

Detailed Appraisal		D18: Rail Enhancements between Aberdeen and the Central Belt						
Estimated total Public Sector Funding Requirement:		Capital Costs/grant			£250m - £500m (Passenger improvements: Phase 1: £100m - £250m, Phase 2: £100m - £250m Freight improvements £50m - £100m) - Phase 1 £100m - £250m 1.75 -2.25 / Phase 1 £100m - £250m			
		Annual Revenue Support Present Value of Cost to Gvt BCR/PVB						
Summary Impact on STAG Criteria	Environment Safety Economy Integration Accessibility and Social Inclusion	---	--	-	0	+	++	+++
(Judgement based on available information against a 7pt. scale.)								
Intervention Description:								
<p>This intervention supports the objectives to improve public transport competitiveness between Aberdeen and the Central Belt and provide enhanced opportunities to move freight by rail.</p> <p>It would involve:</p> <ul style="list-style-type: none">Recasting of the passenger timetable on the Aberdeen – Dundee – Edinburgh / Glasgow corridors to provide express and stopping services;Providing one express train per hour to Glasgow (2¼ hour journey time);Providing one express train per hour to Edinburgh (2 hour journey time); andNo stops at intermediate settlements (except Dundee) for express services. <p>Phase 1 would include line speed improvements, additional loops to allow passing of freight trains and upgraded signalling along the entire length of the line to reduce headway times.</p> <p>Phase 2 would involve the removal of the single track at Usan, including a new bridge over Montrose Basin.</p> <p>Additional freight improvements: The passenger enhancements could be optimised to benefit freight operations. It is envisaged that this would include:</p> <ul style="list-style-type: none">Provision of bi-directional signalling to reduce the impact of engineering works (permitting the route to remain open for freight throughout the day and week);Increased length of freight loops (allowing longer freight trains); andRemoval of speed limits that are below 75mph for freight trains. <p>Included within this intervention is the capability to operate low floor wagons that are currently becoming available for use on the network. These would allow standard containers to be carried on existing infrastructure with minimal physical works, such as targeted gauge enhancements at appropriate structures.</p>								

Summary: Rationale for Selection

This intervention would help to reduce journey times between Aberdeen and the Central Belt by around 20 minutes, the majority of which would be delivered under Phase 1. This intervention would assist in allowing travellers to achieve an effective working day when travelling between Scotland's four largest cities. These improvements would lead to an increase in demand for rail travel, and a modal shift from private car use.

The freight improvements would make it considerably more attractive for freight hauliers to move containers and other goods by rail, by reducing journey times.

The improvements required to facilitate the improved passenger services are relatively modest compared with the works required for freight. This gives the passenger service improvements a good performance in terms of value for money, with the freight improvements being more marginal. However, the potential benefit from this in terms of reduced emissions control would make the overall improvement worthwhile.

The environmental impact this intervention is forecast to have on biodiversity and water quality has been identified at the strategic level as part of the Strategic Environmental Assessment and Appropriate Assessment. Appropriate mitigation and avoidance measures have been identified and will be further refined should this intervention be taken forward.

