

HSUK SCOTTISH RAIL STRATEGY

With Edinburgh and Glasgow comprising two of the UK's principal conurbations, it is natural that both cities will be primary stakeholders in any future UK high speed rail network. Projections for HS2 show high speed lines extending northwards to both Edinburgh and Glasgow, and the scheme's proponents claim major economic benefits accruing from accelerated North-South links, and environmental benefits accruing from short-haul air flows converted to rail.

It is important to appreciate that the core rationale of any high speed rail system is to connect primary conurbations (of 500,000+ population), and this is likely to deter the opening of new lines north of the Forth-Clyde Line. Hence a major proportion of the Scottish population away from the Central Belt seems likely to see no direct benefits from the UK high speed rail project. These areas have been poorly served by rail since the 'Beeching' cuts of the 1960's, and the economic impacts are continuing. The Scottish Government has taken significant steps to redress these connectivity deficiencies, with several rail routes reopened in recent years. But whilst the pace of Scottish reopenings far outstrips performance elsewhere in the UK, progress is still slow.

It seems vital that the UK high speed rail initiative is developed in such a way as to extend operation of high speed services north of the Forth-Clyde Line, and in doing so to spur further reopenings. This will bring benefit to the widest practicable spread of Scottish communities.

The following diagrams chart the development of the Scottish rail network, and illustrate the likely impacts of both HS2 and the alternative High Speed UK scheme. For precise details of the core High Speed UK proposals (as included in the cost estimates), see the HSUK Regional Maps on www.highspeeduk.co.uk.

SRS1 : SCOTTISH NETWORK - PRE-1923 GROUPING

Development of the Scottish railway network occurred almost simultaneous with the English network. The first major route to open (in 1842) was the Edinburgh-Glasgow railway, linking Haymarket and Queen Street; the system then rapidly developed, connecting to other major Scottish cities, and across the border to England. The Scottish network was dominated by 5 major companies. The North British, Caledonian, and Glasgow South-Western handled the primary Anglo-Scottish traffic, and were closely aligned with the North-Eastern, the London North-Western and Midland respectively to comprise the East Coast, West Coast and Midland routes that still exist today. Other principal companies, operating further north, were the Highland and the Great North of Scotland.

SRS2 : 1970 SCOTTISH NETWORK : BEECHING CLOSURES

This diagram illustrates the Scottish rail network in circa 1970, with the closures set out in the 1963 Beeching Report 'Reshaping Britain's Railways' largely complete. In the intervening years, the Scottish rail network suffered major cutbacks. In addition to the closure of many branch lines, primary routes such as Waverley (Edinburgh-Carlisle via Tweeddale), Glenfarg (Edinburgh-Perth via Kinross) and Strathmore (Perth-Aberdeen via Forfar) were also lost. This had major adverse effects upon the Scottish rail network:

- large areas, especially the Borders region, left without any rail services;
- reduced network capacity;
- loss of diversionary routes;
- intercity links to key Northern cities such as Perth, Aberdeen and Inverness regressed to slower regional routes, stopping at most stations (eg Perth-Aberdeen coastal route) leading to increased journey times.

These all represent major connectivity deficiencies which leave major swathes of Scotland without viable rail links, and which restrict the ability of the surviving rail network to compete against road transport.

SRS3 : EXISTING SCOTTISH NETWORK : PRINCIPAL ROUTES

In recent years, the Scottish Government has undertaken significant route reopenings, most notably the Airdrie-Bathgate scheme to create a new electrified rail link between Glasgow and Edinburgh, and the 'Waverley' restoration between Edinburgh and Galashiels. With all of Scotland's major airports (ie Edinburgh, Glasgow and Aberdeen disconnected from the main line network (despite rail routes passing very close), new rail links to Edinburgh and Glasgow airports are under consideration (EARL & GARL); but currently, both projects are stalled.

The diagram also illustrates aspirations for route restoration and development, including reconnection of St Andrews to the rail network, and the Dornoch Link which will considerably accelerate rail journeys to the far North of Scotland.

SRS4 : HS2 & EXISTING SCOTTISH RAIL NETWORK

HS2's 'extended Y' format essentially focusses upon London and the West Midlands, and does not offer good quality connections between other primary (English) regional centres. The 'Carstairs split' of HS2's route into Scotland dictates separate trains to serve both Edinburgh and Glasgow, and this means that intercity services to

UK cities other than London will generally operate at 2-hourly frequencies. The inefficiencies of the Carstairs split effectively preclude a third service strand north of the Forth-Clyde line, to cities such as Aberdeen, Dundee and Inverness. With HS2 terminal locations at Edinburgh and Glasgow not defined, the quality of onward connections from HS2 to Northern communities cannot yet be determined, but prospects do not look good.

