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Levenmouth Sustainable Transport Study

Detailed Options Appraisal Report, November 2019

On behalf of **Transport Scotland**



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


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1 Introduction

1.1 The Purpose of the Report

1.1.1 The purpose of this report is to present the analysis and findings from the Detailed Options Appraisal Stage of the Levenmouth Sustainable Transport Study. This report is the third and final report for the study and documents the final stage of the Transport Appraisal in line with Scottish Transport Appraisal Guidance (STAG). This is a detailed appraisal of the multi-modal transport options identified at the Initial Appraisal: Case for Change Stage and then emerging as being worthy of more detailed consideration from the Preliminary Options Appraisal Stage.

1.2 Other Reports

1.2.1 The Initial Appraisal: Case for Change report was published in November 2018. This report was the first in a series of three reports and documented the first stage of the study. The Initial Appraisal, in line with STAG, involved identifying evidenced transport problems and opportunities in the study area and setting Transport Planning Objectives (TPOs) to reflect the changes sought to address these problems and opportunities. A range of potential multi-modal transport options were then generated, assessed and sifted so that only options worthy of further consideration were taken forward to the appraisal stage.

1.2.2 The Preliminary Options Appraisal report was published in May 2019. This report documented the penultimate stage of the study. This involved an appraisal of the multi-modal transport options taken forward to the appraisal stage. The options were appraised qualitatively in terms of their performance against the STAG and the TPOs. This resulted in some options being rejected so that only options worthy of further detailed consideration were taken forward to the Detailed Options Appraisal Stage.

1.2.3 The analysis and findings of the Initial Appraisal: Case for Change and Preliminary Options Appraisal are presented in the respective reports and not repeated in this report. **The reporting for the Levenmouth Sustainable Transport Study comprises the three reports together from the three consecutive stages of the study: Initial Appraisal: Case for Change Report; Preliminary Options Appraisal Report; and the Detailed Options Appraisal Report.**

1.3 Recommended Multi-Modal Transport Options for Detailed Appraisal

1.3.1 Several multi-modal options were considered at the Preliminary Options Appraisal stage and six options emerged to be taken forward for consideration at the Detailed Options Appraisal stage. The options are presented in Table 1 below.

1.3.2 **It should be noted that the STAG process does not prioritise between options and therefore no weighting or hierarchy is applied to any of the options listed below – the numbering system is used for presentation and reference purposes only.**

Table 1: Recommended Multi-Modal Transport Options for Detailed Appraisal

Option Ref.	Type	Title	Description
1	Accessibility	Enhanced local public transport services	Maintain existing bus services while improving local public transport facilities and information services
2	Accessibility	Improve local bus services	Improve local bus services connecting towns in the Levenmouth area to Leven
3	Accessibility	Improve bus-rail connections	Improve bus services to rail stations at Markinch, Kirkcaldy and Glenrothes
4	Accessibility	Improve regional bus services	Improve regional bus services linking Leven with Kirkcaldy, Glenrothes, Dunfermline, St Andrews, Dundee, Edinburgh and Glasgow
6	Public Transport and Freight	Re-open existing rail line to passengers and freight	Provision of a passenger only rail line, or a passenger and freight rail line, along the alignment of the existing, disused, rail line between Thornton North Junction and Leven
10	Active Travel	Active travel network	Provision of new and / or improved active travel routes linking the towns within Levenmouth, to key services and public transport interchanges, as well as to the East Neuk

1.4 The Structure of the Report

1.4.1 Following this introductory chapter, the remainder of this report is structured as follows:

- Chapter 2: describes the methodology that has been applied in carrying out the Detailed Options Appraisal.
- Chapter 3: details the total forecast demand for all public transport travel with each option in place, including details of demand abstraction from existing railway stations for the rail option variants.
- Chapter 4: contains the detailed appraisal of each option against the SMART (Specific, Measurable, Attainable, Relevant and Timed) Transport Planning Objectives.

- Chapter 5: contains the detailed appraisal of each option against the five STAG criteria, including Environment, Safety, Economy, Integration, and Accessibility & Social Inclusion.
- Chapter 6: contains a detailed analysis of the public sector cost of each option and the Transport Economic Efficiency (TEE) appraisal.
- Chapter 7: contains a detailed analysis of the risk and uncertainty associated with each option, including an implementability appraisal covering Feasibility, Affordability and Public Acceptability criteria.
- Chapter 8: provides a summary of the Detailed Options Appraisal findings.

2 Methodology

2.1 Scottish Transport Appraisal Guidance (STAG)

2.1.1 The **Detailed Options Appraisal** stage of the Levenmouth Sustainable Transport Study has been undertaken using STAG. The STAG process is split into four parts as shown in Figure 1 below: Initial Appraisal: Case for Change; Preliminary Options Appraisal; Detailed Options Appraisal; and Post Appraisal. The Detailed Options Appraisal forms the third part of the overall process.

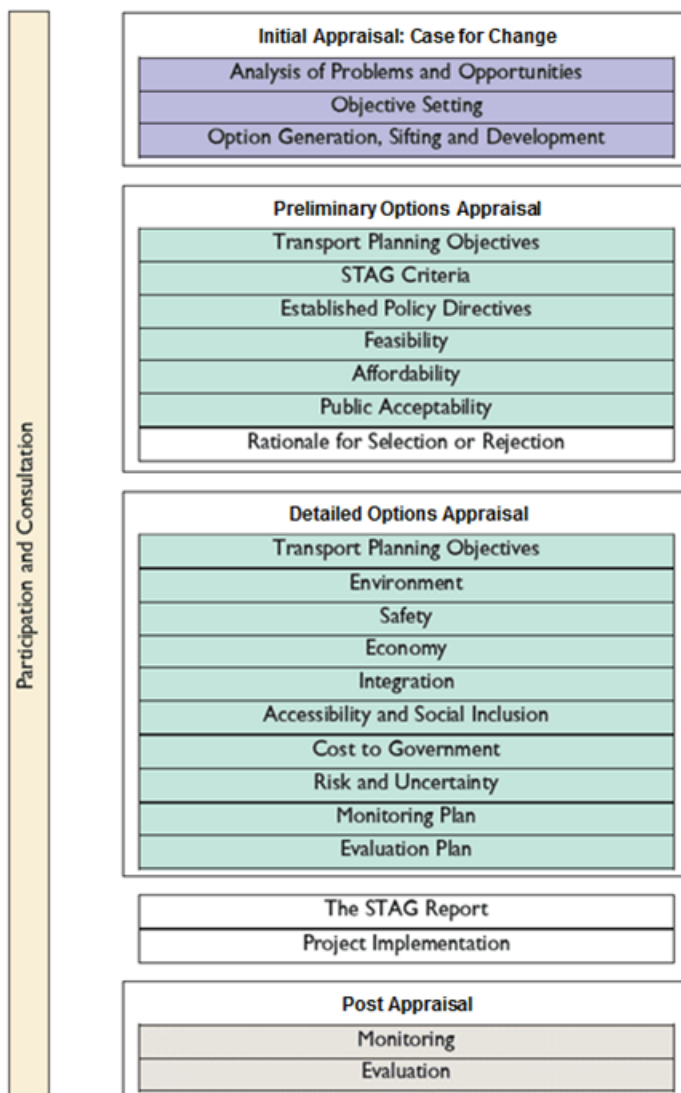


Figure 1: STAG Process

2.2 Approach to Detailed Options Appraisal

2.2.1 The Detailed Options Appraisal draws on both quantitative and qualitative information for the analysis to determine the nature and significance of impacts. It has been undertaken using the following approach:

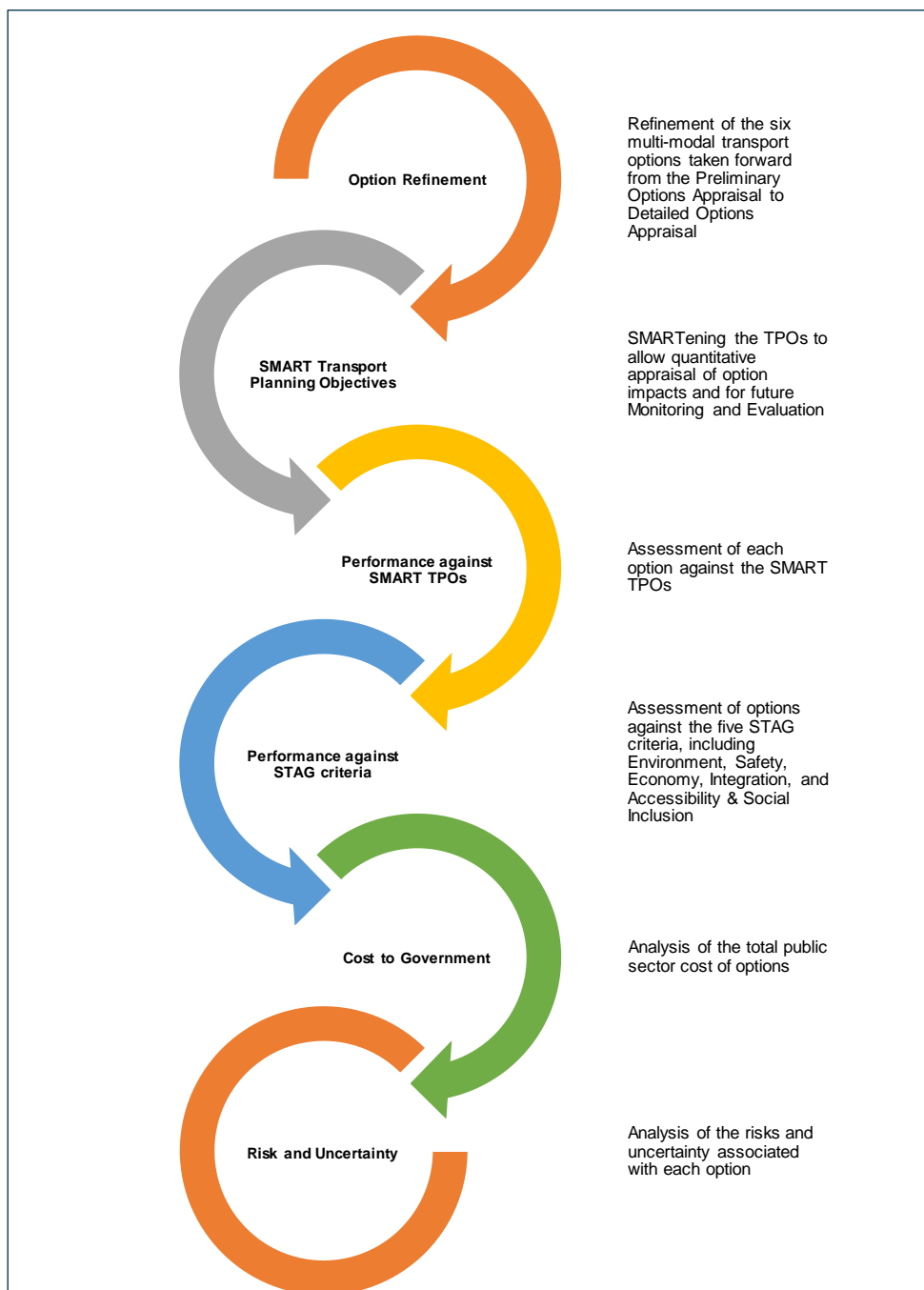


Figure 2: Detailed Options Appraisal Methodology

2.2.2 The Detailed Options Appraisal considers the performance of each option against the **SMART TPOs**; five **STAG Criteria**; **Cost to Government**; and **Risks and Uncertainty**, including the potential **Feasibility, Affordability and Public Acceptability** risks associated with delivery of each option. The options brought forward from the Preliminary Options Appraisal Stage were relatively high-level. Therefore, prior to undertaking the detailed appraisal the options were

refined, providing greater definition. Details of the approach to refine options and the options established for detailed appraisal are described below.

2.3 Options refined and established for Detailed Appraisal

- 2.3.1 Considering the findings from the Preliminary Options Appraisal, the options taken forward to detailed appraisal were refined, leading to a final list of options as described below.

Option 1: Maintain existing bus services while improving local public transport facilities and information services

- 2.3.2 Many elements included as part of Option 1 are currently being considered by Fife Council/operators or have already been introduced, particularly enhancements to information services for local bus services. It was therefore agreed with the Project Working Group that Option 1 would instead form part of the Do-Minimum scenario [i.e. the scenario which represents the existing road and public transport network infrastructure along with committed, future year transport improvement measures and land-use developments against which all options would be compared].

Option 2: Improve local bus services

- 2.3.3 This option would improve local bus services connecting residential settlements in the Levenmouth area to Leven, particularly services 9 and 9A between Methil and Lower Methil and Leven. Following a review of the existing timetable, the service frequency of both services was increased by adding one bus per hour to each service.

Option 3: Improve bus-rail connections

- 2.3.4 Option 3 includes improvements to bus service 44B, serving Markinch rail station and Glenrothes via Buckhaven. Bus service 44B hours of operation were extended to cover the morning time period [i.e. 7am to 10am], providing an overall increase in frequency during this time period. Introducing bus service 44B to cover the Inter-peak period [i.e. 10am to 4pm], or Glenrothes to Leven during the morning time period or Leven to Glenrothes during the evening period [i.e. 4pm to 7pm] would not be commercially viable. This is because the areas the bus currently serves are already covered by other services/routes and would therefore result in duplicating service 7A or service 44. The level of demand that would be unique to service 44B could be reasonably expected to be very low and the resources required to deliver these additional improvements would be costly with no likelihood of sufficient patronage being generated to offset the cost. For example, Methil / Buckhaven to Markinch and Glenrothes are about the only movements that could not be completed direct on an alternative service. Furthermore, changing existing bus service 44 operations during those other time periods would likely penalise existing users of the 44 service.

Option 4: Improve regional bus services

- 2.3.5 Option 4 includes improvements to regional bus services linking Leven with St Andrews and Dundee. Bus service 97 was combined with some of the bus service 99 departures [i.e. St Andrews to Dundee] to create a direct service between Leven and Dundee via St Andrews, with a journey time of under one hour. The frequency of this new service is the same as the existing service 97. The improvements would essentially include removing stops to speed up services and / or slight variations on some services on a route (perhaps alternate departures) to capture passengers from other areas rather than any new services. A review of existing bus timetables has shown that the current level of service is relatively good from Leven to Dunfermline, Kirkcaldy, Glenrothes, Glasgow and Edinburgh. It would be disproportionate to increase the frequencies and number of departures on both X58 and X60 services to Edinburgh. Similarly, it would be disproportionate to increase the frequency and number of departures on the X27 service to Glasgow. This is because the resources required to deliver these extra services would

be costly with no likelihood of sufficient patronage being generated to offset the cost. For example, the X58 / X60 currently operates every 60 minutes; to increase to every 30 minutes which would be the next logical step, would require an additional four buses at a total annual cost of approximately £600k. The X27 would require five extra buses, potentially costing £750k.

Option 6: Re-open existing rail line to passengers

2.3.6 Option 6 includes four variants as described below:

- **Option 6A:** One train per hour via Kirkcaldy, stopping at Leven.
- **Option 6B:** One train per hour via Kirkcaldy, stopping at Leven and Cameron Bridge.
- **Option 6C:** Two trains per hour (one train per hour via Kirkcaldy and one train per hour via Dunfermline), stopping at Leven.
- **Option 6D:** Two trains per hour (one train per hour via Kirkcaldy and one train per hour via Dunfermline), stopping at Leven and Cameron Bridge.

2.3.7 During the stakeholder engagement exercise the opportunity for freight services was positively received by some businesses across the Levenmouth area. However, no firm commitment was made in relation to the use of the rail line for carrying freight. The focus of the appraisal of a rail option has therefore been on passenger services.

2.3.8 For reporting purposes, where the impacts of each variant under Option 6 differ significantly [e.g. in the economic assessment] each variant is reported separately. Where the differences between the four variants are likely to be minor or difficult to distinguish [e.g. some elements of the environmental appraisal and the integration appraisal], the overarching Option 6 description has been used in the reporting [i.e. re-open existing rail line to passengers].

Option 10: Provision of new and / or improved active travel routes linking the towns within Levenmouth, to key services and public transport interchanges, as well as to the East Neuk

2.3.9 Option 10 has not been appraised as a standalone option as, on its own, it would not address the evidenced problems or meet the TPOs. Opportunities do exist to encourage walking and cycling locally. Option 10 would best be considered as a supplementary option to complement the other public transport options rather than an option in its own right.

2.3.10 Assumptions on the elements forming each option for the purposes of the transport appraisal, including service patterns, frequencies and fares, are provided in Appendix A to this report.

2.4 SMART Transport Planning Objectives

2.4.1 A set of Transport Planning Objectives (TPOs) were developed during the Initial Appraisal: Case for Change stage of the study to reflect the changes required in the study area to address the evidenced problems and realise the opportunities. **It should be noted that there is no weighting or hierarchy applied to any of the TPOs. The numbering system is used for presentation and reference purposes only:**

- **TPO 1:** Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area.
- **TPO 2:** Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population.

- **TPO 3:** Increase the sustainable mode share for the residents and workforce in the Levenmouth area.

2.4.2 These TPOs play a pivotal role in the appraisal process and provide a means to assess the performance of the options in terms of addressing the evidenced problems across the Levenmouth area transport network.

2.5 STAG Criteria

2.5.1 The likely impacts of the multi-modal options have also been appraised against the five STAG criteria [i.e. Environment, Safety, Economy, Integration and Accessibility & Social Inclusion) and sub-criteria as shown below:

Environment

- Noise and Vibration
- Global Air Quality (CO₂)
- Local Air Quality particulates (PM₁₀) and nitrogen dioxide (NO₂)
- Water Quality, Drainage and Flood Defence
- Geology
- Biodiversity and Habitats
- Landscape
- Visual Amenity
- Agriculture and Soils
- Cultural Heritage

Safety

- Accidents
- Security

Economy

- Transport Economic Efficiency

Integration

- Transport Integration
- Transport and Land Use Integration
- Policy Integration

Accessibility and Social Inclusion

- Community Accessibility
- Comparative Accessibility

2.5.2 As set out in STAG, for the appraisal findings which are qualitative/quantitative and are not monetised, a seven-point scale assessment was undertaken for each option against the TPOs and STAG criteria. The seven-point scale is set out below and considers the relative size and scale of the likely impacts, in qualitative terms.

- **Major benefit (+3):** these are benefits or positive impacts which, depending on the scale of benefit or severity of impact, the practitioner feels should be a principal consideration when assessing an option's eligibility for funding.
- **Moderate benefit (+2):** the option is anticipated to have only a moderate benefit or positive impact. Moderate benefits and impacts are those which taken in isolation may not determine an option's eligibility for funding but taken together do so.
- **Minor benefit (+1):** the option is anticipated to have only a small benefit or positive impact. Small benefits or impacts are those which are worth noting, but the practitioner believes are not likely to contribute materially to determining whether an option is funded or otherwise.
- **Neutral (0):** the option is anticipated to have no or negligible benefit or negative impact.
- **Small minor cost or negative impact (-1):** the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding but taken together could do so.
- **Moderate cost or negative impact (-2):** the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding but taken together could do so.
- **Major cost or negative impact (-3):** these are costs or negative impacts which, depending on the scale of cost or severity of impact, the practitioner should take into consideration when assessing an option's eligibility for funding.

2.6 Cost to Government

2.6.1 STAG requires that the net cost of an option is assessed from a public spending perspective; this is then compared with the total monetised benefits as part of the TEE assessment which considers economic performance of an option. Cost to Government refers to all costs incurred by the public sector, net of any revenues. The total net cost comprises:

- Investment costs;
- Operating and maintenance costs;
- Grant / subsidy payments
- Revenues; and
- Taxation.

2.7 Risk and Uncertainty

2.7.1 There may be uncertainty around some of the assumptions made in any transport appraisal and this carries risk in the appraisal findings which will determine overall value for money of each option in terms of economic, social and environmental benefits. Risk and uncertainty are therefore a routine consideration as part of any appraisal, helping to establish the most appropriate approach to the appraisal of options (and the associated risks and uncertainties of the approach) including, but not limited to, the most appropriate approach to estimating the costs and monetised benefits of each option as part of the TEE assessment.

2.8 SEStran Regional Model (SRM12)

2.8.1 The SRM12 model was the principal quantitative tool used to assess the impacts of each option.

2.8.2 The SRM12 model is a strategic multi-modal transport model representing the principal road network, bus services and all rail services across South East Scotland. The model has been calibrated and validated to represent 2012 travel conditions. The model forecasts assume that only those road and public transport interventions that are currently committed are delivered and therefore coded into the model. The modelled road (blue links) and rail network (black links) coverage in the Levenmouth area and beyond is shown in Figure 3 below.

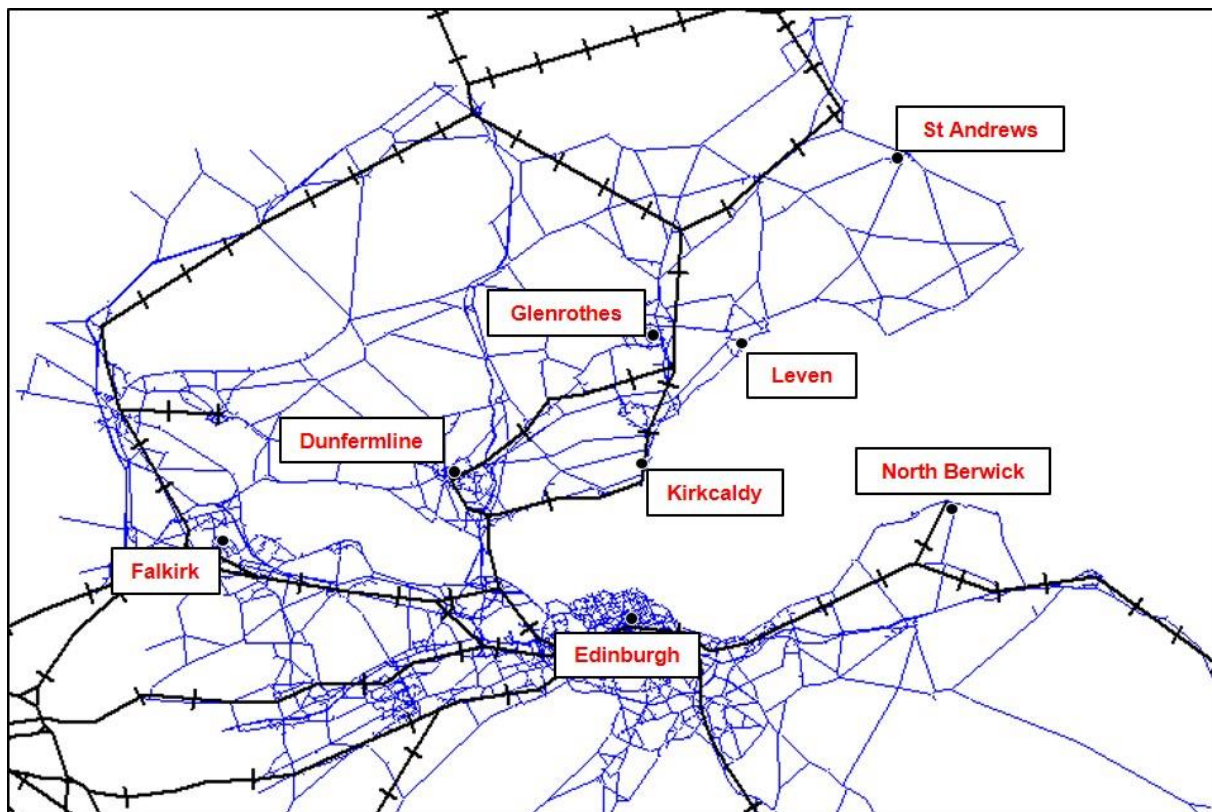


Figure 3: SRM12 Road and Rail Network, Levenmouth Area and Beyond

Land Use

2.8.3 The land-use projections inherent in the forecasts years have made use of the Assembly of Planning Policy Inputs 2014 (APPI2014) data collected by Transport Scotland from all local authority planning departments and data used for the SESplan Strategic Development Plan (SDP) Cross Boundary Study (CBS). This information has fed into the Transport and Economic Land Use Model of Scotland 2014 (TELMoS14), providing forecast household, population, employment and transport demand data to SRM12.

2.8.4 The standard forecast scenario contains predicted travel demand associated with the delivery of a proportion of the local development plan (committed and non-committed sites) within each forecast year. It can be considered as a “high growth” land use scenario and represents a worst-case scenario in terms of operational performance and potential environmental impacts of the proposed options. This forecast land-use scenario has formed the “core” transport modelling scenario for the assessment of the options. The land use is identical between the Do-Minimum and Option scenarios.

Induced Travel Demand

- 2.8.5 When a new transport intervention is introduced to the transport system, travellers may alter their travel behaviour in several ways. This may include changing their mode of transport, frequency of travel, choice of route, time of travel and even their origin [e.g. where they stay] or destination [e.g. where they work]. In order to evaluate possible induced travel demand effects, variable trip matrix techniques are adopted. The principle behind the variable trip matrix technique is that the Do-Minimum scenario and Option travel demand matrices vary as a result of changes in the supply networks and associated changes in travel costs.
- 2.8.6 The SRM12 model does not generate purely 'new' trips; trips come from the redistribution of existing trips, modal-shift and from time shifting. SRM12 retains the total number of person trips when the different options are tested, but the amount and share of car and public transport trips changes. Any additional public transport trips are not 'new' trips, they are existing person trips changing their origin / destination, time of travel or mode of travel.
- 2.8.7 It is also possible to undertake a 'fixed travel demand' approach where no changes are made to travel demand between the Do-Minimum scenario and the Option being tested. This approach would be undertaken if the option being tested did not generate a significant level of induced trips [e.g. there would be no real material change in mode of travel or time of travel between the Do-Minimum scenario and Option].
- 2.8.8 A 'fixed travel demand' approach using the Do-Minimum scenario demands has been adopted for testing Bus Options 2, 3 and 4 because these options have not generated a significant level of induced trips. The key reason for this is that the bus options have not significantly increased road capacity or public transport services and therefore significant changes in traffic and travel patterns are not evident in SRM12. It is important to emphasise that the bus options still have an effect in the model insofar as these options are attractive for people without access to a car. Rail Option 6 has generated some induced travel demand and therefore a 'variable travel demand' approach has been adopted. More details on the approach to transport modelling is provided in Appendix B to this report.

2.9 Quantitative Appraisal Tools

- 2.9.1 Appendix C provides details of other quantitative appraisal tools, in addition to SRM12 described above, used to assess the performance of each option against the Transport Planning Objectives (TPOs) and STAG criteria. This includes:

- **Transport Users Benefit Appraisal (TUBA)** – for the economic assessment.
- **Costs and Benefits to Accidents Light Touch (COBALT)** – for the safety assessment.
- **Carbon Tool for Local Authorities** – for the environment assessment.
- **TRACC** – for the assessment against the TPOs.

3 Public Transport Travel Demand Forecasts

3.1 Introduction

3.1.1 This chapter provides details of the public transport travel demand forecasts, including forecast bus and rail passengers and demand abstraction from existing railway stations. It is based on comparisons between the forecast year Do-Minimum scenario and each Option as described in Chapter 2.

3.2 Do-Minimum Forecasts

3.2.1 The forecast year Do-Minimum public transport travel demand matrices were obtained from the SRM12 model. SRM12 uses planning data and the anticipated changes in population, household and employment levels to forecast the level and distribution of road and public transport trip making over time. **The public transport travel demand matrices are composite travel demand matrices meaning that the demand for public transport presented in this sub-section is the total demand for all public transport travel modes combined [i.e. bus and rail].**

3.2.2 Table 2 below shows the change in the total demand for all public transport travel modes over time across the Levenmouth area in the Do-Minimum scenario.

Table 2: Total Demand for All Public Transport Travel Modes, Do-Minimum Scenario, Levenmouth Area, in person trips

Year	AM Peak Hour (8am – 9am)	Inter-Peak Hour (10am – 4pm)	PM Peak Hour (5pm – 6pm)	Weekday 12-hour (7am-7-pm)	Annual Total (in millions)
2022 Do-Minimum	1,000	760	800	8,740	3.7
2027 Do-Minimum	940	710	750	8,180	3.4
2037 Do-Minimum	880	640	690	7,480	3.1
% change (2022 to 2027)	-6%	-7%	-6%	-6%	-6%
% change (2022 to 2037)	-12%	-16%	-14%	-14%	-15%
Values rounded to nearest ten					

3.2.3 The following key points can be determined from Table 2:

- The total demand for all public transport travel modes in the Do-Minimum scenario is highest in the AM Peak hour in each forecast year across the Levenmouth area.
- Approximately 3.7 million public transport trips are forecast in 2022 compared to 3.1 million by 2037. This equates to a 15% decrease over time across the Levenmouth area.
- The decrease in the total demand for public transport over time across the Levenmouth area in the Do-Minimum scenario reflects recent national trends (decreasing) for passenger journeys made by bus and / or coach¹.

¹ <https://www.transport.gov.scot/publication/scottish-transport-statistics-no-37-2018-edition/sct01193326941-05/>

3.3 Total Demand for Public Transport with Bus Options

- 3.3.1 As discussed in Chapter 2, a ‘fixed travel demand’ approach using the Do-Minimum scenario travel demands was adopted for testing Bus Options 2, 3 and 4. This means that the Do-Minimum level of total public transport travel demand was used in the assessment of each bus option. This also means that the change in the total demand for all public transport travel modes over time across the Levenmouth area with the bus options in place is the same as the Do-Minimum scenario shown in Table 2 above and therefore is not repeated here.
- 3.3.2 The ‘fixed travel demand’ approach allows for modal shift within the SRM12 PT assignment [i.e. between walking, bus and rail]. Therefore, despite a decrease in the total demand for all public transport travel modes over time, it does not necessarily mean that the forecast demand in each bus option also decreases. In fact, as described in Section 3.5 below, Bus Options 2, 3 and 4 show an increase in bus passenger numbers over time across the Levenmouth area when compared to the Do-Minimum scenario.
- 3.3.3 It should be noted that the future year Do-Minimum models contain the same bus services as the base year, and therefore they will not necessarily provide an alternative option for trips to and from areas of new development. In effect, the bus network is constrained to 2012 levels of service and routing, meaning modelled service patterns are not responsive to any changes on the road network, such as route changes to avoid heavily congested areas or better serve new developments.

3.4 Total Demand for Public Transport with Rail Options

- 3.4.1 A ‘variable travel demand’ approach has been adopted for testing Rail Options 6A, 6B, 6C and 6D. Table 3 below shows the total demand for all public transport travel modes with the rail options in place, with percentage change compared to the Do-Minimum scenario in brackets.

Table 3: Total Demand for All Public Transport Travel Modes with Rail Options in place, Levenmouth Area, in person trips

Year	AM Peak Hour (8am – 9am)	Inter-Peak Hour (10am – 4pm)	PM Peak Hour (5pm – 6pm)	Weekday 12-hour (7am-7-pm)	Annual Total (millions)
2027 Do-Minimum	940	710	750	8,180	3.42
Option 6A	980 (+4%)	720 (+1%)	780 (+4%)	8,160 (0%)	3.50 (+2%)
Option 6B	1,000 (+6%)	730 (+3%)	800 (+7%)	8,300 (+1%)	3.56 (+4%)
Option 6C	990 (+5%)	740 (+4%)	800 (+7%)	8,340 (+2%)	3.58 (+5%)
Option 6D	1,010 (+7%)	750 (+6%)	820 (+9%)	8,490 (+4%)	3.64 (+6%)
2037 Do-Minimum	880	640	690	7,480	3.11
Option 6A	920 (+5%)	650 (+2%)	730 (+6%)	7,500 (0%)	3.19 (+3%)
Option 6B	950 (+8%)	650 (+2%)	750 (+9%)	7,610 (+2%)	3.22 (+4%)
Option 6C	930 (+6%)	660 (+3%)	750 (+9%)	7,620 (+2%)	3.25 (+4%)
Option 6D	960 (+9%)	670 (+5%)	770 (+12%)	7,790 (+4%)	3.31 (+6%)
Values rounded to nearest ten					

3.4.2 The following key points can be determined from Table 3:

- The total demand for all public transport travel modes with the rail options in place increases in all time periods.
- Higher increases generally occur in the peak periods when compared to the inter-peak.
- The total demand for all public transport travel modes with Rail Option 6D in place is consistently higher when compared to the other rail option variants.
- Approximately 3.64 million public transport trips are forecast in Rail Option 6D by 2027 and 3.31 million by 2037, an increase of 6% when compared to the Do-Minimum scenario.

3.5 Forecast Bus Passengers

3.5.1 The sub-section presents forecast bus passenger combined boardings and alightings across the Levenmouth area for the Do-Minimum scenario and Bus Options 2, 3 and 4. These are shown in Table 4 below and are bus mode-specific.

Table 4: Bus Passenger Combined Boardings & Alightings, Levenmouth Area, in persons

	Do-Minimum	Bus Options		
		Option 2	Option 3	Option 4
Year 2027				
Weekday 12-hour (7am-7pm)	6,200	32,500	8,200	11,400
2027 Total (in millions)	2.3	14.2	2.5	4.8
Year 2037				
Weekday 12-hour (7am-7pm)	5,700	26,700	7,600	11,100
2037 Total (in millions)	2.1	11.6	2.3	4.7
Weekday 12-hour values rounded to nearest hundred				

3.5.2 The following key points can be determined from Table 4:

- Under all bus options, passenger numbers increase compared to the Do-Minimum scenario.
- The largest increase in bus passengers occurs under Option 2, with enhancements to local services.
- Under all bus options, passenger numbers are lower in 2037 compared to 2027 across the Levenmouth area and this reflects recent national trends (decreasing) for passenger journeys made by bus and / or coach.

3.6 Forecast Rail Passengers

3.6.1 Forecast rail passenger combined boardings and alightings for each of the four variants under Option 6 are shown in Table 5 below. These are rail-mode specific.

Table 5: Rail Passenger Combined Boardings & Alightings, Cameron Bridge and Leven, in persons²

	Rail Options					
	Option 6A	Option 6B		Option 6C	Option 6D	
	Leven	Leven	Cameron Bridge	Leven	Leven	Cameron Bridge
Year 2027						
Weekday 12-hour (7am-7pm)	700	500	400	1,500	1,100	600
Annual Total	282,000	217,000	159,000	603,000	452,000	256,000
Year 2037						
Weekday 12-hour (7am-7pm)	700	600	500	1,600	1,200	700
Annual Total	293,000	229,000	168,000	641,000	490,000	260,000
Weekday 12-hour values rounded to nearest hundred						

3.6.2 The following key points can be determined from Table 5:

- Option 6D has the greatest number of combined boardings and alightings (Leven and Cameron Bridge stations combined) in 2027 and 2037.
- Option 6C, with Leven station only, is the second highest.
- The least forecast number of passengers occurs in Option 6A, approximately one third of the total number forecast under Option 6D.
- Under all rail option variants forecast passenger boardings and alightings numbers are higher in 2037 compared to 2027 and this reflects recent national trends (increasing) for passenger journeys made by rail³.

3.7 Rail Station Forecast Demand

3.7.1 Demand for new stations typically comes from three sources: generated demand [i.e. the trip would not have been made previously]; mode switching [i.e. the trip would have been previously made by another mode such as car or bus]; and abstraction of demand from existing stations

² Figures are boardings and alightings at the stations and not passenger demand from the stations.

³ <https://www.transport.gov.scot/publication/scottish-transport-statistics-no-37-2018-edition/sct01193326941-10/>

[i.e. the trip would have been previously made from an existing station]. This sub-section focusses on the latter, abstraction of demand from existing rail stations.

3.7.2 The existing stations where rail demand is expected to be abstracted from to the proposed new stations at Leven and Cameron Bridge in 2037 are shown in Table 6 below. The total abstraction demand as a percentage of the total combined boardings and alightings at Leven and Cameron Bridge in 2037 is also shown in brackets. Markinch, Glenrothes-with-Thornton and Kirkcaldy stations have been selected since it is these three stations that connect Levenmouth residents to other areas of Fife and beyond.

Table 6: Rail Demand Abstraction from existing Rail Stations in 2037

Station	Rail Options			
	Option 6A	Option 6B	Option 6C	Option 6D
Markinch	55,000	79,000	73,000	93,000
Glenrothes-with-Thornton	0	0	0	0
Kirkcaldy	15,000	28,000	62,000	53,000
Total	70,000 (24%)	107,000 (27%)	135,000 (21%)	146,000 (19%)
Values rounded to nearest thousand				

3.7.3 From Table 6, the following can be determined:

- Option 6D attracts the greatest number of existing rail users, in absolute terms, from both Markinch and Kirkcaldy stations to the proposed new stations at Leven and Cameron Bridge.
- There is no rail demand abstracted from Glenrothes-with-Thornton station. This is unsurprising given that there is little, if any, forecast demand to and from the Levenmouth area and East Neuk that uses this station.
- Across all rail option variants, the level of demand abstracted from existing rail stations at Markinch and Kirkcaldy ranges from 19% in Option 6D to 27% in Option 6B.

3.7.4 Excluding abstraction, the majority of demand for the proposed new stations at Leven and Cameron Bridge will come from mode switching [i.e. the trip would have been previously made by another mode such as car or bus].

3.8 Comparator Rail Stations

3.8.1 It is useful to consider how the forecast boardings and alightings in 2037 at the proposed Leven and Cameron Bridge stations compare against selected stations in Scotland using Office of Rail and Road (ORR) station usage data⁴.

3.8.2 In 2017-18 there were just over 1.1 million entries and exits at Kirkcaldy station, with Kirkcaldy having a population of just over 50,000 in 2016. There were just under 950,000 combined entries and exits at the two stations in Dunfermline, which had a population of 53,000 in 2016. In 2017-18 Leuchars had 613,000 entries and exits with a population of just under 17,600 in

⁴ Office for Rail and Road, Station Usage Data 2017-18, <https://dataportal.orr.gov.uk/statistics/usage/estimates-of-station-usage/>

2016. Comparing against selected stations on the Borders Railway, Tweedbank and Galashiels saw entries and exits of 437,000 and 356,000 in 2017-18 respectively, with both towns having smaller populations than Levenmouth.

- 3.8.3 Therefore, a combined total of 750,000 boardings and alightings forecast at Leven (490,000) and Cameron Bridge (260,000) and for a population size of 43,000 by 2037 compares favourably with other rail stations in towns with similar populations.

4 Option Performance against SMART Transport Planning Objectives

4.1 Introduction

4.1.1 The TPOs set out below were developed during the Initial Appraisal: Case for Change stage of the study to reflect the changes sought in the study area to address the evidenced problems. **It should be noted that there is no weighting or hierarchy applied to any of the Transport Planning Objectives. The numbering system is used for presentation and reference purposes only.**

- **TPO 1:** Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area.
- **TPO 2:** Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population.
- **TPO 3:** Increase the sustainable mode share for the residents and workforce in the Levenmouth area.

4.1.2 In accordance with STAG, TPOs should be developed with SMART principles in mind, that is the objectives should be:

- Specific: stating in precise terms what is sought;
- Measurable: it will be possible to measure whether the objective has been achieved;
- Attainable: there is general agreement that the objective can be achieved;
- Relevant: it is a sensible indicator or proxy for the change which is sought; and
- Timed: it will be associated with an agreed future point by which it will have been met.

4.1.3 It is acknowledged that TPOs may not be fully SMART at the earlier stages of the appraisal process; however, they should be subject to review and refinement as the process develops and more detail comes forward. This is important to establish study objectives that provide a framework against which performance can be assessed as part of Monitoring and Evaluation activities following the implementation of measures.

4.1.4 The SMARTening of the TPOs as part of the Detailed Appraisal is shown in Table 7 below.

4.1.5 For any option(s) progressed it will be important to: keep the indicators for the TPOs under review; set up and maintain a clear project evaluation plan; and see that the necessary data and information is collected both before and after project implementation to facilitate the evaluation.

