

Intervention 16 – Infrastructure to encourage rail freight

1 Description of Package

This project will deliver a number of rail loading gauge improvements to enable larger freight vehicles to run, encouraging modal shift from road to rail transport. It would deliver on the commitments to increase the proportion of freight carried by rail by 7.5%, of which 7.5% of the growth will represent growth in new business as measured by net tonne miles. This was referenced in the Scottish High Level Output Specification (HLOS) and set out in the Office of Rail and Road's (ORR) 18th Periodic Review (PR18) Determination to Network Rail to improve freight gauge across the interurban network in Scotland and on cross-border routes. The Industry Growth Plan prepared by the Scottish Industry Joint Freight Board in 2019 constituted that plan.

It is recommended that a number of small scale gauge improvements is undertaken within Phase 1 of the Strategic Transport Projects Review (STPR2), with longer-term gauge improvements being appraised in Phase 2 to cover an optimal freight / electrification composite gauge programme as key contributor to de-carbonising of Scotland's Railway through increased electric traction and an increased proportion of freight being carried in Scotland by rail.

The Phase 1 recommendations cover two specific elements of the work: firstly the implementation of gauge clearance work on the shortlist of key structures that would enable the Glasgow & South Western (G&SW) and Annbank routes to act as a diversionary route for larger freight vehicles. Secondly undertake analysis of the survey data obtained from the survey of the core rail freight network to identify which structures on the West Coast Main Line, routes within Central Scotland and to the freight termini at Aberdeen / Inverness / Fife would require additional clearance to accommodate larger freight vehicles with consideration of options up to a W12 loading gauge.

The remainder of structures on the Glasgow & South Western (G&SW) and Annbank routes and structures on the West Coast Main Line, routes within Central Scotland and to the freight termini at Aberdeen / Inverness / Fife requiring additional clearance to accommodate larger freight traffic would be considered as part of the STPR2 Phase 2 process.

There are opportunities for value engineering if gauge clearance work to accommodate larger freight vehicles is undertaken alongside any gauge clearance work required work required to support the decarbonisation and electrification programme.

An indicative freight prioritised priority listing for the core intermodal network is set out to be tested and evaluated as part of this package.



- Priority 1 – West Coast Main Line (WCML) W12 – Scottish Strategic Freight Network (SSFN)
 - Priority 2 – Carmuir West to Aberdeen - Scottish Strategic Freight Network (SSFN)
 - Priority 2 – Perth to Inverness - Scottish Strategic Freight Network (SSFN)
 - Priority 4 – Aberdeen to Inverness - Scottish Strategic Freight Network (SSFN)
 - Priority 5 – Glasgow & South Western (G&SW) – Primary (via Barrhead) - Diversions
 - Priority 6 – Glasgow & South Western (G&SW) Secondary - Diversions
 - Priority 7 – Alloa and Kincardine Branch to Thornton Remaining
- Red = Strategic; Blue = Core, Yellow – Diversions

Strategic, Core and Diversions routes

2 What we have heard?

As part of the STPR2 consultation process, gauging was mentioned 4 times as part of the National Thematic Freight and Logistics Workshop held in August 2019.

- Capacity and Loading Gauge Capability across the Scottish Rail Network
- Rail Gauge Limitations – Reliance on Diesel Locomotives
- Improve Rail Freight gauge on particular routes

In addition, the Scottish Joint Freight Board (SJFB) Industry Growth Plan set out the requirements of a Scottish Strategic Freight Network including the required routes. (See adjacent graphic).

There were also a number of references to gauge enhancement as part of the consultation and engagement process. In summary from the Regional Transport Working Groups, and other national / thematic workshops (excluding the public online consultation) a total of 16 direct references to gauging were identified. Of the 16, 11 were National Options, and of the remaining 5, Forth Valley, Glasgow City Region, Forth Valley, Tay City and Highland and Islands were identified.



Timber Rail Freight Trial, Georgemas Junction Railhead, September 2020

3 The evidence base to support a case for change

One of the key demands of the rail freight industry for a long time has been for gauge enhancements to allow greater access to the network for larger freight vehicles with a W10 loading gauge, which is necessary to accommodate “High Cube” Containers, as demonstrated in a Network Rail Freight Route Utilisation Report¹. Furthermore, the DfT published its long-term vision for the Strategic Freight Network in 2009, emphasising a focus on loading gauge enhancement to W10/12 in Control Period 4 (CP4) (2009

¹ Network Rail, Freight Route Utilisation Strategy, 2007, Available at:

<https://web.archive.org/web/20120302212305/http://www.networkrail.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/freight/freight%20rus.pdf>

– 2014), and W12 loading gauge on all strategic container routes²

Gauge enhancements and Route Availability enhancements are an important part of Network Rail’s CP6 programme, Scottish Joint Freight Board Industry Growth Plan (2019), to improve route availability in Scotland and therefore reducing restrictions for the common Class 66 locomotive and to enable the conveyance of W12 / S45 containers / swapbodies on the Scottish Strategic Freight Network (SSFN) and W9 loading gauge on other less intensive intermodal routes.