HS2's chosen route along the axis of the West Coast Main Line - as shown on diagram SRS4 - also raises huge engineering and environmental issues. These are most severe around the fringes of the English Lake District, where a circa 50km long 'base tunnel', extending from Kendal to Penrith, can reasonably be predicted. Major tunnelling will also be required to replicate the current WCML 'Beattock' crossing of the Scottish Southern Uplands.

Possibly on account of the routeing inefficiencies listed above, and the engineering difficulties of the west-sided HS2 route to Scotland, in June 2015 HS2 Ltd has deemed this route to have 'no business case'. Current initiatives to investigate on-line upgrades of the WCML to Scotland seem unlikely to deliver more viable outcomes.

SRS5: EAST-SIDED HS2 APPROACH TO SCOTLAND AS MODELLED BY HS2 LTD

The obvious alternative to HS2's chosen west-sided route to Scotland - ie a high speed line aligned to the east of the Pennines - would seem to offer major advantages, including easier topography, and all the efficiencies of the 3 primary cities of Newcastle, Edinburgh and Glasgow being placed on a single line of route. Yet HS2 Ltd has chosen not to examine this route, and has instead modelled (as shown on Diagram SRS5) a clearly unfeasible cross-Border route running east-west through the Scottish Southern Uplands (approximately following Tweeddale and requiring a 'base tunnel' circa 40-50km in length) to a point in Upper Clydesdale where services (or service pattern) would split for Edinburgh and Glasgow. This would replicate the inefficiencies of the chosen HS2 route.

SRS6 : HIGH SPEED UK AND OTHER DEVELOPMENTS TO SCOTTISH RAIL SYSTEM

High Speed UK's proposed route fully demonstrates the advantages of the logical east-sided route that was ignored by HS2 Ltd. It is located in the easier and less sensitive topography closer to the east of the Pennines, and it can be accomplished with a much shorter length of tunnelling (even allowing for the significant lengths of tunnel required to access central stations in both Newcastle and Edinburgh).

For Scotland to gain maximum benefit from the UK high speed rail initiative, it is necessary to extend high speed services north of the Forth-Clyde Line. With the existing Scottish regional network slow, and lacking the capacity to accommodate higher speed services, the optimum strategy is to restore the abandoned Glenfarg and Strathmore routes to provide a new and faster inland 'spine' to augment the existing routes.

SRS7 : HIGH SPEED UK INTEGRATED WITH EXISTING NETWORK

High Speed UK's 'spine & spur' configuration will link Scotland to all English regional centres, and creates major efficiencies through placing Newcastle, Edinburgh and Glasgow on a single line of route. This also puts Edinburgh Waverley at the hub of the Scottish network, aligns with the Scottish aspiration for a high speed link between Edinburgh and Glasgow, and requires only a second service strand to access Northern cities - including Perth, Dundee, Aberdeen and Inverness - across the Forth Bridge. Restoration of the inland Glenfarg and Strathmore routes will allow step-change capacity and journey time benefits on Northern routes.

The diagram also illustrates the potential to extend the Waverley restoration towards the populous English North-East. This will create major new connectivity benefits, both for Tweeddale and for the Northumbrian communities around Wooler and Alnwick. Although this 'Waverley Nouveau' route would follow a substantial length of 2-track high speed line, sufficient capacity should exist to accommodate a single hourly 'local' service.

SRS8 : ENHANCED RAIL CONNECTIVITY TO EDINBURGH AIRPORT

The restored Glenfarg and Strathmore routes, together with High Speed UK's high speed link between Edinburgh and Glasgow, create an 'Inverse T' model for an upgraded Scottish intercity rail network, extending northwards across the Forth Bridge to Perth, Dundee, Aberdeen and Inverness. At the hub of this system is Edinburgh Airport, and this creates the potential for rail services to radiate across Scotland, linking the airport to all major regional centres. High Speed UK would connect Glasgow Central to Edinburgh Airport in less than 20 minutes, with trains continuing north to (for example) Perth and Aberdeen. The diagram illustrates a scheme for a new underground airport railway station, with links extending to the Edinburgh-Glasgow routes to the south, and to the Forth Bridge route to the north.