Table 7: SMART Transport Planning Objectives

TPO	Specific	Measurable	Attainable	Relevant	Timed
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area.	This objective relates to improving public transport connectivity and accessibility within the Levenmouth area.	<ul style="list-style-type: none"> ▪ Scottish Index of Multiple Deprivation. ▪ Journey times to key destinations measured using TRACC accessibility software. ▪ 2021 Census. 	Collaborative working required between local authority, operators and other public transport stakeholders.	<ul style="list-style-type: none"> ▪ Supportive of improved access to employment, education opportunities and social and economic well-being. ▪ Higher than average levels of unemployment. ▪ Lower levels of participation compared to the Scottish average. 	<ul style="list-style-type: none"> ▪ Baseline established prior to scheme opening. ▪ Timeframe linked to 10-year period from year of opening with interim monitoring in line with finalised Monitoring and Evaluation Framework.
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population.	This objective relates to improving public transport connectivity and accessibility to and from the Levenmouth area.	<ul style="list-style-type: none"> ▪ Scottish Index of Multiple Deprivation. ▪ Journey times to key destinations measured using TRACC accessibility software. ▪ 2021 Census. 	Collaborative working required between local authority, Transport Scotland, operators and other public transport stakeholders.	<ul style="list-style-type: none"> ▪ Supportive of improved access to employment, education opportunities and social and economic well-being. ▪ Higher than average levels of unemployment. ▪ Lower levels of participation compared to the Scottish average ▪ Relatively high levels of multiple deprivation 	<ul style="list-style-type: none"> ▪ Baseline established prior to scheme opening. ▪ Timeframe linked to 10-year period from year of opening with interim monitoring in line with finalised Monitoring and Evaluation Framework.
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area.	This objective relates to increasing sustainable modal share and promotion of access by public transport to / from and within the Levenmouth area.	<ul style="list-style-type: none"> ▪ Travel-to-Work Data ▪ Scottish Household Survey Travel Diary ▪ 2021 census 	Collaborative working required between local authority, Transport Scotland, operators and other public transport stakeholders.	<ul style="list-style-type: none"> ▪ Supportive of national, regional and local policies to provide for and promote travel by mores sustainable modes (climate emergency.) ▪ Low levels of car ownership with higher dependence on public transport. 	<ul style="list-style-type: none"> ▪ Baseline established prior to scheme opening. ▪ Timeframe linked to 10-year period from year of opening with interim monitoring in line with finalised Monitoring and Evaluation Framework.

4.1.6 Several key performance indicators (KPIs) have been used to assess the performance of the options against the TPOs. These are shown in Table 8 below.

Table 8: Transport Planning Objectives and KPIs

TPO	KPIs
TPO1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	<ul style="list-style-type: none"> ▪ Average journey time improvements to local education facilities ▪ Average journey time to local health facilities ▪ Average journey time to local leisure facilities ▪ Average journey time to local retail facilities
TPO2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	<ul style="list-style-type: none"> ▪ Journey time improvements to Edinburgh by public transport ▪ Journey time improvements to Glasgow by public transport ▪ Journey time improvements to Dundee by public transport ▪ Journey time improvements to Dunfermline, Glenrothes and Kirkcaldy by public transport
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	<ul style="list-style-type: none"> ▪ Public transport mode share for trips made within and to and from Levenmouth.

4.2 Option Assessment against TPOs

4.2.1 For reporting purposes, where the impacts of the four rail option variants [i.e. Options 6A, 6B, 6C and 6D] against the TPOs are likely to be minor or difficult to distinguish, then only Option 6 has been used in the reporting, otherwise each option variant has been used.

TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area

4.2.2 Improving access to employment and other services such as education, healthcare and leisure facilities within the Levenmouth area, and particularly to the town of Leven itself where many of these services are located, would be facilitated most by Option 2 through enhancement to local bus services. This option would reduce journey times by bus as well as increasing frequency and extending the operating hours, thus offering a more attractive alternative to the private car and improve connectivity between settlements within the Levenmouth area. Extending the timetable hours would also increase the opportunities, services and locations that could be accessed earlier in the day or later in the evening.

4.2.3 Having explored various options, it was decided that the local option improvement would involve combining the frequency (buses per hour) of services 9 and 9A between Methil / Lower Methil and Leven. This would result in earlier and later running services as well as increased frequency. The services were increased by adding 1bph to each of them as set out in Table 9 below:

Table 9: Changes in Frequency for Services 9 / 9A

Time Period	Existing	Proposed
AM Peak	1	3
Inter Peak	2	4
PM Peak	1	3

4.2.4 Figure 4 below provides an illustrative example of the benefits to local residents from improvements in the 9 / 9A bus service and how it would reduce journey times for many residents wanting to access Leven between 8am and 9am. While the grey shaded area shows no reduction in journey times for some local areas, there would be a saving of 5 minutes on a 25-minute journey time or a 3-minute reduction on a 15-minute journey time for some. While some would not see a journey time saving on a particular service, the changes in local services would provide a doubling of service frequency and therefore give residents improved access and greater choice of services. Providing a journey time saving and improved frequency to services accessing Leven, Option 2 will generate a major benefit.

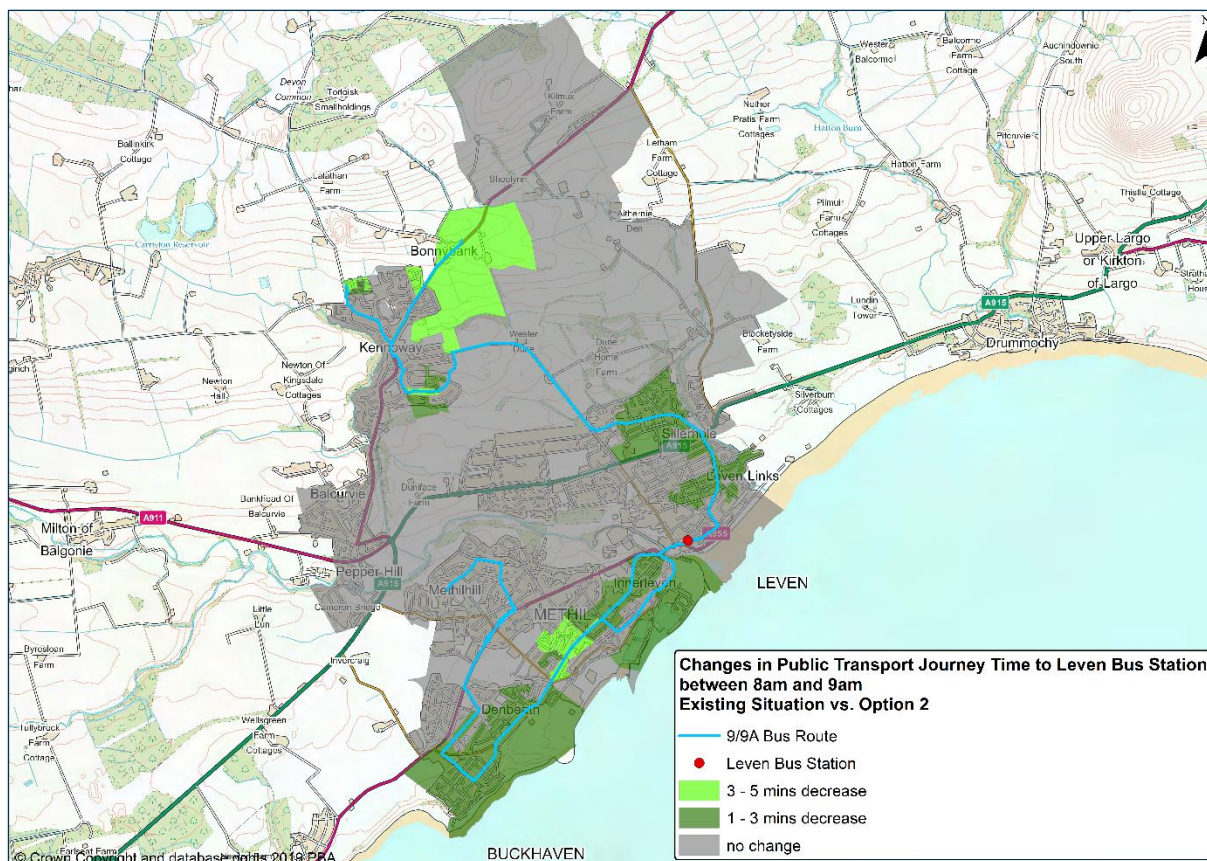


Figure 4: Changes in Public Transport Journey Times to Leven Bus Station

4.2.5 For Option 3, improved bus services to Markinch railway station would include additional local stops, therefore resulting in some, minor, benefits. This option would also provide journey time benefits for some areas along the route that currently experience relatively poor access to the bus network, but not to the extent to that offered by Option 2.

4.2.6 Option 4 would be focussed on improving linkages to areas beyond the Levenmouth area, and particularly to enhance accessibility and connectivity to key employment locations. Other than

to Leven itself, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area. The improvements to the services would positively impact on some local residents accessing Leven, however, and therefore have a minor benefit against TPO1.

- 4.2.7 Option 6 would provide journey time benefits for Levenmouth residents, resulting from improved access to settlements via the rail network. Other than accessing services in Leven itself for those travelling into the area, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area and would therefore have a minor benefit.

TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population

- 4.2.8 Option 2, through reduced journey times, improved frequency and earlier/later running services for many residents, would provide greater accessibility to Leven and, via connecting services, beyond by increasing local bus service frequencies at certain times of the day and introducing other services earlier and later in the day. This would improve access to services outside of the Levenmouth area and therefore offer a moderate benefit against TPO2.
- 4.2.9 Option 3 would provide improved access to and from the national rail network via Markinch and would also provide improved access to jobs and other facilities/services outside the Levenmouth area. It would equally support access to and from the Levenmouth area. Figure 5 below shows the reductions in journey times to Edinburgh (travelling between 08:30 and 11:30) from improving bus services between Leven and Markinch station. While the figure reveals the reduction in overall journey time to Edinburgh, the main element of the time saving is generated by the reduced journey time on the bus. Figure 5 shows that by extending the timetable / improving the frequency to cover early morning periods, the journey time to the station for some residents in Methilhill to Markinch could be reduced by 10 to 13 minutes (on a current journey of around 40 minutes) or by 1 to 10 minutes (on a journey time of 20 to 25 minutes) for those who live nearer the station. These impacts generate a moderate benefit to TPO2.

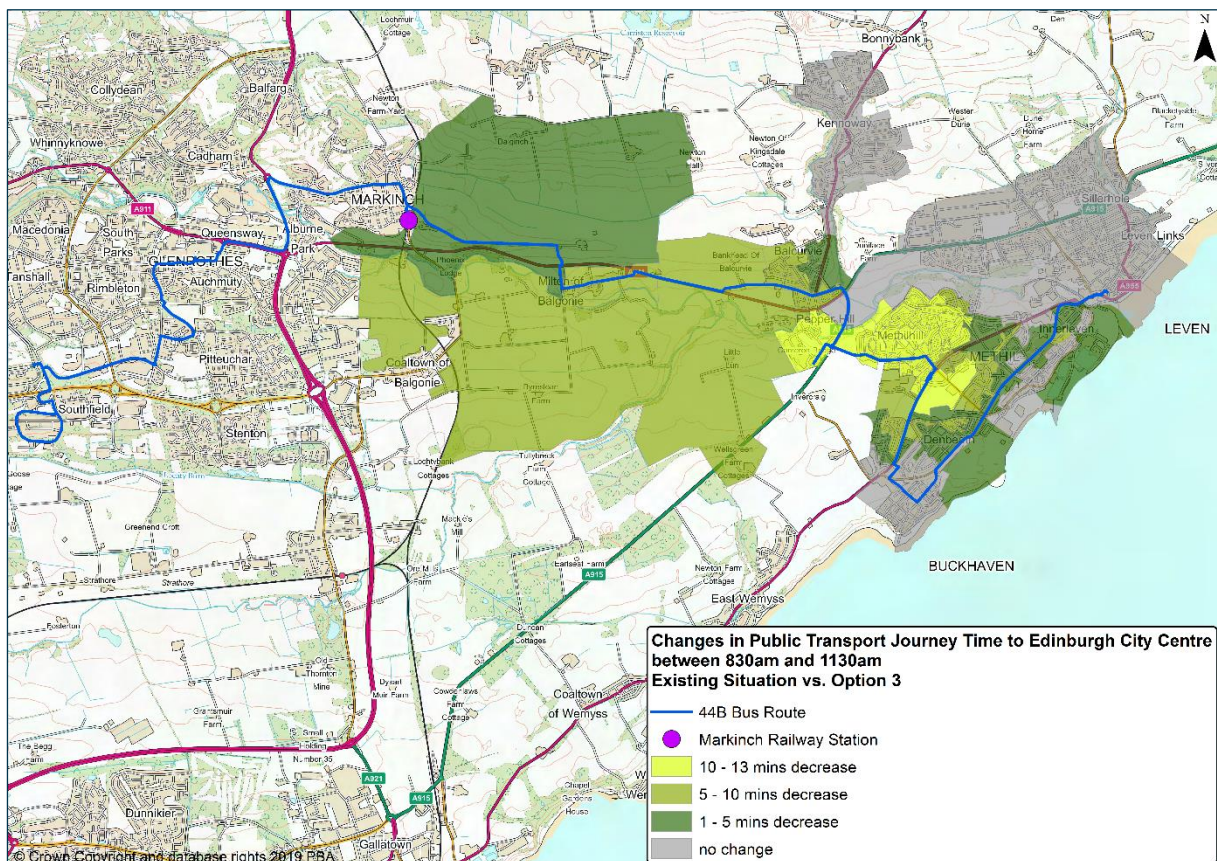


Figure 5: Changes in Public Transport Journey Time to Edinburgh City Centre from Improved Bus Services to Markinch

- 4.2.10 Option 4 would reduce journey times by bus by around 10 minutes for a 70-minute end-to-end service. It would also offer a more competitive alternative to the private car and enhance accessibility and connectivity with employment areas in St Andrews and Dundee. It would also improve access to important key public services such as health and education in St Andrews and Dundee, scoring a moderate benefit against TPO2.
- 4.2.11 Option 6 would perform best against TPO2. This option would improve access to the rail network for local residents and enhance business and tourist access to the area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. The Initial Appraisal revealed that residents of Levenmouth had access to up to 80,000 jobs within 60 minutes using public transport. This compares with a figure of up to 450,000 for residents of Kirkcaldy. Figure 6 below shows the change in employment opportunities generated by the re-introduction of the rail line (Option 6D). A Hansen Indicator is used to measure the impact on access to employment. The figure shows positive changes of between 5% and 10% for a number of areas in the Levenmouth area and north east of Levenmouth.

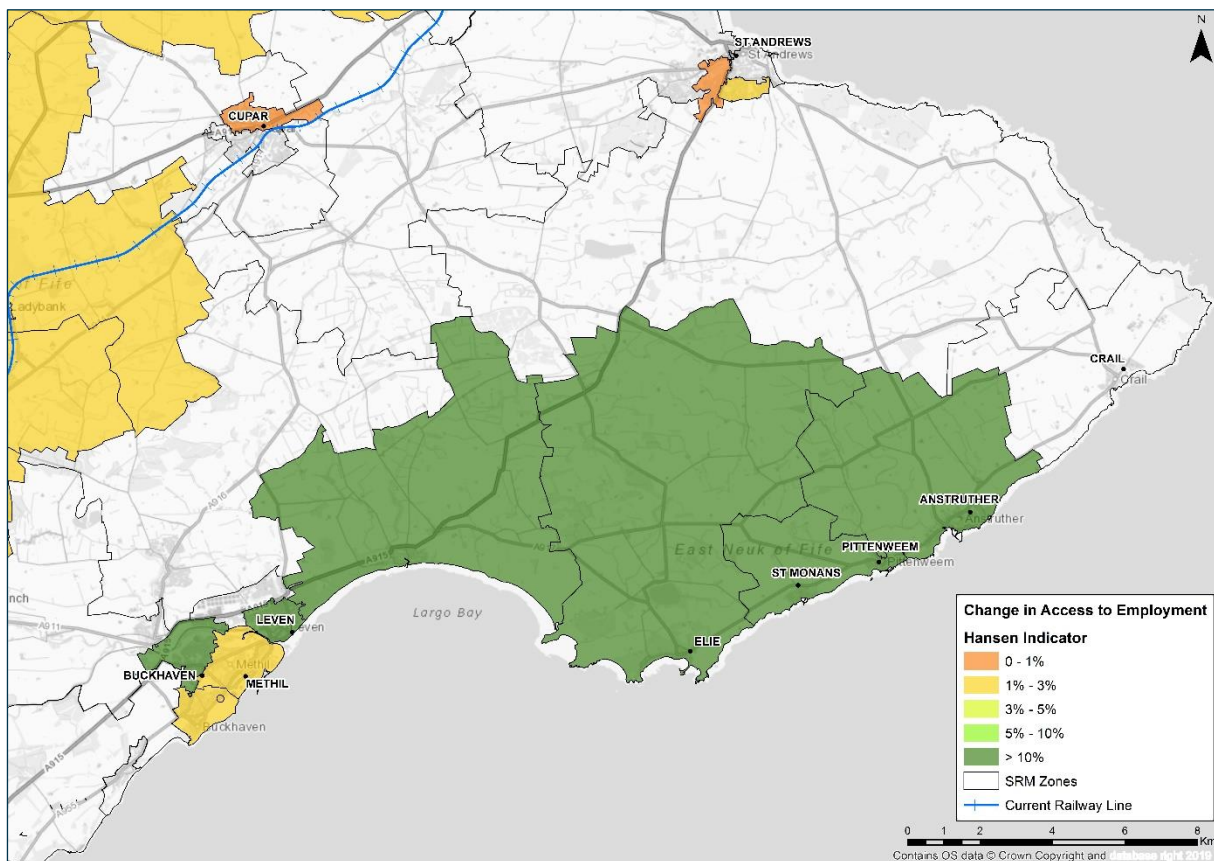


Figure 6: Changes in Access to Employment from Re-introduction of Rail Services

- 4.2.12 This option is also likely to have a positive impact on making the Levenmouth area a more attractive location for businesses to locate and for people to visit – access to the rail network and a suitably qualified labour force was seen as a key constraint for businesses investing/locating in the Levenmouth area.
- 4.2.13 Option 6, particularly, would provide improved access to Edinburgh, as well as to Kirkcaldy where a number of people visit or are employed. While the journey time saving will depend on where one starts the journey and the time of day they are travelling, many will see up to 50 minutes saving on a current return journey of three hours between Leven and Edinburgh city centre. This option scores a major benefit against TPO2.

TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area

- 4.2.14 The key indicator being used to measure the performance of the options against this third TPO is public transport mode share for trips within, and to and from Levenmouth.
- 4.2.15 Figure 7 below shows the 2037 AM Peak hour car mode share and public transport mode share of commuter trips from the Levenmouth area in the Do-Minimum scenario and with the rail options in place. The ‘fixed travel demand’ approach adopted for the testing of bus options 2, 3 and 4 does not provide quantitative results on the impact of bus options against TPO3.
- 4.2.16 It was highlighted in Chapter 3, that the model showed an increase in bus boardings and alightings across all bus options. This is an intuitive response from the model because the bus options have resulted in reductions in modelled travel costs due to the improved bus services which, in turn, encourages greater bus usage. However, the reductions in travel costs are not

significant enough to result in a shift in mode from car to bus, hence why we have used a 'fixed travel demand' approach. Therefore, the reason for the increase in bus boardings and alighting is as a result of travellers that would have otherwise walked to reach their destination in the Do-Minimum scenario now make use of the new services in the bus options.

- 4.2.17 It is, however, likely that the introduction of these bus options could induce a shift from car to bus for some local trips in and around the Levenmouth area and for some regional trips beyond. Therefore, the performance of each bus option against TPO3 is described in qualitative terms below.
- 4.2.18 Option 2 would encourage a shift from private car to public transport for some people making local trips. It would augment existing bus services and increase opportunity to travel by bus. It would provide opportunities for people to use public transport earlier in the day and later in the evening, as well as doubling frequency on some services throughout the day, when current services are limited. Option 2 performs best for trips within the Levenmouth area and scores a moderate benefit overall against TPO3.
- 4.2.19 Improved access to the rail network, under Option 3, would promote sustainable transport use, both in terms of people who would otherwise drive to Markinch rail station and those who would previously make the whole journey by car but now switch due to better integration between bus and train. However, the impacts are likely to be small given the number of people shifting mode, thus scoring a minor benefit.
- 4.2.20 Option 4 would augment existing bus services and increase opportunity to travel by bus beyond the Levenmouth area. It would encourage a shift from private car to public transport. However, again, the number of trips it would affect is likely to be relatively small, thus scoring a minor benefit.
- 4.2.21 All four rail option variants would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Figure 7 shows an increase in public transport mode share (+2%) and an equivalent decrease in car mode share for AM Peak hour commuter trips from Levenmouth in 2037. Option 6 would perform best for trips to and from the Levenmouth area and scores a moderate benefit against TPO3.

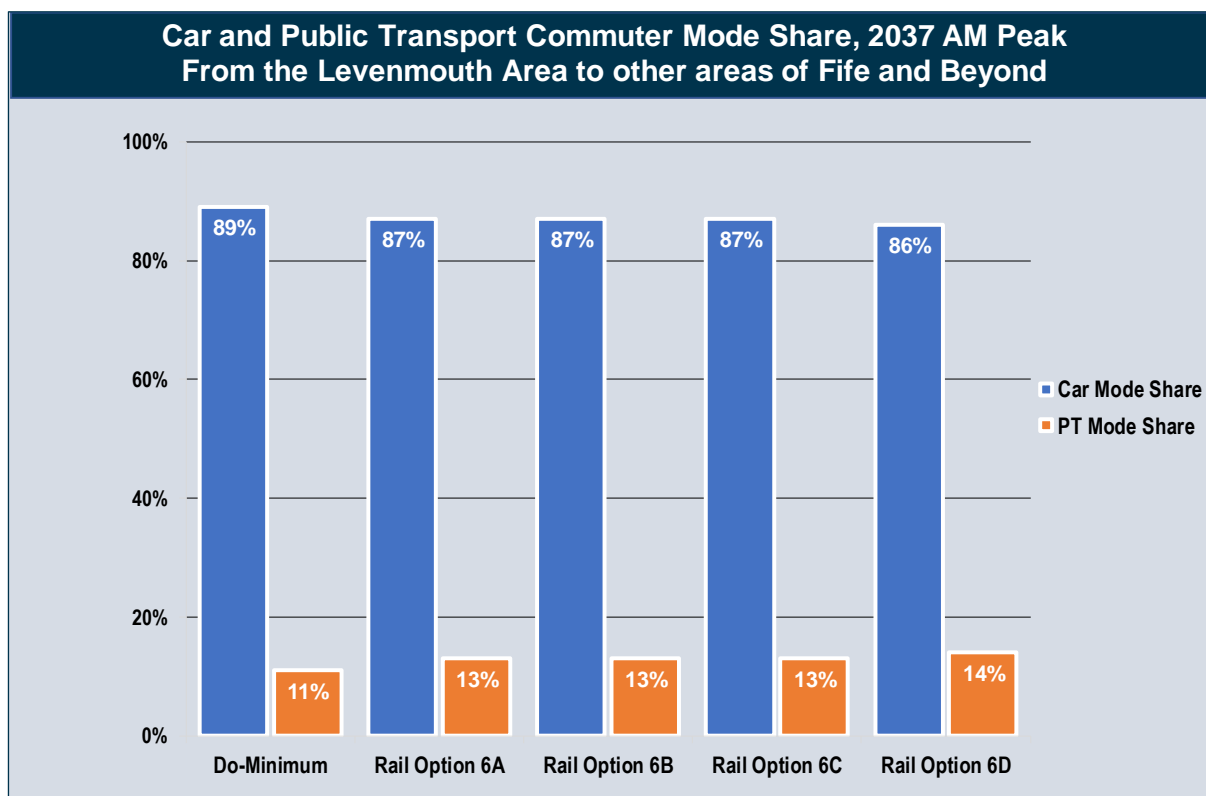


Figure 7: Car and PT Commuter Mode Share, AM Peak, from Levenmouth

Transport Planning Objectives Summary

- 4.2.22 A summary of the assessment against the transport planning objectives is shown in Table 10 below.
- 4.2.23 Option 2 performs well (major benefit) against TPO1 by improving local bus access to Leven where a number of facilities are located. The option performs better against TPO1 than all other options. This is not unexpected given the option is primarily focussed on generating improvements to local bus services and access to facilities within the Levenmouth area. Option 2 has a moderate benefit against TPO2, as it would provide greater access to Leven and, via connecting services, beyond by increasing local bus service frequencies at certain times of the day to connect with regional services. Option 2 scores a moderate benefit under TPO3 as it would encourage a shift from private car to bus for some people making local trips (NB as described above, a shift from car to bus with the bus options in place cannot be captured, and therefore quantified, in the modelling). Option 2 would also provide opportunities for people to use public transport earlier in the day and later in the evening when current services are limited. It would also increase frequency throughout the day.
- 4.2.24 Option 3 scores a minor benefit under TPO1 due to improvements to the bus service to Markinch including additional local stops. It generates a moderate benefit under TPO2 as it would provide improved access to jobs and other services outside of the Levenmouth area. For TPO3, Option 3 scores a minor benefit as it would, in reality, encourage people who would otherwise drive to Markinch train station to use the improved bus service as journey times to the station for many residents would decline.
- 4.2.25 Option 4 scores a minor benefit under TPO1 as it would not have a significant impact on local services, albeit the services would see some improvements in the local area before travelling onward outside of Levenmouth, thus positively impacting on some local residents. Option 4 scores a moderate benefit against TPO2 by improving journey times and access to services in St Andrews and Dundee. It scores a minor benefit against TPO3 as, in reality, it could encourage

modal shift from car to bus for those making journeys where public transport services beyond the Levenmouth area are improved.

- 4.2.26 Option 6 scores a minor benefit against TPO1. This is lower than Option 2 and the same as Options 3 and 4. While there would be benefits for those accessing local service, they are likely to be relatively small and be restricted to those arriving in Leven by rail to access local facilities.
- 4.2.27 Against TPO2, Option 6 performs the best of all options, with a major benefit. This option would improve access to the rail network for local residents and enhance business and tourist access to the Levenmouth area. This option would also provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents. It would also provide additional wider, indirect benefits and travel options for north east Fife communities.
- 4.2.28 The Option scored a moderate benefit against TPO3. This was equal to Option 2 and higher than options 3 and 4. Option 6, including its four variants, would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use.

Table 10: Summary of Option Assessment against TPOs

	TPO 1	TPO 2	TPO 3
Option Ref.	Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	Increase the sustainable mode share for the residents and workforce in the Levenmouth area
2	+3 (major benefit)	+2 (moderate benefit)	+2 (moderate benefit)
3	+1 (minor benefit)	+2 (moderate benefit)	+1 (minor benefit)
4	+1 (minor benefit)	+2 (moderate benefit)	+1 (minor benefit)
6	+1 (minor benefit)	+3 (major benefit)	+2 (moderate benefit)

5 Option Impacts against STAG Criteria

5.1 Introduction

- 5.1.1 This chapter describes the impact of the options against the five STAG criteria, consisting of Environment, Safety, Economy, Integration, and Accessibility & Social Inclusion. Full Appraisal Summary Tables (ASTs) are provided in Appendix F to this report.
- 5.1.2 Many of the appraisal findings from the previous study undertaken in 2016 continue to be relevant to this study; however, the findings are amended and further developed where necessary.
- 5.1.3 For ease of reference, the final list of multi-modal transport options for the detailed appraisal are presented again in Table 11 below.

Table 11: Final List of Multi-Modal Transport Options for Detailed Appraisal

Option Ref.	Type	Title	Description
2	Accessibility	Improve local bus services	Improve local bus services connecting towns in the Levenmouth area to Leven
3	Accessibility	Improve bus-rail connections	Improve bus services to Markinch rail station and Glenrothes
4	Accessibility	Improve regional bus services	Improve regional bus services linking Leven with St Andrews and Dundee
6	Public Transport	Re-open existing rail line to passengers	Provision of a passenger only rail line along the alignment of the existing, disused, rail line between Thornton North Junction and Leven

- 5.1.4 The STAG seven-point scale assessment is shown below and was undertaken for each option against the five STAG criteria. Where impacts cannot be monetised, the approach considers the relative size and scale of the likely impacts (benefits / negative) in qualitative terms:

+3	+2	+1	0	-1	-2	-3
Major benefit	Moderate benefit	Minor benefit	Neutral (no benefit or impact)	Small minor cost or negative impact	Moderate cost or negative impact	Major cost or negative impacts

5.2 Environment

5.2.1 STAG sets out several criteria that need to be considered as part of the environmental appraisal of the multi-modal transport options. These are:

- Noise and Vibration;
- Global Air Quality – Carbon Dioxide (CO₂);
- Local Air Quality – Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂);
- Water Quality, Drainage and Flood Defence;
- Geology;
- Biodiversity and Habitats;
- Landscape;
- Visual Amenity;
- Agriculture and Soils; and
- Cultural Heritage.

5.2.2 For the environmental appraisal of the options, in some cases a range of impacts have been predicted. This reflects potentially varying effects associated with different aspects of each option. For example, some options have the potential for minor beneficial impacts associated with the relief of traffic from modal shift due to new rail and / or bus options. The environmental impact of the implementation of some of those options may, however, also have the potential for negative impacts in other areas, particularly on the natural and cultural heritage. Impacts predicted to be moderate or greater are considered to be significant environmental effects.

Option 2: Improve Local Bus Services

Noise and Vibration

5.2.3 This option would result in modal shift from car to bus resulting in minor reductions in traffic flows and associated emissions on key roads within the Levenmouth area. No significant effects on transport noise or vibration are predicted.

5.2.4 Overall the option is anticipated to have a minor benefit (+1) on noise and vibration.

Global Air Quality – Carbon Dioxide (CO₂)

5.2.5 Minor reductions in traffic flows within the Levenmouth area are predicted from this option. However, additional bus services could outweigh any positive car impacts from modal shift. No significant effects on global (carbon) emissions are predicted.

5.2.6 Overall the option is anticipated to have a minor benefit (+1) or small negative impact (-1) on global air quality.

Local Air Quality – Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂)

- 5.2.7 Changes in routing of buses in the urban areas of Methil / Leven, will result in minor benefits and negative effects on air quality in the immediate vicinity of bus routes. However, the overall impacts will be small and no significant effects on local air pollutant emissions are predicted.
- 5.2.8 Overall the option is anticipated to have a minor benefit (+1) or small negative impact (-1) on local air quality.

Water Quality, Drainage and Flood Defence

- 5.2.9 No significant effects on water quality, drainage and flood defence are predicted from this option taking account of assumed design and mitigation.
- 5.2.10 Overall the option is anticipated to have no benefit or impact (O).

Geology

- 5.2.11 No significant effects on geology or geological/material resources are predicted for this option.
- 5.2.12 Overall the option is anticipated to have no benefit or impact (O).

Biodiversity and Habitats

- 5.2.13 No significant effects on biodiversity and habitats are predicted from this option.
- 5.2.14 Overall the option is anticipated to have no benefit or impact (O).

Landscape

- 5.2.15 No significant effects on landscape and townscape are predicted from this option.
- 5.2.16 Overall the option is anticipated to have no benefit or impact (O).

Visual Amenity

- 5.2.17 No significant effects on visual amenity are predicted from this option taking account of assumed design and mitigation.
- 5.2.18 Overall the option is anticipated to have no benefit or impact (O).

Agriculture and Soils

- 5.2.19 No significant effects on agriculture and soils are predicted for this option.

5.2.20 Overall the option is anticipated to have no benefit or impact (O).

Cultural Heritage

5.2.21 No significant effects on cultural heritage are predicted from this option.

5.2.22 Overall the option is anticipated to have no benefit or impact (O).

Option 3: Improve Bus-Rail Connections

5.2.23 From the constraints baseline analysis, key sensitivities and designations in the local area e.g. baseline sensitivities and designations include:

- A Candidate Noise Management Area (CNMA) in Glenrothes;
- proximity to the Firth of Forth Special Protection Area (SPA)/Ramsar site and Site of Special Scientific Interest (SSSI) which follows much of the Fife coast in the study area;
- Gardens and Designed Landscapes at Balbirnie (north east edge of Markinch), Leslie House (north west of Glenrothes city centre) and at Letham Glen in Leven; and
- Conservation Areas at Links Road (Leven), Markinch and Cadham village.

Noise and Vibration

5.2.24 Improved branding and timetabling may encourage increased use of bus and rail services with the potential for small changes in use of other modes [e.g. reduced use of private car on existing key roads between Levenmouth and Glenrothes with Thornton, Kirkcaldy and Markinch].

5.2.25 As the option does not involve any new physical works, no short-term noise effects associated with construction works are predicted.

5.2.26 Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport. No significant traffic noise or vibration effects are predicted from these changes.

5.2.27 No significant effects on transport noise or vibration for receptors adjacent to bus routes are predicted.

5.2.28 No significant effects on Candidate Noise Management Areas (CNMAs) in Kirkcaldy and Glenrothes are predicted.

5.2.29 Overall the option is anticipated to have a minor benefit (+1) on noise and vibration.

Global Air Quality – Carbon Dioxide (CO₂)

5.2.30 Improved branding and timetabling changes may encourage increased use of bus and rail services with the potential for small changes in use of other modes (e.g. reduced use of private car).

- 5.2.31 Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport which would contribute to modest reductions in global emissions.
- 5.2.32 No significant effects on global (carbon) emissions are predicted.
- 5.2.33 Overall the option is anticipated to have no impact or a minor benefit (+1) on global air quality.

Local Air Quality – Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂)

- 5.2.34 This option may encourage increased use of bus and rail services with the potential for small changes in use of other modes (e.g. reduced use of private car on existing key roads between Leven and Markinch).
- 5.2.35 Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport which would contribute to modest reductions in local air pollutant emissions.
- 5.2.36 If this option results in some changes in routing of buses in the urban areas of Buckhaven/Methil/Leven and Markinch there is potential for positive or negative effects on air quality in the immediate vicinity of these locations. However, no significant overall effects on local air pollutant emissions or ambient air quality concentrations in the vicinity of the affected roads are predicted.
- 5.2.37 Use of very low emissions bus vehicles on the amended routes offers the potential for minor beneficial effects on local air quality.
- 5.2.38 Overall the option is anticipated to have a minor benefit (+1) or small negative impact (-1) on local air quality.

Water Quality, Drainage and Flood Defence

- 5.2.39 Improved branding and timetabling changes may encourage increased use of bus services with potentially small changes in use of other modes (e.g. reduced use of private car) with the potential for very small impacts on run-off quality from existing roads and urban areas which are not predicted to be significant.
- 5.2.40 No significant effects on water quality, drainage and flood defence are predicted from this option.
- 5.2.41 The option is predicted to have no benefit or impact (O) on water quality, drainage and flood defence.

Geology

- 5.2.42 The proposals for improvements to bus services would not require new works affecting geological sites or resources.
- 5.2.43 No significant effects on geology or geological/material resources are predicted for this option.
- 5.2.44 Overall the option is anticipated to have no benefit or impact (O) on geology.

Biodiversity and Habitats

- 5.2.45 This option may encourage increased use of bus service with the potential for small changes in use of other modes (e.g. reduced use of private car).
- 5.2.46 Transport modelling indicates modest levels of modal shift and no significant impacts on habitat and species disturbance and wildlife collisions associated with road traffic in the study area are predicted.
- 5.2.47 No significant effects on biodiversity and habitats are predicted from this option.
- 5.2.48 Overall the option is anticipated to have no benefit or impact (O) on biodiversity and habitats.

Landscape

- 5.2.49 No new infrastructure is proposed for this option.
- 5.2.50 Overall no significant effects on landscape and townscape are predicted from this option.
- 5.2.51 Overall the option is anticipated to have no benefit or impact (O) on landscape.

Visual Amenity

- 5.2.52 Improved branding and timetabling changes may encourage increased use of bus service with the potential for small changes in use of other modes (e.g. reduced use of private car).
- 5.2.53 Transport modelling indicates that these changes would be small, and no significant visual impacts associated with reduced traffic on key routes between Levenmouth and Markinch are predicted.
- 5.2.54 Overall no significant effects on visual amenity are predicted from this option.
- 5.2.55 Overall the option is anticipated to have no benefit or impact (O) on visual amenity.

Agriculture and Soils

- 5.2.56 It is assumed that no new works would be undertaken and no new agricultural land take or other effects on farm units would be required for this option.
- 5.2.57 No significant effects on agriculture and soils are predicted for this option.
- 5.2.58 Overall the option is anticipated to have no benefit or impact (O) on agriculture and soils.

Cultural Heritage

- 5.2.59 Improved branding and timetabling changes may encourage increased use of bus service with the potential for small changes in use of other modes (e.g. reduced use of private car).

- 5.2.60 Traffic modelling indicates that these changes would be small and no significant effects on setting of cultural heritage features such as Balbirmie Garden and Designed Landscape and Conservation Areas in Links Road (Leven), Markinch and Cadham village associated with reduced traffic on key routes are predicted.
- 5.2.61 Overall no significant effects on cultural heritage are predicted from this option.
- 5.2.62 Overall the option is anticipated to have no benefit or impact (O) on cultural heritage receptors.

Option 4: Improve Regional Bus Services

Noise and Vibration

- 5.2.63 Potential for short term noise effects during construction of any new hubs would be temporary and not predicted to be significant.
- 5.2.64 Minor reductions in traffic flows on key roads in the study area and beyond are expected from this option.
- 5.2.65 No significant effects on transport noise or vibration for receptors adjacent to bus routes are predicted.
- 5.2.66 Overall the option is anticipated to have a minor benefit (+1) on noise and vibration.

Global Air Quality – Carbon Dioxide (CO₂)

- 5.2.67 Minor reductions in traffic flows and associated emissions on key roads in the study area and beyond are expected from this option.
- 5.2.68 No significant effects on global (carbon) emissions are predicted.
- 5.2.69 Overall the option is anticipated to have no impact or a minor benefit (+1) predicted for global air quality.

Local Air Quality – Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂)

- 5.2.70 If the option resulted in changes in routeing of buses in the urban areas of Buckhaven/Methil/Leven and destination, there is minor potential for positive or negative effects on air quality in the immediate vicinity of these locations.
- 5.2.71 No significant effects on local air pollutant emissions are predicted.
- 5.2.72 Overall the option is anticipated to have a minor benefit (+1) or small negative impact (-1) on local air quality.

Water Quality, Drainage and Flood Defence

- 5.2.73 No significant effects on water quality, drainage and flood defence are predicted from this option.
- 5.2.74 Overall the option is anticipated to have no benefit or impact (O).

Geology

- 5.2.75 No significant effects on geology or geological/material resources are predicted for this option.
- 5.2.76 Overall the option is anticipated to have no benefit or impact (O).

Biodiversity and Habitats

- 5.2.77 No significant effects on biodiversity and habitats are predicted from this option.
- 5.2.78 Overall the option is anticipated to have no benefit or impact (O).

Landscape

- 5.2.79 No significant effects on landscape and townscape are predicted from this option.
- 5.2.80 Overall the option is anticipated to have no benefit or impact (O).

Visual Amenity

- 5.2.81 No significant effects on visual amenity are predicted from this option.
- 5.2.82 Overall the option is anticipated to have no benefit or impact (O).

Agriculture and Soils

- 5.2.83 No significant effects on agriculture and soils are predicted for this option.
- 5.2.84 Overall the option is anticipated to have no benefit or impact (O).

Cultural Heritage

- 5.2.85 No significant effects on cultural heritage are predicted from this option.
- 5.2.86 Overall the option is anticipated to have no benefit or impact (O).

Option 6: Re-open Existing Rail Line to Passengers

- 5.2.87 This option would involve the provision of a passenger only rail line along the alignment of the existing, disused, rail line between Thornton North Junction and Leven.
- 5.2.88 Key baseline sensitivities and designations include:

- Rail-based Candidate Noise Management Areas (CNMAs) close to the railway route in Kirkcaldy;

- Sensitive receptors (residential properties) adjacent to the line of railway, particularly at the edge of Windygates and Leven;
- Railway line crossings of the River Ore and River Leven;
- Areas of railway land downstream of Cameron Bridge lie within the flood plain for the River Leven;
- Proximity to the Firth of Forth Special Protection Area (SPA) /Ramsar site and Site of Special Scientific Interest (SSSI) which follows much of the coast in the study corridor;
- The former railway passes through the southern part of the Kennoway - Windygates Wildlife Site at the eastern edge of Windygates;
- Areas of ancient woodland and native woodland are located adjacent to the route of the disused railway line;
- There is a Conservation Area at Links Road in Leven; and
- Cameron Bridge Distillery is a Listed Building (category B).

