

Detailed Appraisal		D22 – Edinburgh to Glasgow Rail Improvements Programme						
Estimated total Public Sector Funding Requirement:		<i>Capital Costs/grant</i> <i>Annual Revenue Support Present</i> <i>Value of Cost to Gvt</i> <i>BCR/PVB</i>				£500m - £1bn -£8m to -£14m per annum £500m - £1bn 0.75 – 1.25		
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 was identified early in the STPR and brought forward in a study which considered improvements to the capacity, frequency and journey time of rail services between Edinburgh and Glasgow.</p> <p>This intervention supports a number of objectives relating to access to jobs from the perspective of both employers and employees, emissions and public transport capacity on the corridor between Edinburgh and Glasgow.</p> <p>A number of potential packages of infrastructure and service enhancements were examined. The Minister announced to Parliament in Autumn 2007 that the preferred strategy would be to provide:</p> <ul style="list-style-type: none">• An electrified railway between Edinburgh and Glasgow Queen Street (including diversion routes), the line via Cumbernauld and lines to Dunblane and Alloa;• A new station at Gogar to serve Edinburgh Airport (via tram) and a new curve at Dalmeny to allow Edinburgh to Glasgow services to access the new station;• Six trains per hour between Edinburgh and Queen Street with the fastest journey time of around 35 minutes and a mixture of stopping patterns to serve intermediate stations;• Access to Edinburgh Park station for Edinburgh to Glasgow services; and• Three trains per hour between Edinburgh and Glasgow Central (one stopping service and two semi-fast services) serving both the Shotts and Carstairs routes.								
Summary: Rationale for Selection								
<p>This intervention would provide an increase in capacity between Edinburgh and Glasgow as well as reducing the journey time between the two cities. These combined would help maintain, and in some cases enhance, the labour market catchment area that can commute into the two cities within 60-minutes, counteracting the forecast decrease in labour market catchment caused by forecast increases in congestion and journey times on the road network. The improvements would encourage travellers to choose to travel by rail instead of private car. Electrification of the lines would also further help to reduce emissions within the corridor between Edinburgh and Glasgow. The intervention also provides a key linkage from the rail network to Edinburgh Airport, through the provision of a new station at Gogar and interchange with the tram.</p> <p>The enhancement to services between Edinburgh and Glasgow via Shotts or Carstairs would improve public transport capacity between Edinburgh and Livingston / Glasgow. It would also improve connectivity and interchange opportunities (via Glasgow Central) between Edinburgh and Inverclyde / Ayrshire, further helping to maintain the labour market catchment area for the two cities, and encouraging rail use in place of private car.</p> <p>This intervention, as a committed scheme, has a strong business case, offering value for money.</p> <p><i>This intervention was an early deliverable within STPR and a more detailed analysis of the issues, options and solutions can be found within the Edinburgh – Glasgow Rail Improvements report, which has previously been published and is available on the Transport Scotland website.</i></p>								

Table 22.1.1 STPR Objectives

STPR Objectives	
<p><u>STPR Objective E1:</u> To maintain the 60-minute commutable labour market area at the current level, with a particular focus on linking areas of economic activity.</p> <p><u>STPR Objective E2</u> To enhance public transport interchange opportunities, where feasible to do so.</p> <p><u>STPR Objective E3</u> To increase public transport capacity and frequency between Fife and Edinburgh.</p> <p><u>STPR Objective E4</u> To promote continuing reduction in accident rates and severity rates across the strategic transport network.</p> <p><u>STPR Objective E5</u> To promote journey time reductions, particularly by public transport, between the Central Belt and Aberdeen/Inverness primarily to allow business to achieve an effective working day when travelling between these centres.</p> <p><u>STPR Objective E6</u> To promote efficient and effective transport links to support the development and implementation of the proposed national development at Edinburgh Airport identified in the NPF2.</p> <p><u>STPR Objective G1:</u> To increase the public transport access to and between areas of economic activity and regeneration with minimal need for interchange.</p> <p><u>STPR Objective G2:</u> To improve the efficiency of the M8 motorway during periods of peak demand with a focus on reducing the conflict between longer distance and local traffic, increasing the people carrying capacity and freight carrying capacity of existing road, and demand management.</p>	<p>E1: Strongly Positive – This intervention would provide a key linkage between Edinburgh city centre and West Edinburgh and, by decreasing journey time along the Edinburgh to Glasgow via Falkirk (E&G) route and from key points along the Shotts line, would maintain, and in some cases increase, the rail 60-minute commutable labour market area.</p> <p>E2: Positive – The provision of a new station at Gogar (Edinburgh Airport), together with improvements at Haymarket, stopping some Glasgow services at Edinburgh Park and other station upgrades would all serve to increase the opportunity and quality of interchange. This would also provide the opportunity for easier interchange for trips from Fife to West Lothian and Glasgow.</p> <p>E3: Neutral – This intervention would have no significant impact on this objective.</p> <p>E4: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on accident and severity rates.</p> <p>E5: Neutral – This intervention would have no significant impact on this objective.</p> <p>E6: Strongly Positive – This intervention would provide a new station at Gogar to serve Edinburgh Airport, via the tram connection, which would be accessible by trains on the E&G and lines north of the Forth.</p> <p>G1: Positive – This intervention would provide more rail capacity into Glasgow city centre and would provide more direct services through to the west of the city centre.</p> <p>G2: Neutral – This intervention would have no significant impact on this objective.</p>

