparate locations to a single Rail Operating Centre (ROC) located in Glasgow, supported by Edinburgh, Inverness and Banavie Signalling Centres. From 2019, there are proposals to close a number of signal boxes driven by the condition of the assets and the cost of operating them. In the longer term, the signal box closures will achieve a reduction in operating costs following the migration of control to the ROC or Signalling Centres.

The integration of these strategies is key to the development of each route, as between them they cover the needs and requirements of both passengers and freight going forward.

Route context

Glasgow Queen Street High Level (HL) to Edinburgh Waverley

The route provides a fast, frequent interurban service between Scotland's two largest cities, Glasgow and Edinburgh (known as the E&G service), and plays an important role in connecting these centres. Starting at either Glasgow Queen Street HL station or Edinburgh Waverley station it runs for 47 miles via Falkirk High. There are eight intermediate stations along the route and ScotRail operates four trains per hour over the majority of the day. It is predominantly a two track passenger route with only three freight trains per day operating on various sections.

Glasgow/Edinburgh to Aberdeen (including Fife Circle)

The route provides a fast, frequent interurban service between Glasgow/Edinburgh and Aberdeen via Perth and Dundee. It plays an important role in connecting the north east of Scotland to the central belt and beyond. There is also a stopping service around the Fife Circle providing a link to Edinburgh and beyond. Part of the route conveys freight traffic to Aberdeen.

Perth to Inverness

The route provides a crucial role in linking the central belt with Inverness and beyond. It is predominantly single track with passing loops and also conveys freight traffic to Inverness and the Far North lines.

Aberdeen to Inverness

The route provides a cross-country link between Aberdeen and Inverness. It is predominantly single track with passing loops and is mainly a passenger route. There is however, regular freight traffic from south of Aberdeen to Raith's Farm at Dyce and the Waterloo freight terminal at Aberdeen Harbour.

Inverness to Wick/Thurso/Kyle of Lochalsh

The route links Inverness with the north and west Highlands. It is single track throughout with passing loops and although mainly a scheduled passenger route it also conveys some charter and freight

traffic.

West Coast Main Line to Glasgow Central

The route from Glasgow to Carstairs and onto Carlisle makes up the northern portion of the West Coast Main Line (WCML). The route provides Anglo Scottish services to London, Birmingham and Manchester. There is also a two hourly Anglo Scottish service from Glasgow Central to the North East, Midlands and South West England via Carstairs and Edinburgh. The WCML is a crucial artery for Anglo Scottish freight traffic and part of the route conveys freight traffic to Mossend, Grangemouth and beyond. ScotRail also operates frequent local services to Lanarkshire over part of the route although some connectivity between Motherwell and Glasgow Central is provided by other operators.

Glasgow Conurbation market

The route covers rail journeys to stations in the greater Glasgow area including Ayr, Ardrossan, Largs, Wemyss Bay, Gourock, Helensburgh, Balloch, Milngavie, Cumbernauld, Croy, Whifflet, Drumgelloch, Carstairs, Lanark, Larkhall, Motherwell, Newton, Neilston, East Kilbride, Barrhead, Kilmarnock, Paisley Canal and Shotts. These services are provided by ScotRail. The route is predominantly electrified with some infill diesel traffic on the non-electric lines. Part of the route conveys freight traffic to Hunterston, Mossend and beyond.

Kilmarnock to Gretna Junction

The route plays a role linking Ayrshire with Gretna Junction, Carlisle and beyond. It is also the main Anglo Scottish arterial freight route for bulk freight traffic between Ayrshire and north east England.

Ayr to Stranraer

The route links Ayrshire with the former ferry port of Stranraer, providing connectivity to the south west corner of Scotland.

Edinburgh to Carstairs & Holytown

The route plays a role in the core cross-country network, with fast and semi-fast services linking Edinburgh to Carstairs as well as the route via Shotts to Holytown. The Carstairs and Holytown lines also convey internal Scottish and Anglo Scottish freight traffic.

Glasgow to Stirling and Perth

The route plays a role in the core cross-country network, with fast and semi-fast services linking Stirling and Perth on to Dundee, Aberdeen and Inverness serving intermediate towns along the route. Part of the route conveys freight traffic to Aberdeen and Inverness.

East Coast Main Line to Edinburgh Waverley

The route from Edinburgh to Berwick-upon-Tweed and on to Newcastle makes up the northern portion of the East Coast Main Line (ECML). This route is a vital north to south artery for long distance traffic from London to Scotland via Yorkshire and the North East and serves the commuter and regional passenger markets as well as carrying significant amounts of rail freight.