Table D18.1.1 STPR Objectives

STPR Objectives	
<p><u>STPR Objective 5.1:</u> To improve the public transport competitiveness between Aberdeen and Dundee (and hence onwards to the Central Belt).</p>	<p>5.1: Strongly Positive – The proposed journey times of 2 hours 15 minutes from Aberdeen to Glasgow and 2 hours from Aberdeen to Edinburgh represent a reduction of approximately 20 minutes from the existing journey times. This intervention would therefore enhance the competitiveness of rail transport for passengers travelling between Aberdeen and the Central Belt. Certain rail freight enhancements to the network in the northeast may have a direct effect on public transport competitiveness. The reason for this is that slow moving freight trains can negatively affect passenger trains; by increasing the length of loops and increasing the line speed, freight trains can be routed into the passing loops, when necessary, with a benefit to passenger trains.</p>
<p><u>STPR Objective 5.2:</u> To contribute to reducing both overall emissions and emissions per person kilometre through providing for alternatives to road freight movement on the corridor.</p>	<p>5.2: Positive – This intervention would include the provision or extension of freight passing loops in order to reduce pathing conflicts with passenger trains. This intervention would offer the opportunity to implement further infrastructure enhancement that would significantly improve capacity and service for freight transport. These improvements would allow longer and faster freight trains which could carry standard 9'6" deep sea containers. Furthermore, bi-directional signalling would minimise disruption from engineering works, allowing rail traffic to operate throughout the day and week. Overall, these interventions could significantly improve provision for freight transport, enhancing the competitiveness of rail in comparison with road freight and facilitating modal shift in freight transport. Rail alternatives could produce significant benefits in terms of carbon efficiency. These improvements are likely to make it considerably more attractive for freight hauliers to move containers and other goods by rail, by reducing journey times, allowing freight to arrive at times suitable for the final receiver and allowing standard deep sea containers to be carried. This would provide an attractive alternative for road freight and could be expected to encourage modal shift from road to rail. This potential modal shift could lead to significant reductions in emissions in this corridor.</p>
<p><u>STPR Objective 5.3:</u> To promote continuing reduction in accident rates and severity rates across the strategic transport network, recognising the need to continue the work of the Strategic Road Safety Plan through the STPR period</p>	<p>5.3: Slightly Positive – The overall impact of the measures on accident rates and severity rates would be small but positive due to the anticipated reduction in freight transported by road and increased rail mode share for passenger trips.</p>
<p><u>STPR Objective 5.4:</u> To promote journey time reductions, particularly by public transport, between the Central Belt and Aberdeen primarily to allow business to achieve an effective working day when travelling between these centres.</p>	<p>5.4: Strongly Positive – The proposed journey times of 2 hours 15 minutes from Aberdeen to Glasgow and 2 hours from Aberdeen to Edinburgh represent a reduction of approximately 20 minutes from the existing journey times. This intervention would therefore enhance the competitiveness of rail transport for passengers travelling between Aberdeen and the central belt. Rail freight enhancements to the network in the northeast will have a positive effect on journey times between the Central Belt and Aberdeen for existing rail freight and public transport alike. Journey time reductions also assist the train operators with operating costs and competitiveness.</p>
<p><u>STPR Objective 12.1:</u> To reduce Edinburgh to Perth public transport journey times and increase opportunities to travel by public transport.</p>	<p>12.1: Strongly Positive – The fastest options for travel between Edinburgh and Perth are currently direct services via Stirling or Kirkcaldy that complete the journey in just over 1 hr 20 minutes. Some of the proposed improvements between Edinburgh and Dundee would generate journey time savings for trips via Kirkcaldy.</p>