SRS9 : HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS

With Anglo-Scottish intercity services diverted onto High Speed UK's inland cross-Border route via Wooler, it becomes necessary to consider the future of the coastal ECML route via Berwick. Currently, intercity services (both East Coast and CrossCountry) call at Morpeth, Alnmouth, Berwick and Dunbar; but the service pattern is irregular and infrequent, and offers poor local connectivity. With a relatively small local population (collectively less than 100,000), there is insufficient traffic to support frequent local services; and with the clear difficulties of maintaining a coastal electrified railway, continued operation of the line could possibly be deemed unviable.

The HSUK strategy, of developing a parallel Continental Gauge freight network, provides an invaluable opportunity to develop a new 'base load' flow, that will transform the economics of the residual ECML. With no tunnels, no major stations, and no critical flows that cannot be diverted, there is no serious impediment to undertaking the necessary works to enable taller and wider freight traffic to operate. This is not possible with development of HS2 along the WCML corridor.

KEY

- HIGHLAND RAILWAY
- GREAT NORTH OF SCOTLAND
- CALEDONIAN
- GLASGOW SOUTH WESTERN
- NORTH BRITISH
- NORTH-EASTERN RAILWAY
- PRINCIPAL/SECONDARY
- TERTIARY/ LOCAL STATION

SCOTTISH RAIL SYSTEM : 1
 SCOTTISH NETWORK -
 PRE-1923 GROUPING

DIAGRAM **SRS 1**
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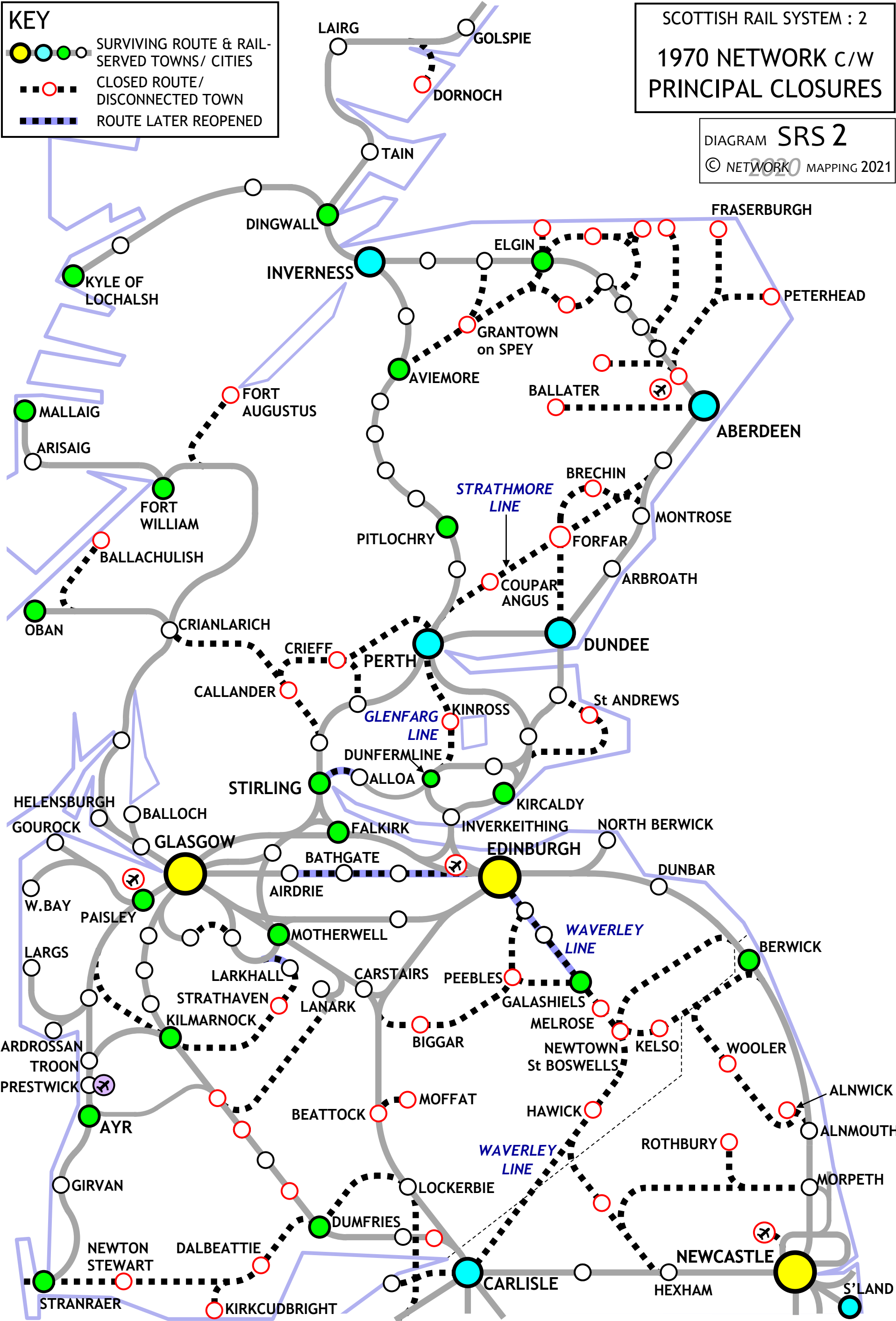