Edinburgh Conurbation market

The Edinburgh local network connects East Lothian to Edinburgh via intermediate stations on the ECML, North Berwick branch, as well as routes from Caldercruix via Bathgate, Falkirk Grahamston and Shotts. The main ECML arterial freight route runs via Millerhill to Craiglockhart/Slateford Junction and beyond. The route links Edinburgh with the borders via Newcraighall and south to Tweedbank.

West Highland

The route links Central Scotland with Oban, Fort William, Mallaig, and the intermediate towns along the route and generates significant tourist traffic as it passes through areas of natural beauty including the Loch Lomond & Trossachs National Park. It is single track throughout with passing loops and is also used to convey freight to Glen Douglas and Fort William.

Key markets and traffic flows

The passenger services which cover the route can be broken down into five distinct groups:

The **Glasgow Conurbation** market covers rail journeys to stations in the greater Glasgow area for semi-fast and stopping services to: Ayr, Ardrossan, Largs, Wemyss Bay, Gourock, Helensburgh, Balloch, Milngavie, Cumbernauld, Croy, Whifflet, Drumgelloch, Carstairs, Lanark, Larkhall, Motherwell, Newton, Neilston, East Kilbride,

Barrhead, Kilmarnock, Paisley Canal and Shotts. These services are provided by ScotRail with some connectivity between Motherwell and Glasgow Central provided by other operators. The routes are predominantly electrified with some infill diesel traffic on the non-electric lines.

The **Edinburgh Conurbation** market includes the journeys that start and end within the Edinburgh area. This is taken as all stations to/from Falkirk Grahamston, North Berwick, Drem, Dunbar, Tweedbank, Caldercruix and Shotts. These services are all provided by ScotRail. The routes are predominantly electrified with some infill diesel traffic on the non-electric lines.

The **Interurban** market includes journeys between the conurbations and major cities and towns in Scotland. This reflects the areas that are served by the interurban express services and commuter services to the regional centres. The majority of services are operated by ScotRail, with CrossCountry, Caledonian Sleeper and Virgin Trains East Coast providing some services north of Edinburgh to Dundee, Aberdeen and Inverness and between Edinburgh Waverley and Glasgow Central via Carstairs. First TransPennine Express provides services between Edinburgh Waverley, Glasgow Central and Lockerbie.

The **Rural** market includes rail journeys that start or end at stations on the rural lines. This includes the Far North, Kyle of Lochalsh, West Highland to Oban, Fort William and Mallaig, Stranraer and Glasgow & South Western (G&SW). Services on the routes are provided entirely by ScotRail with the exception of the Caledonian Sleeper and the seasonal Jacobite service between Fort William and Mallaig.

The **Anglo Scottish** market comprises journeys between England and Scotland on the ECML and WCML. Virgin Trains East Coast and CrossCountry provide the majority of the ECML services and Virgin Trains and First TransPennine Express provide the majority of West Coast services. ScotRail provides connectivity between Dumfries and Carlisle (and onwards to Newcastle) and Serco operates the Caledonian Sleeper services from Inverness, Aberdeen, Fort William, Glasgow Central and Edinburgh Waverley to London.

With the closure of Longannet Power Station and the decline in the movement of Scots Anglo coal, the **Freight** market in Scotland, in

terms of tonnes lifted, is driven by both domestic and intermodal traffic which accounts for over 50 per cent of the traffic moved in Scotland. A large proportion of the intermodal traffic moves to and from the terminals at Mossend, Coatbridge and Grangemouth with other facilities at Inverness and Aberdeen. Scots Anglo coal has reduced significantly but still runs from Hunterston, Killoch and Greenburn. Cement is distributed by rail within Scotland from Oxwellmains near Dunbar to Uddingston, Inverness and Aberdeen and to various destinations in England, also to Mossend from Clitheroe. Other traffic includes Royal Mail to Shieldmuir on the WCML, alumina (from North Blyth to Fort William), industrial minerals including calcium carbonate to Irvine paper mill and fuel products from Grangemouth. Automotive traffic to Mossend is also a growing market.

Performance

Please refer to the [Delivery Plan](#) which presents the “contract” against which ORR will measure Network Rail’s Performance in Control Period 5.

Infrastructure investment in Control Period 5 (2014 – 2019)

There are a number of infrastructure investments planned in Control Period 5. They include the projects identified below.