<p><u>STPR Objective G3:</u> To address rail capacity and connectivity issues in central Glasgow.</p> <p><u>STPR Objective G4:</u> To promote continuing reduction in accident rates and severity rates across the strategic transport network.</p> <p><u>STPR Objective G5:</u> To promote journey time reductions, particularly by public transport, between the Central Belt and Aberdeen/Inverness primarily to allow business to achieve an effective working day when travelling between these centres.</p> <p><u>STPR Objective G6:</u> To promote efficient and effective transport links to support the development and implementation of the proposed national development at Glasgow Airport identified in the NPF2.</p> <p><u>STPR Objective 9.1</u> To address current and forecast rail overcrowding into Glasgow.</p> <p><u>STPR Objective 9.2</u> To improve the efficiency and reliability of the operation of the southern sections of the M80 on approach to Glasgow, particularly for priority vehicles.</p> <p><u>STPR Objective 9.3</u> To reduce the severity of accidents to the national average.</p> <p><u>STPR Objective 9.4</u> To promote journey time reductions, particularly by public transport, between the Central Belt and Aberdeen/Inverness primarily to allow business to achieve an effective working day when travelling between these centres.</p> <p><u>STPR Objective 10.1</u> To improve access to Grangemouth port and freight hub.</p> <p><u>STPR Objective 10.2</u> To address shortfalls in the provision of public transport to and from Edinburgh and increase public transport modal share.</p> <p><u>STPR Objective 10.3</u> To promote continuing reduction in accident rates and severity rates across the strategic transport network.</p>	<p>G3: Slightly Positive – The improvements to services on the E&G line in particular, requires new infrastructure in Glasgow to provide enhanced access to the low level system, new turnback facilities and improved platform capacity at Queen Street. These would be provided through this intervention.</p> <p>G4: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on accident and severity rates.</p> <p>G5: Neutral – This intervention would have no significant impact on this objective.</p> <p>G6: Slightly Positive – By improving the connectivity and journey time on routes between Edinburgh and Glasgow Central, this intervention would deliver improved accessibility to the Glasgow Airport Rail Link.</p> <p>9.1: Positive – This intervention would deliver enhanced capacity on the route into Glasgow, in particular by providing local and regional services to augment the operation of the main E&G services.</p> <p>9.2: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on this objective.</p> <p>9.3: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on accident and severity rates</p> <p>9.4: Neutral – this intervention would have no significant impact on this objective.</p> <p>10.1: Slightly Positive – The provision of an electrified railway on the E&G, together with various junction infrastructure works, would provide the basis for access improvements to Grangemouth. However, additional works, such as electrification, would be required within Grangemouth to take full advantage of these works.</p> <p>10.2: Positive – This intervention would provide additional capacity on the route and a shorter journey time, supporting a modal shift to rail.</p> <p>10.3: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on accident and severity rates.</p>
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<p><u>STPR Objective 10.4</u> To promote efficient and effective transport links to support the development and implementation of the proposed national developments at Grangemouth and Edinburgh Airport identified in the NPF2.</p> <p><u>STPR Objective 13.1</u> To increase public transport capacity and reduce journey time between Edinburgh and Glasgow.</p> <p><u>STPR Objective 13.2</u> To make best use of the available road space and better manage peak demand.</p> <p><u>STPR Objective 13.3</u> To increase public transport capacity and frequency between Livingston and Edinburgh.</p> <p><u>STPR Objective 13.4</u> To contribute to both a reduction in emissions per person kilometre and a reduction in overall emissions.</p> <p><u>STPR Objective 13.5</u> To promote continuing reduction in accident rates and severity rates across the strategic transport network.</p> <p><u>STPR Objective 13.6</u> To promote efficient and effective transport links to support the development and implementation of the proposed national developments at Grangemouth and Edinburgh Airport identified in the NPF2.</p>	<p>10.4: Positive – The provision of an electrified railway on the E&G, together with various junction infrastructure works, would provide the basis for access improvements to Grangemouth. However, additional works, such as electrification, would be required within Grangemouth to take full advantage of these works. This intervention would provide a new station at Gogar to serve Edinburgh Airport, via the tram connection, which would be accessible by trains on the E&G (including Stirling and Dunblane).</p> <p>13.1: Strongly Positive – This intervention would significantly reduce the rail journey time between Edinburgh and Glasgow on both the E&G and via Shotts.</p> <p>13.2: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on this objective.</p> <p>13.3: Positive – This intervention would provide additional capacity through the improvements to services on the Shotts line.</p> <p>13.4: Slightly Positive – The adoption of electric traction and modal shift from road to rail would help to reduce emissions.</p> <p>13.5: Neutral – Although it would provide for a modal shift from road to rail, it is unlikely to have a significant impact on accident and severity rates.</p> <p>13.6: Positive – The provision of an electrified railway on the E&G, together with various junction infrastructure works, would provide the basis for access improvements to Grangemouth. However, additional works, such as electrification, would be required within Grangemouth to take full advantage of these works. This intervention would provide a new station at Gogar to serve Edinburgh Airport that would be accessible by trains on the E&G and lines north of the Forth.</p>
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Table 22.1.2 STAG Criteria