KEY

- SURVIVING ROUTE & RAIL-SERVED TOWNS/ CITIES
- CLOSED ROUTE/ DISCONNECTED TOWN
- ROUTE LATER REOPENED

SCOTTISH RAIL SYSTEM : 2
 1970 NETWORK C/W
 PRINCIPAL CLOSURES

DIAGRAM **SRS 2**
 © NETWORK 2020 MAPPING 2021

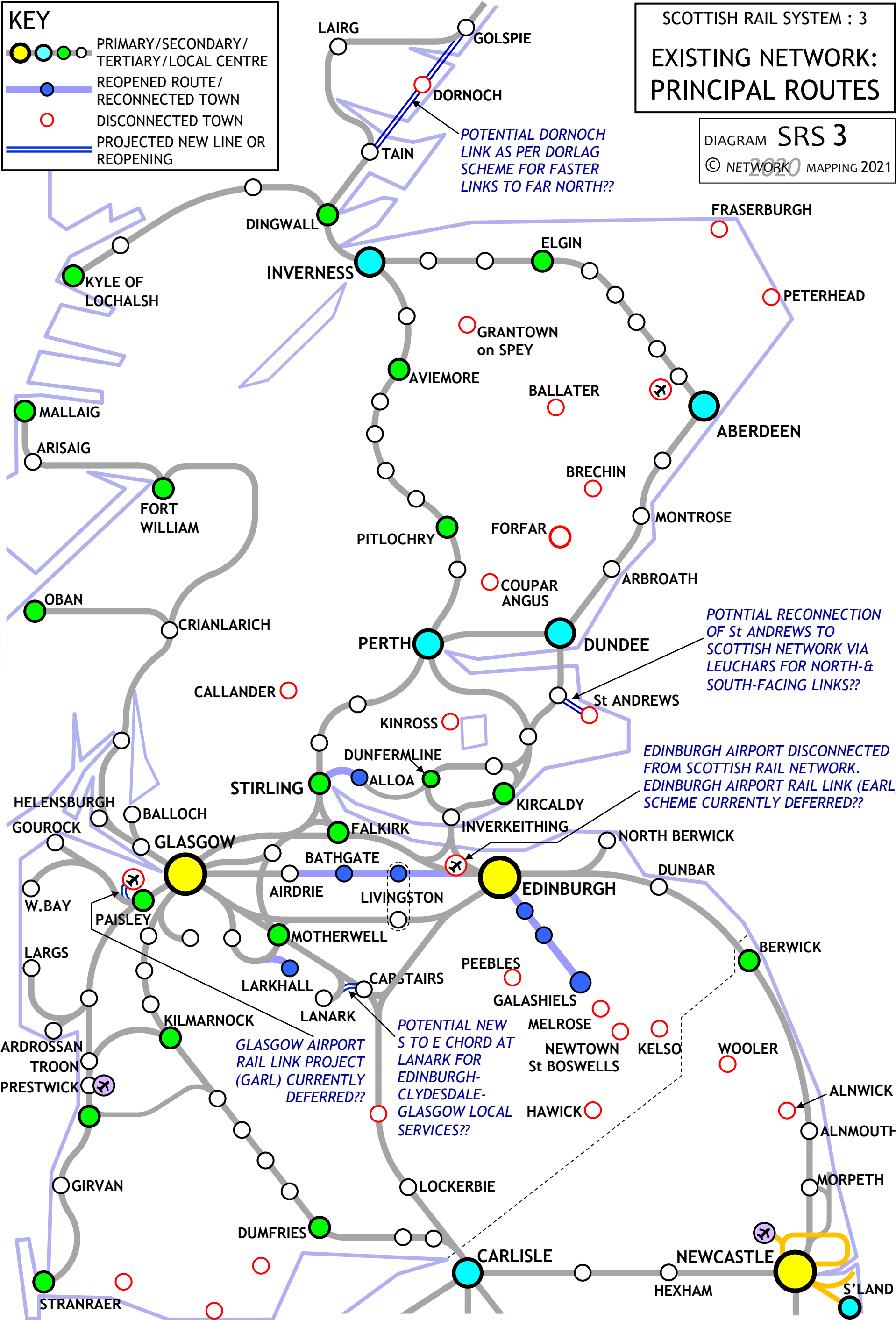


KEY




- ● ● ○ PRIMARY/SECONDARY/TERTIARY/LOCAL CENTRE
- ● REOPENED ROUTE/RECONNECTED TOWN
- DISCONNECTED TOWN
- PROJECTED NEW LINE OR REOPENING