<p><u>STPR Objective 12.4/14.4:</u> To promote efficient and effective transport links to support the development and implementation of the proposed national developments at Rosyth, Forth Crossing and Edinburgh Airport identified in the NPF2.</p> <p><u>STPR Objective 12.5:</u> To improve the efficiency of the M90/A90 during periods of peak demand with a focus on reducing the conflict between longer distance and local traffic.</p> <p><u>STPR Objective 14.1:</u> To reduce public transport journey time between Edinburgh and Dundee.</p> <p><u>STPR Objective 14.2:</u> To increase public transport capacity and frequency between Fife and Edinburgh.</p> <p><u>STPR Objective 14.3:</u> To promote journey time reductions between the Central Belt and Aberdeen/Inverness primarily to allow business to achieve an effective working day when travelling between these centres.</p>	<p>The proposed service enhancements would significantly enhance rail capacity. During a three-hour peak period an additional 1100 seats would be provided on services arriving at Aberdeen (based on 1 additional train per hour on Edinburgh to Dundee and Edinburgh to Aberdeen services).</p> <p>12.4/14.4: Positive – The successful development of an international container terminal at Rosyth would be enhanced if supported by appropriate rail connections. Rosyth port is connected by rail to Inverkeithing on the East Coast Mainline; northbound journeys from the port would therefore benefit from the improvements proposed in this intervention. The implementation of passing loops to accommodate freight trains in particular, would help cater for any increase in rail freight as a result of development at the port. The improvements would enable carriage of standard 9'6" deep sea containers, facilitating transfer to rail of sea freight arriving at Rosyth. The existing Forth Road Bridge suffers from congestion during peak hours. The proposed rail improvements would complement the national development of the Forth Replacement Crossing by providing a more competitive public transport alternative along routes crossing the Forth.</p> <p>12.5: Slightly Positive – This intervention would not affect road journey times directly. However, rail service enhancements could result in some modal shift. This would improve the peak period efficiency of roads such as the M90/A90. The proposed freight improvements would be likely to encourage modal shift from road to rail in freight haulage. This would reduce disruption due to large vehicles on the M90/A90, with beneficial impacts on the efficiency of the route.</p> <p>14.1: Strongly Positive – This intervention contains measures specifically targeted to improve rail journey times between Edinburgh and Dundee.</p> <p>14.2: Positive – Extra rail capacity to provide express services in addition to local services is envisaged as part of the intervention of measures promoting rail journey time improvements between Edinburgh and Dundee. Measures to provide separate services would result in increased public transport capacity for both strategic journeys and local trips between Fife and Edinburgh.</p> <p>14.3: Strongly Positive - The planned journey times of 2 hours 15 minutes from Aberdeen to Glasgow and 2 hours from Aberdeen to Edinburgh represent a reduction in public transport journey times between Aberdeen and the Central Belt by approximately 20 minutes. On a round trip, businesses would benefit from journey time savings of approximately 40 minutes. Subject to the improvements, a round trip between Aberdeen and Glasgow would take 4 hours 30 minutes and a round trip from Aberdeen to Edinburgh would take 4 hours, allowing businesses to achieve a more effective working day when travelling between these centres. These journey time improvements would also benefit freight movements.</p>
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Table D18.1.2 STAG Criteria

STAG Criteria		
Criteria:	Assessment Summary:	Supporting Information:
Environment:	Minor Benefit/Major Negative Impact	This intervention has the potential for moderate to major adverse effects on the natural environment, including biodiversity, cultural heritage, soils and geology and the water environment; however, these effects are highly dependent on the finalised location of the works, and avoidance or mitigation could well be possible through sensitive siting. Construction of the new bridge over the Montrose Basin is a particular issue, given the multiple national and international designations that cover the area.
Safety:	Minor Benefit	The overall impact of the measures on road safety would be likely to be small but positive, due to the modal shift of passengers and freight from road to rail.
Economy:	Major Benefit	<p>Transport Economic Efficiency (TEE): The measures in this intervention would result in significant journey time savings for rail passengers, reducing journey times between Aberdeen and the Central Belt by approximately 20 minutes. Modelling suggests that patronage at the key stations along the line, i.e. Glasgow Queen Street, Edinburgh Haymarket, Aberdeen and Perth would increase. However, station usage at Dundee is forecast to decrease. The proposed rail enhancements between Edinburgh and Dundee would reduce journey times and encourage modal shift for people travelling from parts of Fife to Edinburgh, particularly commuters.</p> <p>The proposed service frequency enhancements would increase the seat capacity arriving at Aberdeen by 1100 over a three hour peak period (based on one six-car additional train per hour on both the Edinburgh to Aberdeen and Edinburgh to Dundee routes) open these journey time improvements to a large number of additional rail passengers.</p> <p>Wider Economic Benefits (WEBs): The proposed improvements would give journey time reductions of approximately 40 minutes on round trips between Aberdeen and the Central Belt. The improved journey times of 4 hours and 4 hours 30 mins for a round trip from Aberdeen to Edinburgh and Glasgow respectively would enhance efficiency and productivity for business travellers, enabling them to achieve a more effective working day when travelling between these locations. Strengthening links between Scotland's cities is a key strategy in achieving competitiveness in the Scottish Government's emerging National Planning Framework 2. If the proposed rail freight enhancements are implemented, businesses would benefit from more efficient freight links both within Scotland and to overseas, via improved provision for rail freight on routes connecting to Rosyth port. The improvements would reduce journey times from Dundee, Edinburgh and Edinburgh Airport (through connection with the tram network), enhancing the efficiency and competitiveness of Scottish organisations conducting international business.</p> <p>Economic Activity and Location Impacts (EALIs): This intervention promotes efficient commuter links into urban areas, maximising the 60-minute commutable labour area to these locations. This intervention would have beneficial impacts on employment and productivity in key urban centres, in particular, Aberdeen, Edinburgh and Dundee. The enhancements proposed also offer opportunities for improved rail accessibility to the proposed container terminal at Rosyth. This intervention also offers the potential to create jobs at the freight hubs.</p>
Integration:	Moderate Benefit	Transport Integration: The Freight Action Plan (FAP) for Scotland (2006) encourages modal shift of freight transport from road to rail and sea as a priority for reducing vehicle kilometres and emissions. Rail freight enhancements will help in the creation of integrated road and rail transport through the requirement for freight hubs for distribution to local towns and cities. Similarly, some companies from Scandinavia and other North Sea destinations that use Aberdeen harbour could benefit from better rail