Borders Railway - delivered in 2015, providing a new railway line linking Midlothian and the Scottish Borders areas to central Edinburgh and the national rail network. The project provided:

- 30 miles of new single track railway with passing loops to create a rail route in the Scottish Borders connecting the Borders into the existing rail network at Newcraighall
- 7 new stations at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow, Galashiels and Tweedbank
- 6 station car parks at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow and Tweedbank.

Edinburgh to Glasgow Improvement Programme (EGIP) Initial Phase

The key outputs of EGIP include a reduction in journey times and increased passenger capacity on the main Edinburgh to Glasgow route, contributing to the Scottish Government's goals of improving economic growth, connectivity and reducing road congestion. Electrification will also contribute towards the Scottish Government's commitment to reduce carbon emissions.

The increase in capacity will be achieved through electrification and the introduction of longer train formations. Four-car Electric Multiple Units (EMUs) will be introduced, operating as eight-car formations during peak periods. These will replace the current three-car Diesel Multiple Units (DMUs) which operate as six-car formations during peak periods. End to end journey times will be progressively reduced from the current fastest journey time of around 50 minutes to 42 minutes on completion of EGIP and the electrification of other routes that connect with the corridor.

Key Output 1 includes:

- Glasgow Queen St High Level to Newbridge Junction (via Falkirk High) Electrification
- Cumbernauld to Greenhill Lower Junction Electrification

- Glasgow Queen Street High Level station capacity
- Platform extensions at Croy, Falkirk High, Polmont and Linlithgow
- Haymarket to Inverkeithing signalling headways - delivered in 2015
- Edinburgh Waverley station capacity
- Edinburgh EMU depot at Millerhill
- Edinburgh Gateway station - delivered in December 2016

Key Outputs 2, 3 and 4 includes:

- Glasgow Queen Street High Level station : concourse works to accommodate 8-carriage length trains
- Edinburgh to Glasgow (E&G) linespeed improvements.

Aberdeen to Inverness Rail Line Improvements Phase 1, delivering capacity improvements including redoubling and signalling enhancements to enable the operation of enhanced commuting services. The project will also include working with station promoters to deliver Kintore and Dalcross new stations.

Rolling Programme of Electrification

The Rolling Programme of Electrification of 100 single track kilometres per annum following completion of EGIP was specified by the Scottish Government in their High Level Output Specification published in June 2012 and includes for CP5:

- Rutherglen East Jn – Langloan Jn – Coatbridge Jn – Whifflet North Jn - delivered Sept 2014
- Greenhill Lower – Carmuir West Junction – Falkirk Grahamston and Polmont
- Carmuir West – Stirling – Dunblane – Alloa (including Larbert Jn to Carmuir East Jn)
- Holytown Jn – Shotts – Midcalder Jn.

Expansion of the electrified network will bring many benefits, including faster journey times for passenger and freight trains. Where journey time savings are sufficiently significant (and sufficient capacity is available) there is the potential to run

additional services on electrified routes.

Highland Main Line Rail Improvements Phase 2, providing infrastructure to deliver an hourly train service in each direction between Perth and Inverness extending to either Glasgow or Edinburgh with an average end to end journey time reduction of around 10 minutes in both directions and more efficient freight operations that better respond to the demand from Freight customers.

Motherwell Area stabling, electrifying the remaining ‘back of Shops’ siding to permit the stabling of additional EMUs at Motherwell - delivered July 2014.

Motherwell re-signalling enhancements, increasing capacity and capability of the network by the provision of 3-aspect signalling between Holytown Junction and Midcalder Junction.

For more information on the outputs of each project refer to the [Enhancement Delivery Plan](#) Appendix for the detailed Project Definition sheets.

Ring Fenced Funds

There are a number of ring-fenced funds that can be used to enhance the rail network in CP5. These are:

- Station Fund
- Strategic Rail Freight Investment Fund
- Scottish Network Improvement Fund
- Future Network Development Fund
- Level Crossing Fund.

Beyond Control Period 5

Through the Long Term Planning Process (LTPP) and ongoing dialogue with funders and stakeholders the rail industry has formulated and agreed investment options and choices for the network in Scotland. A number of options have also been proposed in England which will have benefits for cross-border services.