STAG Criteria		
Criteria:	Assessment Summary:	Supporting Information:
Environment:	Minor Negative Impact / Moderate Benefit	<p>There would be benefits due to reduced emissions from the significant level of transfer from diesel to electric traction on Edinburgh, Glasgow, Dunblane, Cumbernauld and Alloa routes. This would be enhanced by modal shift from road to rail. Increased emissions from more diesel train movements on Shotts line would be offset by a reduction in road based movements. There would be overall beneficial effects on air quality and climate.</p> <p>Adverse impact stems from visual impact of the overhead electric traction system and increased noise/vibration due to increased train movements. No significant impact on flora and fauna have been identified as infrastructure improvements are generally on-line rather than impacting on greenfield locations.</p>
Safety:	Minor Benefit	Improvements to passenger security resulting from improvements to stations and improved infrastructure and signalling giving enhanced safety to rail operations would result in a minor positive benefit.
Economy:	Moderate Benefit	<p>Transport Economic Efficiency (TEE): This intervention would use targeted infrastructure improvements to allow more intensive use of the overall existing rail infrastructure between Edinburgh and Glasgow. It would provide a substantial increase in capacity, a 50 per cent improvement in frequency on the E&G and a reduction in journey time. There would be increased opportunities for interchange.</p> <p>Wider Economic Benefits (WEBs): The wider economic benefits of this intervention would be significant. It would provide a significant journey time saving and major capacity enhancements between Scotland's two largest cities, linking them more effectively. The provision of stops on the E&G service at Gogar (Edinburgh Airport) and Edinburgh Park would also have significant benefits. There would also be benefits to intermediate centres through enhanced access to jobs, other opportunities and services together with benefits to employers and the attraction of continued inward investment. The intervention would also benefit tourism and provide a more effective and efficient means of allowing tourists to travel between Edinburgh and Glasgow.</p> <p>Economic and Location Impacts (EALIs): Providing a 'step-change' in the service provision between Edinburgh and Glasgow Central is likely to have significant impacts at key locations on the Shotts line in particular. The additional capacity provision of up to 1,100 seats per hour arriving in each centre would support continuing development in both the commercial and retail sectors.</p>
Integration:	Moderate Benefit	<p>Transport Integration: Integration between heavy rail services and Edinburgh Tram would be significantly enhanced by the new station at Gogar (Edinburgh Airport), together with improvements at Haymarket and new connections at Edinburgh Park.</p> <p>Transport and Land-Use Integration: This intervention would support development at Edinburgh Airport and West Edinburgh in general (via Edinburgh Park). It would also support general development within the city centres of Edinburgh and Glasgow.</p> <p>Policy Integration: The intervention would be consistent with the aims and outcomes set out in Scotland's Railways. It would also support Sustainable Economic Growth. This would also support collaborative efforts by Edinburgh and Glasgow.</p>
Accessibility and Social Inclusion:	Moderate Benefit	Community Accessibility: The improvements in journey time between and among Edinburgh, Glasgow, Dunblane and Alloa and the intermediate settlements, in tandem with the provision of new services and additional capacity, would improve access