SCOTTISH RAIL SYSTEM : 3
**EXISTING NETWORK:
 PRINCIPAL ROUTES**

DIAGRAM **SRS 3**
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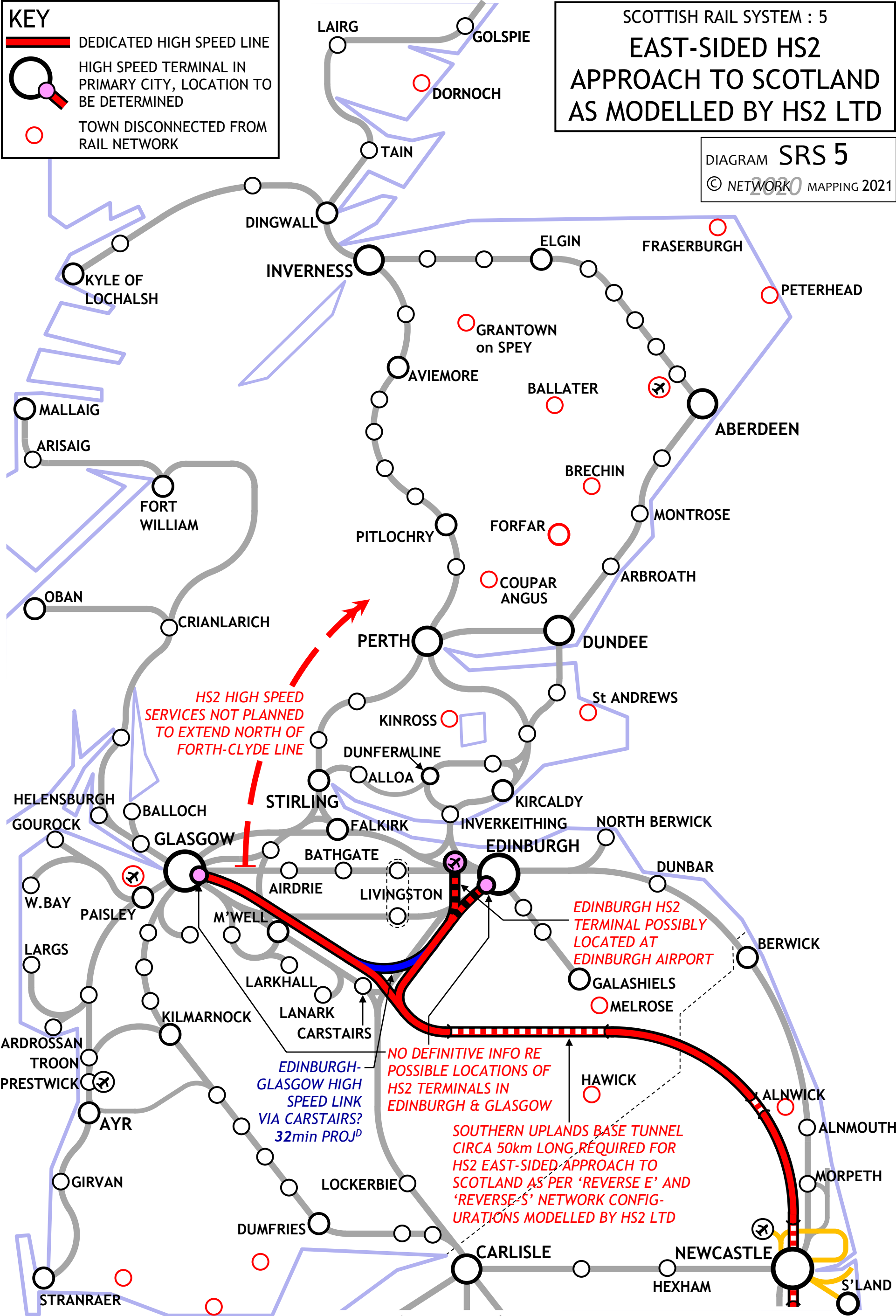