As part of Transport Scotland’s Rail Infrastructure Strategy consultation the Scottish Government is proposing a flexible but

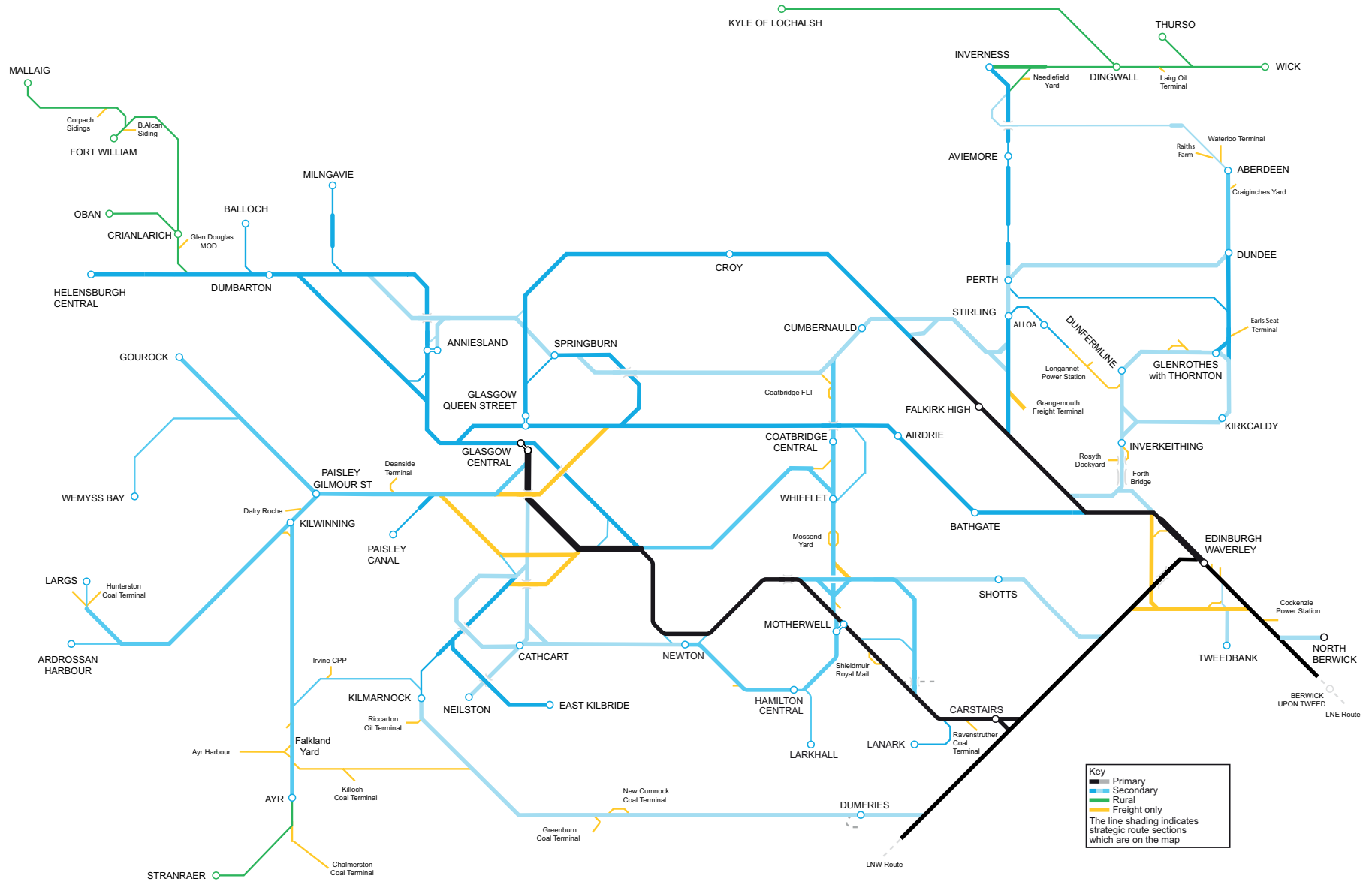
robust process to govern the development, design and delivery of enhancement projects. A need to enhance the LTPP has been recognised, and much of the focus will be on integrating the LTPP with the agreed ‘pipeline’ approach to network enhancements. Going forward from 2019, a decision to commit to a specific enhancement project will be taken when the business case is clear and both cost and affordability are more certain. There will also be a requirement to confirm the availability of suitable capabilities and resources in rail industry supply chains required to deliver projects. Greater flexibility in the choice of development, design and contracting models to be applied to projects will also help to improve value for money and make best use of available industry resources.

This flexible, ‘pipeline’ approach would apply to all potential rail projects, including those being promoted by third parties, and the industry will continue to support promoters as they look to develop their proposals and produce associated business cases for consideration. Any proposed potential rail projects should be viewed within the context of a corridor enhancement and would also help inform choices and pipeline development. Given the funding challenges which exist for future projects and the likely constraints on future borrowing, together with pressure on existing Scottish Government budgets, there is a need for a clear prioritisation of investment options.