5.2.89 Key mitigation for this option would be expected to include:

- Good construction practices would be deployed and would help to mitigate some construction nuisance and impacts and help prevent pollution risks to nearby watercourses;
- Permanent railway drainage would deploy sustainable drainage techniques;
- Any excavated material would be reused for fill in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality;
- Construction works which could affect areas of potentially contaminated land associated with former industrial uses will require more detailed investigation, assessment and if appropriate remediation at later design stages;
- Areas such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey should be carried out pre-reinstatement works, to confirm presence of any of these species and further define any necessary mitigation;
- Site specific surveys would be required to ascertain the potential for effects on bats taking account of the extent of any required bridge works;
- Appropriate landscaping and measures to enhance local biodiversity should be incorporated into the detailed designs of the proposals; and
- New railway infrastructure and buildings would be designed sympathetically to fit with the local landscape and townscape.

5.2.90 While different rail options have been appraised, in terms of their physical environmental impacts they are very similar due to all involving the same alignment. The differences on the number of services and with or without the additional station at Cameron Bridge do not significantly change the impacts and the findings below, including the need for mitigation measures described above.

Noise and Vibration

- 5.2.91 Reinstatement works for the railway (including renewal of the track bed) and passenger stations are likely to generate construction noise and vibration although it is assumed that good construction practices would be deployed and would help to mitigate some impacts.
- 5.2.92 It is predicted that noise and vibration effects would be experienced during construction which could be significant for short periods of intensive activity (e.g. from station, structures and track construction).
- 5.2.93 A reduction in car, and potentially HGV, traffic flows on key roads in the study area or beyond is predicted to have up to minor beneficial environmental effects on communities adjacent to these routes.
- 5.2.94 Operational noise impacts would be predicted from passenger train movements for lineside and near lineside properties, which may be significant dependent on the frequency and timing of rail operations, but which would be mitigated through railway design including where appropriate use of noise barriers.
- 5.2.95 No significant effects on road-based Candidate Noise Management Areas (CNMAs) in Kirkcaldy and Glenrothes are predicted.
- 5.2.96 Overall the option is anticipated to have a minor benefit (+1) or small negative impact (-1) on noise and vibration.

Global Air Quality – Carbon Dioxide (CO₂)

- 5.2.97 Operation of the railway line would result in increased fuel (or electricity) use for railway locomotives with associated carbon emissions.
- 5.2.98 Reductions in car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on emissions from reduced overall vehicle kilometres.
- 5.2.99 Overall the option is anticipated to have a minor to moderate benefit (+2) on global air quality.

Local Air Quality – Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂)

- 5.2.100 Reinstatement works for the railway and stations is likely to generate construction dust during periods of dry weather although it is assumed that good construction practices would be deployed and would mitigate nuisance impacts such that residual effects would not be significant.
- 5.2.101 Operational impacts (emissions to atmosphere from diesel rail locomotives) would be predicted from train movements, the impacts of which would be dependent on the frequency of train operations and the characteristics of locomotives deployed.
- 5.2.102 Emissions of local air pollutants from railway operations are not predicted to significantly affect background concentrations of local air pollutants for receptors within 200m of the rail line.
- 5.2.103 Passenger rail services are predicted to slightly reduce the number of private car journeys made on roads between key destinations in the study area.

5.2.104 Reductions car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on communities adjacent to key routes.

5.2.105 Overall the option is anticipated to have a minor to moderate benefit (+2) on local air quality.

Water Quality, Drainage and Flood Defence

5.2.106 Reinstatement of the former railway corridor could give rise to increased sedimentation of run-off and potential for pollution of watercourses from machinery and plant. Without mitigation potentially polluted discharges could reach nearby watercourses including the River Ore, River Leven and (at the dock area) the Firth of Forth.

5.2.107 It is assumed that good construction practices would be deployed, appropriate mitigation to prevent pollution of nearby watercourses would be installed and permanent drainage would deploy sustainable drainage techniques such that significant effects on hydrology and water quality from permanent redevelopment of the railway would not be predicted.

5.2.108 Reinstatement works for the railway formation, bridges over watercourses and associated passenger station(s) has the potential to locally change hydrology along the railway corridor. However, effects are assumed to be mitigated through measures such as sustainable drainage of the permanent design and significant effects are not predicted.

5.2.109 The areas of the river crossings of the River Ore and River Leven and (downstream of Cameron Bridge) land alongside the River Leven lie within the high-risk flood area and railway design would need to accommodate potential inundation during flood events.

5.2.110 Operational impacts from track drainage and leaks/spills from trains would be predicted from train movements, the impacts of which would be dependent on the frequency of railway operations but are not predicted to be significant.

5.2.111 It is predicted that with mitigation measures in place the permanent development and reinstatement of the railway/station(s) and its operation would not have significant effects on water quality and drainage taking account of assumed design and mitigation.

5.2.112 There is a potential for significant effects on flooding (or as a result of flooding on the railway) and this would require more detailed assessment at later design stages. This would also include further assessment to identify the presence of any culverted watercourses.

5.2.113 Overall the option is anticipated to have a small negative impact (-1) on water quality, drainage and flood defence.

Geology

5.2.114 Reinstatement works for the railway formation and stations could locally affect geological resources, although this is mitigated given the existing presence of the (former) railway route and its engineered structure for much of the route of the line.

5.2.115 It is predicted that with mitigation measures in place the reinstatement of the railway / stations and its operation would not have significant effects on geology. Any excavated material should be re-used for filling in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality.

5.2.116 There is a potential for construction works to affect areas of contaminated land associated with former industrial areas through which the eastern part of the route passes and this would require more detailed investigation, assessment and if appropriate remediation at later design stages.

5.2.117 Overall the option is predicted to have a small negative impact (-1) on geology features.

Biodiversity and Habitats

5.2.118 The railway corridor passes through the southern part of the Kennoway – Windygates Wildlife Site and habitat loss (estimated as approximately 0.6ha of riparian habitat) from the railway's reinstatement is predicted to have a minor adverse effect on this site.

5.2.119 Industrial or urban land such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey would need to be carried out pre-reinstatement works, to confirm presence of any of these species and develop appropriate responses for eradication if necessary.

5.2.120 Reinstatement/construction works for the railway formation and station(s) has the potential to result in localised losses of habitat from clearance of scrubby vegetation which has established on some parts of the former railway corridor, and to disturb species using these areas (particularly breeding birds and mammals) and nearby habitats which include areas of ancient woodland adjacent to the railway corridor.

5.2.121 Habitat loss from key habitats including areas designated in the Semi-Natural Ancient Woodlands Inventory (SNAWI), Ancient Woodland Inventory (AWI) and Native Woodland Survey Scotland (NWSS) is estimated as:

- Rail line approximately 2.2ha of SNAWI, 0.4 ha of AWI and 0.3 ha of NWSS woodlands
- Cameron Bridge station approximately 0.2ha (SNAWI)

5.2.122 Total woodland habitat loss of c.2.9ha for Leven Station alone and c.3.1ha for both Leven and Cameron Bridge Station.

5.2.123 Total Habitat loss (from areas of scrubby vegetation, grassland and the wildlife site) is estimated at 3.7ha for Leven Station alone and 3.9ha for both Leven and Cameron Bridge Station.

5.2.124 Works to bridges over the River Ore and River Leven and other former structures have the potential to affect protected species such as bats which may have established habitats in suitable structures (e.g. cavities). Further site-specific surveys would be required to ascertain the potential for these effects taking account of the extent of any required bridge works.

5.2.125 Potential impacts on freshwater ecology would require to be considered as Atlantic Salmon is known to be present on the River Leven. However, through adoption of good construction practices, reinstatement is not predicted to have any significant effects on fish and other aquatic ecology.

5.2.126 Otters have been recorded within 1km of the railway corridor therefore a pre-construction check would need to be undertaken to see that otter interests are safeguarded. Any necessary licence would be applied for prior to construction if it was considered that otter could be disturbed.

5.2.127 It is predicted that the reinstatement of the railway and construction of station(s) and its operation has the potential for adverse effects on biodiversity as a result of habitat loss (e.g. scrub woodland), habitat fragmentation or disturbance, potential effects on protected species and effects on the local wildlife site. With mitigation these are not predicted to be significant.

5.2.128 Construction disturbance works close to the coast (for re-establishment of the railway at the Methil Dock area) have the potential to indirectly affect the qualifying interests (wintering and passage bird populations) of the Firth of Forth (SPA) /Ramsar site and SSSI. Mitigation measures would need to be employed to see that disturbance did not adversely affect the qualifying interests of the Natura site and it may be necessary to undertake a Habitats Regulations Appraisal (HRA) at later stages.

5.2.129 The option is predicted to have a small negative impact (-1) on biodiversity and habitats.

Landscape

5.2.130 The development proposals are not predicted to directly or indirectly affect any regionally or locally designated landscape areas.

5.2.131 Construction works could give rise to temporary impacts on landscape from construction activity and associated movements of plant and vehicles although these would be short term and are not predicted to be significant.

5.2.132 Reinstatement works for the railway formation and the bridges over watercourses and landscape clearing works required for construction of the associated new railway station(s) would locally but permanently change landscape character along the railway corridor primarily through removal of vegetation which has established in the corridor and through the disturbance of areas of grassland and scrubby areas to facilitate the new development.

5.2.133 The potential for significant landscape effects would be mitigated using former structures (as far as practicable) and ensuring that any new infrastructure was designed sympathetically to fit with the local landscape and townscape.

5.2.134 Mitigation measures would likely see that the reinstatement of the railway, construction of new infrastructure and train operations would have no significant effects on landscape and townscape character of the route in the longer term.

5.2.135 There is potential for significant effects on landscape and townscape dependent on the final form and design of railway and station infrastructure which would need to be designed sympathetically with the surrounding urban fabric.

5.2.136 Overall the option is predicted to have a small negative impact (-1) on landscape.

Visual Amenity

5.2.137 Railway reinstatement including upgraded passenger station(s) has the potential for minor to moderate impacts to visual receptors and key views during construction and from permanent development works.

5.2.138 Operation of the railway may result in some changes in views when train operations are evident however significant impacts are not predicted.

5.2.139 Improved passenger facilities could reduce the number of car journeys on roads in the study area. This is predicted to have minor beneficial visual impacts. Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).

- 5.2.140 Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).
- 5.2.141 It may be possible to mitigate some of these effects in the longer term through measures such as screen planting. Some minor benefit effects are predicted for visual receptors close to roads where traffic movements will be reduced as a result of the railway's operation.
- 5.2.142 Overall the option is predicted to have a moderate negative impact (-2) in the short term reducing to a small negative impact (-1) on visual receptors in the longer term as mitigation planting matures.

Agriculture and Soils

- 5.2.143 Reinstatement works for the railway formation and passenger station(s) has the potential for minor changes to soil resources from construction works and permanent development which it is assumed would be mitigated with good construction practice and would be limited due to the existing presence of the (former) railway route and its engineered structure.
- 5.2.144 The reinstatement of the railway, construction of new stations and railway operations is unlikely to have significant effects on agriculture or soils.
- 5.2.145 No effects on agricultural operations or farm units are predicted.
- 5.2.146 No new areas of agricultural land are assumed to be required for the proposals and most of the redevelopment of the line would be on land which has already been developed in the past for original railway construction.
- 5.2.147 Overall the option is predicted to have no benefit or impact (O) on agriculture and soils

Cultural Heritage

- 5.2.148 Reinstatement of the former railway and passenger station(s) has potential for minor indirect setting effects to historic townscapes (e.g. on the edge of Leven) from construction and permanent development works.
- 5.2.149 No direct or setting effects are predicted on any scheduled monument, Conservation Area, or Garden and Designed Landscape.
- 5.2.150 The railway route and its structures are not subject to any cultural heritage designations and redevelopment work is not predicted to directly impact on any designated areas of importance for archaeology.
- 5.2.151 Development of the new station at Cameron Bridge is predicted to slightly affect the setting of the nearby Category B listed buildings associated with the distillery.
- 5.2.152 It has been assumed that refurbishment of former structures such as bridges and new infrastructure would be designed sympathetically with the townscape character of the areas through which the line passes.
- 5.2.153 There is potential for some minor effects from redevelopment of the railway on historic structures associated with the former railway and its ancillary infrastructure, but these are not predicted to be significant.

5.2.154 No significant effects on archaeology and cultural heritage are predicted from reinstatement of the railway taking account of assumed design and mitigation.

5.2.155 Overall the option is predicted to have no benefit or impact (O) on cultural heritage receptors.

Quantitative Assessment of changes in Local and Global Air Quality

5.2.156 The environmental assessment has been based on a comparison of local air quality (Particulate Matter, PM₁₀, and Nitrogen Dioxide, NO₂) and global air quality (Carbon Dioxide, CO₂) using forecast traffic volumes and speeds by road type across the Do-Minimum and Option forecasts for the Levenmouth area. It is assumed the road network is the same for the Do-Minimum and Option scenarios.

5.2.157 Each option has used the 2027 Do-Minimum for assessment as this is the furthest modelled forecast year that can be included in the Emissions Factor Toolkit.

5.2.158 The results of the environmental assessment are summarised in Table 12 below.

Table 12: Changes in Local and Global Air Quality in 2027, Levenmouth Area

Scenario	Local Air Quality (Annual Emissions of all vehicles in kg/yr)		Global Air Quality (Annual Emissions of all vehicles in tonnes/yr)
	PM ₁₀	NO ₂	CO ₂
2027 Do-Minimum	26,600	43,700	133,800
Option 2, Bus	26,600	43,700	133,900
Benefits compared to Do-Minimum	0	0	-100
Option 3, Bus	26,600	43,700	133,800
Benefits compared to Do-Minimum	0	0	0
Option 4, Bus	26,600	43,700	133,800
Benefits compared to Do-Minimum	0	0	0
Option 6A, Rail	26,500	43,600	133,700
Benefits compared to Do-Minimum	+100	+100	+100
Option 6B, Rail	26,500	43,600	133,700
Benefits compared to Do-Minimum	+100	+100	+100
Option 6C, Rail	26,500	43,600	133,700
Benefits compared to Do-Minimum	+100	+100	+100
Option 6D, Rail	26,500	43,600	133,600

Scenario	Local Air Quality (Annual Emissions of all vehicles in kg/yr)		Global Air Quality (Annual Emissions of all vehicles in tonnes/yr)
	PM ₁₀	NO ₂	CO ₂
Benefits compared to Do-Minimum	+100	+100	+200
Values rounded to nearest hundred			

5.2.159 The following key points can be determined from Table 12:

- There are no material changes in local air quality (PM₁₀ and NO₂ emissions) across the Levenmouth area between the Do-Minimum scenario and Bus Options 2, 3 or 4 by 2027. A similar trend is forecast for changes in global air quality (CO₂).
- There are some air quality benefits forecast in each rail option by 2027, with Option 6D forecast to have the greatest level of air quality benefits.
- Overall, the rail options would perform better than the bus options in terms of air quality benefits.

Summary of Environmental Appraisal

5.2.160 The findings of the environmental appraisal are summarised in Table 13 below. The results indicate that the options aimed at enhancing bus services have the least potential for adverse environmental impacts. This reflects that they do not involve any new development work and the changes in bus services associated with the options are not predicted to have significant effects on traffic related environmental impacts such as roadside noise and air quality.

5.2.161 The rail options involve more significant railway development proposals, but this is based almost entirely on re-opening of a former rail line and is generally not predicted to have significant environmental effects. The rail options have the potential for significant adverse noise impacts from construction and operation on receptors adjacent to the railway line, the extent of which would depend on the frequency and timing of passenger services. With mitigation, it is predicted that these effects would unlikely be significant.

5.2.162 The outputs of demand forecasting indicate that the rail options have a greater potential compared to the bus options to remove traffic from the road network as a result of modal shift. They therefore have greater potential for beneficial impacts on medium to long term roadside noise, albeit in the short-term noise would be higher due to construction impacts on nearby residential communities. Rail would also have a greater impact on local air quality and global emissions, depending on the degree to which modal shift is achieved, and on the nature and frequency of the rail option selected.

Table 13: Summary of Environmental Appraisal

Option Ref.	Noise and vibration	Global Air Quality CO ₂	Local Air Quality (PM ₁₀ and NO ₂)	Water Quality, Drainage and Flood Defence	Geology	Biodiversity and Habitats	Landscape	Visual Amenity	Agriculture and Soils	Cultural Heritage
2	+1 (minor benefit)	+1 (minor benefit) or -1 (small negative impact)	+1 (minor benefit) or -1 (small negative impact)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)
3	+1 (minor benefit)	0 (neutral) to +1 (minor benefit)	+1 (minor benefit) or -1 (small negative impact)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)
4	+1 (minor benefit)	0 (neutral) to +1 (minor benefit)	+1 (minor benefit) or -1 (small negative impact)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)	0 (neutral)
6	+1 (minor benefit) or -1 (small negative impact)	+1 (minor benefit) to +2 (moderate benefit)	+1 (minor benefit) to +2 (moderate benefit)	-1 (small negative impact)	-1 (small negative impact)	-1 (small negative impact)	-1 (small negative impact)	-1 (small negative impact) or -2 (moderate negative impact)	0 (neutral)	0 (neutral)

5.3 Safety

5.3.1 The safety criteria cover two sub-criteria. These are:

- Accidents; and
- Security

5.3.2 Accidents relate to those taking place on all modes, but the advice set out in STAG only effectively requires consideration of accidents taking place on the road network. These are assessed quantitatively below.

5.3.3 Security relates to how safe the transport system is for users, and considers the impact of such initiatives as CCTV, help points, lighting, etc. Following the safety assessment, a qualitative assessment of the security impacts follows.

Accidents

5.3.4 The accident assessment has been based on a comparison of accidents by severity and associated costs across the Do-Minimum and Option forecasts for all seven Fife localities, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction. The road network is the same for the Do-Minimum and Option scenarios.

5.3.5 All options have used the 2027 Do-Minimum as the first forecast year for assessment as, for the purposes of this study, 2027 is the assumed opening year for all options and hence the first year in which any benefits would accrue.

5.3.6 The results of the accident assessment are summarised in Table 14 below.

Table 14: Accident Savings, All Fife Localities, 60-year appraisal

Scenario	Accident Costs (£000)	Total Accidents 2022 – 2081	Average Annual Accidents 2022 – 2081
Do-Minimum	779,668	16,317	272
Option 2	779,682	16,317	272
Benefits compared to Do-Minimum	-14	0	0
Option 3	779,675	16,317	272
Benefits compared to Do-Minimum	-7	0	0
Option 4	779,680	16,317	272
Benefits compared to Do-Minimum	-12	0	0
Option 6A	779,614	16,315	272
Benefits compared to Do-Minimum	56	2	0

Scenario	Accident Costs (£000)	Total Accidents 2022 – 2081	Average Annual Accidents 2022 – 2081
Option 6B	779,593	16,315	272
Benefits compared to Do-Minimum	77	2	0
Option 6C	779,479	16,313	272
Benefits compared to Do-Minimum	191	4	0
Option 6D	779,433	16,311	272
Benefits compared to Do-Minimum	237	6	0

5.3.7 The following key points can be determined from the table above:

- There are no changes in total accident forecast between the Do-Minimum scenario and Bus Options 2, 3 or 4.
- There are some accident benefits forecast in each of the rail options, ranging from two to six accidents saved over the appraisal period.
- Option 6D is forecast to have the greatest level of accident benefits, a total of six accidents saved.
- Overall, the rail options would perform better than the bus options in terms of accident benefits.

Security

5.3.8 STAG Table 8.1 identifies the security indicators for public transport passengers as:

- Site perimeters, entrances and exits;
- Formal surveillance;
- Informal surveillance;
- Landscaping;
- Lighting and visibility; and
- Emergency call (facilities).

5.3.9 These factors have been considered in the qualitative assessment of this sub-criteria. The on-street bus options (Options 2, 3 and 4) are likely to have minor security enhancements resulting from real and perceived improvements to security in relation to bus facilities, such as lighting at stops, and increased natural surveillance from increased passenger numbers on-board and at stops. Improved information can also be expected to positively contribute to increased perceptions of safety for Option 2. For all options, users are likely to benefit from reduced wait times for services on-street and a reduction in the number of connections required to access rail services, particularly from the Methil and Buckhaven areas.

5.3.10 The rail options will likely improve security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities.

Summary of Safety Appraisal

5.3.11 The safety appraisal reveals, in terms of accidents, the rail options perform better than the bus options, with the latter generating very minor accident benefits. The rail options generate benefits of between two and six accidents, with option 6D performing best.

5.3.12 The summary of the safety appraisal is presented in Table 15 below.

Table 15: Summary of Safety Appraisal

Option Ref.	Safety
2	+1 (minor benefit)
3	+1 (minor benefit)
4	+1 (minor benefit)
6	+1 (minor benefit)

5.4 Economy

- 5.4.1 This section describes the economic performance of the options, in line with STAG and standard transport appraisal methodological approach. It is based on comparisons between the Do-Minimum and Option scenarios, including changes in traffic flows, travel distances and average road and public transport journey times. A roads-based assessment was undertaken which included cars, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) and a public transport assessment which included bus and rail modes.
- 5.4.2 The economic assessment was undertaken using the Transport User Benefits Appraisal (TUBA, version 1.9.12) which reflects the latest WebTAG economic appraisal guidance. The GDP Deflator has been used to convert all monetised costs and benefits into a common 2010 price base year. The GDP deflator value for 2010 is 116.76.
- 5.4.3 TUBA inputs for the roads-based assessment are zone-to-zone trips, journey times and travel distances for the Do-Minimum and Do-Something Option scenarios. Similarly, for the public transport assessment, the TUBA inputs are zone-to-zone trips, journey times, travel distances and fares.
- 5.4.4 The SRM12 AM Peak, Inter-Peak and PM Peak time period transport model outputs have been factored to represent a full year of travel, as required by TUBA. The annualisation factors have been generated using data from the Scottish Household Survey (SHS) Travel Diary for the years 2009-2010 and 2012-2016, and are shown in Table 16 below:

Table 16: SRM12 Annualisation Factors

AM Peak Hour to Annual		Average Interpeak to Annual		PM Peak Hour to Annual	
Car Driver	Public Transport	Car Driver	Public Transport	Car Driver	Public Transport
580	530	3,800	3,400	680	680

Methodology

- 5.4.5 A 'fixed travel demand' approach has been adopted based on the "high growth" land use scenario in SRM12 for testing Options 2, 3 and 4. This 'fixed' approach is appropriate as these options do not generate a significant level of induced travel demand. For testing Options 6A, 6B, 6C and 6D, a 'variable travel demand' approach has been adopted, using the same "high growth" land use scenario described above, as these options generate induced travel demand.
- 5.4.6 The economic assessment has been based on the following evaluation criteria:

- Price base year for costs and benefits of 2010.
- Present year value of 2010. This is the year to which all costs and benefits have been discounted.
- Discount rates of 3.5% for the first 30 years from 2019 current year and 3% thereafter have been applied to all Option costs and benefits.
- The opening year for all options is assumed as 2027.
- Appraisal period of 60 years from the first year for which user benefits are calculated.

Assessment of Conventional Benefits

- 5.4.7 TUBA was used to calculate conventional benefits, including journey time savings and vehicle operating costs savings, of each option using outputs from the SRM12 transport model.

Assessment of Accident Benefits

- 5.4.8 The assessment of the potential accident benefits of each Option has been undertaken using Cost and Benefit to Accidents – Light Touch (COBALT) software program. Default COBALT accident rates have been used. The COBALT accident assessment is described in Section 5.3.

Wider Economic Impacts

- 5.4.9 Given the nature of the options and the relatively low density of population, businesses and employment in the local area, the wider economic impacts are most likely to be small. It is also considered that the economic appraisal, as reflected by the Transport Economy Efficiency (TEE) analysis, will sufficiently capture the economic benefits associated with the various proposed options. No Wider Economic Impacts have therefore been appraised as part of the transport appraisal.

- 5.4.10 The economic assessment framework is included in Appendix D to this report.

Economic Performance of Options

The results of the “core” economic assessment for each of the Options, in terms of the net present value of option benefits, for the 60-year appraisal period are outlined in Table 17 below. Full TEE tables are provided in Appendix E.

Table 17: Summary of Net Present Value of Benefits (£m), 60-year appraisal

Item	Bus Options			Rail Options			
	Option 2	Option 3	Option 4	Option 6A	Option 6B	Option 6C	Option 6D
Net Present Value of Benefits, £m							
Journey Time Benefits	£8.57	£0.65	£2.41	£18.29	£15.54	£38.42	£57.03
Vehicle Operating Costs Benefits	£0.03	£0.02	£0.05	£0.00	£0.05	-£0.04	£0.04
User Charges	£0.08	-£0.10	-£0.83	£4.09	£6.11	£14.08	£16.85
During Construction	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Private Sector Provider Impacts	-£0.20	£0.00	£0.96	£0.00	£0.00	£0.00	£0.00
Accident Costs Benefits	£0.00	£0.00	£0.00	£0.06	£0.08	£0.19	£0.24
Indirect Tax Revenues	-£0.00	-£0.02	-£0.16	-£1.09	-£1.14	-£2.95	-£3.25
Greenhouse Gases	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Total Benefits (PVB), £m	£8.49	£0.54	£2.43	£21.34	£20.64	£49.71	£70.91

Distribution of AM Peak PT Travel Time Benefits from Levenmouth

- 5.4.11 While the total economic benefits are important in deriving the monetised benefit cost ratio, it is also important to assess the distribution of the benefits and understand where they will fall and who will gain. In particular, it is useful to determine whether those people who are in most need are benefitting from the intervention, rather than the benefits accruing to those who don't are in less need.
- 5.4.12 Figure 8 below maps the benefits falling in the local area against the areas of deprivation as derived by the Scottish Index of Multiple Deprivation. The Initial Appraisal: Case for Change Report, published November 2018, revealed that six of the ten most deprived data zones (DZs) in Fife, which are ranked amongst the 5% most deprived areas of Scotland, are in the Levenmouth area, affecting approximately 4,200 people, or 12% of the population. Those areas in the most deprived areas of Levenmouth are shown by the darker shaded areas in the figure. The blue columns reveal where the benefits associated with the rail scheme (Option 6D) will fall in Leven. The larger the column the greater the scale of benefits. The figure illustrates that the benefits fall in the most deprived areas and where people are in most need.

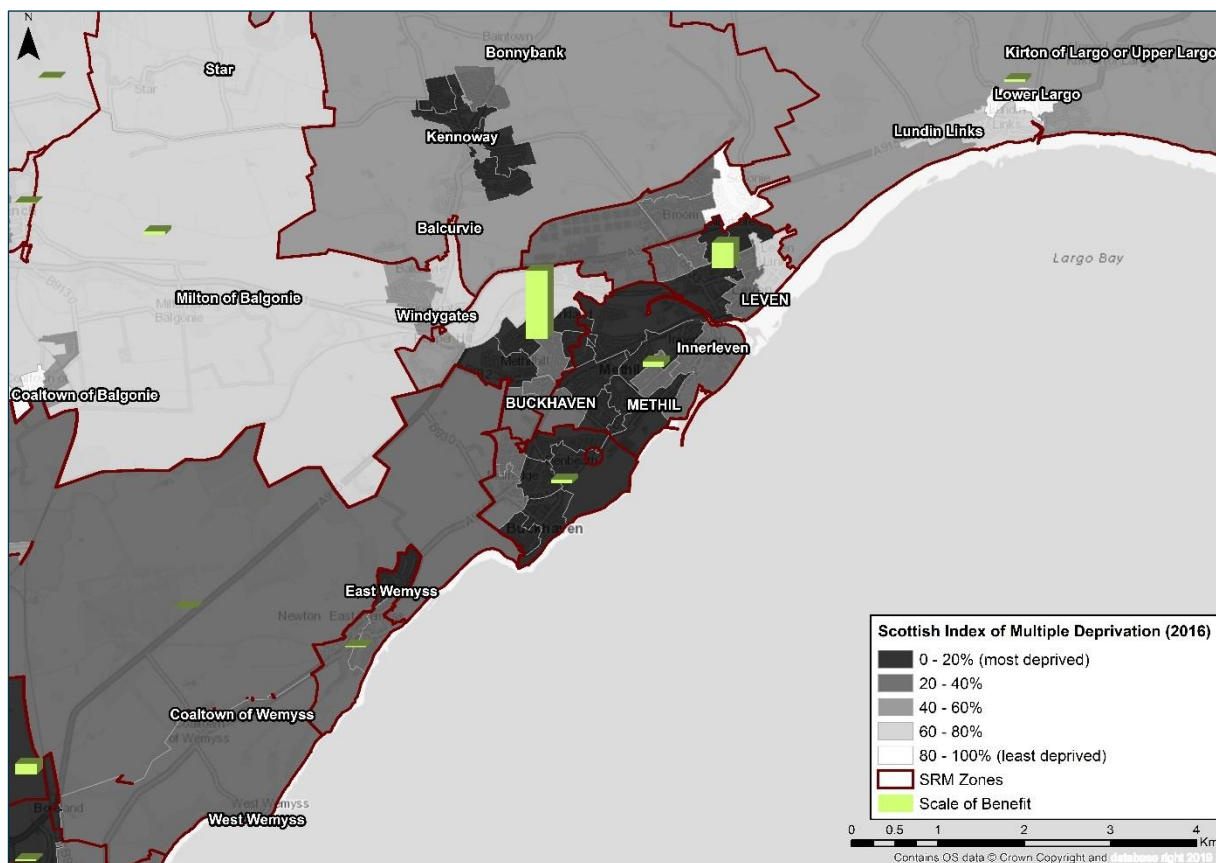


Figure 8: Distribution of AM Peak Public Transport Travel Time Benefits against Scottish Index of Multiple Deprivation

Summary of Economic Benefits

- 5.4.13 The level of monetised economic benefit for the 60-year appraisal that would accrue as a result of the options is higher for the rail options than for the bus options. This is predominantly a result of greater journey times savings from car and bus travel modes to rail than from car and rail modes to bus. The larger journey times savings also indicate a greater reduction in generalised cost [i.e. reduction in travel time and / or fare] for rail travel than bus travel when compared to the Do-Minimum scenario.

- 5.4.14 Bus Option 3 would provide the lowest level of economic performance, although it would still generate journey time benefits across the modelled public transport network when compared to the Do-Minimum scenario. Rail Option 6D would provide the highest level of benefits from journey time improvements for the rail options.
- 5.4.15 As discussed in section 5.3, based on the COBALT assessment, only the rail options would generate reductions in accident, that is the software is predicting a decrease in the number of accidents over time compared to the Do-Minimum and as a result a decrease in predicted accident costs. The results of the COBALT assessment indicate that Rail Option 6D would provide the greatest level of accident benefits, albeit the level of benefit is relatively small.

5.5 Integration

5.5.1 The options have been appraised taking account of integration in relation to:

- Transport integration: consideration of options in terms of services and ticketing, infrastructure and information;
- Transport and land-use integration: an assessment of the impact of options on proposed or existing land-use developments; and
- Policy integration: a check of options against national policy and specific accessibility issues such as disability, health, rural affairs and social inclusion.

Transport Integration

5.5.2 The Transport Integration appraisal has been summarised at a high level in Table 18 below. This highlights an overall moderate benefit (+2) for Options 2, 3 and 6, and an overall minor benefit (+1) for Option 4.

5.5.3 Benefits are likely to be associated with service and ticketing integration, especially for bus options that improve existing bus / rail connections by timetable matching and branding, with further integration of ticketing and information. The rail benefits are from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a rail station situated within walking distance of the existing Leven Bus Station would improve integration between these modes.

5.5.4 While options have been appraised independently rather than collectively or in packages, the combination of local bus improvements, particularly those to Leven bus station in close proximity to a proposed rail station, combined with a new rail service will score more highly in terms of transport integration than they do in isolation. This would be even higher, in terms of benefits, if it included an active travel solution within a combined integrated package of options.

Table 18: Summary of Transport Integration Appraisal

Indicator		Bus Options			Rail Option
		Option 2	Option 3	Option 4	Option 6
Services and Ticketing	Seamless PT Network	+2 (moderate benefit)	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)
	Seamless Ticketing	+2 (moderate benefit)	+2 (moderate benefit)	+2 (moderate benefit)	+2 (moderate benefit)
Infrastructure and information	Quality Infrastructure	+2 (moderate benefit)	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)
	Layout Infrastructure	+1 (minor benefit)	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)
	Information	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)	+2 (moderate benefit)
	Visible Staff Presence	0 (neutral)	0 (neutral)	0 (neutral)	+1 (minor benefit)
	Physical Linkage for Next Journey	+1 (minor benefit)	+1 (minor benefit)	+1 (minor benefit)	+2 (moderate benefit)

Indicator		Bus Options			Rail Option
		Option 2	Option 3	Option 4	Option 6
	Overall Score	+2 (moderate benefit)	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)

Transport and Land Use Integration

5.5.5 The transport and land use sub-objective consider whether:

- there are conflicts with the land requirements for the option;
- the option fits with policy at all levels concerning transport and land use; and
- the option conflicts with any other existing or planned development.

5.5.6 National planning policy advocates a well-connected and integrated approach. This is underpinned by National Planning Framework Three (NPF3) and Scottish Planning Policy (SPP). SPP promotes patterns of development which:

- optimise the use of existing infrastructure;
- reduce the need to travel;
- provide safe and convenient transport opportunities for walking and cycling for both active travel and recreation, and facilitate travel by public transport; and
- enable the integration of transport modes.

SESplan Strategic Development Plan (2013)

5.5.7 The SESplan Strategic Development Plan (2013) sets out to achieve 'By 2032, the Edinburgh City Region is a healthier, more prosperous and sustainable place which continues to be internationally recognised as an outstanding area in which to live, work and do business.'

5.5.8 In October 2016, SESplan published the second Proposed Strategic Development Plan for consultation. This included the Levenmouth rail link, noting that it was not committed.

5.5.9 SESplan's second proposed Strategic Development Plan was submitted to Scottish Ministers for examination in June 2017. In May 2019 SESplan was advised that the Proposed Strategic Development Plan (SDP 2) had been rejected by the Scottish Ministers as the Plan had failed to satisfy Ministers that it had been informed by an adequate and timely Transport Appraisal and had not taken sufficient account of the relationship between land use and transport.

FIFEplan 2017

5.5.10 FIFEplan was adopted by Fife Council in 2017 and sets out the policies and proposals for the development and use of land across Fife.

5.5.11 FIFEplan focuses on the key themes of people, place and economy and safeguards the Thornton to Leven rail link for future reinstatement as a passenger rail line to provide direct access to the central Scotland rail network and the services and employment opportunities there.

5.5.12 FIFEplan highlights the decline of traditional industries within the Levenmouth area and its relative isolation with no rail link or dual carriageway link to the primary road network. The Plan emphasises the need for a comprehensive approach to the physical, social, and economic regeneration of the area. The development strategy for the Levenmouth area aims to promote regeneration in the area through several proposals:

- the identification of land for 1,650 new homes through the Levenmouth Strategic Land Allocation to help reverse the population decline experienced in the area;
- the re-use of derelict land and buildings in the Levenmouth area to be given priority; and
- the current increase in activity within the Fife Energy Park has underlined the need to look at local infrastructure to see that it continues to develop and grow to the benefit of adjacent communities.

5.5.13 FIFEplan safeguards the Thornton to Leven rail link for future reinstatement as a passenger rail line. A number of other transport improvements are outlined in relation to the Levenmouth Area Local Development Plan Proposals including a number of active travel and bus interventions. Also listed are access/junction and transport corridor upgrades, including upgrades to Percival Road and provision of an east-west link road between Percival Road and Methilhaven Road.

5.5.14 The Levenmouth Link Road project is also included in the plan which proposes road enhancements to make Lower Methil, the waterfront area and Energy Park Fife more accessible, and passes through the Strategic Land Allocation with the final route to be determined through the master-planning process.

Impacts of Options against Transport and Land Use Integration

5.5.15 The bus options, which include improvements to integration of bus and rail from both Leven town centre, with a branded bus service, as well as the areas of Methil, Methilhill, Buckhaven, and Windygates, have the potential to support the Plan by providing improved access to the Energy Park and the Cameron Bridge (Distillery and Hospital) employment areas.

5.5.16 The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA.

Policy Integration

5.5.17 The policy integration sub-objective considers the options in the wider Scottish policy context. This includes consideration of the contribution of the options to meeting the Government's purpose and national transport policy objectives.

5.5.18 For the purposes of the Detailed Options Appraisal, the following policy documents, plans and strategies have been considered:

- Scottish Government's Economic Strategy, 2015.
- National Transport Strategy, 2016.
- SEStran Regional Transport Strategy, 2015 Refresh.
- Plan for Fife Local Outcome Improvement Plan (2017 to 2027).
- Fife Council Local Transport Strategy (2006).

Scottish Government's Economic Strategy (2015)

5.5.19 The Scottish Government's Economic Strategy sets out its overall purpose, which is:

"To focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth."

5.5.20 This is supported by the following five strategic objectives:

- Wealthier and Fairer – Enable businesses and people to increase their wealth and more people to share fairly in that wealth;
- Healthier – Help people to sustain and improve their health, especially in disadvantaged communities, ensuring better, local and faster access to health care;
- Safer and Stronger – Help local communities to flourish, becoming stronger, safer place to live, offering improved opportunities and a better quality of life;
- Smarter – Expand opportunities for Scots to succeed from nurture through to life- long learning ensuring higher and more widely shared achievements; and
- Greener – Improve Scotland's natural and built environment and the sustainable use and enjoyment of it.

National Transport Strategy (NTS) (2016)

5.5.21 The National Transport Strategy (NTS) refresh reconfirmed the high-level objectives set out in the white paper entitled Scotland's Transport Future (2004), and the National Transport Strategy (2006). They are to:

- promote economic growth by building, enhancing managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and
- improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

5.5.22 The NTS also set out three strategic outcomes which are intended to provide the focus for delivering the high-level objectives. The strategic outcomes are to:

- improve journey times and connections: to tackle congestion and the lack of integration and connections in transport which impact on our high-level objectives for economic growth, social inclusion, integration and safety;
- reduce emissions: to tackle the issues of climate change, air quality and health improvement which impact on our high-level objective for protecting the environment and improving health; and

- improve quality, accessibility and affordability: to give people a choice of public transport, where availability means better quality transport services and value for money or an alternative to the car.

SEStran Regional Transport Strategy (RTS), Refresh 2015

5.5.23 The SEStran Regional Transport Strategy (RTS) Refresh 2015 – 2025 pulls together transport considerations from across South East Scotland and presents the following Vision Statement:

“South East Scotland is a dynamic and growing area which aspires to become one of northern Europe’s leading economic regions. Essential to this is the development of a transport system which enables businesses to function effectively, allows all groups in society to share in the region’s success through high quality access to services and opportunities, respects the environment, and contributes to better health.”

5.5.24 This Vision is realised through the following objectives:

‘Economy’ – to ensure transport facilities encourage economic growth, regional prosperity and vitality in a sustainable manner:

- widening labour markets;
- improving connectivity;
- supporting other strategies; and
- tackling congestion.

‘Accessibility’ – to improve accessibility for those with limited transport choice or no access to a car, particularly those who live in rural areas:

- targeting improvements in access to employment, health and other services / opportunities; and
- addressing barriers to the use of public transport, including cost.

‘Environment’ – to ensure that development is achieved in an environmentally sustainable manner:

- reducing greenhouse gas emissions and other pollutants; and
- enabling sustainable travel/reduce car dependency.

‘Safety and Health’ – to promote a healthier and more active SEStran area population:

- reducing transport related injuries and deaths;
- improving the health of the population; and
- tackling local air quality and transport related noise.

Plan for Fife Local Outcome Improvement Plan (2017 to 2027)

5.5.25 The Plan for Fife aims to bring together local public service providers and communities to improve the quality of life for people who live in, work in or visit Fife. It has four priority themes:

- creating **opportunities for all** so that no-one is left behind;

- creating **thriving places** which are safe, well designed and maintained places that promote wellbeing;
- **creating inclusive growth and jobs**, with growth in the local economy benefitting everyone, and not passing people and places by; and
- **community led services**, with communities at the heart of how services are designed.