Upon review, these gauge enhancement projects listed in the STPR2 option spreadsheet scored “Positive” for reducing environmental impact, improving connectivity, health & safety, economic growth and reliability & resilience.

The development of an “Enhanced Rail Freight Network” package, outlining improvements to key routes linking Strategic Rail Freight Installations (SRFIs) and Ports was outlined before the creation of the Strategic Transport Projects Review (STPR2) and in line with the specifications as set out in the Scottish Joint Freight Board (SJFB) Industry Growth Plan in April 2019.

4 The strategic rationale

This intervention will enable the forecast freight demand throughout Scotland to be realised by enabling the required loading gauge for W12 / S45 container and swapbody equipment to be operated on the Scottish Strategic Freight Network on the core routes using standard wagon platforms and freight traffic with a W9 loading gauge on other less intensive intermodal routes. There is a strong policy context for this intervention, it will meet Scottish Government rail freight growth objectives which were set out in the Control Period 6 (2019 – 2024) High Level Output Specification (HLOS). Gauge Clearance will help to support sustainable economic growth and decarbonisation of Scotland’s freight transport by encouraging modal shift of HGVs to rail, thus supportive of NTS investment hierarchies through the support of mode shift from road to rail which is a more sustainable transport priority group particularly for medium – longer distances and in some cases relatively short origin – destination pairs. It is also supportive of the NTS2 climate change and inclusive economic growth priorities.

This supports the Scottish Government’s strategy to create a Strategic Freight Network of high capability routes that deliver a resilient timetable for passenger and freight services, and adequate diversionary route capacity during planned and unplanned disruption.

² Department for Transport, Strategic Freight Network – The Long-Term Vision, 2009

<https://webarchive.nationalarchives.gov.uk/20110504024713/http://www.dft.gov.uk/pgr/rail/strategyfinance/strategy/freightnetwork/>

This intervention will contribute to the evidence base to confirm the requirement and sequencing for the required gauge clearance to support the intermodal freight traffic sector on both routes to be electrified to W12 / S45 Standard and for freight traffic with a W9 loading gauge on other less intensive intermodal routes. This is required to inform both the order of and detail of the forthcoming rolling programme of electrification and infrastructure investment required for freight routes across Scotland.

For optimum intermodal rail freight operations, the ability to convey intermodal containers and Swapbodies on core routes using conventional 1,000m wagon platforms to W12 / S45 standard is essential. It is possible to use in some cases an alternative technical solution, such as utilisation of wagons with a lower platform, but this can be complex and is sub optimal in terms of operating economics on the core freight routes.

In addition to the commitments made by the Scottish Government, there is an urgent and early requirement for the Scottish Government to signal to the market (Freight Operating Companies directly, and also Customers, Investors and Funders) of the commitment of the Scottish Government to support the decarbonisation of the rail freight network in Scotland.

In so doing, this will support rail freight operating company (and the associated leasing companies) to invest in bringing forward the required investments in electric and hybrid electric locomotives such as the recently launched Class 93 tri-mode locomotives which naturally have a multi-decade asset life. The current mainstay of the UK Rail Freight Locomotive fleet, the Class 66 diesel, is coming up for asset replacement in the early 2030's,

Such an early decision by the Scottish Government, would provide a strong signal to the market of its intentions and provide confidence to the Freight Operating Companies and their investors of the freight decarbonisation and to Industry and the financial markets that there will not be a competitive disadvantage and arguably the opposite by continuing to operate and invest in Scotland.

This gauge clearance scheme would also be consistent with the aims and objectives as set out by the Scottish Governments Green Investment Portfolio which was launched at the Mossend International Rail Freight Park in early September 2020 and supportive of a recent announcement by Russell's Group of a major strategic freight and logistics facility including a rail hub at the former Ravenscraig Steel Factory.

Why Now? (Part of Phase 1)

Gauge clearance is critical for the provision of diversionary routes to improve network resilience, especially in relation to climate change events e.g. improving Glasgow & South Western (G&SW) loading gauge to provide a viable alternative to the West Coast Main Line (which carries the vast majority of cross-border rail freight into Scotland), to mitigate against any future unexpected route closures such as the near collapse Lamington Viaduct in 2016 which closed the West Coast Main Line for over 7 weeks and had a devastating impact on cross-border rail freight.