The choices are proposed to accommodate forecast rail demand and also take into account a number of key issues that are likely to shape the way the railway in Scotland will develop in the coming years. These relate to: safety, performance, resilience, construction of High Speed 2 and the move towards a Digital Railway. Further details on these options can be found in Network Rail’s [Scotland Route Study](#) published in July 2016; RDG’s ‘[Investing in the Future](#)’ published in September 2016 and RDG’s ‘[Scotland’s Rail Infrastructure: The Rail Industry’s Advice for 2019 Onwards](#)’ published in February 2017.

SRS	Name
G.11	Border to Edinburgh
G.12	North Berwick Branch
N.06	Border (near Gretna Junction) and Carstairs South Junction
P.01	Glasgow Queen Street - Edinburgh Waverley via Falkirk High
P.02	Haymarket East Junction – Carstairs
P.03	Edinburgh - Drumgelloch
P.04	Dunblane/Alloa - Polmont Junction/Greenhill Upper Junction
P.05	Portobello Junction to Newcraighall
P.06	Fife Circle
P.07	Dundee - Dunblane
P.08	Dundee/Perth – Thornton Jcns
P.09	Dundee – Aberdeen
P.10	Aberdeen – Inverness
P.11	Perth – Inverness
P.12	Far North & Kyle Branch
P.13	Borders Line
P.98	Other Freight Lines
P.99	Other Freight Lines
Q.01	West Coast Main Line between Glasgow Central High Level and Carstairs
Q.02	Midcalder Junction – Holytown Junction
Q.03	Glasgow Central – Ayr/Largs/Wemyss Bay/Gourock lines
Q.04	Glasgow North Electric Routes
Q.05	Stranraer – Ayr
Q.06	Paisley Canal Branch
Q.07	Muirhouse Junction – East Kilbride/Kilmarnock
Q.08	Scottish Border – Barassie Junction (G&SW)
Q.09	Eglington Street Junction – Neilston/Newton including Cathcart Circle
Q.10	Newton – Gartsherrie South Junction/Rutherglen Junction
Q.11	Lanark Branch
Q.12	Anniesland – Greenhill Lower Junction
Q.13	Gretna – Border (G&SW)
Q.14	West Highland Line
Q.99	Other Freight Lines