		<p>freight integration to distribute goods across Scotland and the rest of the UK. There are plans to improve the facilities at Waterloo Sidings at the Aberdeen Port. A new terminal is being built at Raithes Farm adjacent to Aberdeen Airport and could be used for express parcels.</p> <p>Transport and Land-use Integration: The measures proposed as part of this intervention would not have a significant impact on transport and land-use integration. However, the development of Areas of Economic Activity in key urban locations including Aberdeen, Dundee, Edinburgh and Glasgow is seen as important for the growth of local and regional economies, and this intervention would be likely to help facilitate such development.</p> <p>Policy Integration: This intervention comprises rail enhancements and would therefore be likely to generate some benefits towards social inclusion. However, this intervention does not promote enhancements in network coverage and therefore remains limited in scope albeit with a potentially significant magnitude. This intervention will promote modal shift and will deliver a beneficial impact in relation to road traffic reduction aspirations.</p>
Accessibility and Social Inclusion:	Minor benefit	<p>Community Accessibility: This intervention is not designed to improve public transport area coverage and the benefits to community accessibility would be likely to remain limited. However, the intervention comprises measures to improve rail journey times and would therefore generate some benefits in terms of accessibility to services. Residents within the catchment area of stations along the Fife line would benefit from improved accessibility to employment opportunities in Edinburgh and Dundee as a result.</p> <p>Rail freight improvements and integration with lifeline ferry services from Aberdeen to Orkney and Shetland are included in the FAP as being important to the creation of jobs in remote and rural areas. Freight enhancements would build on the recent gauge enhancement to Elgin.</p> <p>Comparative Accessibility: This intervention will affect local and long distance rail passengers and freight traffic over the route.</p>

Table D18.1.3 Key Strategic Outcomes

Key Strategic Outcomes (KSOs)		
Objective:	Assessment Summary:	Supporting Information:
Improve Journey Times and Connections:	Major Benefit	<p>This intervention contains infrastructure improvements and service enhancements that would result in significant journey time savings (approximately 20 minutes) for trips between Aberdeen and the Central Belt. The improvements would remove the one remaining section of single track line on the East Coast Mainline, which is a recognised constraint to providing improved rail connections to the North East of Scotland. Businesses would benefit from more efficient connections between key urban centres within Scotland.</p> <p>Scotland's current freight network is concentrated around links from the south to the Central Belt. Improved rail freight links to the north and northeast will significantly improve journey times for consolidated train loads of freight to and from Aberdeen, and in turn provide potential rail freight access to the cities of Dundee, Perth and Stirling en-route.</p>
Reduce Emissions:	Minor Benefit	<p>This intervention would encourage some modal shift from road to rail. Passenger service improvements would encourage this transfer for some private car users whilst rail freight improvements would encourage this transfer for road freight hauliers. This could result in a slight reduction of CO2e emissions, particularly due to a reduction in the number of kilometres driven by HGVs.</p> <p>Modern freight, rolling stock and diesel tractive design ensures that the effect on communities affected by increased rail freight utilisation along strategic sections of the network is kept to a minimum, through reduced exhaust emissions. Furthermore, improved suspension and wagon design reduces vibration and noise emissions.</p>
Improve Quality, Accessibility and Affordability:	Minor Benefit	<p>This intervention would result in faster journeys between Aberdeen and the Central Belt and between Dundee/Fife and Edinburgh, improving the quality and competitiveness of rail connections.</p> <p>Faster rail services from Fife would increase the accessibility of employment opportunities in Edinburgh and Dundee. However, the proposed enhancements would not extend network coverage and the target area would therefore be restricted to the catchment of existing rail stations. This intervention is not expected to impact on affordability.</p>