		<p>to jobs and other opportunities by rail. In addition, the improvements to services via Shotts and Carstairs would significantly improve the accessibility of intermediate locations in terms of access to jobs and opportunities.</p> <p>Comparative Accessibility: It is unlikely that the distribution of impacts would differ by age, gender, car ownership or income group. The new infrastructure would be fully DDA compliant.</p>
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Table 22.1.3 Key Strategic Outcomes

Key Strategic Outcomes (KSOs)		
Objective:	Assessment Summary:	Supporting Information:
Improve Journey Times and Connections:	Major Benefit	The reduction in journey time on the E&G is significant and would provide a 'step change' in the rail journey time between the two main centres; providing a fastest journey time of around 35 minutes compared with the current of around 50 minutes. For some locations, the improved service via Shotts or Carstairs would result in this service becoming a viable competitor both for journeys by car, and to the current service on the E&G line. This would allow passenger loadings to be more effectively distributed, and provide a greater level of resilience to disruptions in the network. For other intermediate stations, there would be benefits to connectivity and journey time. The provision of new interchange opportunities at Gogar (Edinburgh Airport) and Edinburgh Park would provide enhanced connectivity from Fife to West Lothian and Glasgow, removing the need to travel via the centre of Edinburgh.
Reduce Emissions:	Moderate Benefit	The electrification of the E&G line and lines to Cumbernauld, Dunblane and Alloa would replace a significant proportion of diesel operated services in Scotland with electric traction. Together with a modal shift from car, this would result in a reduction in emissions. In addition, the electricity supply could be sourced from more environmentally friendly sources. Although increased services on the Shotts line would be operated by diesel trains, the increase in emissions would be offset by a reduction resulting from modal shift from private car to rail.
Improve Quality, Accessibility and Affordability:	Moderate Benefit	The provision of up to 1,100 additional seats per hour arriving in both Edinburgh and Glasgow city centres would be of significant benefit in improving the quality of the rail service offering to passengers. Of additional benefit would be the splitting of local (Glasgow Outer Suburban) services and more regional focused services to better serve routes into Glasgow Queen Street. The provision of six trains per hour between Edinburgh and Glasgow, additional services to Stirling and Glasgow Outer Suburban services would all serve to increase the accessibility of the rail network by providing 'turn-up-and-go' capability for a number of key movements. No impact on affordability is forecast.

Table 22.1.4 Scottish Government's Strategic Objectives

Scottish Government's Strategic Objectives		
Objective:	Assessment Summary:	Supporting Information:
Safer and Stronger:	Major Benefit	The provision of infrastructure and services to allow more services and increased passenger carrying capacity would fundamentally strengthen rail system operation and provide a greater degree of resilience to disruptions.
Smarter:	Moderate Benefit	The reduction in journey time for journeys into Glasgow and Edinburgh would reduce the overall journey time to major colleges

		and universities based within these cities and increase the potential catchment for a given overall journey time.
Wealthier and Fairer:	Major Benefit	The reduction in journey time, increase in frequency and increase in passenger carrying capacity between Edinburgh and Glasgow would continue to support both cities in their role as key economic drivers of the Scottish economy.
Greener:	Minor Benefit	Electrifying the railway network between Edinburgh and Glasgow including lines to Cumbernauld, Dunblane and Alloa, would substantially reduce the number of diesel powered services operating in Scotland which would reduce transport emissions from transport.
Healthier:	Minor Benefit	Reducing emissions would impact positively on human health and reduce health service costs in the long term, although the effects would be minor. There would be some benefits in terms of access to health services by improving the journey time, frequency and capacity of services into the central areas of Edinburgh and Glasgow for onward connection to major hospitals or other health care units.

Table 22.1.5 Implementability Appraisal

Implementability Appraisal	
Technical:	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. 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.
Operational:	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.
Public:	Proposals for improved services on the Shotts line (the Caledonian Express), have been in the public domain for some time, and have received a generally positive response. The early work within STPR relating to this particular intervention has been available and was the subject of a Ministerial announcement to Parliament.