Scotland Route map

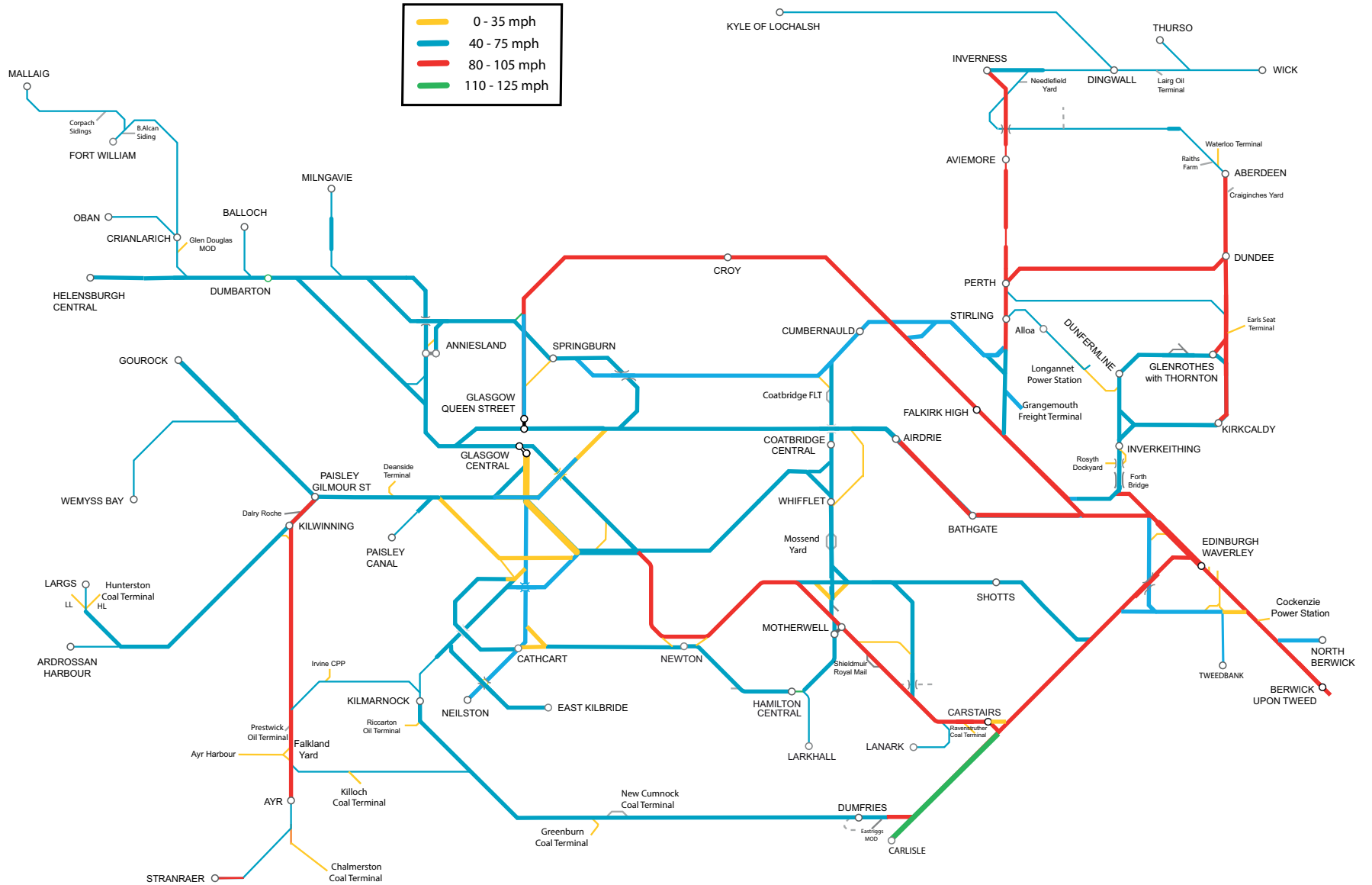


Scotland Capability maps

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Linespeed