Table D18.1.4 Scottish Government's Strategic Objectives

Scottish Government's Strategic Objectives		
Objective:	Assessment Summary:	Supporting Information:
Safer and Stronger:	Minor Benefit	<p>This intervention would go some way towards improving the quality and accessibility of rail services between Aberdeen and the Central Belt. Users of key inter-urban services on the route would benefit from significantly improved journey times. Residents in Fife would benefit from improved connectivity to economic opportunities in Fife and Dundee.</p> <p>Benefits to road safety are likely to be minimal although positive due to the reduction in road traffic from the anticipated modal shift from road to rail.</p>
Smarter:	Neutral	<p>This intervention would have no direct impact on access to specific schools, colleges and universities for those living along the corridor. However, reducing journey times between the major cities would result in improved overall accessibility to education services.</p>
Wealthier and Fairer:	Major Benefit	<p>This intervention would significantly improve rail journey times along key routes from Aberdeen to the Central Belt, generating significant efficiency gains for business travel between these centres. Improved provision for freight transport would benefit businesses by strengthening transport links to markets and suppliers both within Scotland and overseas, via links to a new container terminal at Rosyth port and the existing facility at Grangemouth. Journey time improvements along the Fife line would improve links to employment opportunities in Edinburgh and Dundee for residents of Fife. More efficient rail connections between Fife and Edinburgh would also help curb traffic growth on routes across the Forth Road Bridge, contributing to the efficiency of road-based travel along the route. This intervention would also boost the economy in the north of Scotland through improved connections with the Central Belt resulting in increased productivity and efficiency. There may be an increase in the labour catchment area between Dundee and Edinburgh.</p>
Greener:	Minor Benefit	<p>This intervention promotes a degree of modal shift to rail away from the private car, with improvements to air quality, reduced carbon emissions, and increased use of sustainable transport.</p>
Healthier:	Neutral	<p>The measures proposed as part of this intervention would enhance the attractiveness of rail travel along key routes and would be likely to achieve a modal shift from road to rail. However, the intervention is not specifically aimed at improving the uptake of active travel modes, i.e. walking and cycling, and the benefits to health services would therefore be likely to be negligible.</p>

Table D18.1.5 Implementability Appraisal

Implementability Appraisal	
Technical:	<p>It is expected that no untried techniques would be required when implementing any aspects of this intervention. However, as the design stages progress, localised issues may arise, such as the risk of subsidence due to mining, which may require increased technical capacities to overcome.</p> <p>Construction of some aspects of this intervention may have an impact on operating existing services, however much of this work could be carried out at times when the disruption would be minimised.</p>
Operational:	<p>Running additional rail services places extra pressure on the rail network and can increase the risk of delays. However, it is expected that these issues would be mitigated by ensuring that the works included within the intervention have sufficient capacity for the proposed service levels. No significant operational impacts are anticipated from this intervention.</p>
Public:	<p>In general terms, the intervention would be likely to improve service provision and modal shift and would therefore be likely to meet with public approval. The movement of freight from road to rail would be generally welcomed.</p>