KEY

-  DEDICATED HIGH SPEED LINE
-  HIGH SPEED TERMINAL IN PRIMARY CITY, LOCATION TO BE DETERMINED
-  TOWN DISCONNECTED FROM RAIL NETWORK

SCOTTISH RAIL SYSTEM : 5
**EAST-SIDED HS2
 APPROACH TO SCOTLAND
 AS MODELLED BY HS2 LTD**

DIAGRAM **SRS 5**
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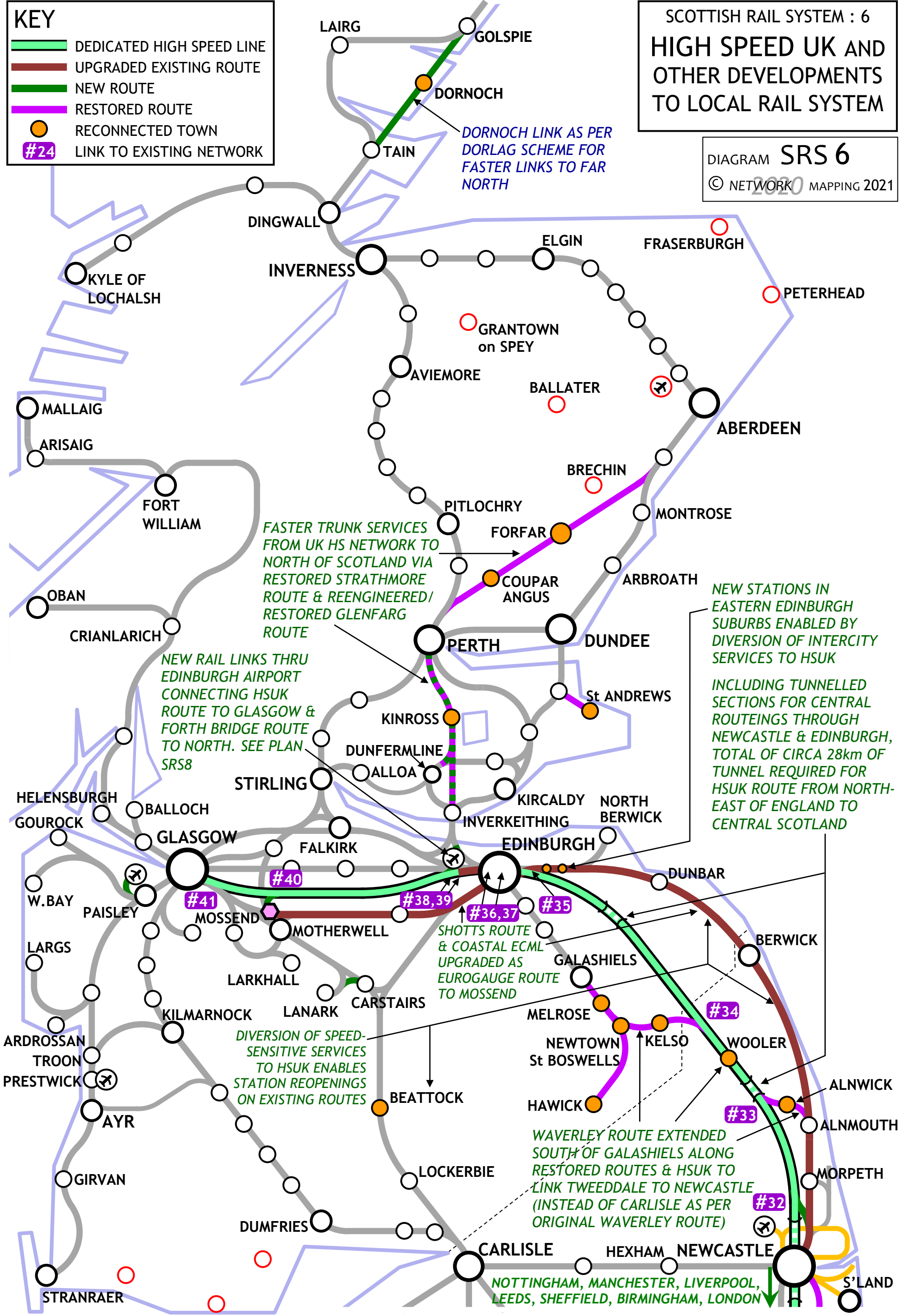


KEY

- █ DEDICATED HIGH SPEED LINE
- █ UPGRADED EXISTING ROUTE
- █ NEW ROUTE
- █ RESTORED ROUTE
- RECONNECTED TOWN
- #24 LINK TO EXISTING NETWORK