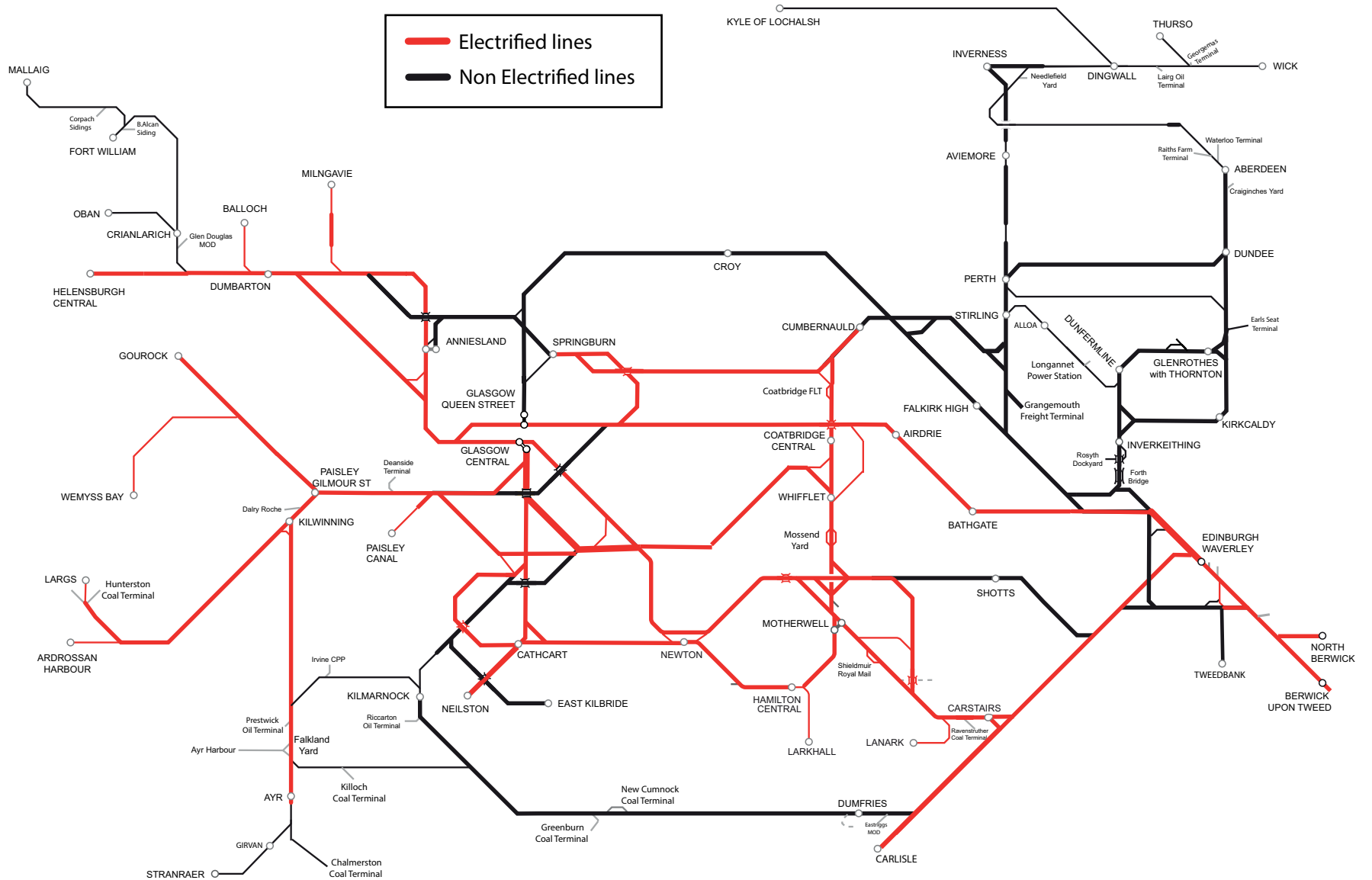


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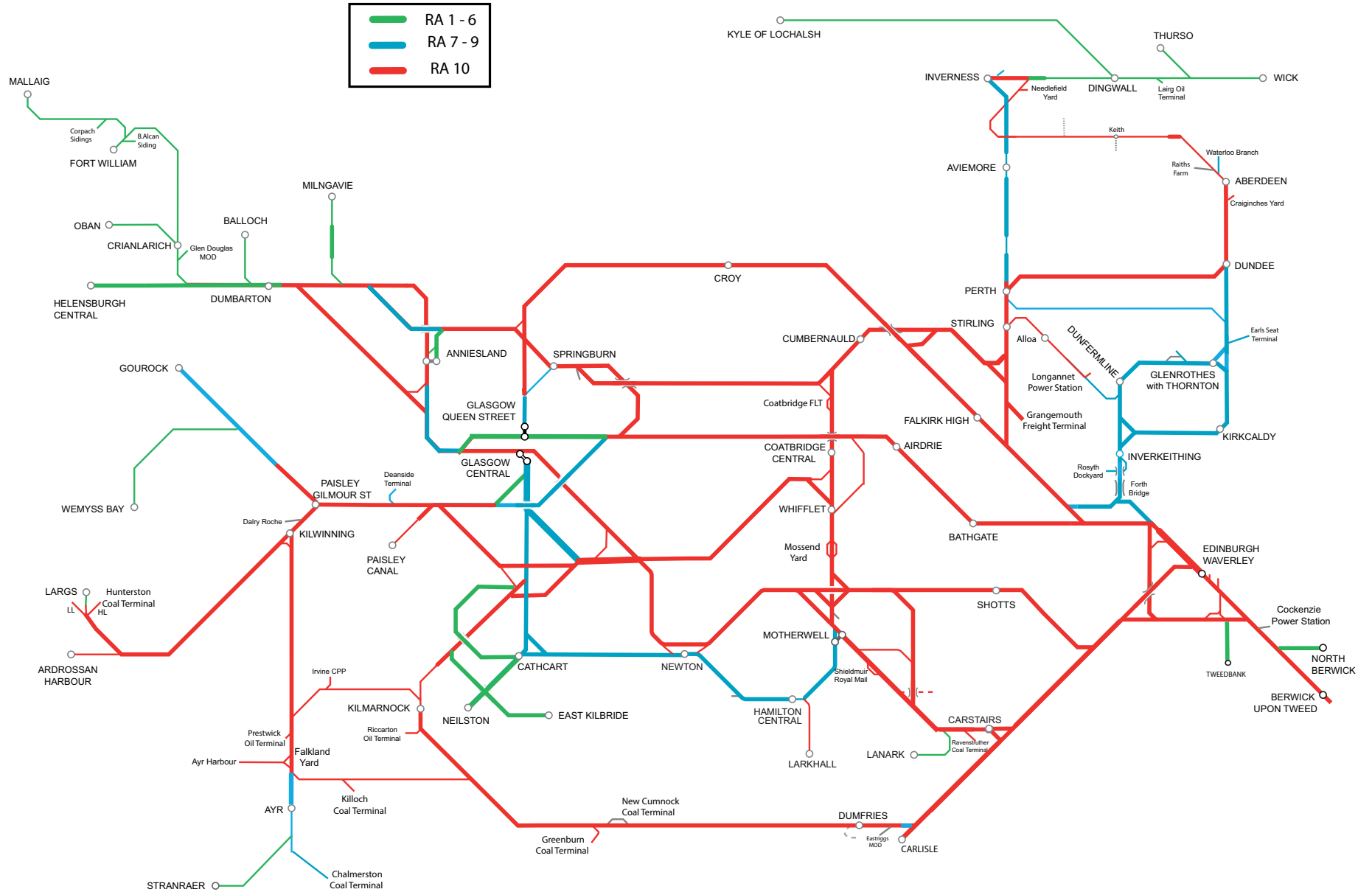
Electrification