5 Meeting the STPR2 Transport Planning Objectives (Gauge Clearance)

TRANSPORT PLANNING OBJECTIVE	CONTRIBUTION	SCALE OF IMPACT (-3 to +3)
A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target.	Provides for modal shift of freight from road to rail particularly for trunk haul intermodal freight which has up to 5 times less carbon emissions, even with current diesel haulage, per tonne moved than road haulage. With electric traction the difference will be even larger.	✓✓✓
An inclusive strategic transport system that improves the affordability and accessibility of public transport.	Gauge clearance allows the movement of 9'6" containers which are the most common type of deep sea container without the need for a technical low floor / pocket intermodal wagon. This improves the economics of rail freight as current conventional container flats can be used.	✓✓
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.	Gauge clearance allows for greater opportunity for modal shift of trunk haul intermodal containers removing unnecessary HGV's from trunk routes in and to / from Scotland.	✓✓
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.	Gauge clearance by permitting greater opportunity for modal shift reduces HGV movements on the trunk road network, makes a positive contribution to road safety, improves air quality and reduces noise and vibration on these routes. Protects the competitiveness of the economy of Scotland by providing for a zero-carbon trunk haul supply chain capability as an early competitive advantage.	✓✓✓
A reliable and resilient strategic transport system that is safe and secure for users.	Gauge clearance in itself does not make for a more reliable and resilient supply chain but does contribute to improved safety through modal shift of freight from road to rail which is subject to a far more regulated safety and operational regime which in so doing is a more reliable and resilient mode than road transport.	✓

6 Addressing the Post COVID-19 Priorities

POST-C19 PRIORITIES	CONTRIBUTION
Employment	As gauge clearance is completed on the core intermodal freight routes, the forecast would be that the market would respond by offering new and additional intermodal services to / from Ports to / from Scottish Distribution Centres / Manufacturing Facilities as part of an integrated supply chain network. This will protect and grow (modestly) employment in this sector.
The Environment	Gauge Clearance will help to facilitate modal shift of trunk haul freight (in particular) from road to rail, which will help to improve local air quality and reduce greenhouse gas emissions. Electrification of the freight network will provide further improvements to air quality and emission reductions.
Education	Doesn't significantly impact on education save for the growth of intermodal transport will require qualified personnel to plan, manage and operate modern complex supply chains in Scotland and beyond.
Equalities	Doesn't directly impact on Equalities but does so indirectly through modal shift of freight from road to rail which for environmental reasons improves safety and air quality which disproportionately impacts disadvantaged groups to a greater degree.

7 SEA, EqIA and Other Impact Assessments³

ASSESSMENT	COMMENTARY
SEA (Strategic Environmental Assessment)	The modal shift associated with this intervention will help improve air quality and reduce greenhouse gas emissions. The intervention will therefore complement the SEA and help progress the SEA objectives.
EqIA (Equality Impact Assessment)	Improvement in road safety (fewer accidents) and air quality may have a benefit for disadvantaged groups, who are differentially and disproportionately affected by these impacts..
ICIA (Island Communities Impact Assessment)	There are unlikely to be any direct impacts on island communities, which are not served by rail.
CRWIA (Children's Rights and Wellbeing Impact Assessment)	The improvements in road safety and air quality may have a benefit on the children and young people who are differentially and disproportionately affected by these impacts.
FSDA (Fairer Scotland Duty Impact Assessment)	Through an improvement in air quality by facilitating a modal shift of trunk haul intermodal freight from road to rail, this may help to reduce health inequalities experienced by deprived communities who are disproportionately affected by transport emissions and accidents.

³ All of these impact assessments are currently underway, but no formal assessments have yet been undertaken. Please note SEA and EqIA scoping reports have been produced and consulted upon.

8 Implementability and Interdependencies

IMPLEMENTABILITY CRITERIA	COMMENTARY
Feasibility	Route specific - although sub optimal technical solutions are available however they increase operating costs and are less than efficient per tonne moved than an infrastructure gauge clearance programme.
Affordability	Route specific – however current appraisal methods and business cases do not sufficiently account for carbon reduction and air quality, or freight value of time and reliability.
Public Acceptability	Very High – Historically one of the most popular responses by the public for freight modal shift.

Key Interdependencies

Gauge Clearance is generally linked to electrification but not exclusively. To maximise its effectiveness, gauge clearance is part of an overall package of electrification and track works (line speed for freight) and regulation loops (length and entering speed) and on a terminal to terminal basis.

Decarbonisation projects – optimal electrification + freight gauge opportunities will have a better business case than standalone electrification or improved freight gauge proposals

Gauge Clearance has been included in Phase 1 of STPR2 as it consistent with the 2017 Scottish HLOS and as an infrastructure requirement to enable mode shift of freight to rail as part of an integrated decarbonised multi-modal supply chain capability for Scotland to support its internal and external trade requirements.