SCOTTISH RAIL SYSTEM : 6
HIGH SPEED UK AND OTHER DEVELOPMENTS TO LOCAL RAIL SYSTEM

DIAGRAM **SRS 6**
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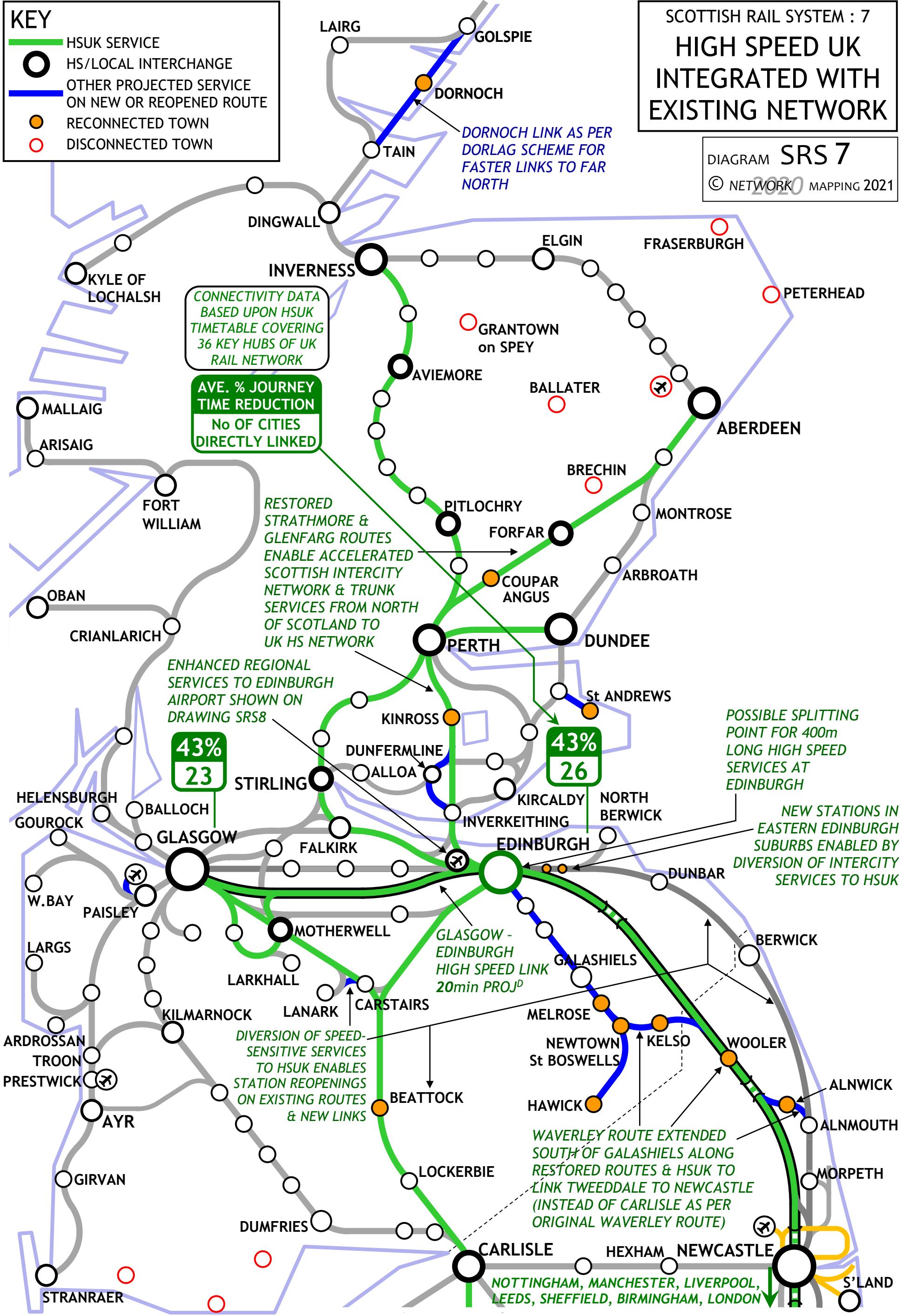


KEY

- HSUK SERVICE
- HS/LOCAL INTERCHANGE
- OTHER PROJECTED SERVICE ON NEW OR REOPENED ROUTE
- RECONNECTED TOWN
- DISCONNECTED TOWN