Scotland

Capability maps

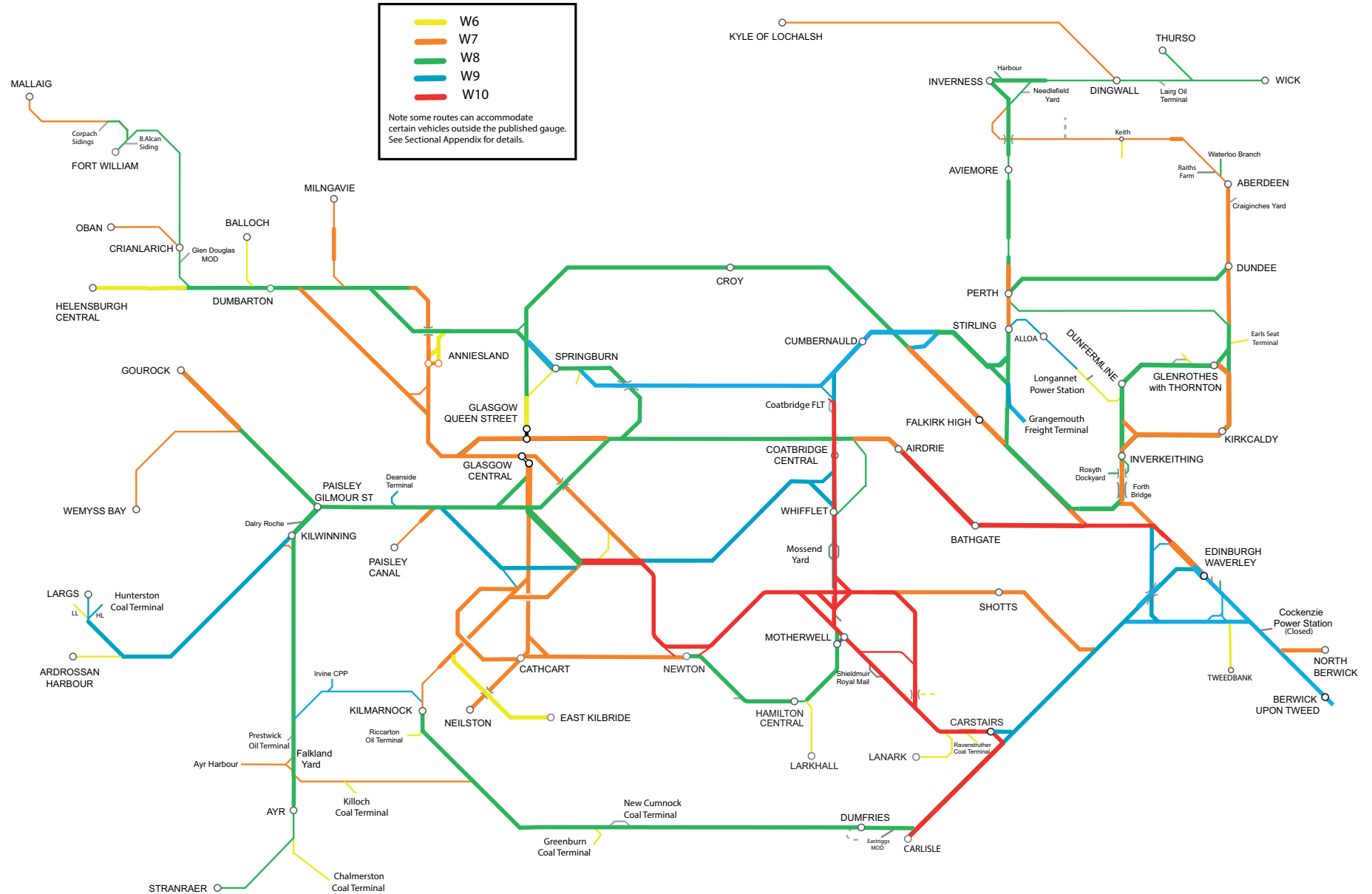
Route availability



Scotland

Capability maps

Gauge



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