5.5.26 The Plan for a fairer Fife sees investing in connectivity and transport at the heart of the overall strategy and key to providing equal opportunity, reducing disadvantage and combatting poverty in the area. The option to reintroduce the rail link in Leven is seen as integral to achieving these objectives.

Fife Council Local Transport Strategy (2006)

5.5.27 The Local Transport Strategy (LTS) for Fife 2006 – 2026 sets the 5-year short-term programme, 10-year medium-term plan and longer-term 20-year vision and objectives for transport delivery in Fife. The plan aspires to *‘develop an integrated and sustainable transport system, which is accessible to all’*.

5.5.28 The LTS recognises a range of transportation improvements will be required to enable development to proceed. Some of the major issues within each of the areas include the Strategic Development Areas in West, Mid and East areas of Fife.

5.5.29 In relation to Mid-Fife, requirements identified include improvements to the key linkages to town centres and the public transport network; to the road network around the Redhouse Interchange (which is on the A92 trunk road and under the control of Transport Scotland), including a road link to the Standing Stane road. A possible new rail halt to East Kirkcaldy and promotion of the possible re-opening of the rail link to Levenmouth and a new station in Leven are also highlighted.

5.5.30 All the options promote travel by alternatives to the private car. The rail options would serve to increase the public transport choice to also include rail as well as bus services. All the options would positively impact on encouraging mode shift, with wider benefits provided in terms of health, inclusion and promotion of active travel.

Climate Emergency

5.5.31 The Scottish Government has declared a global climate emergency and announced a target of net-zero emissions by 2045, one of the most ambitious statutory targets in the world.

Appropriateness of Options in light of Wider Policy

5.5.32 Both the bus and rail options would promote and encourage sustainable travel and therefore align with national, regional and local transport policies as well as wider policy drivers such as movement towards a low carbon transport system. The rail option would have a larger carbon impact than the local and regional bus options as well as bus services linking to the rail stations.

5.5.33 The options would also support wider policy drivers. For example, both the bus and rail options would support objectives to promote equality and inclusion by improving access to opportunities beyond Levenmouth and Fife. The rail option, particularly, would provide quicker access to cultural, health, employment and education facilities and services, such as in Edinburgh, helping to support sustainable and inclusive growth in the area.

5.5.34 In line with STAG, consideration has also been given to the following key areas, with each discussed below:

- Disability;
- Health;
- Rural Affairs; and
- Social inclusion.

Disability

5.5.35 The bus service options could be operated using low-floor vehicles, providing easier access for all. In addition, the design of the rail stations would be fully compliant with the Equality Act 2010 and provide full access for the mobility impaired as well as young families with pushchairs and the elderly.

Health

5.5.36 For all options, the expected mode shift from car to public transport and associated reduction in road vehicle-km would impact positively on reducing emissions; however, this impact is largest for the rail options. The rail options would support walking and cycling access to the rail stations (as part of the design and planning process) at Leven and Cameron Bridge, in order to promote active travel where possible and negate the impact of car trips to the stations. The rail option, however, would potentially result in the loss of amenity along some parts of the disused rail track currently used for walking.

Rural Affairs

5.5.37 The study area is not within a rural locale and therefore has no direct bearing on policies relating to retaining and improving the vitality of rural communities.

Social Inclusion

5.5.38 As noted in the Initial Appraisal: Case for Change Report, November 2018, social deprivation is an identified problem within Levenmouth. Six of the ten most deprived data zones (DZs) in Fife, which are ranked amongst the 5% most deprived areas of Scotland, are in the Levenmouth area, affecting approximately 4,200 people, or 12% of the Levenmouth area population.

Summary of Integration Appraisal

5.5.39 The summary of the integration appraisal is shown in Table 19 below.

5.5.40 Option 2 would generate moderate benefits in terms of transport integration by improving timetable integration between local bus services e.g. matching with buses serving other parts of Levenmouth from Leven bus station. Ticketing between services would be integrated. Option 2 would generate minor land use integration benefits. The option supports, for example, FIFEplan by providing improved access to the Energy Park and the Cameron Bridge (Distillery

and Hospital) employment areas. It would also improve accessibility and connectivity between settlements, such as Methil, Methilhill, Buckhaven and Windygates. Option 2 would promote and encourage sustainable travel for local journeys and therefore align with national, regional and local transport policies on environment, thus supporting targets set in response to the declaration of the climate emergency. It would also support other wider policy drivers [e.g. to promote equality and inclusion by improving local access to key services such as health / GPs, employment and leisure facilities in the Levenmouth area], therefore scoring a moderate benefit in terms of policy integration. Overall it scores a moderate benefit under integration.

5.5.41 Option 3 scores a moderate benefit under transport integration. Benefits would be associated with service and ticketing integration that improve existing bus / rail connections by timetable matching and branding, with further integration of ticketing and information. Under land-use and transport integration, Option 3 will support FIFEplan 2017 and SESplan Strategic Development Plan (2013) and scores a minor benefit. Option 3 supports a number of local (Council), regional (SEStran) and National (Transport Scotland) policy documents, particularly in aiming to encourage modal shift from private car to public transport. For policy integration it scores a moderate benefit and also a moderate benefit overall for integration.

5.5.42 For Option 4, there are minor benefits for transport integration, with these generated by improved integration of local and regional services. The option will support FIFEplan 2017 and SESplan Strategic Development Plan (2013), with minor benefits for land use and transport integration. The intervention supports a number of local (Council), regional (SEStran) and National (Transport Scotland) policy documents, particularly in aiming to encourage modal shift from private car to public transport. For policy integration, Option 4 scores a minor benefit and also a minor benefit overall for integration.

5.5.43 For Option 6, the rail benefits accrue from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a station situated within walking distance of the existing Leven Bus Station would improve integration between these modes. Option 6 scores a moderate benefit under transport integration. The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA and therefore scores a minor benefit under land use and transport integration. All of the rail options would support a number of local, regional and national transport policies, in particular encouraging greater use of public transport and supporting social inclusion. The rail option scores a major benefit under policy integration and a moderate benefit overall for the integration criterion.

Table 19: Summary of Integration Appraisal

Option Ref.	Transport Integration	Land Use and Transport Integration	Policy Integration	Overall Score
2	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)	+2 (moderate benefit)
3	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)	+2 (moderate benefit)
4	+1 (minor benefit)	+1 (minor benefit)	+1 (minor benefit)	+1 (minor benefit)
6	+2 (moderate benefit)	+1 (minor benefit)	+3 (major benefit)	+2 (moderate benefit)

5.6 Accessibility & Social Inclusion

5.6.1 The Accessibility and Social Inclusion objective covers two sub-objectives:

- Community Accessibility.
- Comparative Accessibility.

5.6.2 **Community Accessibility** includes consideration of the public transport network coverage and local accessibility, which is essentially opportunities to walk or cycle to services or facilities.

5.6.3 **Comparative Accessibility** includes consideration of people groups and the needs of any socially excluded groups, and geographic consideration of locations relative to proposed interventions.

Community Accessibility

5.6.4 All the options will have a moderate benefit impact on community accessibility. Option 2 helps maintain and improve public transport connections to central Leven from surrounding local settlements, in particular Methil, Buckhaven, East Wemyss and Coaltown of Wemyss areas. It will not directly improve walking and cycling connections but will help facilitate non-car access to services and facilities.

5.6.5 Similarly, Option 3 enhances connections to the rail station at Markinch. Option 4 also improves public transport network coverage by improving regional bus services to St Andrews and Dundee.

5.6.6 All rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife (Kirkcaldy and Glenrothes) and beyond, particularly Edinburgh.

New Rail Infrastructure and Services: Evidence of Impacts on Existing Bus Services

5.6.7 It should be noted, however, that the introduction of rail services could have an adverse impact on existing and future bus services. For example, people may typically make a journey by bus and move to the train following the introduction of a new service, thus impacting on the viability of bus services on certain routes. This may not only impact on point-to-point services that cover the same origin and destination, but it can also impact on local trips as bus services that could be removed would also cover intermediate stops along the whole route [e.g. people using the bus for a part of the route].

5.6.8 The recently completed Borders Railway Year 2 Evaluation provides some evidence of the potential impacts that can occur to bus services when a new rail link is introduced. The evaluation report, published in February 2018, contains information on how bus service frequency has changed between 2015 and 2017 following the re-opening of the Borders Railway in September 2015. In both Midlothian and the Scottish Borders there is evidence of the bus service frequency decreasing, with the impacts appearing to be greatest in the Scottish Borders. The report can be found using this link:
<https://www.transport.gov.scot/publication/borders-railway-year-2-evaluation-survey-of-users-and-non-users-february-2018/>.

5.6.9 It is clear that the impact on local and regional bus services that serve Levenmouth and other users along the route should be monitored if a rail option is progressed to the next stage.

Train Services in Areas of Multiple Deprivation

5.6.10 The Initial Appraisal: Case for Change Report, published November 2018, highlighted that the Levenmouth area suffers from high levels of multiple deprivation [i.e. included within the 20% most deprived areas of Scotland], as defined by the Scottish Index of Multiple Deprivation (SIMD 2016). Selected comparator settlements that also suffer from high levels of multiple deprivation, including Motherwell and Wishaw, Greenock, Larkhall and Port Glasgow, but are served by rail, are shown in Table 20 below. These settlements have at least one railway station and, in most instances, more than one.

5.6.11 It is noticeable that Motherwell, Greenock and Port Glasgow all have regular services with at least four per hour during the off peak. Larkhall is the only selected settlement that has one railway station and has a lower level of service compared to the other comparator areas.

Table 20: Weekday train service provision in selected comparator areas suffering from Multiple Deprivation

Settlement	Population in 2016 ⁵	Nearest Rail Station(s)	Lowest Rail Service Frequency, Off Peak
Motherwell and Wishaw	124,790	Motherwell Airbles Shieldmuir Wishaw	Every 10 minutes Every 15 minutes Every 30 minutes Every 20 minutes
Greenock	44,250	Greenock Central Greenock West	Every 15 minutes Every 15 minutes
Larkhall	16,200	Larkhall	Every 30 minutes
Port Glasgow	15,410	Port Glasgow Woodhall	Every 12 minutes Every 30 minutes

5.6.12 There are other comparator areas across Scotland (not shown in the table above) such as Bonnybridge in Falkirk and St Andrews in Fife that have relatively low levels of multiple deprivation but are not served directly by rail. It is therefore clear that there are many influential factors affecting levels of multiple deprivation and that direct access to a rail station may not necessarily have an impact. Improved transport provision may or may not be the solution on its own or as part of a group of different types of interventions to resolving such social issues.

Comparative Accessibility

5.6.13 Similarly, to community accessibility, all options will have a positive impact in terms of comparative accessibility. As the Initial Appraisal: Case for Change demonstrated, Levenmouth consists of several local areas that exhibit relatively high social deprivation across many cohorts, including educational attainment, employment, health, crime and housing.

5.6.14 Option 2 will have a minor benefit, compared to current provision of public transport, for people accessing a wide range of local services. Option 3 will provide a moderate benefit by improving bus services to rail stations that then allow access to services beyond the Levenmouth area. Option 4 will provide a minor benefit by improving bus access to regional services in St Andrews and Dundee.

5.6.15 The rail options under Option 6 will provide a major benefit under comparative accessibility. Information gathered through the engagement exercise, particularly with schools, suggested

⁵ Source: <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/settlements-and-localities>

that particular groups were being socially excluded due to the current provision of public transport. Anecdotal evidence suggests that some secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh on a daily basis by public transport while living at home. There was also the suggestion that the return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact as having very few students living locally dampens expectation of school pupils as they do not see that as the norm and attainable.

5.6.16 Interviews with school teachers highlighted that many primary school children are being excluded from access to cultural and education experiences, such as the National Museum in Edinburgh, because buses are not feasible for large primary school groups and hiring private coaches is too costly within existing school budgets. There was also anecdotal evidence suggesting that of some primary school children never having a visit to Edinburgh by the time they had started secondary school, which was unusual compared to other schoolchildren in Fife living in areas or attending schools with access to rail services.

Summary of Accessibility & Social Inclusion Appraisal

5.6.17 A summary of the accessibility & social inclusion appraisal is presented in Table 21 below.

Table 21: Summary of Accessibility & Social Inclusion Appraisal

Option Ref.	Community Accessibility	Comparative Accessibility	Overall Score
2	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)
3	+2 (moderate benefit)	+2 (moderate benefit)	+2 (moderate benefit)
4	+2 (moderate benefit)	+1 (minor benefit)	+2 (moderate benefit)
6	+2 (moderate benefit)	+3 (major benefit)	+3 (major benefit)

5.6.18 Full Appraisal Summary Tables (ASTs) are provided in Appendix F to this report.

6 Analysis of Cost to Government and Value for Money

6.1 Introduction

6.1.1 STAG requires that the net cost of an option is assessed from a public spending perspective; this is then compared with the total benefits to provide an overall value for money assessment. It is important to recognise that value for money does not only include a comparison of the quantified and monetised impacts of the options, versus the do-minimum, under the economy criterion. This is the economic value for money. To determine the overall value for money, the appraisal needs to allow for the qualitative and quantitative social and environmental impacts associated with the options. This chapter considers these elements of the appraisal.

6.2 Cost to Government

6.2.1 To determine the overall value for money of an option, the benefits and disbenefits of an option should be considered against the cost to government. The cost to government refers to all costs incurred by the public sector, net of any revenues. The total net cost comprises:

- investment costs;
- operating and maintenance costs;
- grant / subsidy payments;
- revenues; and
- taxation

6.3 Public Sector Costs

Investment Costs

6.3.1 Investment costs include all infrastructure and other capital costs incurred by public sector operators that are in addition to the Do Minimum.

6.3.2 In line with STAG, all investment costs should be adjusted for “Optimism Bias”. A 44% uplift for optimism bias has been applied to the investment costs.

Operating and Maintenance Costs

6.3.3 Operating and maintenance costs include the annual recurring costs incurred in running and maintaining the options considered. Bus operation costs primarily include staff and fuel expenses, as well as any new vehicles that may be required. Rail operational costs for Option 6 cover factors such as the leasing of trains, track and station access charges, staff and fuel costs.

Grants and Subsidy Payments

- 6.3.4 Grant and subsidy payments can be made by the Government to private sector operators when revenues do not cover investment and operating costs.

Revenue

- 6.3.5 Public sector revenues relate to user charges, which represent monetary transfers from the users to the Government.

Cost Estimates

- 6.3.6 The cost estimates are shown in Table 22 below as required by TUBA. The operating and maintenance costs have been based on the information available. However, if a rail option were to be progressed, for example through the rail industry's Governance for Railway Investment Projects (GRIP) design and delivery process, then more detailed forecasting of the relevant costs would be required.
- 6.3.7 Preparation and construction costs include 44% optimism bias. For the purposes of the appraisal of the rail options and the adjustment to allow for optimism bias, it is assumed that the project is defined as 'standard engineering' as opposed to 'non-standard engineering' (66% adjustment), due to much of the rail line already being in place, therefore reducing potential construction risk.
- 6.3.8 Maintenance and operating costs have been estimated for the 60-year appraisal period and the preparation and construction cost spend profile has been spread over the expected construction time period.

Table 22: Estimated Costs (£m) in 2019 prices, excluding VAT (undiscounted)

Cost Item	Bus Options			Rail Options			
	Option 2	Option 3	Option 4	Option 6A	Option 6B	Option 6C	Option 6D
Preparation	-	-	-	£13.64	£13.64	£13.64	£13.64
Construction	-	-	-	£53.05	£56.46	£53.05	£56.46
Operating	£19.51	£3.73	-	£57.53	£57.53	£97.09	£97.09
Maintenance	£2.11	£0.91	-	£15.90	£17.10	£15.90	£17.10
Total (60 year)	£21.62	£4.64	£0.00	£140.12	£144.73	£179.68	£184.29
Values rounded to nearest thousand							

- 6.3.9 From the table above it can be seen that no costs have been attributed to Option 4. This option would provide new through links from Leven to Dundee by combining two existing services: 97 (Leven – St Andrews) and 99 (St Andrews – Dundee). The option would involve buses running through from service 97 to service 99 and vice versa, enabling passengers to travel between Leven and Dundee without having to change buses in St Andrews.

6.3.10 This revision to how buses are scheduled on the two services can be achieved with minimal changes to the existing timetables because buses currently meet at the same time in St Andrews. Instead of returning to their respective origin points, as currently happens, under Option 4, buses would continue through on the other service. Because there are limited or no changes to timetables, it is assumed that the option can be delivered for negligible additional costs.

6.4 Cost-Benefit Analysis

6.4.1 The economic appraisal has been based on a 60-year appraisal period and all results are expressed in 2010 prices, in line with transport appraisal guidance. Similarly, to the estimate of benefits, monetary values have been discounted at 3.5% for the first 30 years and 3% for the remainder of the evaluation period. It has been assumed that all operator revenue generated under each option is transferred to government thus reducing subsidy. The benefits were discussed and presented in the Economy section in Chapter 5 and the costs are set out above.

6.4.2 The results of the cost-benefit analysis for each option are presented in Table 23 below.

Table 23: Summary of Economic Performance of Options, 60-year appraisal

Item	Bus Options			Rail Options			
	Option 2	Option 3	Option 4	Option 6A	Option 6B	Option 6C	Option 6D
Net Present Value of Benefits, £m	£8.49	£0.54	£2.43	£21.34	£20.64	£49.71	£70.91
Net Present Value of Costs (PVC), £m	£5.59	£1.05	£0.00	£50.34	£52.76	£45.48	£46.27
Overall Net Present Value (NPV), £m	£2.90	-£0.51	£2.43	-£29.00	-£32.12	£4.22	£24.65
Benefit to Cost Ratio (BCR)	1.5	0.5	-	0.4	0.4	1.1	1.5

6.4.3 Considering all benefit and cost elements which make up the overall Benefit to Cost Ratio (BCR), Bus Option 2 and Rail Option 6D are forecast to perform best in terms of the monetised appraisal. The analysis shows that both have a BCR of 1.5. The next best performing option is Rail Option 6C with a BCR of 1.1. Bus Option 4 can be delivered for no additional costs. The benefits that could be delivered by the rail options are significantly higher than those that could be delivered by the bus options. Bus Option 2 and Rail Option 6D perform best in terms of economic value for money.

6.5 Overall Value for Money

6.5.1 While Options 2 and 6D offer the highest economic value for money with option 6D resulting in the highest level of benefits, both of these options also perform well against the environmental, integration and social inclusion & accessibility criteria. This means the overall value for money is greater than that for economy alone.

7 Analysis of Risk and Uncertainty

7.1 Introduction

7.1.1 This chapter presents a detailed analysis of the risk and uncertainty associated with each option, covering four key areas:

- Feasibility, Affordability and Public Acceptability.
- Risk Management.
- Optimism Bias.
- Uncertainty Analysis.

7.1.2 The main purpose of this analysis is to obtain the best possible estimate of the costs and benefits associated with each option.

7.2 Feasibility, Affordability and Public Acceptability

Feasibility

7.2.1 This section considers the technical feasibility, affordability and deliverability risks of each of the options.

7.2.2 No significant technical issues related to the implementation of Option 2 are anticipated. In terms of deliverability, Option 2 would require reconfiguration of existing bus timetables and, potentially, additional bus fleets. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.

7.2.3 No significant technical issues related to the implementation of Option 3 are expected. This option would require reconfiguration of existing bus timetables and potentially additional bus fleets. Currently, bus operations within the Levenmouth area are focused on integrating timetables of bus services – in practice, better integration may be achieved through higher bus frequencies. This option would require effort in terms of negotiation and agreement with public transport operators regarding service provision, including integration of bus and rail timetables.

7.2.4 No significant technical issues related to the implementation of Option 4 are expected. This option would require reconfiguration of existing bus timetables. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.

7.2.5 Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. However, a substantial amount of rail infrastructure is already in place and a service has previously operated along the line. This option is therefore expected to be technically feasible and no insurmountable technical problems anticipated. If this option is progressed, any requirements for additional rolling stock, and associated additional servicing and maintenance, would need to be considered in more detail through the GRIP process.

Affordability

- 7.2.6 This section considers the scale of the financing burden on the promoting authority and other possible funding organisations, including ongoing operating and maintenance costs.
- 7.2.7 The discussion on costs in chapter 6 suggests that Option 2 would be a relatively low operating revenue option. The commercial impact of any improved local bus services would be dependent on the demand for that service and how any additional fare revenue compared with the additional costs. It could be that service improvements would have to be funded by the public purse and options to cover that would need to be explored. This option may increase passenger numbers and operating revenue; however, funding may be required for new 'kick start' services to be commercially viable after four years so that no financial burden materialises.
- 7.2.8 Similar to Option 2, Option 3 would be a relatively low operating revenue option and would ultimately depend on the impact on demand / fare revenue versus costs. If revenue does not outweigh the additional cost, then options would have to be explored to establish its long-term viability.
- 7.2.9 The analysis suggests that the marginal costs associated with Option 4 would be negligible, reflecting minimal changes to timetable and no additional vehicles would be required.
- 7.2.10 All of the rail options would require considerable costs, particularly in terms of construction of the line and additional rolling stock to deliver the services. Chapter 6 estimates that Option 6D, for example, would require £56.5m to bring the existing disused rail line up to an appropriate standard and £97.1m for additional rolling stock. These costs would be considered in more detail through the GRIP process if this option is progressed. Optimism bias has been added to the costs to reflect the level of risk associated with the construction element, particularly, and the level of uncertainty around what specifically would be required to improve the rail line.

Public Acceptability

- 7.2.11 This section considers how acceptable the options would be to the public and is very much informed by the findings from the engagement exercise as well as the public surveys.
- 7.2.12 It is expected that Option 2 would have public support in terms of it enhancing the current bus network as issues around local bus services were raised by a number of people in response to the public survey – over 50% of respondents said that the length of travel times, frequency of services and timetable hours were having a negative impact on their ability to travel within the Levenmouth area . It is anticipated, however, that it would not fulfil widespread aspirations around the public transport offering for the area, and particularly public transport services and access to key education, health, employment, cultural and leisure facilities beyond the Levenmouth area.
- 7.2.13 It is expected that Option 3 would have an element of public support in terms of it enhancing the bus network and integrating bus and rail services, although, similar to Option 2, it is anticipated that it would not fulfil widespread aspirations around the public transport offering for the area.
- 7.2.14 It is expected that Option 4 would also have an element of public support in terms of it enhancing the current bus network and improving regional connections, although it is anticipated that it would also not fulfil the wider aspirations around the public transport offering for the area.
- 7.2.15 Option 6 has significant public support and has received considerable support from residents (including a local campaign group) and businesses via the online surveys. From the information

gathered and views expressed during the engagement, the local community would strongly support this option.

7.3 Risk Management

7.3.1 Risk management is a structured approach to identifying, assessing and controlling risks that emerge during the option lifecycle. This supports better decision making by developing a more thorough understanding of the risks inherent within an option and their likely impact. Risk management involves:

- identifying possible risks in advance and putting mechanisms in place to minimise the likelihood of their materialising with adverse effects;
- having processes in place to monitor risks, and access to reliable, up-to-date information about risks;
- the right balance of control in place to mitigate the adverse consequences of the risks, if they should materialise; and
- decision making processes supported by a framework of risk analysis and evaluation.

7.3.2 A proactive approach to risk management from the outset helps facilitate bringing more certainty to a project at an earlier stage. This, in turn, can help to provide greater confidence and reduced requirement for optimism bias to address potential under-estimation of costs and delivery timeframe, and over-statement of benefits.

7.3.3 Table 24 sets out key risks that will need to be considered and managed if option(s) are progressed to the next stage.

Table 24: Risks of Introducing Rail and Local Public Transport Services

Risk	Potential Mitigation
<p><u>High expectation of transformation due to new Rail infrastructure</u></p> <p>There is a perception by stakeholders that the area is in decline and that investment in rail infrastructure will have a transformational impact. Although the appraisal has shown the potential benefits of the rail option, having a rail station may not necessarily mean an area will automatically become more prosperous and will not necessarily address other, perhaps more complex, social problems.</p>	<p>If a rail option is progressed, it is suggested that work to maximise the benefits of this should also be progressed, working with partners on other interventions which will complement and take advantage of opportunities in the area.</p>

Risk	Potential Mitigation
<p><u>Affordability of Rail fares</u></p> <p>Throughout the gathering of evidence and data for the Levenmouth Sustainable Transport Study, rail fare affordability was an issue expressed by stakeholders and the public which was proven through analysis of comparable journeys from towns of similar distance to/from Glasgow or Edinburgh. An assumption has been made on the potential rail fare of new stations and sensitivity testing undertaken to determine the impact of fare price on the business case for the railway reopening. However, the transport modelling cannot determine if the transport is 'affordable' to people from a specific location. Therefore, there is a risk that the rail option is not affordable to use, hence the forecast usage could be currently overestimated.</p>	<p>Rail Delivery Group has recently consulted with passengers on the approach to fares setting among rail franchisees. Transport Scotland will consider RDG's recommendations alongside the reviewed NTS to determine the best approach to fare setting in future at a national level, encompassing Fife and the rest of Scotland, rather than changing fares on individual routes in isolation.</p>
<p><u>Viability of local bus services</u></p> <p>The re-introduction of the service will lead to modal shift from bus as well as cars. Reduced demand on local bus services (as witnessed in the Borders following the opening of the Borders Rail line) has the potential to adversely impact on the commercial viability of some local and regional bus routes / services. Thus, depending on the nature of the impact, there could be greater requirements for subsidy in order to keep services in operation.</p>	<p>Issue of declining bus service provision is recognised in the New National Transport Strategy.</p> <p>Transport Bill – key provisions for bus service improvements including greater powers for local authorities.</p>
<p><u>Cost of local bus improvements</u></p> <p>The bus improvements tested are changes to services and do not include any significant capital costs. Transport Scotland does not have any routes to provide revenue funding and it is understood Fife Council currently provide significant subsidy to bus operators. Financial support to ensure provision of bus services will need to be explored in further detail.</p>	<p>Enter discussions with Fife Council on how this option could be funded, highlighting opportunities through the Transport Bill.</p>
<p><u>Viability of local retailers</u></p> <p>The introduction of the service may see local people spending more of their income outside of the Levenmouth area than they currently do, e.g. family day trips to Edinburgh - impacting on local retailers. However, this could be outweighed as more people are able to visit Levenmouth, similar to the (short term) pattern of events witnessed in the Borders.</p>	<p>Create a cross-sector partnering group which will maximise the benefits of the transport interventions by working with other organisations and businesses on what they can contribute to ensure success.</p>

7.4 Optimism Bias

- 7.4.1 As discussed in Chapter 6, option investment cost estimates have been adjusted to include Optimism Bias using the Standard Civil Engineering Uplift of 44%. This uplift has been used to cover unknowns at this stage such as market conditions (price and availability), interface with third parties currently unknown etc.

7.5 Uncertainty Analysis

- 7.5.1 Uncertainty analysis is a routine part of appraisal and modelling and is used to test the vulnerability of the options to future uncertainties which are unavoidable. Through analysing the range of inputs and the values that key variables may take, uncertainty analysis allows any resultant effects on the associated impacts of options to be examined. For the purposes of this study, the following scenario and sensitivity tests were developed:

Scenario and Sensitivity Tests

- **“Alternative Growth” Scenario Test** – this test takes account of changes to land-use and development set out in the Fife local development plan “capped” at 2022 levels through to the 2037 forecast year. The Alternative Growth scenario test therefore assumes no change in travel demand post 2022. It has been undertaken to understand the impacts on the economic assessment. More details on the alternative growth scenario are described below.
- **Rail Fares Sensitivity Test** – this test assumes the rail fare from Leven and Cameron Bridge stations to Edinburgh are commensurate with that currently from Markinch to Edinburgh. The test has been undertaken to understand the forecast impacts on the demand for rail travel to and from the Levenmouth area, and to understand the impacts on the economic assessment.
- **Rail Rolling Stock Sensitivity Tests:**
 - **Test 1: No Rolling Stock Lease Charges.** This test assumes rail rolling stock is available within the current ScotRail fleet to fulfil the operating service assumptions for the best performing rail option [i.e. Rail Option 6D]. It is assumed that rolling stock lease charges would not be incurred; however, other additional operating costs such as staff costs, fuel costs and track access charges would be incurred. This test been undertaken to understand the impacts on the economic assessment.
 - **Test 2: No Additional Operating Costs.** This test also assumes rail rolling stock is available within the current ScotRail fleet to fulfil the operating service assumptions for Rail Option 6D. However, it is assumed that the rolling stock that would be used to deliver the service is already incurring all operating costs. Therefore, no additional operating costs would be incurred. This second test has also been undertaken to understand the impacts on the economic assessment.

Alternative Growth Scenario

- 7.5.2 The “Alternative Growth Scenario” was developed with travel demand growth capped at 2022 levels through to the 2037 forecast year [i.e. assuming no change in travel demand post 2022]. The “Core Growth Scenario” used in the main assessment of the options was developed with travel demand growth changing over time. It is therefore helpful to identify the changes in travel demand over time between the two scenarios to better understand the impacts on the economic assessment. The changes in public transport demand growth specifically within the Levenmouth area as well as to and from the Levenmouth area have been considered because it is these movements that are most important to the options being tested in terms of their economic performance. The most important travel movements for each option are based on the type of service each option provides [i.e. local or regional service] and are shown in Table 25 below.

Table 25: Most Important Travel Movements by Option

Option Ref.	Title	Description	Service Type	Most Important Travel Movements
2	Improve local bus services	Improve local bus services connecting towns in the Levenmouth area to Leven	Local	Within Levenmouth
3	Improve bus-rail connections	Improve bus services to Markinch rail station and Glenrothes	Regional	To / From Levenmouth
4	Improve regional bus services	Improve regional bus services linking Leven with St Andrews and Dundee	Regional	To / From Levenmouth
6	Re-open existing rail line to passengers	Provision of a passenger only rail line along the alignment of the existing, disused, rail line between Thornton North Junction and Leven	Regional	To / From Levenmouth

7.5.3 Figure 9 below shows the growth in public transport travel demand over time with Bus Option 2 in place specifically for trips within the Levenmouth area – it is those trips that are most important to Bus Option 2 and its economic performance.

7.5.4 The figure shows that public transport growth in the alternative scenario is constant over time, as expected, but higher when compared with the core scenario. Therefore, the alternative scenario represents a best-case scenario in terms of the economic performance of Bus Option 2 because it contains a higher level of public transport demand over time when compared with the core scenario.

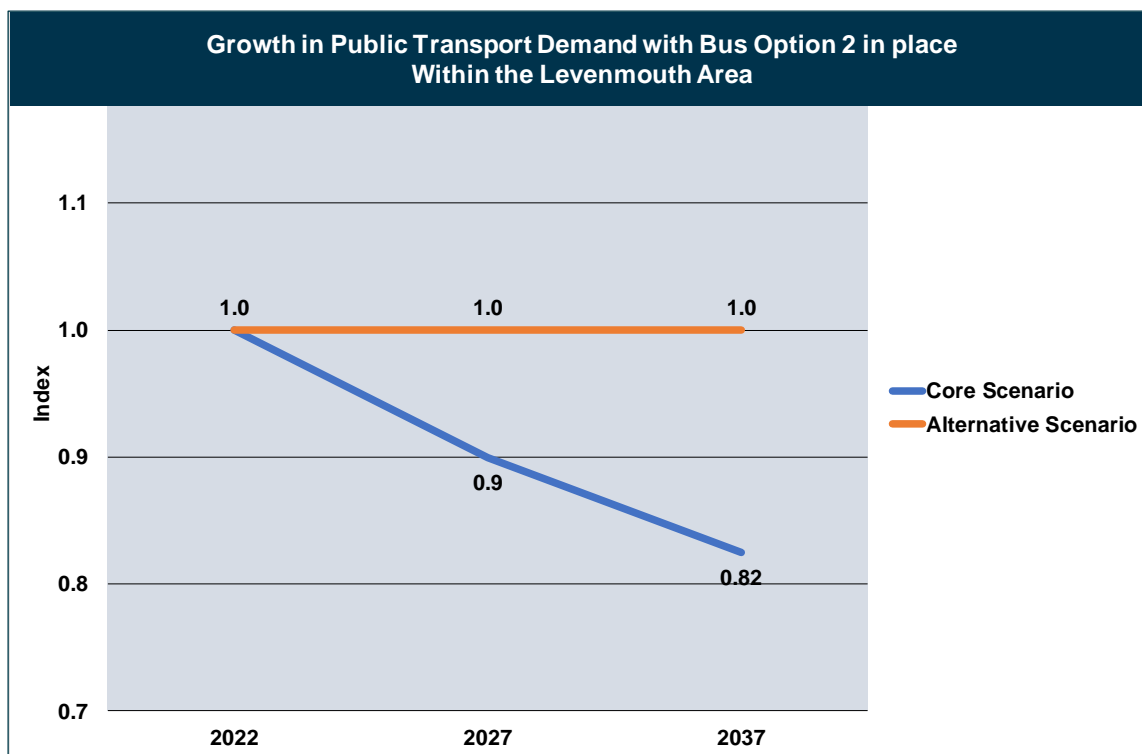


Figure 9: Growth in Public Transport Demand over time with Bus Option 2 in place, within Levenmouth, Core and Alternative Growth Scenarios

- 7.5.5 Figure 10 below shows the growth in public transport travel demand over time with Bus Options 3 and 4 in place specifically for trips to and from the Levenmouth area – it is those trips that are most important to Bus Options 3 and 4 and their economic performance.
- 7.5.6 The figure shows that public transport growth in the alternative scenario is constant over time, as expected, but lower when compared with the core scenario. Therefore, the alternative scenario in this case represents a worst-case scenario in terms of the economic performance of Bus Options 3 and 4 because it contains a lower level of public transport demand over time when compared with the core scenario.

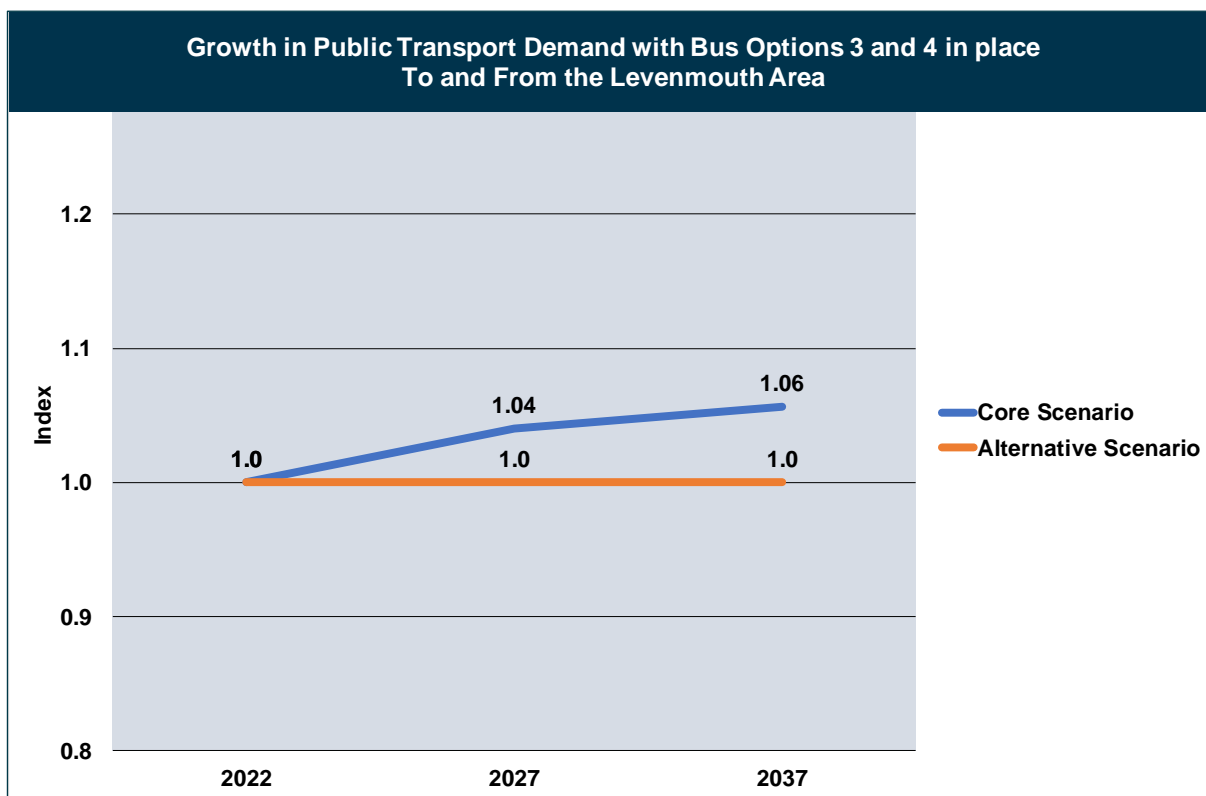


Figure 10: Growth in Public Transport Demand with Bus Options 3 and 4 in place, to and from Levenmouth, Core and Alternative Growth Scenarios

- 7.5.7 Similarly, Figure 11 below shows the growth in public transport travel demand over time with the rail option variants in place specifically for trips to and from the Levenmouth area – it is those trips that are most important to the rail option variants and their economic performance.
- 7.5.8 The figure shows that public transport growth in the alternative scenario is constant over time, as expected, but lower when compared with the core scenario. Therefore, the alternative scenario represents a worst-case scenario in terms of the economic performance of the rail option variants because it contains a lower level of public transport demand over time when compared with the core scenario.

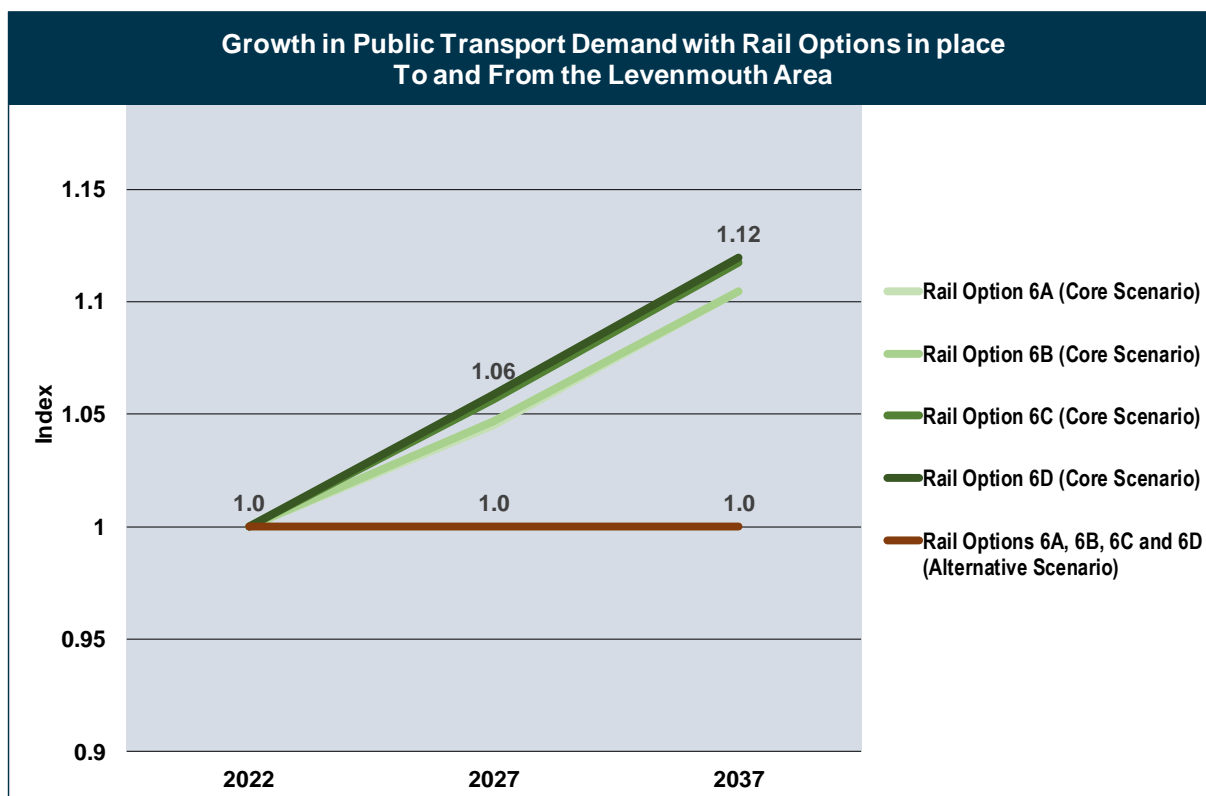


Figure 11: Growth in Public Transport Demand with Rail Options in place, to and from Levenmouth, Core and Alternative Growth Scenarios

Scenario and Sensitivity Testing of the Economic Assessment

- 7.5.9 The “core” economic assessment used the “high growth” land-use scenario from SRM12 which contains additional travel demand associated with the delivery of a proportion of the Fife local development plan (committed and non-committed sites) within each forecast year. Scenario testing of the economic assessment has been undertaken using an “alternative growth” scenario as described above.
- 7.5.10 It is acknowledged that scenario tests could be carried out with respect to the timing in delivery of proposed transport schemes to understand how they impact on the results of the appraisal, in addition to the scenario and sensitivity tests described above. Two schemes which could influence travel demands and patterns across Fife, and potentially the Levenmouth area, are the Revolution in Rail proposals, announced in March 2016 by the then Transport Minister, and the ongoing delivery of the Forth Crossing Public Transport Strategy, related to the Forth Replacement Crossing project, which was refreshed in 2012. WebTAG guidance states schemes which are “near certain” should be included in the “core” modelling. As such, both schemes are included in the 2022 Do-Minimum forecasts and subsequent forecast years.
- 7.5.11 Smaller schemes contained in the model, including junction improvements throughout the Fife road network, are unlikely to influence travel demand to any significant degree across the wider Levenmouth area. For this reason, scenario testing of the timing and delivery of these proposals has not been included in the economic assessment.