SCOTTISH RAIL SYSTEM : 7
HIGH SPEED UK INTEGRATED WITH EXISTING NETWORK

DIAGRAM **SRS 7**
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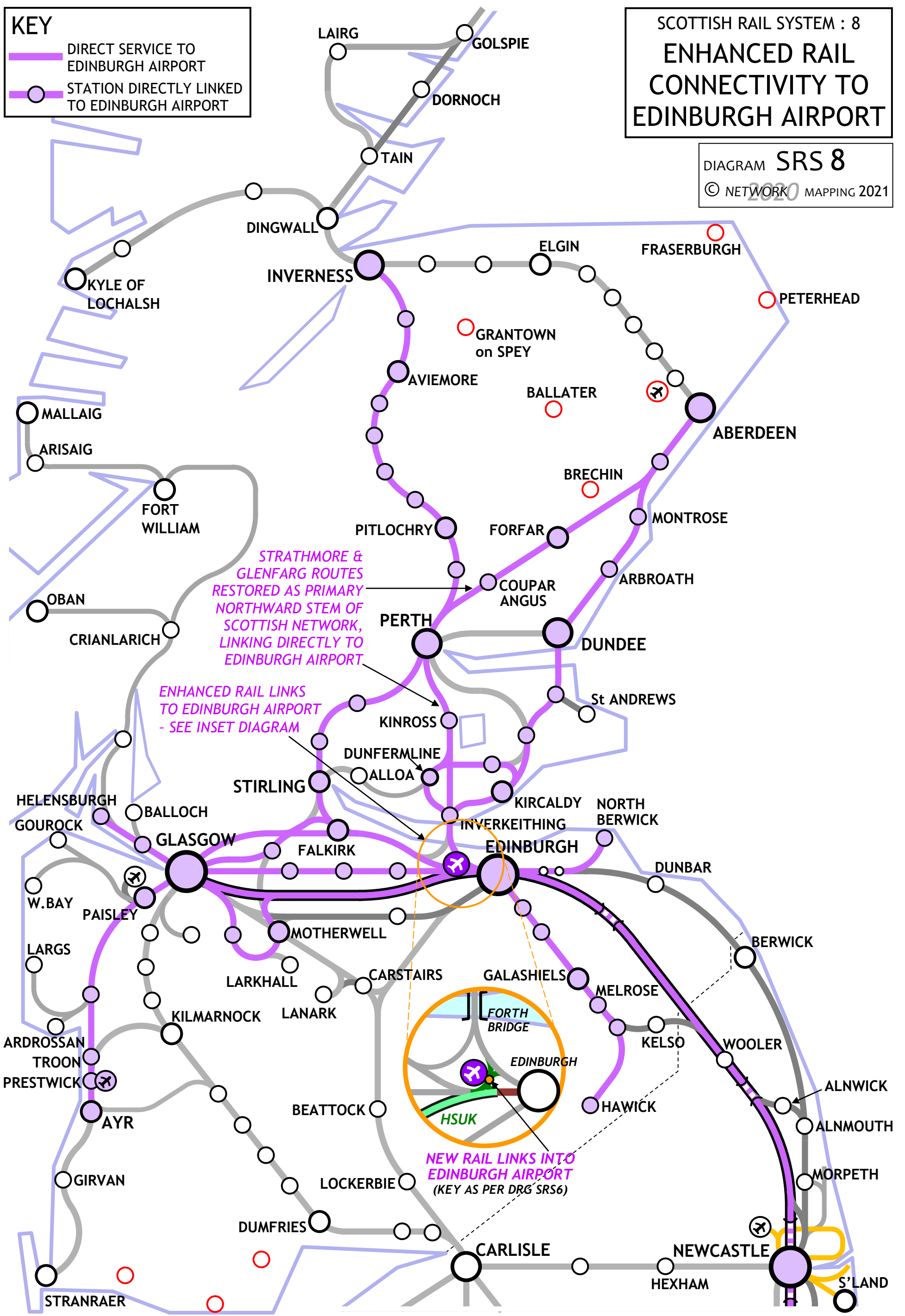


KEY

- DIRECT SERVICE TO EDINBURGH AIRPORT
- STATION DIRECTLY LINKED TO EDINBURGH AIRPORT

SCOTTISH RAIL SYSTEM : 8
ENHANCED RAIL CONNECTIVITY TO EDINBURGH AIRPORT

DIAGRAM **SRS 8**
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KEY

-  DEDICATED HIGH SPEED LINE
-  KEY FREIGHT ROUTE & YARD
-  FREIGHT ROUTE CAPABLE OF UP-GRADE TO CONTINENTAL GAUGE
-  RESTORED/NEW/UPGRADED ROUTE

SCOTTISH RAIL SYSTEM : 9
HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS

DIAGRAM **SRS 9**
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