Scenario Test Results

- 7.5.12 The results of the scenario test for each of the Options for the 60-year appraisal period are outlined in Table 26 below. Full scenario test TEE tables are included in Appendix E to this report.

Table 26: Summary of Economic Performance of Options, Alternative Growth Scenario Test, 60-year appraisal

Item	Bus Options			Rail Options			
	Option 2	Option 3	Option 4	Option 6A	Option 6B	Option 6C	Option 6D
Net Present Value of Benefits, £m							
Journey Time Benefits	£12.33	£0.09	£1.87	£19.93	£20.09	£34.66	£35.29
Vehicle Operating Costs Benefits	£0.03	-£0.01	-£0.03	£0.14	-£0.02	£0.21	£0.35
User Charges	-£0.01	-£0.11	-£0.70	£3.43	£5.11	£12.66	£15.15
During Construction	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Private Sector Provider Impacts	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Accident Costs Benefits	£0.00	£0.00	£0.00	£0.06	£0.07	£0.19	£0.24
Indirect Tax Revenues	-£0.01	-£0.02	-£0.11	-£1.20	-£1.51	-£2.44	-£2.72
Greenhouse Gases	0	0	0	0	0	0	0
Total Benefits (PVB), £m	£12.33	-£0.05	£1.85	£22.36	£23.74	£45.29	£48.30
Net Present Value of Costs (PVC), £m	£5.48	£1.04	£0.00	£50.22	£49.67	£49.95	£50.94
Overall Net Present Value (NPV), £m	£6.86	-£1.09	£1.85	-£27.86	-£25.93	-£4.66	-£2.64
Benefit to Cost Ratio (BCR)	2.3	0.0	-	0.4	0.5	0.9	0.9

Scenario Test Analysis

- 7.5.13 With the alternative growth demand scenario, the net present value of the Option scenario benefits is lower in some cases than that shown in the “core” assessment, specifically Bus Options 3 and 4 and Rail Options 6C and 6D. The BCRs for these options are also lower and this is in line with expectations because the alternative growth scenario contains a lower number of public transport trips in each forecast year when compared to the “high growth” scenario used in the core assessment. There is also no change in the net present value of scheme investment or scheme operating costs under the alternative growth scenario; however, the overall net present value of costs does change because of the differences in operator revenue which is transferred to local / central government as a cost saving.
- 7.5.14 For **Bus Option 2** and for **Rail Options 6A and 6B**, the total benefits increase in the alternative growth scenario and this is primarily driven by greater journey time benefits being accrued. This results in a higher BCR for Bus Option 2 and the same or slightly higher BCR for Rail Options 6A and 6B when compared to the core scenario. The reasons for these increases are explained below:
- 7.5.15 In **Bus Option 2**, the proposed changes to bus service provision would improve local bus services connecting residential settlements in the Levenmouth area to Leven. Therefore, changes in the demand for public transport over time specifically within the Levenmouth area are of importance to the economic performance of this option. As shown in Figure 9 above, the demand for public transport specifically within the Levenmouth area is forecast to decrease over time in the core scenario. This means that under the alternative growth scenario, forecast demand is in fact higher in 2027 and 2037 when compared with the core scenario. The higher level of demand is the main contributory factor to the increase in journey time benefits and, hence, the higher BCR evident in the summary of economic performance of Bus Option 2 under the alternative growth scenario test.
- 7.5.16 In **Rail Options 6A and 6B**, the BCRs are similar in both the core and alternative growth scenarios. For Option 6A, the BCR is the same in both scenarios [i.e. 0.4] but has slightly higher Net Present Value of Benefits and slightly lower Present Value of Costs in the alternative growth scenario. For Option 6B, the BCR is slightly higher in the alternative growth scenario [i.e. 0.5 compared with 0.4 in the core scenario] and also has slightly higher Net Present Value of Benefits and slightly lower Present Value of Costs. The slightly higher Net Present Value of Benefits is being driven by an increase in commuter journey time benefits under the alternative growth scenario. The main reason for this increase is due to reductions in rail crowding. This is described further below.
- 7.5.17 In both the core and alternative growth scenarios, in 2027 and 2037 there is crowding on the rail service between Leven and Edinburgh and some people are “crowded off,” particularly those commuting. This results in a journey time disbenefit to them as those “crowded off” would need to use an alternative slower mode such as bus to reach their destination. Under the alternative scenario, there is no growth in demand between Levenmouth and Edinburgh from 2027 onwards and therefore there is no change in the journey time disbenefit from crowding in each forecast year. However, under the core scenario, there is an increase in demand from 2027 to 2037 for travel between Levenmouth and Edinburgh, and this is reflected in Figure 11 above. This results in higher numbers of people being “crowded off” over time and therefore greater levels of journey time disbenefits. The journey time disbenefits under the alternative growth scenario are therefore slightly lower than those generated under the core growth scenario, resulting in the same or slightly higher BCR in Options 6A and 6B.
- 7.5.18 Overall, Option 3 would provide the poorest level of economic performance under the alternative growth scenario, in terms of the BCR, and Option 2 and Options 6C and 6D the highest, with Option 6D generating the greatest benefits.
- 7.5.19 The core assessment and scenario test indicate that Bus Option 2 and Rail Option 6D provide consistent performance when assessed against the Do-Minimum insofar as Option 2 is the best

performing bus option and Option 6D is the best performing rail option. Both have BCRs and other quantitative / qualitative benefits that offer overall value for money. Option 6D would provide the highest level of benefits after opening and the greatest longevity in terms of future performance. Option 2 would provide benefits that outweigh its costs. The scenario test provides additional confidence in the overall economic assessment results and the overall ranking of the economic performance of the options.

7.5.20 Rail Fares Sensitivity Test Results

7.5.21 The forecast impacts of the rail fares sensitivity test on combined annual boardings and alightings at the proposed new stations at Leven and Cameron Bridge for the best performing rail option [i.e. Option 6D] in 2037 are shown in Figure 12 below.

7.5.22 The results of the fares sensitivity test on the economic assessment for the best performing rail option are outlined in Table 27 below. The full rail fares sensitivity test TEE table is included in Appendix E to this report.

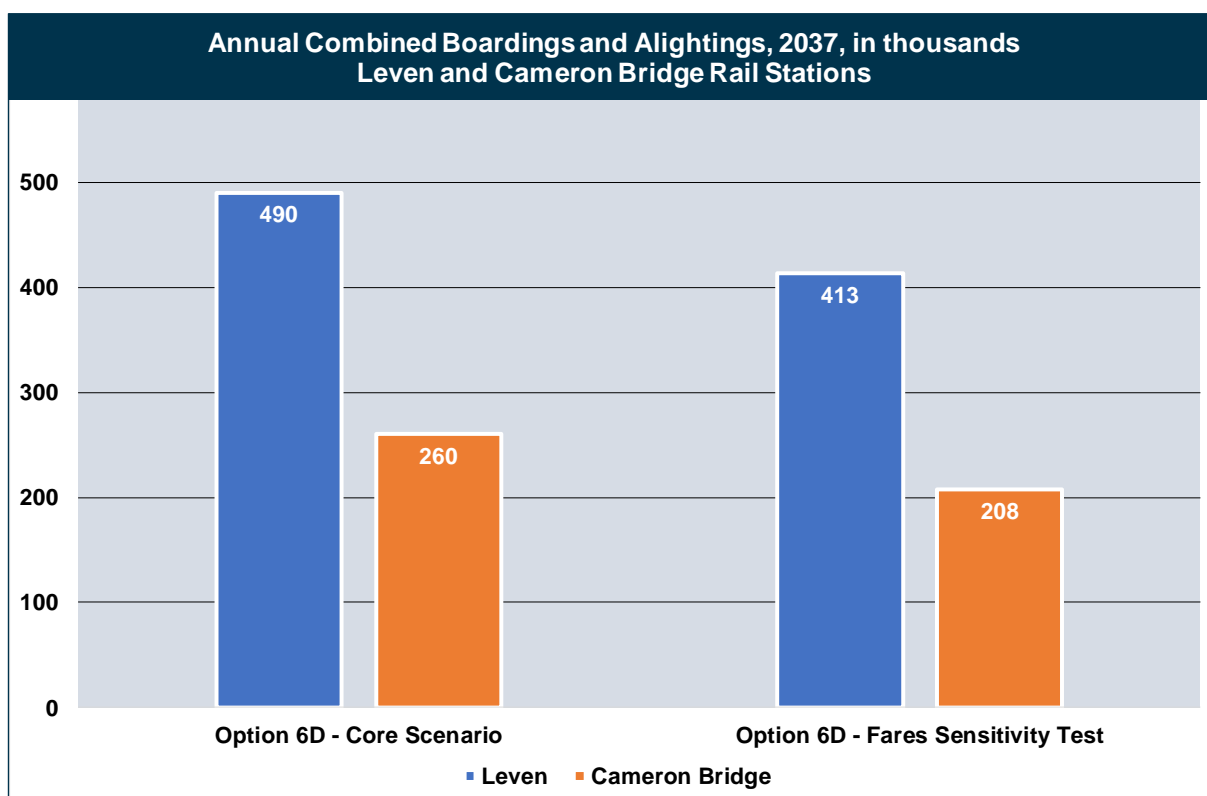


Figure 12: Rail Fares Sensitivity Test, Combined Boardings and Alightings

Table 27: Summary of Economic Performance of Options, Rail fares Sensitivity Test, 60-year appraisal

Item	Option 6D – Rail Fares Sensitivity Test
Net Present Value of Benefits, £m	
Journey Time Benefits	£46.29
Vehicle Operating Costs Benefits	£0.07
User Charges	£10.33

Item	Option 6D – Rail Fares Sensitivity Test
During Construction	£0.00
Private Sector Provider Impacts	£0.00
Accident Costs Benefits	£0.23
Indirect Tax Revenues	-£4.10
Greenhouse Gases	£0.00
Total Benefits (PVB), £m	£52.81
Net Present Value of Costs (PVC), £m	£40.66
Overall Net Present Value (NPV), £m	£12.15
Benefit to Cost Ratio (BCR)	1.3

Rail Fares Sensitivity Test Analysis

7.5.23 With the rail fares sensitivity test, the net present value of Option 6D scenario benefits is lower than that shown in the “core” assessment. The BCR is also lower and this is in line with expectations because the rail fares sensitivity test contains higher rail fares, and hence a lower number of combined boardings and alightings are forecast at Leven and Cameron Bridge in 2037 (621,000) when compared to the “core” assessment (750,000). There is also no change in the net present value of scheme investment or scheme operating costs; however, the overall net present value of costs does change because of the differences in operator revenue under the rail fares sensitivity test which is transferred to central government as a cost saving. Option 6D would provide a poorer level of economic performance under the rail fares sensitivity test, in terms of the BCR, when compared to the “core” assessment.

7.5.24 It is clear that any change to rail fares can have a significant impact on the potential demand for the proposed new rail line and the economic performance of the option. The economic performance of Rail Option 6D is, however, still resilient under the higher fares sensitivity test with benefits that outweigh its costs.

7.5.25 As highlighted in the Preliminary Options Appraisal Report, published May 2019, the Rail Delivery Group has recently consulted with passengers on the approach to fares setting among rail franchisees. Transport Scotland will consider RDG’s recommendations alongside the reviewed NTS to determine the best approach to fare setting in future at a national level, encompassing Fife and the rest of Scotland, rather than changing fares on individual routes in isolation.

Rail Rolling Stock Sensitivity Tests Analysis

7.5.26 There is uncertainty around whether the best performing rail option [i.e. Rail Option 6D] would require additional rolling stock to deliver the service or whether it could be delivered using the existing ScotRail fleet. If this option is taken forward, this would need to be explored and analysed in detail during the GRIP process. However, the rail rolling stock sensitivity tests described above were undertaken to understand the sensitivity of changes to rolling stock lease

charges and operating costs, and therefore the monetised Benefit to Cost ratio, should existing rolling stock be made available and able to be deployed to deliver the best performing rail option.

- 7.5.27 The core scenario assumes that additional rolling stock would be required to operate the service to and from Leven. It therefore represents a worst-case scenario in terms of rolling stock needed to meet the service requirements of the proposed scheme. Estimated costs associated with this additional rolling stock included staff costs, fuel costs, rolling stock lease charges and track access charges.
- 7.5.28 The first sensitivity test assumes that rolling stock is available within the current ScotRail fleet and it assumes that no additional rolling stock lease charges would be incurred to operate the service to and from Leven – these charges would therefore already be incurred in the Do-Minimum scenario. There could, however, be other costs / charges such as staff costs, fuel costs and track access charges depending what the rolling stock was used for in its existing role and these have been included in this sensitivity test. Therefore, the overall estimated operating costs in this first sensitivity test are lower than those in the core scenario, resulting in the BCR increasing from 1.5 in the 'core' scenario to 1.6.
- 7.5.29 The second sensitivity test assumes that there would be no additional operating costs to deliver the best performing rail option. It is assumed that the existing rail rolling stock that would be deployed to deliver the service would already incur all the operating costs, including all staff costs, fuel costs, rolling stock lease charges and track access charges. Therefore, no additional operating costs would be incurred once it is deployed to provide the service to and from Leven. In this test, the reduction in operating costs compared to the 'core' scenario results in the BCR increasing from 1.5 to 2.1.
- 7.5.30 It is clear that the sensitivity test results in terms of economic performance of the best performing rail option [Rail Option 6D] are resilient to changes in rolling stock assumptions.
- 7.5.31 Full TEE tables for the Rail Rolling Stock sensitivity tests are included in Appendix E to this report.

8 Summary and Recommendations of Detailed Options Appraisal

8.1 Introduction

- 8.1.1 This Detailed Options Appraisal has assessed, in quantitative and qualitative terms, the multi-modal transport options brought forward from the Preliminary Options Appraisal stage of the Levenmouth Sustainable Transport Study.
- 8.1.2 In line with STAG guidance, it has considered the performance of each option against SMART Transport Planning Objectives (TPOs); the impacts of the options against the five STAG Criteria; a detailed assessment of the net cost of each option from a public spending perspective; and a detailed analysis of the risk and uncertainty associated with each option.

8.2 Summary

- 8.2.1 The Detailed Options Appraisal findings are summarised for each of the options as follows:

Option 2 – Improve Local Bus Services

- 8.2.2 Overall, Option 2 performs well (major benefit) against TPO1, to improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area. This is not unexpected given that this option is focussed on improvements to local bus services and access to facilities within the Levenmouth area.
- 8.2.3 Option 2 has a moderate benefit against TPO2, to improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population. It would provide greater accessibility to Leven and, via connecting services, beyond by increasing local bus service frequencies at certain times of the day and introducing other services earlier and later in the day.
- 8.2.4 Option 2 scores a moderate benefit under TPO3, which aims to increase the sustainable mode share for the residents and workforce in the Levenmouth area. It would encourage a shift from private car to public transport for some people making local trips. It would augment existing bus services and increase opportunity to travel by bus. It would also provide opportunities for people to use public transport earlier in the day and later in the evening when current services are limited.
- 8.2.5 Against the STAG criteria, Option 2 is likely to have a neutral impact against most environment sub criteria, albeit it is likely to have a minor benefit impact on noise and vibration (through reductions in traffic flows). Against global and air quality sub criteria there could be a minor benefit or minor negative impact: there would be benefits as people switched from car to bus for local trips, however additional and re-routing of services could outweigh the beneficial impact of modal shift from car. Against the safety criterion, Option 2 scores a minor benefit as there will be a small improvement in security due to enhancements in bus facilities, such as lighting at bus stops and increased natural surveillance from increased passenger numbers on board and at bus stops. Option 2 scores a moderate benefit overall for integration, generating benefits from better integrating bus services (transport integration), supporting local development plans (land-use integration) and consistency with several local, regional and national policies e.g. environment, inclusiveness/equality and disabilities (policy integration). Option 2 also scores a moderate benefit under accessibility & social inclusion criterion, by improving public transport connections to local services, such as health and employment (community accessibility) and supporting disadvantaged groups in an area of relatively high social deprivation (comparative accessibility). Particularly those in settlements who require access to Leven.

- 8.2.6 No significant technical issues related to the implementation of Option 2 are anticipated. In terms of deliverability, Option 2 would require reconfiguration of existing bus timetables and potentially additional bus fleets. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.
- 8.2.7 It is expected that Option 2 would have public support in terms of it enhancing the current bus network as issues around current local bus services were raised by a number of people in response to the public survey – over half of all respondents said that the length of travel times, frequency of services and timetable hours were having a negative impact on their ability to travel within the Levenmouth area. It is anticipated, however, that it would not fulfil widespread aspirations around the public transport offering for the area, and particularly public transport services beyond the Levenmouth area.
- 8.2.8 In terms of economic value for money against the STAG criteria, Option 2 has a benefit to cost ratio of 1.5. Added to this it generates a range of minor to moderate social benefits and is, in the main, neutral in terms of environment.

Option 3 – Improve Bus-Rail Connections

- 8.2.9 Option 3 performs well against the TPOs but less well than Option 2. Against TPO1, improved bus services to the rail station at Markinch would include additional local stops, resulting in minor benefits. This option would also provide journey time benefits for some areas currently experiencing relatively poor access to the bus network, but not as much as Option 2.
- 8.2.10 Against TPO2, Option 3 scores a moderate benefit. It would provide improved access to and from the national rail network and would also provide improved access to jobs and other facilities / services outside the Levenmouth area. It would equally support access to the area.
- 8.2.11 Against TPO3, Option 3 scores a minor benefit. Improved access to the rail network would promote sustainable transport use, both in terms of people who would otherwise drive to the rail station and those who would previously make the whole journey by car but now switch due to better integration between bus and train.
- 8.2.12 Against the environment STAG criterion, Option 3 performs very similar to Option 2, with most impacts scoring neutral. There are minor benefits scored against noise and vibration and global air quality as people switch to buses from cars. Local air quality could have minor benefit or minor negative: improved services will encourage people to switch to bus from car, but changes to routing in the urban areas of Buckhaven, Methil and Leven as well as, for example, Markinch have the potential for negative effects in the immediate vicinity of these locations. Similar to Option 2, there is a minor benefit for Option 3 in terms of safety, also driven by improved lighting at bus stops and increased natural surveillance from more passenger numbers. Option 3 scores a moderate benefit under integration, with the same scoring for transport integration, land use and transport integration and policy integration as Option 2. Option 3 scores a moderate benefit for accessibility & social inclusion. For community accessibility the option enhances connections to the rail network and therefore improving access to destinations beyond the Levenmouth area. Similarly, for comparative accessibility, those living in the deprived areas of Levenmouth will have improved access to services beyond the Levenmouth area via the three stations.
- 8.2.13 No significant technical issues related to the implementation of Option 3 are expected. This option would require reconfiguration of existing bus timetables and potentially additional bus fleets. Currently, bus operations within the Levenmouth area are focused on integrating timetables of bus services – in practice, better integration may be achieved through higher bus frequencies. This option would require negotiation and agreement with public transport operators regarding service provision, including integration of bus and rail timetables.
- 8.2.14 It is expected that Option 3 would have an element of public support in terms of it enhancing the bus network and integrating bus and rail services, although, similar to Option 2, it is

anticipated that it would not fulfil widespread aspirations around the public transport offering for the area.

- 8.2.15 In terms of performance against the economic criterion, the monetised benefits generated by Option 3 are outweighed by the costs, with a benefit cost ratio of 0.5. While the costs associated with this option are lower than Option 2, the monetised benefits generated by improving bus services to the rail network, such as at Markinch, are also lower than those generated by improving local bus services. The BCR is therefore lower than Option 2.
- 8.2.16 While Option 3 will also have social and environmental benefits, these are no greater than Option 2 and will therefore not provide a better overall value for money solution. It also does not perform any better against any of the TPOs than Option 2.

Option 4 – Improve Regional Bus Services

- 8.2.17 In terms of performance against the TPOs, Option 4 scores the same against each of the TPOs as Option 3, with a minor benefit against TPO1, a moderate benefit against TPO2 and a minor benefit against TPO3. The moderate benefit against TPO2 is generated by the option improving regional bus links – reducing regional bus journey times, offering a more competitive alternative to the private car and enhancing accessibility and connectivity to employment areas in, for example, Dundee and St Andrews. It would also improve access to important key public services such as health and education.
- 8.2.18 In terms of performance against the STAG criteria, Option 4 scores the same as Options 2 and 3, with neutral impacts against most of the sub criteria and minor benefits against noise and vibration and global air quality. Against safety, Option 4 again scores the same as the other bus options 2 and 3, with a minor benefit generated by improved security at bus stops. Option 4 scores least well under integration. While it scores positively against all integration sub criteria, the benefits are minor for each. Improving regional services does not have as much of an impact on transport integration or policy integration as improving local bus services and integrating them with regional services or integrating buses with rail stations. Option 4 scored a moderate benefit under community accessibility by enhancing public transport network coverage through improvements to regional bus services. In terms of comparative accessibility, the improvements of bus links generate a minor benefit to socially excluded groups.
- 8.2.19 No significant technical issues related to the implementation of Option 4 are expected. Like Option 3, this option would require reconfiguration of existing bus timetables but no additions to the bus fleet. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.
- 8.2.20 It is expected that Option 4 would also have an element of public support in terms of it enhancing the current bus network and improving regional connections, although it is anticipated that it would also not fulfil the wider aspirations around the public transport offering for the area.
- 8.2.21 In terms of economic performance, the present value of benefits generated by this option at £2.43m are higher than Option 3 (£0.54m) but lower than Option 2 (£8.49m). However, there are negligible additional costs associated with this option as it is assumed that the proposed services could essentially be delivered with existing resources. This means that the Option performs well against the economic criterion. However, the economic benefits generated are relatively small, the social benefits are not as high as the other options and the option also does not perform as well against the TPOs.

Option 6 – Re-open existing rail line to passengers

- 8.2.22 Option 6 scores a minor benefit against TPO1. This is lower than Option 2 and the same as Options 3 and 4. While there would be benefits for those accessing local service, they are likely to be relatively small and be restricted to those arriving in Leven by rail. Against TPO2, Option 6 performs the best of all options, with a major benefit. This option would improve access to the

rail network for local residents and enhance business and tourist access to the Levenmouth area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. The Option scored a moderate benefit against TPO3. This was equal to Option 2 and higher than options 3 and 4. Option 6 would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Under this option, the transport model forecasts increased use of public transport and therefore more sustainable travel options.

- 8.2.23 Against the environmental criterion Option 6 performs least well under several sub-criteria, such as noise and vibration, geology, landscape and visual amenity and neutral in others e.g. agriculture and soils and cultural heritage. The minor negatives reflect the impacts associated with the construction and operation of the new rail line, however many of these impacts could be reduced through mitigation. Option 6, however, scored a moderate benefit under global air quality and local air quality due to people switching mode from car to rail. Option 6 scores a minor benefit against safety and has a positive impact on security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities. In terms of integration, Option 6 generates a moderate benefit overall against the integration criterion. It scores a moderate benefit under transport integration, minor benefit under land use integration and major benefit under policy integration. The latter was the highest of all options due to the strong linkages with local and national policies on inclusion, environment and economy.
- 8.2.24 Under accessibility & social inclusion, Option 6 scores a major benefit, the highest of all options. This was split as a moderate benefit under community accessibility and a major benefit under comparative accessibility. For the former, all rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife [e.g. Kirkcaldy and Glenrothes] and beyond, particularly Edinburgh. For comparative accessibility, the rail options under Option 6 will provide a major benefit. Information gathered through the engagement exercise, particularly with schools, suggested that particular groups were being socially excluded due to the current provision of public transport. Anecdotal evidence suggests that some secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh daily by public transport while living at home. It was also suggested that the return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact, as having very few students living locally dampens expectations of school pupils as they do not see that as the norm and attainable. Anecdotal evidence also suggested that some primary school children are being excluded from access to cultural and education experiences, such as the National Museum in Edinburgh, because buses are not feasible for large primary school groups and hiring private coaches is too costly within existing school budgets. Also, there was anecdotal evidence of some primary school children never having a visit to Edinburgh by the time they had started secondary school, which was unusual compared to other schoolchildren in Fife at a school or living in an area with access to rail services.
- 8.2.25 Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. However, these challenges are not likely to be a major obstacle and can be overcome given the previous existence of rail services along the route. A substantial amount of rail infrastructure is already in place.
- 8.2.26 Option 6 has significant public support and has received backing from residents, including a local rail campaign group, and businesses via the surveys carried out to inform the appraisal. The local community would support this option.

8.2.27 In terms of economic performance, the monetised benefits generated by Options 6A and 6B (with one service per hour) do not outweigh the costs with BCRs of 0.4 and 0.4 respectively. The BCRs of Options 6C (two services per hour and one station at Leven) and 6D (two services per hour and stations at Leven and Cameron Bridge), however, are 1.1 and 1.5 respectively. Option 6D is the best performing option in terms of economic performance. It also performs well against several of the social (integration and accessibility & social inclusion) and environmental impacts and therefore overall value for money.

8.3 Uncertainty analysis

8.3.1 Scenario and sensitivity tests were undertaken to test the vulnerability of the options to future uncertainties which are unavoidable. The scenario test using alternative travel demand has shown that Bus Option 2 and Rail Option 6D would provide the highest level of benefits of all bus options and rail options respectively and also the highest BCRs [i.e. 2.3 and 0.9 respectively] in this test. The sensitivity testing using higher rail fares has shown that the economic performance of Option 6D is still resilient in comparison to the core assessment with benefits that outweigh its costs. Similarly, the sensitivity tests using lower operating costs associated with additional rail rolling stock to meet the service requirements of Option 6D also remains resilient with BCRs increasing from 1.5 in the core assessment to 1.6 or 2.1. The scenario and sensitivity tests have therefore shown that Option 2 and Option 6D provides consistent economic performance when compared to the core assessment and the other options, and that both options are resilient to changes in assumptions tested for travel demand, rail fares and rail rolling stock.

8.4 Conclusions and Recommendations

8.4.1 Option 2 performs best against TPO1 and Option 6 performs best against TPO2. Both options perform equally well against TPO3 (moderate benefit) and higher than the other options (3 and 4).

8.4.2 Both options also perform better, in the main, than the other options when assessed against the STAG criteria, albeit for different reasons. The improvements to local bus services will support accessibility to services located in Leven, while the re-introduction of the rail line from Leven will improve accessibility to services outside the Levenmouth area, particularly employment. Local and regional accessibility issues were highlighted during the engagement and online surveys and the evidence shows that areas of Fife such as Dunfermline and Kirkcaldy have much greater access to employment opportunities within an hour using public transport (up to 450,000 jobs) compared to Levenmouth (up to 80,000 jobs) which is the fourth largest populated area of Fife. This is important at a time when more locals are having to travel further afield for employment due to the decline in traditional industries which have not been replaced by a sufficient number of new businesses locating and investing in the area. It is also important given the relatively low number of local households with access to a car.

8.4.3 Both the local bus improvements and rail options generate economic benefits greater than costs over the 60-year appraisal period. Under the core assessment, the improvements to local buses generate a BCR of 1.5 and the preferred rail option also generates a BCR of 1.5. The economic benefits therefore outweigh the costs. Option 6D resulted in the highest level of economic benefits in comparison.

8.4.4 In addition to the economic benefits, both options generate a range of environmental, safety, integration and social inclusion & accessibility benefits, thus offering the best overall value for money. While the focus of the appraisal of rail options has been on rail passenger services, rail freight is a potential future opportunity.

8.4.5 Overall, options 2 and 6 together are the best performing in terms of meeting the TPOs and against the STAG criteria, thus offering the greatest overall value for money in economic, social and environmental terms. Option 6D has emerged as the highest overall value for money option.

- 8.4.6 Overall, the appraisal demonstrates that a package of transport measures comprising improved local bus services, the reintroduction of the rail link for passenger services and an improved active travel option provides the most optimum transport solution to address the evidenced problems in the Levenmouth area and help realise a number of opportunities. This fully integrated transport solution is the best performing solution to meet all of the study objectives and therefore meet the needs of people and businesses in the Levenmouth area. This integrated transport solution provides the most optimal overall value for money solution on social, economic and environmental terms. It is therefore recommended that these three options are worthy of further consideration by Transport Scotland.

Appendix A Option Assumptions

Appendix A provides details of the assumptions for each option.

Option 2
 Type of Option: Accessibility
 Title: Improve local bus services
 Description: Improve local bus services connecting towns in the Levenmouth area to Leven

Option 2
 ● Existing Bus Station
 — Improving Local Bus Services

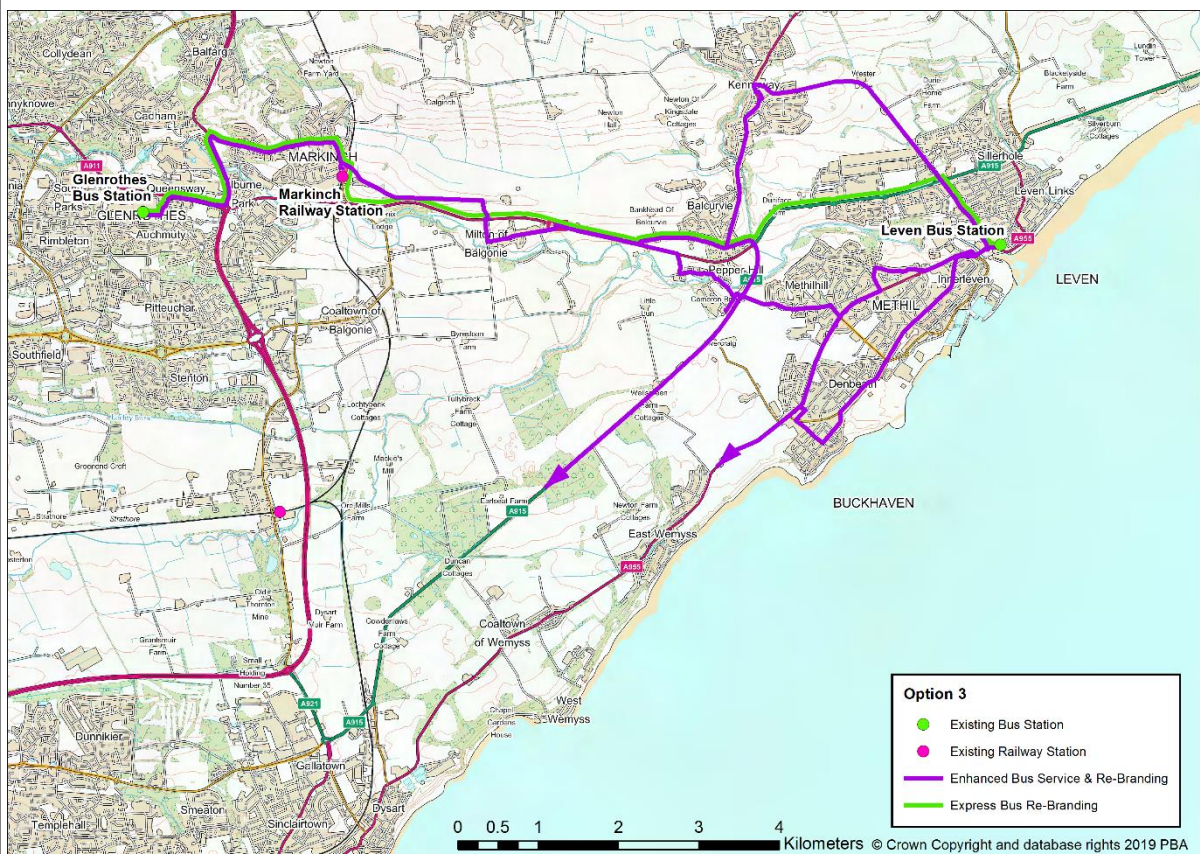
0 0.25 0.5 1 1.5 2 Kilometers © Crown Copyright and database rights 2019 PBA

Indicative layout for illustrative purposes only

This option would involve improving local services linking Leven with Methil and Lower Methil, particularly services 9 and 9A between Methil and Lower Methil and Leven.

Frequencies – the service frequency of services 9 and 9A was increased by adding one bus per hour to each service, resulting in a greater level of service within Levenmouth.

Option 3
 Type of Option: Accessibility
 Title: Improve bus-rail connections
 Description: Improve bus services to Markinch rail station and Glenrothes



Indicative layout for illustrative purposes only

This option includes improvements to bus service 44B serving Markinch rail station and Glenrothes via Buckhaven.

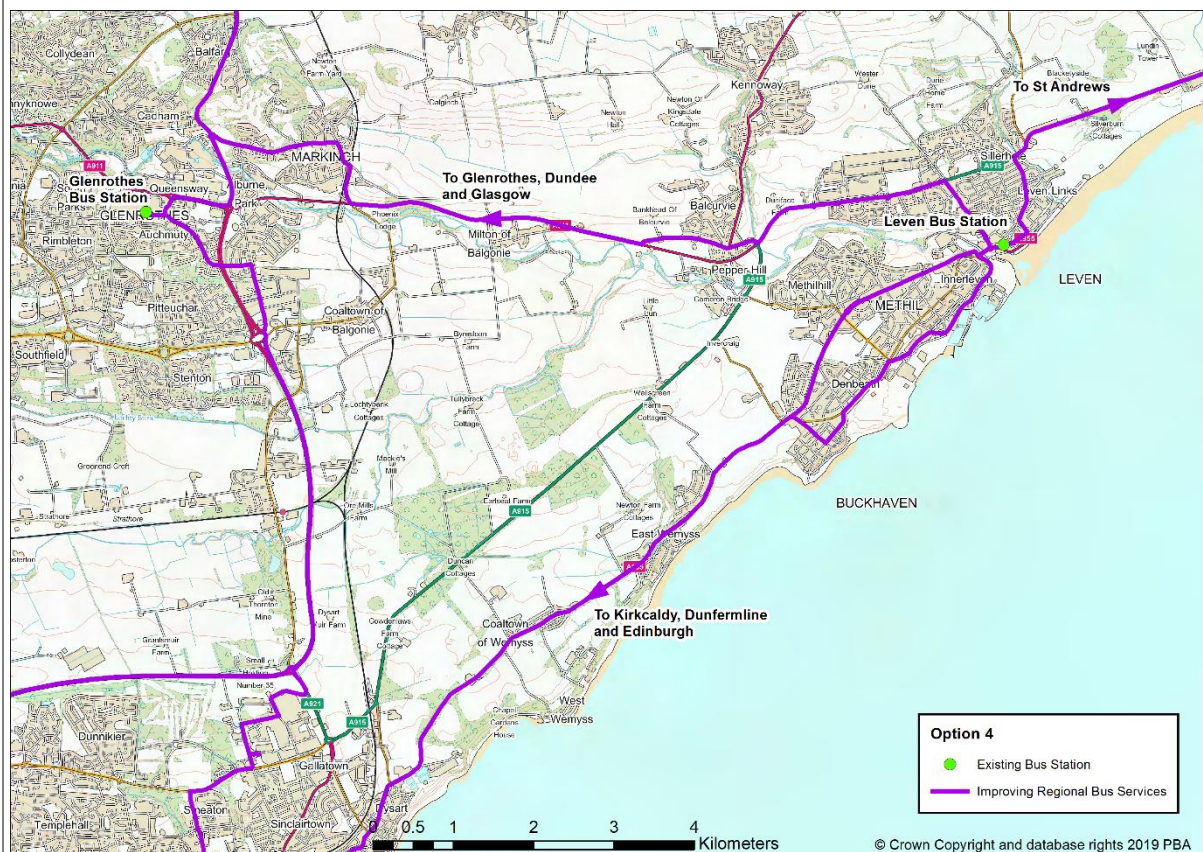
Frequencies – Service 44B hours of operation were extended to cover the morning time period [i.e. 7am to 10am], providing an overall increase in frequency during this time period and hence a greater level of service.

Option 4

Type of Option: Accessibility

Title: Improve regional bus services

Description: Improve regional bus services linking Leven with St Andrews and Dundee



Indicative layout for illustrative purposes only

This option would be aimed at improving linkages to areas beyond the Levenmouth area. The frequency of existing bus services would be increased, and more direct services would be run between Leven and St Andrews and Dundee. The improvements would essentially include removing stops to speed up services and / or slight variations on some services on a route (perhaps alternate departures) to capture passengers from other areas rather than any new services.

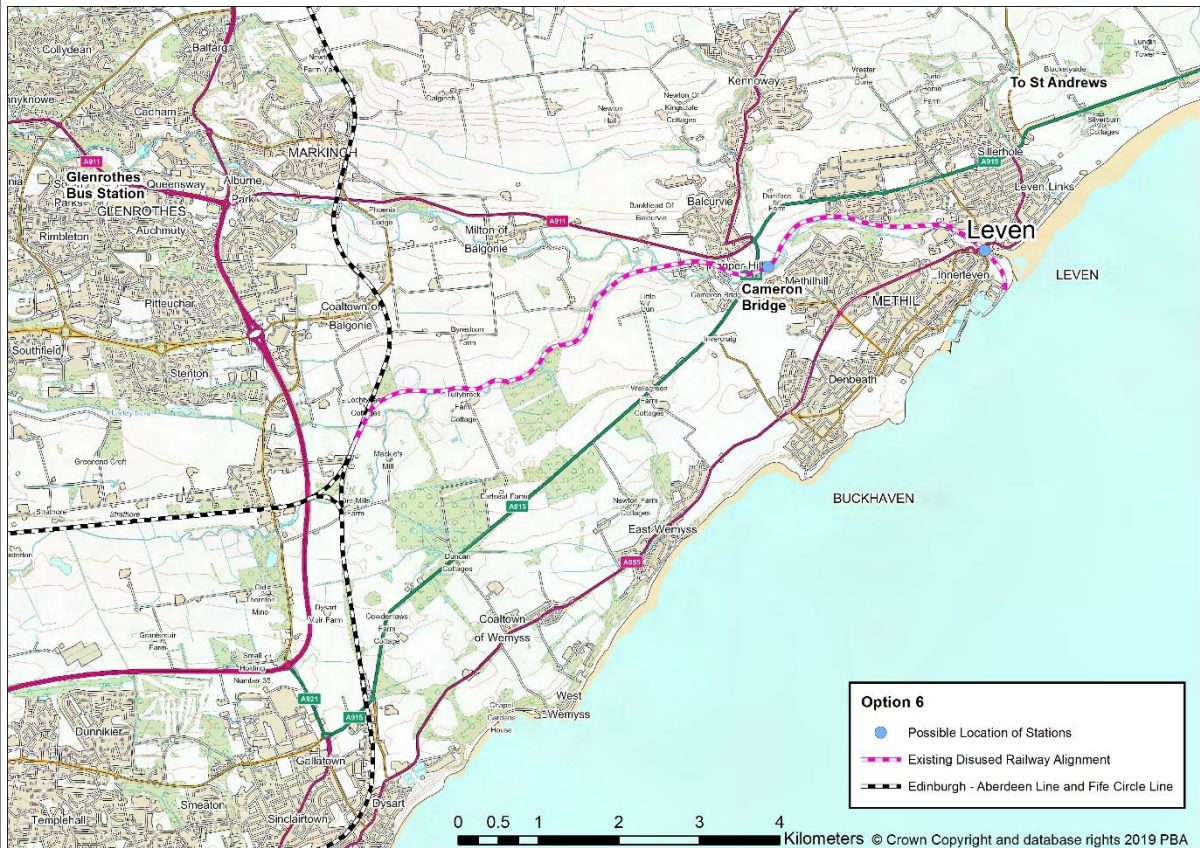
Frequencies – the frequency of this ‘new’ service is the same as the existing service 97.

Option 6

Type of Option: Public Transport

Title: Re-open existing rail line to passengers only

Description: Provision of a passenger only rail line along the alignment of the existing, disused, rail line between Thornton North Junction and Leven



Indicative layout for illustrative purposes only

This option would involve re-opening the existing, disused, rail line to passenger services between Leven and the existing mainline. Passenger services would be served by a new service or the extension / diversion of existing rail services. Sub-options would include the development of a rail station at Leven and Cameron Bridge, summarised as:

- a) Passenger only rail option, with a station provided at Leven only.
- b) Passenger only rail option, with stations provided at Leven and Cameron Bridge.

Service Route, Stopping Patterns and Frequency Assumptions

Variant	From	To	via	Frequency	New Station(s)	Comments / Assumptions	Journey time (mins)
A	Edinburgh	Leven	Kirkcaldy	1 train per hour	Leven	<ul style="list-style-type: none"> Extend current Edinburgh to G-w-T terminating service via Kirkcaldy to Leven - service will not stop at G-w-T Assumed journey time of 18 minutes from Kirkcaldy to Leven [assumes 10mins run time on branch line] All stops expect Edinburgh Gateway 	70
	Leven	Edinburgh	Kirkcaldy	1 train per hour			69
B	Edinburgh	Leven	Kirkcaldy	1 train per hour	Leven and Cameron Bridge	<ul style="list-style-type: none"> Extend current Edinburgh to G-w-T terminating service via Kirkcaldy to Leven - service will not stop at G-w-T Assumed journey time of 20 minutes from Leven to Kirkcaldy [assumes 12mins on branch line due to stop at Cameron Bridge] All stops expect Edinburgh Gateway 	72
	Leven	Edinburgh	Kirkcaldy	1 train per hour			71
C	Edinburgh	Leven	Kirkcaldy	1 train per hour	Leven	<ul style="list-style-type: none"> Extend current Edinburgh to G-w-T terminating service via Kirkcaldy to Leven - service will not stop at G-w-T Assumed journey time of 18 minutes from Kirkcaldy to Leven [assumes 10mins run time on branch line] All stops expect Edinburgh Gateway 	70
	Leven	Edinburgh	Kirkcaldy	1 train per hour			69
	Edinburgh	Leven	Dunfermline	1 train per hour	Leven	<ul style="list-style-type: none"> Extend current Edinburgh to Cowdenbeath terminating service via Dunfermline to Leven - extended service will stop at Lochgelly, Cardenden, G-w-T Assumed journey time of 12 minutes from G-w-T to Leven [assumes 10mins run time on branch line] All stops expect Edinburgh Gateway 	75
	Leven	Edinburgh	Dunfermline	1 train per hour			74
D	Edinburgh	Leven	Kirkcaldy	1 train per hour	Leven and Cameron Bridge	<ul style="list-style-type: none"> Extend current Edinburgh to G-w-T terminating service via Kirkcaldy to Leven - service will not stop at G-w-T Assumed journey time of 20 minutes from Leven to Kirkcaldy [assumes 12mins on branch line due to stop at Cameron Bridge] All stops expect Edinburgh Gateway 	72
	Leven	Edinburgh	Kirkcaldy	1 train per hour			71
	Edinburgh	Leven	Dunfermline	1 train per hour	Leven and Cameron Bridge	<ul style="list-style-type: none"> Extend current Edinburgh to Cowdenbeath terminating service via Dunfermline to Leven - extended service will stop at Lochgelly, Cardenden, G-w-T Assumed journey time of 14 minutes from G-w-T to Leven [assumes 12mins run time on branch line] All stops expect Edinburgh Gateway 	77
	Leven	Edinburgh	Dunfermline	1 train per hour			76

Rail Fares

- Leven and Cameron Bridge rail fares are modelled the same as those from Glenrothes-With-Thornton station plus 50p.
- Modelled rail fares are in 2010 prices meaning 50p today is 43p in 2010 prices using 2019 GDP deflator⁶.
- Rail fare to / from Leven and Cameron Bridge to Glenrothes-With-Thornton is modelled the same as Glenrothes-With-Thornton to Kirkcaldy.
- Rail fare from Leven to Cameron Bridge (and vice versa) is £1.

Park and Ride

- 100 free spaces at Leven
- 100 free spaces at Cameron Bridge

⁶ <https://www.gov.uk/government/publications/tag-data-book>

Appendix B Transport Modelling Approach

Transport Modelling

Transport modelling has helped support the appraisal of the options against Environment, Safety, Economy, and Accessibility and Social Inclusion criteria. The options appraisal against Integration criteria was qualitatively assessed.

A range of transport options were developed as part of this study. Each option was considered in terms of its appropriateness to be appraised within a transport model. The transport model that was available for application was the SEStran Regional Model (SRM). The most recent version, SRM12, which was developed by SYSTRA on behalf of Transport Scotland in late 2018 includes model forecast years of 2022, 2027, 2032 and 2037.

The SRM12 model is a strategic multi-modal transport model representing the principal road network, bus services and all rail services across South East Scotland. The model has been calibrated and validated to represent 2012 transport conditions. The model forecasts assume that only those road and public transport interventions that are currently committed are delivered and therefore coded into the model.

The land-use projections inherent in the forecasts years have made use of the Assembly of Planning Policy Inputs 2014 (APPI2014) data collected by Transport Scotland from all local authority planning departments, and data used for the SESplan Strategic Development Plan (SDP) Cross Boundary Study (CBS). This information has fed into the Transport and Economic Land Use Model of Scotland 2014 (TELMoS14), providing forecast household, population, employment and transport demand data to SRM12. The forecast scenario contains predicted travel demand associated with the delivery of a proportion of the local development plan (committed and non-committed sites) within each forecast year.

Model Review

A review of the model was undertaken to establish a model that appropriately reflected current 'real world' conditions in and around the sphere of influence of the Levenmouth area so that the model did not unduly under/overestimate option benefits during the detailed appraisal stage.

The review included identifying changes in road network infrastructure and public transport service provision that have occurred between 2012 and the present day in and around the Levenmouth area, as well as the wider Fife area. Any proposed model changes that were deemed relevant and significant to include in SRM12 were coded into the forecast year networks. Examples included:

Road network supply:

- delivery of new road schemes, including capacity improvements;
- revised junction configurations, including signal timings;
- speed limit changes; and
- infrastructure to support build-out of new development sites.

PT service provision:

- changes to local and regional bus services, including routes, stopping patterns, frequencies and fares;
- changes in rail services, including routes, stopping patterns, frequencies and fares;

- new bus lanes; and
- new P&R sites.

A review of TELMoS planning data inputs was undertaken to determine how developments contained within FIFEplan were modelled within the Levenmouth area:

Table 28: Residential and Commercial Developments, Levenmouth Area (FIFEplan 2017)

Reference	Location	Area (ha)	Description	Est. Capacity
LEV 001	Leven Vale South	3.1	Housing	75
LEV 002	Leven Vale West	11.0	Housing	200
LEV 003	Land at Cupar Road	5.4	Housing	100
LEV 004	Mountfleurie	1.2	Employment	-
LEV 006	Former Gasworks site	0.4	Development opportunity	-
LEV 007	Former Threeways Inn/North Street Gap Site	0.4	Development opportunity	-
LVA 001	Sea Road, Muiredge, Percival Road	107.5	Strategic Land Allocation	1,650

Model Inputs and Assumptions

Time Periods

SRM12 covers three modelled time periods within a “typical” average weekday as follows:

- Average AM Peak hour between 7am and 10am
- Average Inter-Peak hour between 10am and 4pm
- Average PM Peak hour between 4pm and 7pm

A “typical” average weekday covers neutral months of the year, [i.e. outside of holiday periods and excluding weekends]. The model does not represent off-peak (7pm-7am), weekend (Saturday 24 hour and Sunday 24 hour) or holiday travel conditions.

Forecast Years

Four forecast years were developed by SYSTRA for SRM12 based on the strategic growth forecasts taken from TELMoS and the Transport Model for Scotland 2014 (TMfS14) for the future years of 2022, 2027, 2032 and 2037. Three of these forecast years were used in the assessment of the recommended multi-modal transport options for detailed appraisal: 2022, 2027 and 2037.

Future Year Do-Minimum Networks

The SRM12 model networks for the proposed options were based on the Do-Minimum network scenarios for each of the forecast years. The Do-Minimum scenarios represent the current road network infrastructure along with committed, future year wider area network improvements and traffic and travel demand growth forecasts. The Do-Minimum scenario has formed the benchmark to compare the recommended options, with the resultant impacts feeding into the STAG criteria assessments, where relevant.

Given the geographical coverage of SRM12, not all future year transport interventions outside of the model extents, which could potentially impact on Fife, can be included in the model. However, such interventions and the likely traffic and travel impacts are included in TMfS14 and are therefore taken account of in SRM12 through the cordoning process used to develop the future year travel demand forecasts. The Do-Minimum road and public transport infrastructure interventions that were included in the model are shown in Tables 29 and 30 respectively below.

Table 29: Road Interventions, Do-Minimum Network

ID	Year	intervention	Local Authority
R1	2017	Wester Inch - Bathgate Town Centre Link Road	West Lothian
R2	2017	Access to B6454 Pinkie Road	Edinburgh
R3	2017	M9 Junction 1a improvements	West Lothian
R4	2017	Grangemouth - Earl's Gate Roundabout upgrade	Falkirk
R5	2017	Haymarket Area Road Layout	Edinburgh
R6	2017	Princes St Area Road Layout	Edinburgh
R7	2017	B800 signals at Kirkliston	Edinburgh
R8	2017	20 mph schemes	Edinburgh
R9	2017	Urbanisation of the A7 Hardengreen to Gilmerton Road Roundabout	Midlothian
R10	2017	Improvements to A701 Corridor (Midlothian)	Midlothian
R11	2017	Houston Road-Drumshoreland Link Road at Pumpherston	West Lothian
R12	2017	A68 Soutra - Oxton Road Improvement	Scottish Borders
R13	2017	Access to Brodie Road & Slips to A1 at Dunbar	East Lothian
R14	2017	Access to B1347	East Lothian
R15	2017	Edinburgh 20mph zones	Edinburgh
R16	2017	Queensferry Crossing	Edinburgh
R17	2022	New right turning lane added at A702/Bush Loan junction	Midlothian
R18	2022	Signalisation of A701/Mauricewood Road junction	Midlothian
R19	2022	New roundabout at A702/Mauricewood Road junction	Midlothian
R20	2022	A89 Distributor Road between Clarkson Road and Greendykes Road	West Lothian
R21	2022	Bus priority and new signalised junction at the A71/B7031 junction	West Lothian
R22	2022	Bus priority and new signalised junction at the B7015/A71 junction	West Lothian
R23	2022	Junction improvements on B8020 at Broxburn and Newton	West Lothian
R24	2022	Winchburgh Distributor Road connection to East Broxburn	West Lothian
R25	2022	Speed limit on B9080 reduced from 60mph to 30mph (partially)	West Lothian
R26	2022	A801 Avon Gorge	West Lothian
R27	2022	Access to A6094 North of A1 & to A199 East of A6094	East Lothian
R28	2022	Access to B6471 & A6093 & new link road	East Lothian
R29	2022	New slip road access to/from A1 Northbound with underpass connection	East Lothian
R30	2022	Access to Edinburgh Road at Prestongrange Road & further East along B1361	East Lothian
R31	2022	A1 Intersection at A199 signal improvements	East Lothian
R32	2022	Signalisation of Bankhead Roundabout	Fife
R33	2022	Signalisation of Preston Roundabout	Fife
R34	2022	New junction on the M9 (Winchburgh)	West Lothian
R35	2022	Signalisation of Bothwell Gardens Roundabout with a Reconfigured Layout	Fife
R36	2022	Signalisation of Redhouse Roundabout	Fife
R37	2022	Signalisation of Pitreavie Roundabout	Fife
R38	2022	Widen southbound approach to Pitreavie roundabout	Fife
R39	2022	A68 Pathhead to Tynehead Junction	Midlothian
R40	2027	Signalisation & Upgrading Leslie Road Corridor	Fife
R41	2027	Signalisation of Gallatown Roundabout	Fife
R42	2027	Distributor Road linking the A706 at Blaeberryhill to the B7066 at Cultsykefoot	West Lothian
R43	2027	A71 bypass north of Wilkieston (Calderwood development)	West Lothian
R44	2027	Levenmouth Link Road	Fife
R45	2027	Signalisation of Standingstane Road/Windygates Road Junction	Fife
R46	All	Development access points	All

Source: SRM12: 2014-2037 Forecasting: Transport Intervention Information Note, SYSTRA, June 2018

Table 30: Public Transport Interventions, Do-Minimum Network

ID	Year	intervention	Local Authority
P1	2017	Rail service improvements between Edinburgh & London	Edinburgh
P2	2017	Edinburgh TRAM (Phase 1a)	Edinburgh
P3	2017	Removal of X48 bus service	Edinburgh
P4	2017	Lothian 20 bus service	Edinburgh
P5	2017	Re-opening of Borders Railway line	Borders, Midlothian, Edinburgh
P6	2017	Edinburgh Gateway Station	Edinburgh
P7	2017	EGIP No change to current service.	All
P8	2017	Journey Time Improvements Journey Time Metrics Table (page 413)	All
P9	2022	Winchburgh Rail Station	West Lothian
P10	2022	Winchburgh park and ride/interchange facilities	West Lothian
P11	2022	Edinburgh Glasgow Rail Improvement Programme	Edinburgh
P12	2022	Forth Crossing Public Transport Strategy	Edinburgh
P13	2022	EGIP End to End and Dunblane to Edinburgh JT improvements	All
P14	2022	Station Car Parking Spaces Increased provision of car-park spaces (page 133)	All

Source: SRM12: 2014-2037 Forecasting: Transport Intervention Information Note, SYSTRA, June 2018

Forecasting

Land Use

The same land-use assumptions were used in the Do-Minimum (without Option) and Option scenarios.

Induced Travel Demand

A 'fixed travel demand' approach was adopted for testing Option 2 to Option 4 inclusive, as these options have not generated a significant level of induced trips. The key reason for this is that these options have not significantly increased road capacity or PT services and therefore significant changes in traffic and travel patterns are not evident in SRM12.

A further factor in using fixed demand analysis for public transport is that modal shift responses in SRM12 tend to come from PT sub-mode choice [i.e. if there is an improvement to rail, non-car available travellers may use rail instead of bus; if there is an improvement to bus, non-car available travellers may use bus instead of rail]. Any modal transfer from car to public transport can only function for those that have a car available and there generally needs to be a significant reduction in the generalised cost for public transport to influence modal shift.

Option 6 was expected to generate some level of induced travel demand and therefore a 'variable travel demand' approach was adopted. Table 31 below presents the modelling approach for each option.

Table 31: Fixed or Variable Demand Approach for Option Scenarios

Option Ref.	Type	Title	Description	Modelling Approach
2	Accessibility	Improve local bus services	Improve local bus services connecting towns in the Levenmouth area to Leven	Fixed Demand
3	Accessibility	Improve bus-rail connections	Improve bus services to Markinch rail station and Glenrothes	Fixed Demand

Option Ref.	Type	Title	Description	Modelling Approach
4	Accessibility	Improve regional bus services	Improve regional bus services linking Leven with St Andrews and Dundee	Fixed Demand
6	Public Transport	Re-open existing rail line to passengers only	Provision of a passenger only rail line along the alignment of the existing, disused, rail line between Thornton North Junction and Leven	Variable Demand

WEIs and Agglomeration

The non-quantified economic benefits were not considered in the economic assessment as discussed in Chapter 5.

Uncertainty Analysis

Uncertainty analysis was used to test the vulnerability of the transport options to future uncertainties. Given the inherent uncertainty in forecasting procedures and that the assessment year is nearly 20 years hence, it is good practice to conduct sensitivity tests to consider other ‘what if’ scenarios to determine the robustness of the modelled option impacts. These sensitivity tests have assisted in creating a range of economic benefit-to-cost ratios and help mitigate the risk of predicting a single outcome from the assessment. The uncertainty analysis included an alternative travel demand growth scenario, hence varying the forecast travel demand from the “core” SRM12 forecasts, two rail rolling stock sensitivity tests and a rail fares sensitivity test. Each is described below.

Defining Alternative Travel Demand Growth Scenarios

A single forecast scenario is provided with the SRM12 model and therefore a pragmatic alternative was required to consider variations in future levels of travel demand which could be attributed to different levels of population growth or employment being achieved.

A review of the standard SRM12 forecast land-use scenario concluded that committed *and* non-committed development (as submitted in the APPI14 data) was included in the forecasts. This forecast scenario can be considered as a “high growth” land use scenario. A further scenario was prepared that contained lower levels of travel demand than the standard SRM12 land-use scenario:

- **“Alternative Growth” Scenario Test** – this test took account of changes to land-use and development set out in the Fife local development plan “capped” at 2022 levels through to the 2037 forecast year. The Alternative Growth scenario test therefore assumed no change in travel demand post 2022. It was used to understand the impacts on the economic assessment.

Defining Rail Rolling Stock Sensitivity Tests

The “core” transport modelling scenario assumed additional rolling stock and associated costs would be needed to meet the requirements of the proposed Leven to Edinburgh service. Two rail rolling stock sensitivity tests were undertaken as described below:

- **Test 1: No Rolling Stock Lease Charges.** This test assumed rail rolling stock was available within the current ScotRail fleet to fulfil the operating service assumptions for the best performing rail option [i.e. Rail Option 6D]. It was assumed that rolling stock lease charges would not be incurred; however,

other additional operating costs such as staff costs, fuel costs and track access charges would be incurred. This test was undertaken to understand the impacts on the economic assessment.

- **Test 2: No Additional Operating Costs.** This test also assumed rail rolling stock was available within the current ScotRail fleet to fulfil the operating service assumptions for Rail Option 6D. However, it was assumed that the rolling stock that would be used to deliver the service is already incurring all operating costs. Therefore, no additional operating costs would be incurred. This second test was also undertaken to understand the impacts on the economic assessment.

Defining Rail Fares Sensitivity Test

The “core” transport modelling scenario used Glenrothes-with-Thornton rail fares plus 50p for travel to and from Leven and Cameron Bridge for the assessment of each rail option. A sensitivity test was undertaken that contained higher rail fares than the “core” transport modelling scenario:

- **Rail Fares Sensitivity Test** – this test assumed Markinch rail fares for travel to and from the proposed Leven and Cameron Bridge rail stations. This test therefore used higher rail fares for certain journeys, including travel to Edinburgh, than the “core” scenario and so the performance of each rail option was examined under what is considered a worst-case scenario. It was used to understand the forecast impacts on the demand for rail travel to and from the Levenmouth area, and the impacts on the economic assessment.

Timing and Delivery of Proposed Transport Schemes

It is acknowledged that sensitivity tests could be carried out with respect to the timing in delivery of proposed transport schemes. Two schemes which could influence travel demands and patterns across Fife, and potentially the Levenmouth area, are the Revolution in Rail proposals (see below), announced in March 2016 by the then Transport Minister, Derek Mackay, and the ongoing delivery of the Forth Crossing Public Transport Strategy, related to the Forth Replacement Crossing project, which was refreshed in 2012. WebTAG guidance states schemes which are “near certain” should be included in the “core” modelling. As such, both schemes were included in the 2022 Do-Minimum forecasts and subsequent forecast years. Smaller schemes contained in the model, including junction improvements throughout the Fife road network, are unlikely to influence travel demand to any significant degree across the wider Levenmouth area. For this reason, sensitivity testing of the timing and delivery of these proposals was not included in the economic assessment.

Revolution in Rail Proposals

The Revolution in Rail proposals taken forward as part of the SRM 2017 to 2037 forecasts are listed below. The assumptions for these enhancements will be consistent with TMfS14.

Dundee:

- Continuation of existing half hourly service to Edinburgh - one limited stop High Speed Train and one regional service.

Edinburgh:

- New through service each hour between Borders railway and Fife. Borders railway primarily operated by 3-coach class 170 trains (up to 30% more seats per train).
- New half hourly service to Glasgow via Cumbernauld, Stepps and Gartcosh.

Glasgow:

- Four trains per hour service to Cumbernauld with two operating via Falkirk Grahamston through to Edinburgh.

Appendix C Quantitative Appraisal Tools

Appendix C provides details of other quantitative appraisal tools, in addition to SRM12 described in Chapter 2, used to assess the performance of each option against the Transport Planning Objectives (TPOs) and STAG criteria. This includes:

- **Transport Users Benefit Appraisal (TUBA)** – for the economic assessment.
- **Costs and Benefits to Accidents Light Touch (COBALT)** – for the safety assessment.
- **Carbon Tool for Local Authorities** – for the environment assessment.
- **TRACC** – for the TPO assessment.

Transport Users Benefit Appraisal (TUBA)

Transport Users Benefit Appraisal (TUBA) is a computer program developed by the Department for Transport (DfT). It is used to undertake an economic appraisal of a multi-modal transport study. The latest version (v1.9.12) was used.

TUBA undertakes a matrix-based appraisal with either fixed or variable trip matrices. TUBA calculates the user benefits in time, fuel vehicle operating costs (VOC), non-fuel VOC and charge; operator and government revenues; and the scheme costs, discounted to the present value year. Values calculated from input model data are interpolated and extrapolated to cover the full appraisal period as necessary. The output file contains all results for various degrees of disaggregation and presents the data in a series of summary tables (TEE) showing the economic efficiency of the transport system.

TUBA does not calculate the benefits associated with changes in accident costs. Accident benefits are calculated using the DfT's COBALT (Cost and Benefit to Accidents – Light Touch) software tool.

Costs and Benefits to Accidents – Light Touch (COBALT)

COBALT (Cost and Benefit to Accidents – Light Touch) is a computer program developed by the DfT to undertake the analysis of the impact on accidents as part of economic appraisal for a road scheme. The latest version using v2018.1 economic parameters was used. COBALT assesses the safety aspects of road schemes using detailed inputs of either (a) separate road links and road junctions that would be impacted by the scheme; or (b) combined links and junctions. The assessment is based on a comparison of accidents by severity and associated costs across an identified network in the 'Do-Minimum' and 'Do-Something' option forecasts, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction.

Carbon Tool for Local Authorities

The Emissions Factors Toolkit (EFT) is published by Defra and the Devolved Administrations to assist local authorities in carrying out Review and Assessment of local air quality as part of their duties under the Environmental Act 1995. It is a tool that allows users to calculate road vehicle pollutant emission rates for oxides of nitrogen (NO_x) and Particulate Matter (PM₁₀ and PM_{2.5}), for a specified year, road type, vehicle speed and vehicle fleet composition. Carbon dioxide (CO₂) emission rates can also be calculated for petrol, diesel and alternative fuelled vehicles. It incorporates updated vehicle exhaust

emission factors and fleet compositions, with the new inclusion of Euro 6 subcategories. The latest version (v8.0.1) was used.

TRACC

TRACC is a GIS-based multimodal accessibility tool, developed by Basemap Ltd in conjunction with the DfT, local authorities and transport planners, which can calculate journey times from selected origin and destination points for public transport, cycling and walking using public transport timetable and road network data. The National Public Transport Data Repository (NPTDR) database is used which provides full service / route / trip information, showing arrival and departure times of the trip journey, for all transport modes. The data is updated every three months.

Appendix D Economic Assessment Framework

Appendix D provides details of the economic assessment framework.

The framework was used to identify the benefits of each of the options and to report the assumptions and results in a coherent and transparent manner. The key elements of the assessment framework and interactions are shown in Figure 13 below. Each of these key elements are described, or referred to, on the following pages.

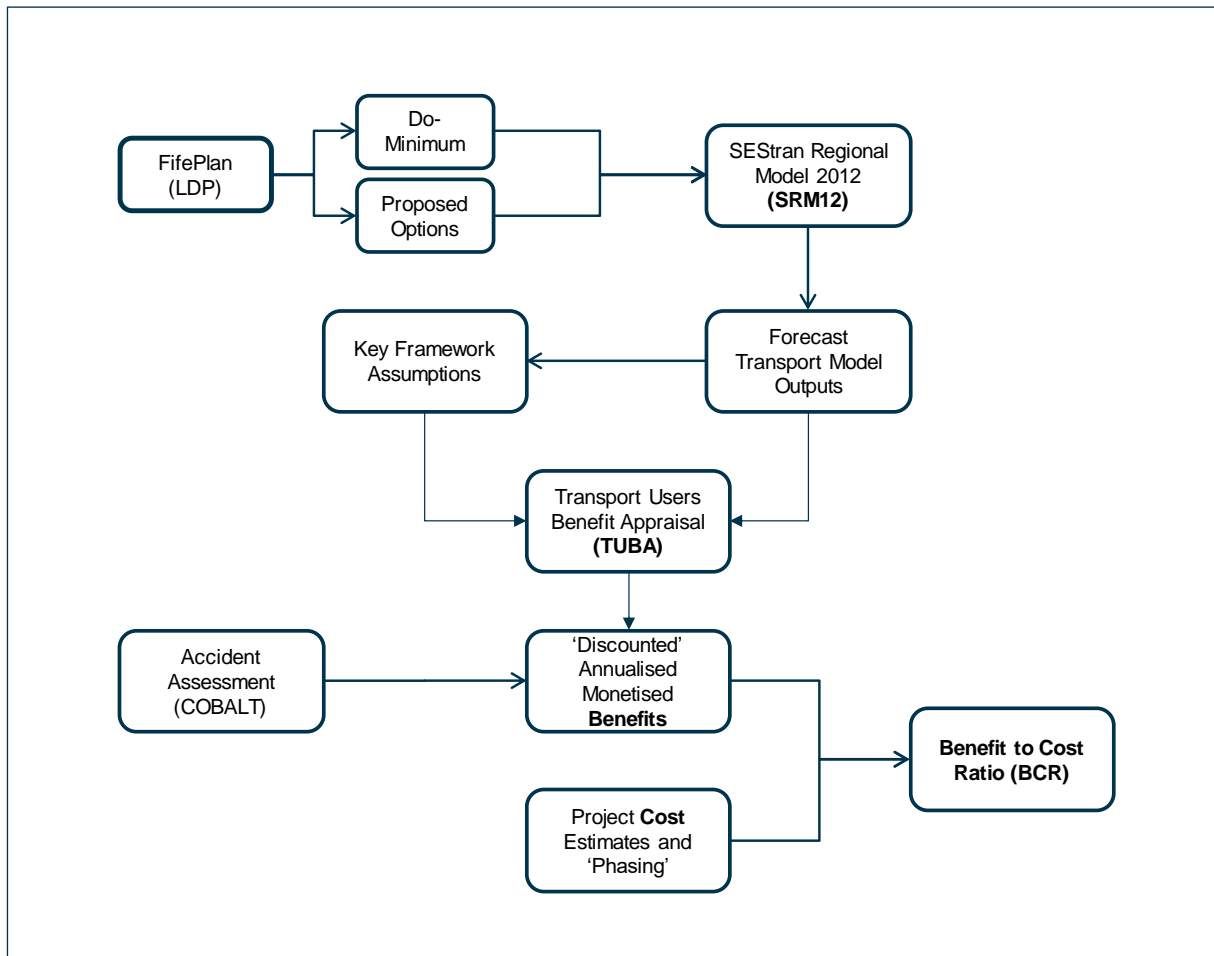


Figure 13: Economic Assessment Framework

Transport Modelling

The economic assessment has considered the transport modelling as described in Section 2. The SRM12 model includes forecast travel demand associated with the delivery of a proportion of the local development plan [i.e. FIFEplan] within each forecast year for the Do-Minimum and Option scenarios.

Economic Efficiency Components

The key components that make up and drive the overall economic efficiency of each option fall into two distinct categories; benefits of the option; and costs of the option. For the purposes of this study, the key components are shown in Table 32 below.

Table 32: Benefit and Cost Components of Economic Efficiency

Benefit Components	Cost Components
Journey time savings	Preparation costs
Vehicle operating cost savings	Construction costs
Accident cost savings	Maintenance costs
User charges	Operating costs

Benefit Components

Journey Time Savings

Total journey time savings are one of the main drivers in determining the economic efficiency of each option, making up a significant proportion of the overall Net Present Value (NPV) of benefits. The value of journey time savings for road and public transport modes has been applied to the forecast journey times in the Do-Minimum and each Option. Journey time reliability benefits have not been considered in the economic assessment.

Vehicle Operating Cost Savings

Vehicle operating cost savings are a function of both speed and road gradient and have been calculated in accordance with the methods adopted in TUBA.

Accident Cost Savings

Accident cost savings have been calculated using COBALT and have used COBALT default accident rates.

User Charges

Changes in user charges have been calculated using the forecast journey times in the Do-Minimum and Option. This is because the net impact on both new and existing public transport passengers, calculated using the rule of a half, will attribute all the net benefit to the change in journey time.

Cost Components

The estimated costs for each Option are detailed in Section 6.3. For all bus and rail options, the cost spend profile is based on a scheme Opening Year of 2027.

Appendix E Transport Economic Efficiency Tables

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 2: Improve Local Bus Services

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	649	28	621
Vehicle operating costs	22	22	0
User charges	-30	0	-30
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	641	50	591
Consumer - Other User Benefits			
Journey Time	7,251	110	7,141
Vehicle operating costs	-64	-64	0
User charges	106	0	106
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	7,293	46	7,247
Business			
Journey Time	672	365	307
Vehicle operating costs	74	74	0
User charges	8	0	8
During Construction	0	0	0
Subtotal	754	439	315
Private Sector Provider Impacts			
Revenue	-98	0	-98
Operating costs	-5,488	0	-5,488
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-98	0	-98
Operating cost transfer from Bus Company (100% to Local Government)	5,488	0	5,488
Subtotal	-196	0	-196
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	558	439	119
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	8,492		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	98	0	98
Operating cost transfer from Bus Company (100% to Local Government)	5,488	0	5,488
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	5,586	0	5,586
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport			
Indirect Tax Revenues	2	16	-14
TOTALS			
Broad Transport Budget	5,586	0	5,586
Wider Public Finances	2	16	-14
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	641		
Economic Efficiency: Consumer Users (Other)	7,293		
Economic Efficiency: Business Users and Providers	558		
Wider Public Finances (Indirect Taxation Revenues)	-2		
Accident Benefits	0		
Present Value of Benefits (PVB)	8,490		
Broad Transport Budget			
Present Value of Costs (PVC)	5,586		
OVERALL IMPACTS			
Net Present Value (NPV)	2,904		
Benefit to Cost Ratio (BCR)	1.5		

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 3: Improve Bus-Rail Connections

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	286	69	217
Vehicle operating costs	10	10	0
User charges	-32	0	-32
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	264	79	185
Consumer - Other User Benefits			
Journey Time	101	-14	115
Vehicle operating costs	-4	-4	0
User charges	-64	0	-64
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	33	-18	51
Business			
Journey Time	267	48	219
Vehicle operating costs	11	11	0
User charges	-8	0	-8
During Construction	0	0	0
Subtotal	270	59	211
Private Sector Provider Impacts			
Revenue	122	0	122
Operating costs	-1,174	0	-1,174
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-122	0	-122
Operating cost transfer from Bus Company (100% to Local Government)	1,174	0	1,174
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	270	59	211
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	567		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	-122	0	-122
Operating cost transfer from Bus Company (100% to Local Government)	1,174	0	1,174
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	1,052	0	1,052
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport			
Indirect Tax Revenues	24	6	18
TOTALS			
Broad Transport Budget	1,052	0	1,052
Wider Public Finances	24	6	18
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	264		
Economic Efficiency: Consumer Users (Other)	33		
Economic Efficiency: Business Users and Providers	270		
Wider Public Finances (Indirect Taxation Revenues)	-24		
Accident Benefits	0		
Present Value of Benefits (PVB)	543		
Broad Transport Budget			
Present Value of Costs (PVC)	1,052		
OVERALL IMPACTS			
Net Present Value (NPV)	-509		
Benefit to Cost Ratio (BCR)	0.5		

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 4: Improve Regional Bus Services

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	1,081	134	947
Vehicle operating costs	26	26	0
User charges	-68	0	-68
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	1,039	160	879
Consumer - Other User Benefits			
Journey Time	1,579	-60	1,639
Vehicle operating costs	-57	-57	0
User charges	-647	0	-647
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	875	-117	992
Business			
Journey Time	-254	168	-422
Vehicle operating costs	80	80	0
User charges	-111	0	-111
During Construction	0	0	0
Subtotal	-285	248	-533
Private Sector Provider Impacts			
Revenue	962	0	962
Operating costs	0	0	0
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-962	0	-962
Operating cost transfer from Bus Company (100% to Local Government)	0	0	0
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	-285	248	-533
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	1,629		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	-962	0	-962
Operating cost transfer from Bus Company (100% to Local Government)	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport			
Indirect Tax Revenues	157	21	136
TOTALS			
Broad Transport Budget	0	0	0
Wider Public Finances	157	21	136
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	1,039		
Economic Efficiency: Consumer Users (Other)	875		
Economic Efficiency: Business Users and Providers	-285		
Wider Public Finances (Indirect Taxation Revenues)	-157		
Accident Benefits	0		
Present Value of Benefits (PVB)	1,472		
Broad Transport Budget			
Present Value of Costs (PVC)	0		
OVERALL IMPACTS			
Net Present Value (NPV)	1,472		
Benefit to Cost Ratio (BCR)	-		

Economic Efficiency of the Transport System (TEE), 60 year appraisal			
Option 6A: Re-open existing, disused, rail line to passengers only			
One train per hour via kirkcaldy, stopping at Leven			
<i>All monetary values are expressed in £1000s</i>			
<i>All costs and disbenefits are negative; all benefits and savings are positive</i>			
Consumer - Commuting User Benefits	All Modes	Road	Public Transport
Journey Time	11,801	426	11,375
Vehicle operating costs	-6	-6	0
User charges	1,038	0	1,038
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	12,833	420	12,413
Consumer - Other User Benefits	All Modes	Road	Public Transport
Journey Time	3,644	111	3,533
Vehicle operating costs	14	14	0
User charges	2,761	0	2,761
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	6,419	125	6,294
Business	All Modes	Road	Public Transport
Journey Time	2,848	62	2,786
Vehicle operating costs	-12	-12	0
User charges	290	0	290
During Construction	0	0	0
Subtotal	3,126	50	3,076
Private Sector Provider Impacts	All Modes	Road	Public Transport
Revenue	7,036	0	7,036
Operating costs	-15,838	0	-15,838
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-7,036	0	-7,036
Operating cost transfer from TOC (100% to Government)	15,838	0	15,838
Subtotal	0	0	0
Other Business Impacts	All Modes	Road	Public Transport
Developer contributions	0	0	0
NET BUSINESS IMPACT	3,126	50	3,076
ACCIDENT BENEFITS	56	56	
Present Value of Transport Economic Efficiency Benefits (PVB)	22,434		
Public Accounts			
Local Government Funding	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	41,539	0	41,539
Revenue transfer (100% to Government)	-7,036	0	-7,036
Operating cost transfer from TOC (100% to Government)	15,838	0	15,838
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	50,341	0	50,341
Central Government Funding: Non-Transport	All Modes	Road	Public Transport
Indirect Tax Revenues	1,093	5	1,088
TOTALS			
Broad Transport Budget	50,341	0	50,341
Wider Public Finances	1,093	5	1,088
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	12,833		
Economic Efficiency: Consumer Users (Other)	6,419		
Economic Efficiency: Business Users and Providers	3,126		
Wider Public Finances (Indirect Taxation Revenues)	-1,093		
Accident Benefits	56		
Present Value of Benefits (PVB)	21,341		
Broad Transport Budget Present Value of Costs (PVC)	50,341		
OVERALL IMPACTS			
Net Present Value (NPV)	-29,000		
Benefit to Cost Ratio (BCR)	0.4		

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 6B: Re-open existing, disused, rail line to passengers only

One train per hour via kirkcaldy, stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	9,787	392	9,395
Vehicle operating costs	26	26	0
User charges	1,827	0	1,827
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	11,640	418	11,222
Consumer - Other User Benefits			
Journey Time	3,244	-111	3,355
Vehicle operating costs	37	37	0
User charges	3,910	0	3,910
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	7,191	-74	7,265
Business			
Journey Time	2,513	111	2,402
Vehicle operating costs	-18	-18	0
User charges	368	0	368
During Construction	0	0	0
Subtotal	2,863	93	2,770
Private Sector Provider Impacts			
Revenue	6,998	0	6,998
Operating costs	-16,142	0	-16,142
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-6,998	0	-6,998
Operating cost transfer from TOC (100% to Government)	16,142	0	16,142
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	2,863	93	2,770
ACCIDENT BENEFITS	77	77	
Present Value of Transport Economic Efficiency Benefits (PVB)	21,771		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-6,998	0	-6,998
Operating cost transfer from TOC (100% to Government)	16,142	0	16,142
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	52,755	0	52,755
Central Government Funding: Non-Transport			
Indirect Tax Revenues	1,136	59	1,077
TOTALS			
Broad Transport Budget	52,755	0	52,755
Wider Public Finances	1,136	59	1,077
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	11,640		
Economic Efficiency: Consumer Users (Other)	7,191		
Economic Efficiency: Business Users and Providers	2,863		
Wider Public Finances (Indirect Taxation Revenues)	-1,136		
Accident Benefits	77		
Present Value of Benefits (PVB)	20,635		
Broad Transport Budget Present Value of Costs (PVC)	52,755		
OVERALL IMPACTS			
Net Present Value (NPV)	-32,120		
Benefit to Cost Ratio (BCR)	0.4		

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 6C: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	26,260	878	25,382
Vehicle operating costs	-157	-157	0
User charges	2,417	0	2,417
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	28,520	721	27,799
Consumer - Other User Benefits			
Journey Time	7,385	188	7,197
Vehicle operating costs	121	121	0
User charges	10,832	0	10,832
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	18,338	309	18,029
Business			
Journey Time	4,772	327	4,445
Vehicle operating costs	-2	-2	0
User charges	833	0	833
During Construction	0	0	0
Subtotal	5,603	325	5,278
Private Sector Provider Impacts			
Revenue	19,036	0	19,036
Operating costs	-22,978	0	-22,978
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-19,036	0	-19,036
Operating cost transfer from TOC (100% to Government)	22,978	0	22,978
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	5,603	325	5,278
ACCIDENT BENEFITS	191	191	
Present Value of Transport Economic Efficiency Benefits (PVB)	52,652		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	41,539	0	41,539
Revenue transfer (100% to Government)	-19,036	0	-19,036
Operating cost transfer from TOC (100% to Government)	22,978	0	22,978
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	45,481	0	45,481
Central Government Funding: Non-Transport			
Indirect Tax Revenues	2,947	-16	2,963
TOTALS			
Broad Transport Budget	45,481	0	45,481
Wider Public Finances	2,947	-16	2,963
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	28,520		
Economic Efficiency: Consumer Users (Other)	18,338		
Economic Efficiency: Business Users and Providers	5,603		
Wider Public Finances (Indirect Taxation Revenues)	-2,947		
Accident Benefits	191		
Present Value of Benefits (PVB)	49,705		
Broad Transport Budget Present Value of Costs (PVC)	45,481		
OVERALL IMPACTS			
Net Present Value (NPV)	4,224		
Benefit to Cost Ratio (BCR)	1.1		

Economic Efficiency of the Transport System (TEE), 60 year appraisal

Option 6D: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	40,684	810	39,874
Vehicle operating costs	-129	-129	0
User charges	3,400	0	3,400
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	43,955	681	43,274
Consumer - Other User Benefits			
Journey Time	9,825	223	9,602
Vehicle operating costs	183	183	0
User charges	12,541	0	12,541
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	22,549	406	22,143
Business			
Journey Time	6,519	422	6,097
Vehicle operating costs	-10	-10	0
User charges	907	0	907
During Construction	0	0	0
Subtotal	7,416	412	7,004
Private Sector Provider Impacts			
Revenue	20,628	0	20,628
Operating costs	-23,283	0	-23,283
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	7,416	412	7,004
ACCIDENT BENEFITS	237	237	
Present Value of Transport Economic Efficiency Benefits (PVB)	74,157		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	46,266	0	46,266
Central Government Funding: Non-Transport			
Indirect Tax Revenues	3,245	44	3,201
TOTALS			
Broad Transport Budget	46,266	0	46,266
Wider Public Finances	3,245	44	3,201
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	43,955		
Economic Efficiency: Consumer Users (Other)	22,549		
Economic Efficiency: Business Users and Providers	7,416		
Wider Public Finances (Indirect Taxation Revenues)	-3,245		
Accident Benefits	237		
Present Value of Benefits (PVB)	70,912		
Broad Transport Budget			
Present Value of Costs (PVC)	46,266		
OVERALL IMPACTS			
Net Present Value (NPV)	24,646		
Benefit to Cost Ratio (BCR)	1.5		

**Economic Efficiency of the Transport System (TEE), 60 year appraisal
Alternative Growth Scenario Test
Option 2: Improve Local Bus Services**

*All monetary values are expressed in £1000s
All costs and disbenefits are negative; all benefits and savings are positive*

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	2,298	103	2,195
Vehicle operating costs	21	21	0
User charges	-18	0	-18
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	2,301	124	2,177
Consumer - Other User Benefits			
Journey Time	9,590	4	9,586
Vehicle operating costs	-10	-10	0
User charges	5	0	5
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	9,585	-6	9,591
Business			
Journey Time	441	135	306
Vehicle operating costs	14	14	0
User charges	3	0	3
During Construction	0	0	0
Subtotal	458	149	309
Private Sector Provider Impacts			
Revenue	13	0	13
Operating costs	-5,488	0	-5,488
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-13	0	-13
Operating cost transfer from Bus Company (100% to Local Government)	5,488	0	5,488
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	458	149	309
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	12,344		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	-13	0	-13
Operating cost transfer from Bus Company (100% to Local Government)	5,488	0	5,488
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	5,475	0	5,475
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport			
Indirect Tax Revenues	11	8	3
TOTALS			
Broad Transport Budget	5,475	0	5,475
Wider Public Finances	11	8	3
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	2,301		
Economic Efficiency: Consumer Users (Other)	9,585		
Economic Efficiency: Business Users and Providers	458		
Wider Public Finances (Indirect Taxation Revenues)	-11		
Accident Benefits	0		
Present Value of Benefits (PVB)	12,333		
Broad Transport Budget Present Value of Costs (PVC)	5,475		
OVERALL IMPACTS			
Net Present Value (NPV)	6,858		
Benefit to Cost Ratio (BCR)	2.3		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 3: Improve Bus-Rail Connections

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

Consumer - Commuting User Benefits	All Modes	Road	Public Transport
Journey Time	117	34	83
Vehicle operating costs	-2	-2	0
User charges	-25	0	-25
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	90	32	58
Consumer - Other User Benefits	All Modes	Road	Public Transport
Journey Time	-110	9	-119
Vehicle operating costs	0	0	0
User charges	-83	0	-83
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	-193	9	-202
Business	All Modes	Road Personal	Public Transport
Journey Time	79	5	74
Vehicle operating costs	-3	-3	0
User charges	-3	0	-3
During Construction	0	0	0
Subtotal	73	2	71
Private Sector Provider Impacts	All Modes	Road	Public Transport
Revenue	132	0	132
Operating costs	-1,174	0	-1,174
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-132	0	-132
Operating cost transfer from Bus Company (100% to Local Government)	1,174	0	1,174
Subtotal	0	0	0
Other Business Impacts	All Modes	Road	Public Transport
Developer contributions	0	0	0
NET BUSINESS IMPACT	73	2	71
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	-30		
Public Accounts			
Local Government Funding	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	-132	0	-132
Operating cost transfer from Bus Company (100% to Local Government)	1,174	0	1,174
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	1,042	0	1,042
Central Government Funding: Transport	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport	All Modes	Road	Public Transport
Indirect Tax Revenues	19	-1	20
TOTALS			
Broad Transport Budget	1,042	0	1,042
Wider Public Finances	19	-1	20
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	90		
Economic Efficiency: Consumer Users (Other)	-193		
Economic Efficiency: Business Users and Providers	73		
Wider Public Finances (Indirect Taxation Revenues)	-19		
Accident Benefits	0		
Present Value of Benefits (PVB)	-49		
Broad Transport Budget Present Value of Costs (PVC)	1,042		
OVERALL IMPACTS			
Net Present Value (NPV)	-1,091		
Benefit to Cost Ratio (BCR)	0.0		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 4: Improve Regional Bus Services

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

Consumer - Commuting User Benefits	All Modes	Road	Public Transport
Journey Time	521	-158	679
Vehicle operating costs	-1	-1	0
User charges	-67	0	-67
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	453	-159	612
Consumer - Other User Benefits	All Modes	Road	Public Transport
Journey Time	1,738	-115	1,853
Vehicle operating costs	-8	-8	0
User charges	-538	0	-538
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	1,192	-123	1,315
Business	All Modes	Road	Public Transport
Journey Time	-388	-99	-289
Vehicle operating costs	-18	-18	0
User charges	-98	0	-98
During Construction	0	0	0
Subtotal	-504	-117	-387
Private Sector Provider Impacts	All Modes	Road	Public Transport
Revenue	818	0	818
Operating costs	0	0	0
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Local Government)	-818	0	-818
Operating cost transfer from Bus Company (100% to Local Government)	0	0	0
Subtotal	0	0	0
Other Business Impacts	All Modes	Road	Public Transport
Developer contributions	0	0	0
NET BUSINESS IMPACT	-504	-117	-387
ACCIDENT BENEFITS	0	0	
Present Value of Transport Economic Efficiency Benefits (PVB)	1,141		
Public Accounts			
Local Government Funding	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Revenue transfer (100% to Local Government)	-818	0	-818
Operating cost transfer from Bus Company (100% to Local Government)	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Non-Transport	All Modes	Road	Public Transport
Indirect Tax Revenues	108	-7	115
TOTALS			
Broad Transport Budget	0	0	0
Wider Public Finances	108	-7	115
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	453		
Economic Efficiency: Consumer Users (Other)	1,192		
Economic Efficiency: Business Users and Providers	-504		
Wider Public Finances (Indirect Taxation Revenues)	-108		
Accident Benefits	0		
Present Value of Benefits (PVB)	1,033		
Broad Transport Budget			
Present Value of Costs (PVC)	0		
OVERALL IMPACTS			
Net Present Value (NPV)	1,033		
Benefit to Cost Ratio (BCR)	-		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 6A: Re-open existing, disused, rail line to passengers only

One train per hour via Kirkcaldy, stopping at Leven

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

Consumer - Commuting User Benefits	All Modes	Road	Public Transport
Journey Time	14,616	422	14,194
Vehicle operating costs	25	25	0
User charges	755	0	755
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	15,396	447	14,949
Consumer - Other User Benefits	All Modes	Road	Public Transport
Journey Time	3,304	252	3,052
Vehicle operating costs	50	50	0
User charges	2,480	0	2,480
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	5,834	302	5,532
Business	All Modes	Road	Public Transport
Journey Time	2,011	160	1,851
Vehicle operating costs	67	67	0
User charges	195	0	195
During Construction	0	0	0
Subtotal	2,273	227	2,046
Private Sector Provider Impacts	All Modes	Road	Public Transport
Revenue	7,155	0	7,155
Operating costs	-15,838	0	-15,838
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-7,155	0	-7,155
Operating cost transfer from TOC (100% to Government)	15,838	0	15,838
Subtotal	0	0	0
Other Business Impacts	All Modes	Road	Public Transport
Developer contributions	0	0	0
NET BUSINESS IMPACT	2,273	227	2,046
ACCIDENT BENEFITS	61	61	
Present Value of Transport Economic Efficiency Benefits (PVB)	23,564		
Public Accounts			
Local Government Funding	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	41,539	0	41,539
Revenue transfer (100% to Government)	-7,155	0	-7,155
Operating cost transfer from TOC (100% to Government)	15,838	0	15,838
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	50,222	0	50,222
Central Government Funding: Non-Transport	All Modes	Road	Public Transport
Indirect Tax Revenues	1,199	103	1,096
TOTALS			
Broad Transport Budget	50,222	0	50,222
Wider Public Finances	1,199	103	1,096
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	15,396		
Economic Efficiency: Consumer Users (Other)	5,834		
Economic Efficiency: Business Users and Providers	2,273		
Wider Public Finances (Indirect Taxation Revenues)	-1,199		
Accident Benefits	61		
Present Value of Benefits (PVB)	22,365		
Broad Transport Budget Present Value of Costs (PVC)	50,222		
OVERALL IMPACTS			
Net Present Value (NPV)	-27,857		
Benefit to Cost Ratio (BCR)	0.4		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 6B: Re-open existing, disused, rail line to passengers only

One train per hour via Kirkcaldy, stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	14,425	333	14,092
Vehicle operating costs	-38	-38	0
User charges	1,297	0	1,297
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	15,684	295	15,389
Consumer - Other User Benefits			
Journey Time	3,692	172	3,520
Vehicle operating costs	-40	-40	0
User charges	3,530	0	3,530
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	7,182	132	7,050
Business			
Journey Time	1,970	81	1,889
Vehicle operating costs	58	58	0
User charges	286	0	286
During Construction	0	0	0
Subtotal	2,314	139	2,175
Private Sector Provider Impacts			
Revenue	10,083	0	10,083
Operating costs	-16,142	0	-16,142
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-10,083	0	-10,083
Operating cost transfer from TOC (100% to Government)	16,142	0	16,142
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	2,314	139	2,175
ACCIDENT BENEFITS	74	74	
Present Value of Transport Economic Efficiency Benefits (PVB)	25,254		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-10,083	0	-10,083
Operating cost transfer from TOC (100% to Government)	16,142	0	16,142
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	49,670	0	49,670
Central Government Funding: Non-Transport			
Indirect Tax Revenues	1,512	-35	1,547
TOTALS			
Broad Transport Budget	49,670	0	49,670
Wider Public Finances	1,512	-35	1,547
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	15,684		
Economic Efficiency: Consumer Users (Other)	7,182		
Economic Efficiency: Business Users and Providers	2,314		
Wider Public Finances (Indirect Taxation Revenues)	-1,512		
Accident Benefits	74		
Present Value of Benefits (PVB)	23,742		
Broad Transport Budget			
Present Value of Costs (PVC)	49,670		
OVERALL IMPACTS			
Net Present Value (NPV)	-25,928		
Benefit to Cost Ratio (BCR)	0.5		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 6C: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	25,726	640	25,086
Vehicle operating costs	79	79	0
User charges	1,946	0	1,946
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	27,751	719	27,032
Consumer - Other User Benefits			
Journey Time	5,144	289	4,855
Vehicle operating costs	88	88	0
User charges	10,127	0	10,127
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	15,359	377	14,982
Business			
Journey Time	3,793	262	3,531
Vehicle operating costs	42	42	0
User charges	591	0	591
During Construction	0	0	0
Subtotal	4,426	304	4,122
Private Sector Provider Impacts			
Revenue	14,570	0	14,570
Operating costs	-22,978	0	-22,978
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-14,570	0	-14,570
Operating cost transfer from TOC (100% to Government)	22,978	0	22,978
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	4,426	304	4,122
ACCIDENT BENEFITS	189	189	
Present Value of Transport Economic Efficiency Benefits (PVB)	47,725		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	41,539	0	41,539
Revenue transfer (100% to Government)	-14,570	0	-14,570
Operating cost transfer from TOC (100% to Government)	22,978	0	22,978
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	49,947	0	49,947
Central Government Funding: Non-Transport			
Indirect Tax Revenues	2,438	181	2,257
TOTALS			
Broad Transport Budget	49,947	0	49,947
Wider Public Finances	2,438	181	2,257
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	27,751		
Economic Efficiency: Consumer Users (Other)	15,359		
Economic Efficiency: Business Users and Providers	4,426		
Wider Public Finances (Indirect Taxation Revenues)	-2,438		
Accident Benefits	189		
Present Value of Benefits (PVB)	45,287		
Broad Transport Budget			
Present Value of Costs (PVC)	49,947		
OVERALL IMPACTS			
Net Present Value (NPV)	-4,660		
Benefit to Cost Ratio (BCR)	0.9		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Alternative Growth Scenario Test

Option 6D: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	26,298	464	25,834
Vehicle operating costs	134	134	0
User charges	2,581	0	2,581
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	29,013	598	28,415
Consumer - Other User Benefits			
Journey Time	5,267	249	5,018
Vehicle operating costs	159	159	0
User charges	11,912	0	11,912
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	17,338	408	16,930
Business			
Journey Time	3,720	81	3,639
Vehicle operating costs	56	56	0
User charges	653	0	653
During Construction	0	0	0
Subtotal	4,429	137	4,292
Private Sector Provider Impacts			
Revenue	15,959	0	15,959
Operating costs	-23,283	0	-23,283
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-15,959	0	-15,959
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	4,429	137	4,292
ACCIDENT BENEFITS	239	239	
Present Value of Transport Economic Efficiency Benefits (PVB)	51,019		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-15,959	0	-15,959
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	50,935	0	50,935
Central Government Funding: Non-Transport			
Indirect Tax Revenues	2,722	260	2,462
TOTALS			
Broad Transport Budget	50,935	0	50,935
Wider Public Finances	2,722	260	2,462
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	29,013		
Economic Efficiency: Consumer Users (Other)	17,338		
Economic Efficiency: Business Users and Providers	4,429		
Wider Public Finances (Indirect Taxation Revenues)	-2,722		
Accident Benefits	239		
Present Value of Benefits (PVB)	48,297		
Broad Transport Budget			
Present Value of Costs (PVC)	50,935		
OVERALL IMPACTS			
Net Present Value (NPV)	-2,638		
Benefit to Cost Ratio (BCR)	0.9		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Rail Fares Sensitivity Test

Option 6D: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

Consumer - Commuting User Benefits	All Modes	Road	Public Transport
Journey Time	32,316	916	31,400
Vehicle operating costs	-90	-90	0
User charges	1,333	0	1,333
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	33,559	826	32,733
Consumer - Other User Benefits	All Modes	Road	Public Transport
Journey Time	8,683	300	8,383
Vehicle operating costs	191	191	0
User charges	8,432	0	8,432
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	17,306	491	16,815
Business	All Modes	Road	Public Transport
Journey Time	5,292	641	4,651
Vehicle operating costs	-32	-32	0
User charges	563	0	563
During Construction	0	0	0
Subtotal	5,823	609	5,214
Private Sector Provider Impacts	All Modes	Road	Public Transport
Revenue	26,236	0	26,236
Operating costs	-23,283	0	-23,283
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-26,236	0	-26,236
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Subtotal	0	0	0
Other Business Impacts	All Modes	Road	Public Transport
Developer contributions	0	0	0
NET BUSINESS IMPACT	5,823	609	5,214
ACCIDENT BENEFITS	229	229	
Present Value of Transport Economic Efficiency Benefits (PVB)	56,917		
Public Accounts			
Local Government Funding	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport	All Modes	Road	Public Transport
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-26,236	0	-26,236
Operating cost transfer from TOC (100% to Government)	23,283	0	23,283
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	40,658	0	40,658
Central Government Funding: Non-Transport	All Modes	Road	Public Transport
Indirect Tax Revenues	4,104	82	4,022
TOTALS			
Broad Transport Budget	40,658	0	40,658
Wider Public Finances	4,104	82	4,022
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	33,559		
Economic Efficiency: Consumer Users (Other)	17,306		
Economic Efficiency: Business Users and Providers	5,823		
Wider Public Finances (Indirect Taxation Revenues)	-4,104		
Accident Benefits	229		
Present Value of Benefits (PVB)	52,813		
Broad Transport Budget			
Present Value of Costs (PVC)	40,658		
OVERALL IMPACTS			
Net Present Value (NPV)	12,155		
Benefit to Cost Ratio (BCR)	1.3		

Economic Efficiency of the Transport System (TEE), 60 year appraisal Rail Rolling Stock Sensitivity Test 1: No Rolling Stock Lease Charges

Option 6D: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	40,684	810	39,874
Vehicle operating costs	-129	-129	0
User charges	3,400	0	3,400
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	43,955	681	43,274
Consumer - Other User Benefits			
Journey Time	9,825	223	9,602
Vehicle operating costs	183	183	0
User charges	12,541	0	12,541
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	22,549	406	22,143
Business			
Journey Time	6,519	422	6,097
Vehicle operating costs	-10	-10	0
User charges	907	0	907
During Construction	0	0	0
Subtotal	7,416	412	7,004
Private Sector Provider Impacts			
Revenue	20,628	0	20,628
Operating costs	-20,228	0	-20,228
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	20,228	0	20,228
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	7,416	412	7,004
ACCIDENT BENEFITS	237	237	
Present Value of Transport Economic Efficiency Benefits (PVB)	74,157		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	20,228	0	20,228
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	43,211	0	43,211
Central Government Funding: Non-Transport			
Indirect Tax Revenues	3,245	44	3,201
TOTALS			
Broad Transport Budget	43,211	0	43,211
Wider Public Finances	3,245	44	3,201
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	43,955		
Economic Efficiency: Consumer Users (Other)	22,549		
Economic Efficiency: Business Users and Providers	7,416		
Wider Public Finances (Indirect Taxation Revenues)	-3,245		
Accident Benefits	237		
Present Value of Benefits (PVB)	70,912		
Broad Transport Budget			
Present Value of Costs (PVC)	43,211		
OVERALL IMPACTS			
Net Present Value (NPV)	27,701		
Benefit to Cost Ratio (BCR)	1.6		

**Economic Efficiency of the Transport System (TEE), 60 year appraisal
Rail Rolling Stock Sensitivity Test 2: No Additional Operating Costs**

Option 6D: Re-open existing, disused, rail line to passengers only

Two trains per hour (1 tph via Kirkcaldy and 1tph via Dunfermline) stopping at Leven and Cameron Bridge

All monetary values are expressed in £1000s

All costs and disbenefits are negative; all benefits and savings are positive

	All Modes	Road	Public Transport
Consumer - Commuting User Benefits			
Journey Time	40,684	810	39,874
Vehicle operating costs	-129	-129	0
User charges	3,400	0	3,400
During Construction	0	0	0
NET CONSUMER - COMMUTING BENEFITS	43,955	681	43,274
Consumer - Other User Benefits			
Journey Time	9,825	223	9,602
Vehicle operating costs	183	183	0
User charges	12,541	0	12,541
During Construction	0	0	0
NET CONSUMER - OTHER BENEFITS	22,549	406	22,143
Business			
Journey Time	6,519	422	6,097
Vehicle operating costs	-10	-10	0
User charges	907	0	907
During Construction	0	0	0
Subtotal	7,416	412	7,004
Private Sector Provider Impacts			
Revenue	20,628	0	20,628
Operating costs	-10,443	0	-10,443
Private sector contribution to investment cost	0	0	0
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	10,443	0	10,443
Subtotal	0	0	0
Other Business Impacts			
Developer contributions	0	0	0
NET BUSINESS IMPACT	7,416	412	7,004
ACCIDENT BENEFITS	237	237	
Present Value of Transport Economic Efficiency Benefits (PVB)	74,157		
Public Accounts			
Local Government Funding			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	0	0	0
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	0	0	0
Central Government Funding: Transport			
Revenue	0	0	0
Operating Costs	0	0	0
Investment Costs	43,611	0	43,611
Revenue transfer (100% to Government)	-20,628	0	-20,628
Operating cost transfer from TOC (100% to Government)	10,443	0	10,443
Developer Contributions	0	0	0
Grant / Subsidy Payments	0	0	0
NET IMPACT	33,426	0	33,426
Central Government Funding: Non-Transport			
Indirect Tax Revenues	3,245	44	3,201
TOTALS			
Broad Transport Budget	33,426	0	33,426
Wider Public Finances	3,245	44	3,201
Analysis of Monetised Costs and Benefits			
Greenhouse Gases	0		
Economic Efficiency: Consumer Users (Commuting)	43,955		
Economic Efficiency: Consumer Users (Other)	22,549		
Economic Efficiency: Business Users and Providers	7,416		
Wider Public Finances (Indirect Taxation Revenues)	-3,245		
Accident Benefits	237		
Present Value of Benefits (PVB)	70,912		
Broad Transport Budget Present Value of Costs (PVC)	33,426		
OVERALL IMPACTS			
Net Present Value (NPV)	37,486		
Benefit to Cost Ratio (BCR)	2.1		

Appendix F Appraisal Summary Tables

Appendix F provides detailed Appraisal Summary Tables (ASTs) for each option.

Table 33: Appraisal Summary Table for Bus Option 2

Option Details			
Name and address of authority or organisation promoting the option		Transport Scotland/Fife Council	
Option Name	Improve local bus services	Name of Planner	Peter Brett Associates LLP
Option Description	Improve local bus services connecting towns in the Levenmouth area to Leven	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £0
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		

Option Details		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been enough to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.	
Transport Planning Objectives		
Objective:	Performance against TPO	Score
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	This option would reduce journey times by bus, offer a more competitive alternative to the private car and improve connectivity between settlements within the Levenmouth area. Extending the timetable hours would also increase the opportunities, services and locations that could be accessed earlier in the day or later in the evening.	+3 (major benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	Option 2 would provide greater accessibility to Leven and, via connecting services, beyond by increasing local bus service frequencies at certain times of the day and introducing other services earlier and later in the day. This would improve access to services outside of the Levenmouth area.	+2 (moderate benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 2 would encourage a shift from private car to public transport for some people making local trips. It would augment existing bus services and increase opportunity to travel by bus. It would also provide opportunities for people to use public transport earlier in the day and later in the evening when current services are limited.	+2 (moderate benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score
Noise and Vibration	This option would result in modal shift from car to bus resulting in minor reductions in traffic flows and associated emissions on key roads within the Levenmouth area. No significant effects on transport noise or vibration are predicted.	+1 (minor benefit)

Option Details		
Global Air Quality (CO ₂)	Minor reductions in traffic flows within the Levenmouth area are predicted from this option. However, additional bus services could outweigh any beneficial car impacts as modal shift is predicted to be negligible. No significant effects on global (carbon) emissions are predicted.	<p>+1 (minor benefit)</p> <p>To -1 (minor negative)</p>
Local Air Quality (PM ₁₀ and NO ₂)	Changes in routing of buses and layouts of bus terminals in the urban areas of Methil / Leven, will result in minor benefit and negative effects on air quality in the immediate vicinity of bus routes. However, the overall impacts will be small and no significant effects on local air pollutant emissions are predicted.	<p>+1 (minor benefit)</p> <p>To -1 (minor negative)</p>
Water Quality, Drainage and Flood Defence	No significant effects on water quality, drainage and flood defence are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Geology	No significant effects on geology or geological/material resources are predicted for this option.	<p>0 (Neutral)</p>
Biodiversity and Habitats	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Landscape	No significant effects on landscapes are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Visual Amenity	No significant effects on visual amenity are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Agriculture and Soils	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Cultural Heritage	No significant effects on cultural heritage are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Safety:		

Option Details		
Accidents	There are no accidents benefits associated with Option 2	Neutral
Security	Option 2 will have minor security enhancements resulting from real and perceived improvements to security in relation to bus facilities, such as lighting at stops, and increased natural surveillance from increased passenger numbers on-board and at stops.	+1 (minor benefit)
Economy:		
TEE	The benefits will be driven by journey time savings from the improvement in services.	PVB £8.49m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	This option will generate moderate benefits in terms of improving timetable integration between local bus services e.g. matching with buses serving other parts of Levenmouth from Leven bus station. Ticketing between services would be integrated.	+2 (moderate benefit)
Transport and Land Use Integration	This option would generate minor land use integration benefits. The option supports, for example, the FifePlan by providing improved access to the Energy Park and the Cameron Bridge (Distillery and Hospital) employment areas. It would also improve accessibility and connectivity between settlements, such as Methil, Methilhill, Buckhaven and Windygates.	+1 (minor benefit)
Policy Integration	This option would promote and encourage sustainable travel for local journeys and therefore align with national, regional and local transport policies on environment, thus supporting targets set in response the declaration of the climate emergency. It would also support other wider policy drivers e.g. to promote equality and inclusion by improving local access to key services such as health/GPs, employment and leisure facilities in the Levenmouth area.	+2 (moderate benefit)
Accessibility & Social Inclusion:		

Option Details		
Community Accessibility	Option 2 helps maintain and improve public transport connections to central Leven from surrounding local settlements, in particular Methil, Buckhaven, East Wemyss and Coaltown of Wemyss areas. It will not directly improve walking and cycling connections but will help facilitate non-car access to services and facilities.	+2 (moderate benefit)
Comparative Accessibility	Option 2 will have a minor benefit, compared to current provision of public transport, for people accessing a wide range of local services.	+1 (minor benefit)
Implementability Appraisal		
Feasibility:	No significant technical issues related to the implementation of Option 2 are anticipated. In terms of deliverability, Option 2 would require reconfiguration of existing bus timetables and potentially additional bus fleets. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.	
Affordability:	The local bus improvements will likely require additional subsidy and the Council's finances are limited. Negotiations will be required with the operator.	
Public Acceptability:	It is expected that Option 2 would have public support in terms of it enhancing the current bus network as issues around local bus services were raised by a number of people in response to the public survey – such as poor service early in the morning and late evening and poor levels of public information. It is anticipated, however, that it would not fulfil widespread aspirations around the public transport offering for the area, and particularly public transport services beyond the Levenmouth area.	

Table 34: Appraisal Summary Table for Bus Option 3

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Improve bus-rail connections	Name of Planner	Peter Brett Associates LLP
Option Description	Improve bus services to rail stations at Markinch, Kirkcaldy and Glenrothes	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £0
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.		
Transport Planning Objectives			
Objective:	Performance against TPO		Score

Option Details		
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Improved bus services to the rail stations at Markinch, Kirkcaldy and Glenrothes would include additional local stops, resulting in minor benefits. This option would also provide journey time benefits for some areas currently experiencing relatively poor access to the bus network, but not as much as Option 2.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	Option 3 would provide improved access to and from the national rail network via Markinch, Kirkcaldy and Glenrothes, and would also provide improved access to jobs and other facilities / services outside the Levenmouth area. It would equally support access to the area.	+2 (moderate benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Improved access to the rail network would promote sustainable transport use, both in terms of people who would otherwise drive to the rail station and those who would previously make the whole journey by car but now switch due to better integration between bus and train.	+1 (minor benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score
Noise and Vibration	<p>Improved branding, timetabling and fare changes may encourage increased use of bus and rail services with the potential for small changes in use of other modes (e.g. reduced use of private car on existing key roads between Levenmouth and Glenrothes with Thornton, Kirkcaldy and Markinch).</p> <p>Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport. No significant traffic noise or vibration effects are predicted from these changes.</p>	+1 (minor benefit)

Option Details		
Global Air Quality (CO ₂)	<p>Improved branding, timetabling and fare changes may encourage increased use of bus and rail services with the potential for small changes in use of other modes (e.g. reduced use of private car)</p> <p>Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport which would contribute to modest reductions in global emissions</p>	<p>+1 (minor benefit)</p>
Local Air Quality (PM ₁₀ and NO ₂)	<p>This option may encourage increased use of bus and rail services with the potential for small changes in use of other modes (e.g. reduced use of private car on existing key roads between Levenmouth and Glenrothes, Kirkcaldy and Markinch).</p> <p>Transport modelling indicates that some minor reductions in road traffic flows on key roads in the study area are expected from this option due to modal shift from car to public transport which would contribute to modest reductions in local air pollutant emissions.</p> <p>If this option results in some changes in routing of buses in the urban areas of Buckhaven/Methil/Leven and Glenrothes, Kirkcaldy and Markinch there is potential for beneficial or negative effects on air quality in the immediate vicinity of these locations. However, no significant overall effects on local air pollutant emissions or ambient air quality concentrations in the vicinity of the affected roads are predicted.</p>	<p>+1 (minor benefit) To -1 (minor negative)</p>
Water Quality, Drainage and Flood Defence	No significant effects on water quality, drainage and flood defence are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>
Geology	No significant effects on geology or geological/material resources are predicted for this option.	<p>0 (Neutral)</p>
Biodiversity and Habitats	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	<p>0 (Neutral)</p>

Option Details		
Landscape	No significant effects on landscapes are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Visual Amenity	No significant effects on visual amenity are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Agriculture and Soils	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Cultural Heritage	No significant effects on cultural heritage are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Safety:		
Accidents	There are no accidents benefits associated with Option 3	0 (Neutral)
Security	Option 3 will have minor security enhancements resulting from real and perceived improvements to security in relation to bus facilities, such as lighting at stops, and increased natural surveillance from increased passenger numbers on-board and at stops.	+1 (minor benefit)
Economy:		
TEE	Limited journey time savings generated by this option.	PVB £0.54m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	Benefits associated with service and ticketing integration that improve existing bus / rail connections by timetable matching and branding, with further integration of ticketing and information.	+2 (moderate benefit)
Transport and Land Use Integration	The option will support FIFEplan 2017 and SESplan Strategic Development Plan (2013)	+1 (minor benefit)

Option Details		
Policy Integration	The intervention supports a number of local (Council), regional (SEStran) and National (Transport Scotland) policy documents, particularly in aiming to encourage modal shift from private car to public transport.	+2 (moderate benefit)
Accessibility & Social Inclusion:		
Community Accessibility	Option 3 enhances connections to rail stations at Markinch, Kirkcaldy and Glenrothes, improving network coverage and enhancing local accessibility.	+2 (moderate benefit)
Comparative Accessibility	Option 3 will provide a moderate benefit by improving bus services to rail stations that then allow access to services beyond the Levenmouth area.	+2 (moderate benefit)
Implementability Appraisal		
Feasibility:	There are no significant technical issues related to the implementation of Option 3 are expected. This option would require reconfiguration of existing bus timetables and potentially additional bus fleets. Currently, bus operators within the Levenmouth area are not geared to integrate with rail – in practice, better integration may be achieved through higher bus frequencies. This option would require effort in terms of negotiation and agreement with public transport operators regarding service provision, including potential integration of bus and rail timetables.	
Affordability:	The option is not deemed to be unaffordable. However, further exploratory discussions will be required with the operator to understand	
Public Acceptability:	It is expected that Option 3 would have an element of public support in terms of it enhancing the bus network and integrating bus and rail services, although, similar to Option 2, it is anticipated that it would not fulfil widespread aspirations around the public transport offering for the area.	

Table 35: Appraisal Summary Table for Bus Option 4

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Improve regional bus services	Name of Planner	Peter Brett Associates LLP
Option Description	Improve regional bus services linking Leven with Kirkcaldy, Glenrothes, Dunfermline, St Andrews, Dundee, Edinburgh and Glasgow	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £0
Funding Sought From (if applicable):	Not applicable	Amount of Application	Not applicable
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.		
Transport Planning Objectives			
Objective:	Performance against TPO	Score	

Option Details		
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Option 4 would be focussed on improving linkages to areas beyond the Levenmouth area, and particularly to enhance accessibility and connectivity to key employment locations. Other than to Leven itself, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	Option 4 would reduce journey times by bus, offer a more competitive alternative to the private car and enhance accessibility and connectivity with employment areas in, for example, Dundee, Edinburgh and Glasgow. It would also improve access to important key public services such as health and education.	+2 (moderate benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 4 would augment existing bus services and increase opportunity to travel by bus beyond the Levenmouth area. It is therefore anticipated, and supported by modelling results, that it would encourage a shift from private car to public transport.	+1 (minor benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score
Noise and Vibration	Potential for short term noise effects during construction of any new hubs would be temporary and not predicted to be significant. Minor reductions in traffic flows on key roads in the study area and beyond are expected from this option.	+1 (minor benefit)
Global Air Quality (CO ₂)	Minor reductions in traffic flows and associated emissions on key roads in the study area and beyond are expected from this option. However, there will be re-routing of services that could add to emissions.	+1 (minor benefit)

Option Details		
Local Air Quality (PM ₁₀ and NO ₂)	If the option resulted in changes in routeing of buses in the urban areas of Buckhaven/Methil/Leven and destination, there is minor potential for beneficial or negative effects on air quality in the immediate vicinity of these locations.	+1 (minor benefit) To -1 (minor negative)
Water Quality, Drainage and Flood Defence	No significant effects on water quality, drainage and flood defence are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Geology	No significant effects on geology or geological/material resources are predicted for this option.	0 (Neutral)
Biodiversity and Habitats	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Landscape	No significant effects on landscapes are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Visual Amenity	No significant effects on visual amenity are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Agriculture and Soils	No significant effects on biodiversity and habitats are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Cultural Heritage	No significant effects on cultural heritage are predicted from this option taking account of assumed design and mitigation.	0 (Neutral)
Safety:		
Accidents	There are no accidents benefits associated with Option 4	0 (Neutral)
Security	Option 4 will have minor security enhancements resulting from real and perceived improvements to security in relation to bus facilities, such as lighting at stops, and increased natural surveillance from increased passenger numbers on-board and at stops.	+1 (minor benefit)

Option Details		
Economy:		
TEE	Benefits generated by reduction in journey times for some regional services	PVB £2.43m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	Benefits associated with improved integration of local and regional services.	+1 (minor benefit)
Transport and Land Use Integration	The option will support FIFEplan 2017 and SESplan Strategic Development Plan (2013)	+1 (minor benefit)
Policy Integration	The intervention supports a number of local (Council), regional (SEStran) and National (Transport Scotland) policy documents, particularly in aiming to encourage modal shift from private car to public transport.	+1 (minor benefit)
Accessibility & Social Inclusion:		
Community Accessibility	Option 4 improves public transport network coverage by improving regional bus services to St Andrews and Dundee.	+2 (moderate benefit)
Comparative Accessibility	Option 4 will provide a minor benefit by improving bus access to regional services in St Andrews and Dundee.	+1 (minor benefit)
Implementability Appraisal		
Feasibility:	No significant technical issues related to the implementation of Option 4 are expected. Similar to Option 3, This option would require reconfiguration of existing bus timetables and potentially additional bus fleets. It would also require effort in terms of negotiation and agreement with bus operators regarding service provision.	
Affordability:	This option could be delivered within existing resources	
Public Acceptability:	It is expected that Option 4 would also have an element of public support in terms of it enhancing the current bus network and improving regional connections, although it is anticipated that it would also not fulfil the wider aspirations around the public transport offering for the area.	

Table 36: Appraisal Summary Table for Rail Option 6A

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Re-open existing rail line to passengers only	Name of Planner	Peter Brett Associates LLP
Option Description	Provision of a passenger only rail line with a station at Leven. The service would be one train per hour (tph) via Kirkcaldy, with the existing service between Edinburgh Waverley and Glenrothes with Thornton operating from Waverley to Leven via Kirkcaldy i.e. not running between Kirkcaldy and Glenrothes.	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £66.69m
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		

Option Details		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.	
Transport Planning Objectives		
Objective:	Performance against TPO	Score
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Option 6 would provide journey time benefits for Levenmouth residents, resulting from improved access to settlements via the rail network. Other than accessing services in Leven itself for those travelling into the area, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	This option would improve access to the rail network for local residents and enhance business and tourist access to the area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. This option is also likely to have a major impact on making the Levenmouth area a more attractive location for businesses to locate and for people to visit.	+3 (major benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 6 would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Under this option, the transport model forecasts increased use of public transport and improvements in global air quality under each rail sub-option, as well as improvements in local air quality.	+2 (moderate benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score

Option Details		
Noise and Vibration	<p>Reinstatement works for the railway (including renewal of the track bed) and passenger stations is likely to generate construction noise and vibration although it is assumed that good construction practices would be deployed and would help to mitigate some impacts.</p> <p>It is predicted that noise and vibration effects would be experienced during construction which could be significant for short periods of intensive activity (e.g. from station, structures and track construction).</p> <p>Operational noise impacts would be predicted from train movements for lineside and near lineside properties, which may be significant dependent on the frequency and timing of rail operations, but which would be mitigated through railway design including where appropriate use of noise barriers.</p>	<p>+1 (minor benefit)</p> <p>To</p> <p>-1 (minor negative)</p>
Global Air Quality (CO ₂)	<p>Operation of the passenger railway line would result in increased fuel (or electricity) use for railway locomotives with associated carbon emissions.</p> <p>Reductions in car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on emissions from reduced and car vehicle kilometres.</p>	<p>+2 (moderate benefit)</p>
Local Air Quality (PM ₁₀ and NO ₂)	<p>Reinstatement works for railway and stations is likely to generate construction dust during periods of dry weather although it is assumed that good construction practices would be deployed and would mitigate nuisance impacts such that residual effects would not be significant.</p> <p>Operational impacts (emissions to atmosphere from diesel rail locomotives) would be predicted from (potentially) passenger train movements, the impacts of which would be dependent on the frequency of train operations and the characteristics of locomotives deployed.</p> <p>Emissions of local air pollutants from railway operations are not predicted to significantly affect background concentrations of local air pollutants for receptors within 200m of the rail line.</p> <p>Passenger rail services are predicted to reduce the number of private car journeys made on roads between key destinations in the study area.</p>	<p>+2 (moderate benefit)</p>

Option Details		
<p>Water Quality, Drainage and Flood Defence</p>	<p>Reinstatement of the former railway corridor could give rise to increased sedimentation of run-off and potential for pollution of watercourses from machinery and plant. Without mitigation potentially polluted discharges could reach nearby watercourses including the River Ore, River Leven and (at the dock area) the Firth of Forth.</p> <p>It is assumed that good construction practices would be deployed, appropriate mitigation to prevent pollution of nearby watercourses would be installed and permanent drainage would deploy sustainable drainage techniques such that significant effects on hydrology and water quality from permanent redevelopment of the railway would not be predicted.</p> <p>Reinstatement works for the railway formation, bridges over watercourses and station(s) has the potential to locally change hydrology along the railway corridor however effects are assumed to be mitigated through measures such as sustainable drainage of the permanent design and significant effects are not predicted.</p> <p>The areas of the river crossings of the River Ore and River Leven and (downstream of Cameron Bridge) land alongside the River Leven lie within the high-risk flood area and railway design would need to accommodate potential inundation during flood events.</p> <p>Operational impacts from track drainage and leaks/spills from trains would be predicted from train movements, the impacts of which would be dependent on the frequency of railway operations but are not predicted to be significant.</p> <p>It is predicted that with mitigation measures in place the permanent development and reinstatement of the railway/station(s) and its operation would not have significant effects on water quality and drainage taking account of assumed design and mitigation.</p>	<p>-1 (minor negative)</p>

Option Details		
Geology	<p>Reinstatement works for the railway formation and passenger stations have the potential to locally affect geological resources although this is mitigated given the existing presence of the (former) railway route and its engineered structure for much of the route of the line.</p> <p>It is predicted that with mitigation measures in place the reinstatement of the railway/stations and its operation would not have significant effects on geology. Any excavated material should be re-used for filling in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality.</p> <p>There is a potential for construction works to affect areas of potentially contaminated land associated with former industrial areas through which the eastern part of the route passes and this would require more detailed investigation, assessment and if appropriate remediation at later design stages.</p>	<p>-1 (minor negative)</p>

Option Details		
Biodiversity and Habitats	<p>The railway corridor passes through the southern part of the Kennoway – Windygates Wildlife Site and habitat loss (estimated as approximately 0.6ha of riparian habitat) from the railway’s reinstatement is predicted to have a minor adverse effect on this site.</p> <p>Industrial or urban land such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey would need to be carried out pre-reinstatement works, to confirm presence of any of these species and develop appropriate responses for eradication if necessary.</p> <p>Reinstatement/construction works for the railway formation and station(s) has the potential to result in localised losses of habitat from clearance of scrubby vegetation which has established on some parts of the former railway corridor, and to disturb species using these areas (particularly breeding birds and mammals) and nearby habitats which include areas of ancient woodland adjacent to the railway corridor.</p> <p>Mitigation measures would be implemented to minimise and adverse impacts.</p>	<p>-1 (minor negative)</p>
Landscape	<p>Construction works could give rise to temporary impacts on landscape from construction activity and associated movements of plant and vehicles although these would be short term and are not predicted to be significant.</p> <p>Reinstatement works for the railway formation and the bridges over watercourses and landscape clearing works required for construction of new railway station(s) would locally but permanently change landscape character along the railway corridor primarily through removal of vegetation which has established in the corridor and through the disturbance of areas of grassland and scrubby areas to facilitate the new development.</p> <p>The potential for significant landscape effects would be mitigated using former structures (as far as practicable) and ensuring that any new infrastructure was designed sympathetically to fit with the local landscape and townscape.</p>	<p>-1 (minor negative)</p>

Option Details		
Visual Amenity	<p>Operation of the railway may result in some changes in views when train operations are evident however significant impacts are not predicted.</p> <p>Potential improved passenger rail services are predicted to reduce the number of car journeys on roads in the study area. These are predicted to have minor beneficial visual impacts. Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>It may be possible to mitigate some of these effects in the longer term through measures such as screen planting. Some minor benefit effects are predicted for visual receptors close to roads where HGV and other traffic movements are reduced as a result of the railway's operation. traffic on key transport routes for local and roadside receptors.</p>	<p>-1 (minor negative) to -2 (moderate negative)</p>

Option Details		
<p>Agriculture and Soils</p>	<p>Reinstatement works for the railway formation and station(s) has the potential for minor changes to soil resources from construction works and permanent development which it is assumed would be mitigated with good construction practice and would be limited due to the existing presence of the (former) railway route and its engineered structure.</p> <p>The reinstatement of the railway, construction of new stations and railway operations is unlikely to have significant effects on agriculture or soils.</p> <p>No effects on agricultural operations or farm units are predicted.</p> <p>No new areas of agricultural land are assumed to be required for the proposals and most of the redevelopment of the line would be on land which has already been developed in the past for original railway construction.</p>	<p>O (neutral)</p>

Option Details		
Cultural Heritage	<p>No direct or setting effects are predicted on any scheduled monument, Conservation Area, or Garden and Designed Landscape.</p> <p>The railway route and its structures are not subject to any cultural heritage designations and redevelopment work is not predicted to directly impact on any designated areas of importance for archaeology.</p> <p>Development of the new station at Cameron Bridge is predicted to slightly affect the setting of the nearby Category B listed buildings associated with the distillery.</p> <p>It has been assumed that refurbishment of former structures such as bridges and new infrastructure would be designed sympathetically with the townscape character of the areas through which the line passes.</p> <p>There is potential for some minor effects from redevelopment of the railway on historic structures associated with the former railway and its ancillary infrastructure, but these are not predicted to be significant.</p> <p>No significant effects on archaeology and cultural heritage are predicted from reinstatement of the railway taking account of assumed design and mitigation.</p>	<p>0 (neutral)</p>
Safety:		
Accidents	Slight reduction in accidents	£56,000
Security	<p>Passenger rail (Option 6) will likely improve security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities.</p>	<p>+1 (minor benefit)</p>
Economy:		

Option Details		
TEE	Benefits mainly driven by journey time savings, followed by reductions in overall user charges	PVB £21.34m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	The rail benefits are from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a station situated within walking distance of the existing Leven Bus Station would improve integration between these modes.	+2 (moderate benefit)
Transport and Land Use Integration	The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA.	+1 (minor benefit)
Policy Integration	All of the rail options would support a number of local, regional and national transport policies, in particular encouraging greater use of public transport and supporting social inclusion.	+3 (major benefit)
Accessibility & Social Inclusion:		
Community Accessibility	All rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife (Kirkcaldy and Glenrothes) and beyond, particularly Edinburgh.	+2 (moderate benefit)

Option Details		
Comparative Accessibility	<p>The rail options under Option 6 will provide a major benefit under comparative accessibility. Information gathered through the engagement exercise, particularly with schools, suggested that particular groups were being socially excluded due to the current provision of public transport. Secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh on a daily basis by public transport while living at home. The return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact as having very few students living locally dampens expectation of school pupils as they do not see that as the norm and attainable.</p>	<p>+3 (major benefit)</p>
Implementability Appraisal		
Feasibility:	<p>Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. A substantial amount of rail infrastructure is already in place and its condition is to be considered. This option is therefore expected to be technically feasible with a line having operated previously. Engagement with the current franchise operator has highlighted capacity issues with regards to existing passenger rail services across the Forth Estuary and that additional rolling stock, servicing and maintenance would be required for any passenger rail service to Leven.</p>	
Affordability:	<p>Option 6 has the highest cost of all options. 6A (with one service and one station) is the least costly of the rail options with preparation, construction, operation and maintenance summing to £140.12m (undiscounted, 2019 prices)</p>	
Public Acceptability:	<p>Option 6 has significant public support and has received support from rail campaign groups and businesses via an online survey. The local community would support this option.</p>	

Table 37: Appraisal Summary Table for Rail Option 6B

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Re-open existing rail line to passengers only	Name of Planner	Peter Brett Associates LLP
Option Description	Provision of a passenger only rail line with stations at Leven and at Cameron Bridge. The service would be one tph via Kirkcaldy, with the existing service between Edinburgh Waverley and Glenrothes with Thornton operating from Waverley to Leven via Kirkcaldy i.e. not running between Kirkcaldy and Glenrothes.	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £70.1m
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		

Option Details		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.	
Transport Planning Objectives		
Objective:	Performance against TPO	Score
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Option 6 would provide journey time benefits for Levenmouth residents, resulting from improved access to settlements via the rail network. Other than accessing services in Leven itself for those travelling into the area, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	This option would improve access to the rail network for local residents and enhance business and tourist access to the area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. This option is also likely to have a major impact on making the Levenmouth area a more attractive location for businesses to locate and for people to visit.	+3 (major benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 6 would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Under this option, the transport model forecasts increased use of public transport and improvements in global air quality under each rail sub-option, as well as improvements in local air quality.	+2 (moderate benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score

Option Details		
Noise and Vibration	<p>Reinstatement works for the railway (including renewal of the track bed) and stations is likely to generate construction noise and vibration although it is assumed that good construction practices would be deployed and would help to mitigate some impacts.</p> <p>It is predicted that noise and vibration effects would be experienced during construction which could be significant for short periods of intensive activity (e.g. from station, structures and track construction).</p> <p>Operational noise impacts would be predicted from train movements for lineside and near lineside properties, which may be significant dependent on the frequency and timing of rail operations, but which would be mitigated through railway design including where appropriate use of noise barriers.</p>	<p>+1 (minor benefit) To -1 (minor negative)</p>
Global Air Quality (CO ₂)	<p>Operation the passenger railway line would result in increased fuel (or electricity) use for railway locomotives with associated carbon emissions.</p> <p>Reductions in car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on emissions from reduced overall HGV and car vehicle kilometres.</p>	<p>+2 (moderate benefit)</p>

Option Details		
Local Air Quality (PM ₁₀ and NO ₂)	<p>Reinstatement works for railway and stations is likely to generate construction dust during periods of dry weather although it is assumed that good construction practices would be deployed and would mitigate nuisance impacts such that residual effects would not be significant.</p> <p>Operational impacts (emissions to atmosphere from diesel rail locomotives) would be predicted from passenger train movements, the impacts of which would be dependent on the frequency of train operations and the characteristics of locomotives deployed.</p> <p>Emissions of local air pollutants from railway operations are not predicted to significantly affect background concentrations of local air pollutants for receptors within 200m of the rail line.</p> <p>Passenger rail services are predicted to reduce the number of private car journeys made on roads between key destinations in the study area.</p>	<p>+2 (moderate benefit)</p>

Option Details		
<p>Water Quality, Drainage and Flood Defence</p>	<p>Reinstatement of the former railway corridor could give rise to increased sedimentation of run-off and potential for pollution of watercourses from machinery and plant. Without mitigation potentially polluted discharges could reach nearby watercourses including the River Ore, River Leven and (at the dock area) the Firth of Forth.</p> <p>It is assumed that good construction practices would be deployed, appropriate mitigation to prevent pollution of nearby watercourses would be installed and permanent drainage would deploy sustainable drainage techniques such that significant effects on hydrology and water quality from permanent redevelopment of the railway would not be predicted.</p> <p>Reinstatement works for the railway formation, bridges over watercourses and station(s) has the potential to locally change hydrology along the railway corridor however effects are assumed to be mitigated through measures such as sustainable drainage of the permanent design and significant effects are not predicted.</p> <p>The areas of the river crossings of the River Ore and River Leven and (downstream of Cameron Bridge) land alongside the River Leven lie within the high-risk flood area and railway design would need to accommodate potential inundation during flood events.</p> <p>Operational impacts from track drainage and leaks/spills from trains would be predicted from train movements, the impacts of which would be dependent on the frequency of railway operations but are not predicted to be significant.</p> <p>It is predicted that with mitigation measures in place the permanent development and reinstatement of the railway/station(s) and its operation would not have significant effects on water quality and drainage taking account of assumed design and mitigation.</p>	<p style="text-align: center;">-1 (minor negative)</p>

Option Details		
Geology	<p>Reinstatement works for the railway formation and passenger stations have the potential to locally affect geological resources although this is mitigated given the existing presence of the (former) railway route and its engineered structure for much of the route of the line.</p> <p>It is predicted that with mitigation measures in place the reinstatement of the railway/stations and its operation would not have significant effects on geology. Any excavated material should be re-used for filling in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality.</p> <p>There is a potential for construction works to affect areas of potentially contaminated land associated with former industrial areas through which the eastern part of the route passes and this would require more detailed investigation, assessment and if appropriate remediation at later design stages.</p>	<p>-1 (minor negative)</p>

Option Details		
Biodiversity and Habitats	<p>The railway corridor passes through the southern part of the Kennoway – Windygates Wildlife Site and habitat loss (estimated as approximately 0.6ha of riparian habitat) from the railway’s reinstatement is predicted to have a minor adverse effect on this site.</p> <p>Industrial or urban land such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey would need to be carried out pre-reinstatement works, to confirm presence of any of these species and develop appropriate responses for eradication if necessary.</p> <p>Reinstatement/construction works for the railway formation and station(s) has the potential to result in localised losses of habitat from clearance of scrubby vegetation which has established on some parts of the former railway corridor, and to disturb species using these areas (particularly breeding birds and mammals) and nearby habitats which include areas of ancient woodland adjacent to the railway corridor.</p> <p>Mitigation measures would be implemented to minimise and adverse impacts.</p>	<p>-1 (minor negative)</p>
Landscape	<p>Construction works could give rise to temporary impacts on landscape from construction activity and associated movements of plant and vehicles although these would be short term and are not predicted to be significant.</p> <p>Reinstatement works for the railway formation and the bridges over watercourses and landscape clearing works required for construction of the new railway station(s) would locally but permanently change landscape character along the railway corridor primarily through removal of vegetation which has established in the corridor and through the disturbance of areas of grassland and scrubby areas to facilitate the new development.</p> <p>The potential for significant landscape effects would be mitigated using former structures (as far as practicable) and ensuring that any new infrastructure was designed sympathetically to fit with the local landscape and townscape.</p>	<p>-1 (minor negative)</p>

Option Details		
Visual Amenity	<p>Operation of the railway may result in some changes in views when train operations are evident however significant impacts are not predicted.</p> <p>Rail services are predicted to reduce the number of car journeys on roads in the study area. These are predicted to have minor beneficial visual impacts. Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>It may be possible to mitigate some of these effects in the longer term through measures such as screen planting. Some minor benefit effects are predicted for visual receptors close to roads where HGV and other traffic movements are reduced as a result of the railway's operation. traffic on key transport routes for local and roadside receptors.</p>	<p>-1 (minor negative)</p> <p>to</p> <p>-2 (moderate negative)</p>

Option Details		
Agriculture and Soils	<p>Reinstatement works for the railway formation and station(s) has the potential for minor changes to soil resources from construction works and permanent development which it is assumed would be mitigated with good construction practice and would be limited due to the existing presence of the (former) railway route and its engineered structure.</p> <p>The reinstatement of the railway, construction of new stations and railway operations is unlikely to have significant effects on agriculture or soils.</p> <p>No effects on agricultural operations or farm units are predicted.</p> <p>No new areas of agricultural land are assumed to be required for the proposals and most of the redevelopment of the line would be on land which has already been developed in the past for original railway construction.</p>	<p>O (neutral)</p>

Option Details		
Cultural Heritage	<p>No direct or setting effects are predicted on any scheduled monument, Conservation Area, or Garden and Designed Landscape.</p> <p>The railway route and its structures are not subject to any cultural heritage designations and redevelopment work is not predicted to directly impact on any designated areas of importance for archaeology.</p> <p>Development of the new station at Cameron Bridge is predicted to slightly affect the setting of the nearby Category B listed buildings associated with the distillery.</p> <p>It has been assumed that refurbishment of former structures such as bridges and new infrastructure would be designed sympathetically with the townscape character of the areas through which the line passes.</p> <p>There is potential for some minor effects from redevelopment of the railway on historic structures associated with the former railway and its ancillary infrastructure, but these are not predicted to be significant.</p> <p>No significant effects on archaeology and cultural heritage are predicted from reinstatement of the railway taking account of assumed design and mitigation.</p>	<p>0 (neutral)</p>
Safety:		
Accidents	Slight reduction in accidents	£77,000
Security	<p>Passenger rail (Option 6) will likely improve security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities.</p>	<p>+1 (minor benefit)</p>
Economy:		

Option Details		
TEE	Benefits mainly driven by journey time savings, followed by reductions in overall user charges	PVB £20.64m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	The rail benefits are from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a station situated within walking distance of the existing Leven Bus Station would improve integration between these modes.	+2 (moderate benefit)
Transport and Land Use Integration	The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA.	+1 (minor benefit)
Policy Integration	All of the rail options would support a number of local, regional and national transport policies, in particular encouraging greater use of public transport and supporting social inclusion.	+3 (major benefit)
Accessibility & Social Inclusion:		
Community Accessibility	All rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife (Kirkcaldy and Glenrothes) and beyond, particularly Edinburgh.	+2 (moderate benefit)

Option Details		
Comparative Accessibility	<p>The rail options under Option 6 will provide a major benefit under comparative accessibility. Information gathered through the engagement exercise, particularly with schools, suggested that particular groups were being socially excluded due to the current provision of public transport. Secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh on a daily basis by public transport while living at home. The return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact as having very few students living locally dampens expectation of school pupils as they do not see that as the norm and attainable.</p>	<p>+3 (major benefit)</p>
Implementability Appraisal		
Feasibility:	<p>Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. A substantial amount of rail infrastructure is already in place and its condition is to be considered. This option is therefore expected to be technically feasible with a line having operated previously. Engagement with the current franchise operator has highlighted capacity issues with regards to existing passenger rail services across the Forth Estuary and that additional rolling stock, servicing and maintenance would be required for any passenger rail service to Leven.</p>	
Affordability:	<p>Option 6 has the highest cost of all options. 6B (with one service and two stations) is the second lowest of the rail options, in terms of costs, with preparation, construction, operation and maintenance summing to £144.73m (undiscounted, 2019 prices)</p>	
Public Acceptability:	<p>Option 6 has significant public support and has received support from rail campaign groups and businesses via an online survey. The local community would support this option.</p>	

Table 38: Appraisal Summary Table for Rail Option 6C

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Re-open existing rail line to passengers only	Name of Planner	Peter Brett Associates LLP
Option Description	Provision of a passenger only rail line with a station at Leven. The service would be one tph via Kirkcaldy and one tph via Cowdenbeath, with the existing service between Edinburgh Waverley and Glenrothes with Thornton operating from Waverley to Leven via Kirkcaldy i.e. not running between Kirkcaldy and Glenrothes.	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £66.69m
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		

Option Details		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.	
Transport Planning Objectives		
Objective:	Performance against TPO	Score
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Option 6 would provide journey time benefits for Levenmouth residents, resulting from improved access to settlements via the rail network. Other than accessing services in Leven itself for those travelling into the area, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	This option would improve access to the rail network for local residents and enhance business and tourist access to the area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. This option is also likely to have a major impact on making the Levenmouth area a more attractive location for businesses to locate and for people to visit.	+3 (major benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 6 would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Under this option, the transport model forecasts increased use of public transport and improvements in global air quality under each rail sub-option, as well as improvements in local air quality.	+2 (moderate benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score

Option Details		
Noise and Vibration	<p>Reinstatement works for the railway (including renewal of the track bed) and stations is likely to generate construction noise and vibration although it is assumed that good construction practices would be deployed and would help to mitigate some impacts.</p> <p>It is predicted that noise and vibration effects would be experienced during construction which could be significant for short periods of intensive activity (e.g. from station, structures and track construction).</p> <p>Operational noise impacts would be predicted from train movements for lineside and near lineside properties, which may be significant dependent on the frequency and timing of rail operations, but which would be mitigated through railway design including where appropriate use of noise barriers.</p>	<p>+1 (minor benefit) to -1 (minor negative)</p>
Global Air Quality (CO ₂)	<p>Operation of the passenger railway line would result in increased fuel (or electricity) use for railway locomotives with associated carbon emissions.</p> <p>Reductions in car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on emissions from reduced overall HGV and car vehicle kilometres.</p>	<p>+2 (moderate benefit)</p>

Option Details		
<p>Local Air Quality (PM₁₀ and NO₂)</p>	<p>Reinstatement works for the railway and stations is likely to generate construction dust during periods of dry weather although it is assumed that good construction practices would be deployed and would mitigate nuisance impacts such that residual effects would not be significant.</p> <p>Operational impacts (emissions to atmosphere from diesel rail locomotives) would be predicted from train movements, the impacts of which would be dependent on the frequency of train operations and the characteristics of locomotives deployed.</p> <p>Emissions of local air pollutants from railway operations are not predicted to significantly affect background concentrations of local air pollutants for receptors within 200m of the rail line.</p> <p>Passenger rail services are predicted to reduce the number of private car journeys made on roads between key destinations in the study area.</p>	<p>+2 (moderate benefit)</p>

Option Details		
<p>Water Quality, Drainage and Flood Defence</p>	<p>Reinstatement of the former railway corridor could give rise to increased sedimentation of run-off and potential for pollution of watercourses from machinery and plant. Without mitigation potentially polluted discharges could reach nearby watercourses including the River Ore, River Leven and (at the dock area) the Firth of Forth.</p> <p>It is assumed that good construction practices would be deployed, appropriate mitigation to prevent pollution of nearby watercourses would be installed and permanent drainage would deploy sustainable drainage techniques such that significant effects on hydrology and water quality from permanent redevelopment of the railway would not be predicted.</p> <p>Reinstatement works for the railway formation, bridges over watercourses and station(s) has the potential to locally change hydrology along the railway corridor however effects are assumed to be mitigated through measures such as sustainable drainage of the permanent design and significant effects are not predicted.</p> <p>The areas of the river crossings of the River Ore and River Leven and (downstream of Cameron Bridge) land alongside the River Leven lie within the high-risk flood area and railway design would need to accommodate potential inundation during flood events.</p> <p>Operational impacts from track drainage and leaks/spills from trains would be predicted from train movements, the impacts of which would be dependent on the frequency of railway operations but are not predicted to be significant.</p> <p>It is predicted that with mitigation measures in place the permanent development and reinstatement of the railway/station(s) and its operation would not have significant effects on water quality and drainage taking account of assumed design and mitigation.</p>	<p>-1 (minor negative)</p>

Option Details		
Geology	<p>Reinstatement works for the railway formation and passenger stations have the potential to locally affect geological resources although this is mitigated given the existing presence of the (former) railway route and its engineered structure for much of the route of the line.</p> <p>It is predicted that with mitigation measures in place the reinstatement of the railway/stations and its operation would not have significant effects on geology. Any excavated material should be re-used for filling in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality.</p> <p>There is a potential for construction works to affect areas of potentially contaminated land associated with former industrial areas through which the eastern part of the route passes and this would require more detailed investigation, assessment and if appropriate remediation at later design stages.</p>	<p>-1 (minor negative)</p>

Option Details		
Biodiversity and Habitats	<p>The railway corridor passes through the southern part of the Kennoway – Windygates Wildlife Site and habitat loss (estimated as approximately 0.6ha of riparian habitat) from the railway’s reinstatement is predicted to have a minor adverse effect on this site.</p> <p>Industrial or urban land such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey would need to be carried out pre-reinstatement works, to confirm presence of any of these species and develop appropriate responses for eradication if necessary.</p> <p>Reinstatement/construction works for the railway formation and station(s) has the potential to result in localised losses of habitat from clearance of scrubby vegetation which has established on some parts of the former railway corridor, and to disturb species using these areas (particularly breeding birds and mammals) and nearby habitats which include areas of ancient woodland adjacent to the railway corridor.</p> <p>Mitigation measures would be implemented to minimise and adverse impacts.</p>	<p>-1 (minor negative)</p>
Landscape	<p>Construction works could give rise to temporary impacts on landscape from construction activity and associated movements of plant and vehicles although these would be short term and are not predicted to be significant.</p> <p>Reinstatement works for the railway formation and the bridges over watercourses and landscape clearing works required for construction of the new railway station(s) would locally but permanently change landscape character along the railway corridor primarily through removal of vegetation which has established in the corridor and through the disturbance of areas of grassland and scrubby areas to facilitate the new development.</p> <p>The potential for significant landscape effects would be mitigated using former structures (as far as practicable) and ensuring that any new infrastructure was designed sympathetically to fit with the local landscape and townscape.</p>	<p>-1 (minor negative)</p>

Option Details		
Visual Amenity	<p>Operation of the railway may result in some changes in views when train operations are evident however significant impacts are not predicted.</p> <p>Rail services are predicted to reduce the number of car journeys on roads in the study area. These are predicted to have minor beneficial visual impacts. Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>It may be possible to mitigate some of these effects in the longer term through measures such as screen planting. Some minor benefit effects are predicted for visual receptors close to roads where HGV and other traffic movements are reduced as a result of the railway's operation. traffic on key transport routes for local and roadside receptors.</p>	<p>-1 (minor negative)</p> <p>To</p> <p>-2 (moderate negative)</p>

Option Details		
Agriculture and Soils	<p>Reinstatement works for the railway formation and station(s) has the potential for minor changes to soil resources from construction works and permanent development which it is assumed would be mitigated with good construction practice and would be limited due to the existing presence of the (former) railway route and its engineered structure.</p> <p>The reinstatement of the railway, construction of new stations and railway operations is unlikely to have significant effects on agriculture or soils.</p> <p>No effects on agricultural operations or farm units are predicted.</p> <p>No new areas of agricultural land are assumed to be required for the proposals and most of the redevelopment of the line would be on land which has already been developed in the past for original railway construction.</p>	<p>O (neutral)</p>

Option Details		
Cultural Heritage	<p>No direct or setting effects are predicted on any scheduled monument, Conservation Area, or Garden and Designed Landscape.</p> <p>The railway route and its structures are not subject to any cultural heritage designations and redevelopment work is not predicted to directly impact on any designated areas of importance for archaeology.</p> <p>Development of the new station at Cameron Bridge is predicted to slightly affect the setting of the nearby Category B listed buildings associated with the distillery.</p> <p>It has been assumed that refurbishment of former structures such as bridges and new infrastructure would be designed sympathetically with the townscape character of the areas through which the line passes.</p> <p>There is potential for some minor effects from redevelopment of the railway on historic structures associated with the former railway and its ancillary infrastructure, but these are not predicted to be significant.</p> <p>No significant effects on archaeology and cultural heritage are predicted from reinstatement of the railway taking account of assumed design and mitigation.</p>	<p>0 (neutral)</p>
Safety:		
Accidents	Slight reduction in accidents	£191,000
Security	<p>Passenger rail (Option 6) will likely improve security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities.</p>	<p>+1 (minor benefit)</p>
Economy:		

Option Details		
TEE	Present value of benefits of £49.71m, mainly driven by journey time savings (£38.42m) and user charges reductions (£14.08m)	PVB £49.71m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	The rail benefits are from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a station situated within walking distance of the existing Leven Bus Station would improve integration between these modes.	+2 (moderate benefit)
Transport and Land Use Integration	The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA.	+1 (minor benefit)
Policy Integration	All of the rail options would support a number of local, regional and national transport policies, in particular encouraging greater use of public transport and supporting social inclusion.	+3 (major benefit)
Accessibility & Social Inclusion:		
Community Accessibility	All rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife (Kirkcaldy and Glenrothes) and beyond, particularly Edinburgh.	+2 (moderate benefit)

Option Details		
Comparative Accessibility	<p>The rail options under Option 6 will provide a major benefit under comparative accessibility. Information gathered through the engagement exercise, particularly with schools, suggested that particular groups were being socially excluded due to the current provision of public transport. Secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh on a daily basis by public transport while living at home. The return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact as having very few students living locally dampens expectation of school pupils as they do not see that as the norm and attainable.</p>	<p>+3 (major benefit)</p>
Implementability Appraisal		
Feasibility:	<p>Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. A substantial amount of rail infrastructure is already in place and its condition is to be considered. This option is therefore expected to be technically feasible with a line having operated previously. Engagement with the current franchise operator has highlighted capacity issues with regards to existing passenger rail services across the Forth Estuary and that additional rolling stock, servicing and maintenance would be required for any passenger rail service to Leven.</p>	
Affordability:	<p>Option 6 has the highest cost of all options. 6C (with two services per hour and one station) is the second highest in terms of cost with preparation, construction, operation and maintenance summing to £179.68m (undiscounted, 2019 prices)</p>	
Public Acceptability:	<p>Option 6 has significant public support and has received support from rail campaign groups and businesses via an online survey. The local community would support this option.</p>	

Table 39: Appraisal Summary Table for Rail Option 6D

Option Details			
Name and address of authority or organisation promoting the option			
Option Name	Re-open existing rail line to passengers only	Name of Planner	Peter Brett Associates LLP
Option Description	Provision of a passenger only rail line, with stations at Leven and at Cameron Bridge. The service would be one tph via Kirkcaldy and one tph via Cowdenbeath, with the existing service between Edinburgh Waverley and Glenrothes with Thornton operating from Waverley to Leven via Kirkcaldy i.e. not running between Kirkcaldy and Glenrothes.	Estimated Total Public Sector Funding Requirement:	Capital Cost in 2019 prices, excluding VAT (undiscounted) £70.1m
Funding Sought From (if applicable):	Unknown at this time	Amount of Application	Unknown at this time
Background Information			
Geographical context	The area of Levenmouth lies in east Fife and is approximately six miles east of Markinch and the same distance north-east from Kirkcaldy, providing a gateway to a large part of the East Neuk in north-east Fife. The area comprises an amalgamation of coastal and inland settlements surrounding the core urban centre of Leven, including Methil, Buckhaven, Methilhill, Windygates and Kennoway. Most local amenities are provided in Leven, serving a catchment population of approximately 35,000 in the Levenmouth area plus a large part of the East Neuk to North East Fife.		
Social context	The Levenmouth area has an ageing population and one that has a record of poor health, low incomes and low levels of education attainment. Whilst Levenmouth has pockets of relative wealth, poverty and inequality in some neighbourhoods is persistent and severe. The Scotland Index of Multiple Deprivation (SIMD) reveals that 23 of the 50 Scottish Index of Multiple Deprivation (SIMD) 2016 data zones in Levenmouth's area are among the 20% most-deprived in Scotland, 12 (=24%) of these are in the 10% most deprived and six (=12%) of these are among the 5% most-deprived data zones in Scotland.		

Option Details		
Economic context	The Levenmouth area has gone through a period of considerable change over the last fifty years. It has experienced a decline in the traditional heavy industrial manufacturing jobs, particularly mining. Whilst many of the old jobs have been replaced by new employment opportunities, and the area has seen significant commercial investment by Diageo and in the Fife Energy Park in recent years, these have not been sufficient to replace all. The area faces economic challenges, with relatively high levels of unemployment and benefit claimants, coupled with relatively low levels of household income compared to other parts of Fife.	
Transport Planning Objectives		
Objective:	Performance against TPO	Score
TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area	Option 6 would provide journey time benefits for Levenmouth residents, resulting from improved access to settlements via the rail network. Other than accessing services in Leven itself for those travelling into the area, this option is not expected to have a notable impact on accessibility to destinations and services within the wider Levenmouth area.	+1 (minor benefit)
TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population	This option would improve access to the rail network for local residents and enhance business and tourist access to the area. This option would provide the opportunity to serve both sides of the Fife Circle thereby augmenting access opportunities for Levenmouth residents and would also provide additional wider, indirect benefits and travel options for north east Fife communities. This option is also likely to have a major impact on making the Levenmouth area a more attractive location for businesses to locate and for people to visit.	+3 (major benefit)
TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area	Option 6 would improve public transport mode choice for the residents and workers of Levenmouth and it is expected to be an attractive option for travel to destinations outside and within Levenmouth such as improved access to East Neuk, therefore promoting sustainable transport use. Under this option, the transport model forecasts increased use of public transport and improvements in global air quality under each rail sub-option, as well as improvements in local air quality.	+2 (moderate benefit)
STAG Criteria		
Criterion		
Environment:	Performance against STAG Criterion	Score

Option Details		
<p>Noise and Vibration</p>	<p>Reinstatement works for the railway (including renewal of the track bed) and stations is likely to generate construction noise and vibration although it is assumed that good construction practices would be deployed and would help to mitigate some impacts.</p> <p>It is predicted that noise and vibration effects would be experienced during construction which could be significant for short periods of intensive activity (e.g. from station, structures and track construction).</p> <p>Operational noise impacts would be predicted from train movements for lineside and near lineside properties, which may be significant dependent on the frequency and timing of rail operations, but which would be mitigated through railway design including where appropriate use of noise barriers.</p>	<p>+1 (minor benefit) To -1 (minor negative)</p>
<p>Global Air Quality (CO₂)</p>	<p>Operation of the passenger railway line would result in increased fuel (or electricity) use for railway locomotives with associated carbon emissions.</p> <p>Reductions in car traffic flows on key roads in the study area and beyond are predicted to have moderate beneficial impacts on emissions from reduced overall HGV and car vehicle kilometres.</p>	<p>+2 (moderate benefit)</p>

Option Details		
Local Air Quality (PM ₁₀ and NO ₂)	<p>Reinstatement works for the railway and stations is likely to generate construction dust during periods of dry weather although it is assumed that good construction practices would be deployed and would mitigate nuisance impacts such that residual effects would not be significant.</p> <p>Operational impacts (emissions to atmosphere from diesel rail locomotives) would be predicted from train movements, the impacts of which would be dependent on the frequency of train operations and the characteristics of locomotives deployed.</p> <p>Emissions of local air pollutants from railway operations are not predicted to significantly affect background concentrations of local air pollutants for receptors within 200m of the rail line.</p> <p>Passenger rail services are predicted to reduce the number of private car journeys made on roads between key destinations in the study area.</p>	<p>+2 (moderate benefit)</p>

Option Details		
<p>Water Quality, Drainage and Flood Defence</p>	<p>Reinstatement of the former railway corridor could give rise to increased sedimentation of run-off and potential for pollution of watercourses from machinery and plant. Without mitigation potentially polluted discharges could reach nearby watercourses including the River Ore, River Leven and (at the dock area) the Firth of Forth.</p> <p>It is assumed that good construction practices would be deployed, appropriate mitigation to prevent pollution of nearby watercourses would be installed and permanent drainage would deploy sustainable drainage techniques such that significant effects on hydrology and water quality from permanent redevelopment of the railway would not be predicted.</p> <p>Reinstatement works for the railway formation, bridges over watercourses and station(s) has the potential to locally change hydrology along the railway corridor however effects are assumed to be mitigated through measures such as sustainable drainage of the permanent design and significant effects are not predicted.</p> <p>The areas of the river crossings of the River Ore and River Leven and (downstream of Cameron Bridge) land alongside the River Leven lie within the high-risk flood area and railway design would need to accommodate potential inundation during flood events.</p> <p>Operational impacts from track drainage and leaks/spills from trains would be predicted from train movements, the impacts of which would be dependent on the frequency of railway operations but are not predicted to be significant.</p> <p>It is predicted that with mitigation measures in place the permanent development and reinstatement of the railway/station(s) and its operation would not have significant effects on water quality and drainage taking account of assumed design and mitigation.</p>	<p style="text-align: center;">-1 (minor negative)</p>

Option Details		
Geology	<p>Reinstatement works for the railway formation and passenger stations have the potential to locally affect geological resources although this is mitigated given the existing presence of the (former) railway route and its engineered structure for much of the route of the line.</p> <p>It is predicted that with mitigation measures in place the reinstatement of the railway/stations and its operation would not have significant effects on geology. Any excavated material should be re-used for filling in earthworks and landscaping and remaining transferred off site for reuse if of suitable quality.</p> <p>There is a potential for construction works to affect areas of potentially contaminated land associated with former industrial areas through which the eastern part of the route passes and this would require more detailed investigation, assessment and if appropriate remediation at later design stages.</p>	<p>-1 (minor negative)</p>

Option Details		
Biodiversity and Habitats	<p>The railway corridor passes through the southern part of the Kennoway – Windygates Wildlife Site and habitat loss (estimated as approximately 0.6ha of riparian habitat) from the railway’s reinstatement is predicted to have a minor adverse effect on this site.</p> <p>Industrial or urban land such as disused rail lines have the potential to contain invasive species therefore an ecological walkover survey would need to be carried out pre-reinstatement works, to confirm presence of any of these species and develop appropriate responses for eradication if necessary.</p> <p>Reinstatement/construction works for the railway formation and station(s) has the potential to result in localised losses of habitat from clearance of scrubby vegetation which has established on some parts of the former railway corridor, and to disturb species using these areas (particularly breeding birds and mammals) and nearby habitats which include areas of ancient woodland adjacent to the railway corridor.</p> <p>Mitigation measures would be implemented to minimise and adverse impacts.</p>	<p>-1 (minor negative)</p>
Landscape	<p>Construction works could give rise to temporary impacts on landscape from construction activity and associated movements of plant and vehicles although these would be short term and are not predicted to be significant.</p> <p>Reinstatement works for the railway formation and the bridges over watercourses and landscape clearing works required for construction of the new railway station(s) would locally but permanently change landscape character along the railway corridor primarily through removal of vegetation which has established in the corridor and through the disturbance of areas of grassland and scrubby areas to facilitate the new development.</p> <p>The potential for significant landscape effects would be mitigated using former structures (as far as practicable) and ensuring that any new infrastructure was designed sympathetically to fit with the local landscape and townscape.</p>	<p>-1 (minor negative)</p>

Option Details		
Visual Amenity	<p>Operation of the railway may result in some changes in views when train operations are evident however significant impacts are not predicted.</p> <p>Rail services are predicted to reduce the number of roads-based car journeys on roads in the study area. These are predicted to have minor beneficial visual impacts. Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>Significant adverse effects on visual amenity are predicted from the permanent development and operation of this option in some locations where receptors or views are particularly close to the railway route (including areas of housing on the edge of Windygates and Leven which have views towards and along the railway).</p> <p>It may be possible to mitigate some of these effects in the longer term through measures such as screen planting. Some minor benefit effects are predicted for visual receptors close to roads where HGV and other traffic movements are reduced as a result of the railway's operation. traffic on key transport routes for local and roadside receptors.</p>	<p>-1 (minor negative)</p> <p>To</p> <p>-2 (moderate negative)</p>

Option Details		
<p>Agriculture and Soils</p>	<p>Reinstatement works for the railway formation and station(s) has the potential for minor changes to soil resources from construction works and permanent development which it is assumed would be mitigated with good construction practice and would be limited due to the existing presence of the (former) railway route and its engineered structure.</p> <p>The reinstatement of the railway, construction of new stations and railway operations is unlikely to have significant effects on agriculture or soils.</p> <p>No effects on agricultural operations or farm units are predicted.</p> <p>No new areas of agricultural land are assumed to be required for the proposals and most of the redevelopment of the line would be on land which has already been developed in the past for original railway construction.</p>	<p>O (neutral)</p>

Option Details		
Cultural Heritage	<p>No direct or setting effects are predicted on any scheduled monument, Conservation Area, or Garden and Designed Landscape.</p> <p>The railway route and its structures are not subject to any cultural heritage designations and redevelopment work is not predicted to directly impact on any designated areas of importance for archaeology.</p> <p>Development of the new station at Cameron Bridge is predicted to slightly affect the setting of the nearby Category B listed buildings associated with the distillery.</p> <p>It has been assumed that refurbishment of former structures such as bridges and new infrastructure would be designed sympathetically with the townscape character of the areas through which the line passes.</p> <p>There is potential for some minor effects from redevelopment of the railway on historic structures associated with the former railway and its ancillary infrastructure, but these are not predicted to be significant.</p> <p>No significant effects on archaeology and cultural heritage are predicted from reinstatement of the railway taking account of assumed design and mitigation.</p>	<p>0 (neutral)</p>
Safety:		
Accidents	Slight reduction in accidents	£237,000
Security	<p>Passenger rail (Option 6) will likely improve security for public transport users through the inclusion of passenger waiting facilities that will be built to at least minimum safety requirements for factors such as site perimeters, entrances and exits, and lighting. The stations/terminals would also likely be of a scale to include periods of staff presence as well as the provision of formal surveillance (CCTV) and on-platform emergency call/information facilities.</p>	<p>+1 (minor benefit)</p>
Economy:		

Option Details		
TEE	Present value of benefits of £70.91m, mainly driven by journey time savings (£57.03m) and savings in user charges for users (£16.85m)	PVB £70.91m
Wider Economic Impacts / Benefits	Not assessed	
Integration:		
Transport Integration	The rail benefits are from direct access to the rail network, simplification of ticketing requirements compared to multiple modes, and improved infrastructure and information from new stations. Furthermore, inclusion of a station situated within walking distance of the existing Leven Bus Station would improve integration between these modes.	+2 (moderate benefit)
Transport and Land Use Integration	The rail option variants integrate well with the existing land use and future development proposals identified in the area. FIFEplan safeguards land for the re-opening of the rail line. The introduction of rail services is likely to help mitigate the travel demand impact of future development proposals in the area such as the significant development within the SDA.	+1 (minor benefit)
Policy Integration	All of the rail options would support a number of local, regional and national transport policies, in particular encouraging greater use of public transport and supporting social inclusion.	+3 (major benefit)
Accessibility & Social Inclusion:		
Community Accessibility	All rail options will provide benefits in terms of public transport network coverage for many residents in the Levenmouth area to several other areas of Fife (Kirkcaldy and Glenrothes) and beyond, particularly Edinburgh.	+2 (moderate benefit)

Option Details		
Comparative Accessibility	<p>The rail options under Option 6 will provide a major benefit under comparative accessibility. Information gathered through the engagement exercise, particularly with schools, suggested that particular groups were being socially excluded due to the current provision of public transport. Secondary school students, for example, were not able to select their preferred higher or further education courses because they could not, reasonably, get to and from Edinburgh on a daily basis by public transport while living at home. The return journey time by bus was prohibitive and moving away from home was deemed to be too costly. This is having a wider community impact as having very few students living locally dampens expectation of school pupils as they do not see that as the norm and attainable.</p>	<p>+3 (major benefit)</p>
Implementability Appraisal		
Feasibility:	<p>Under Option 6, there could be technical challenges associated with re-design and refurbishment of the existing, disused, rail line to bring it up to an appropriate standard commensurate with the operation of passenger services. A substantial amount of rail infrastructure is already in place and its condition is to be considered. This option is therefore expected to be technically feasible with a line having operated previously. Engagement with the current franchise operator has highlighted capacity issues with regards to existing passenger rail services across the Forth Estuary and that additional rolling stock, servicing and maintenance would be required for any passenger rail service to Leven.</p>	
Affordability:	<p>Option 6 has the highest cost of all options. 6D (with two services per hour service and two stations) is the highest cost rail option with preparation, construction, operation and maintenance summing to £184.29m (undiscounted, 2019 prices)</p>	
Public Acceptability:	<p>Option 6 has significant public support and has received support from rail campaign groups and businesses via an online survey. The local community would support this option.</p>	

Peter Brett Associates LLP is a leading development and infrastructure consultancy. As an independent consulting practice of planners, economists, engineers and scientists, we provide trusted advice to create value from land and buildings owned or operated by our clients.

All of our work, from the engineering of landmark buildings and critical infrastructure to the spatial planning and economic evidence in support of development, is evidence based and informed by a deep understanding of what it takes to deliver construction.

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