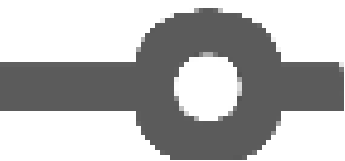




LEVENMOUTH SUSTAINABLE TRANSPORT STUDY - STAG REPORT



SYSTRA



LEVENMOUTH STAG UPDATE

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IDENTIFICATION TABLE

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EXECUTIVE SUMMARY

Introduction

In May 2015, Fife Council commissioned SYSTRA to undertake an appraisal to determine measures to improve sustainable transport options for the Levenmouth area of Fife, with a view to improving its economic vitality. The area is within the top 20% of most deprived communities in Scotland, with several areas within the top 5%, as set out in the most recent SIMD data. However, it has the potential to regenerate through business and tourist development opportunities in the area and its hinterland as well as provide transport opportunities for 1,650 new houses, 15ha of business land, Fife Energy Park, as well as community and educational facilities.

The study was to be undertaken in accordance with the Scottish Transport Appraisal Guidance (STAG).

Recommendation

The preferred option (Option B) is to re-open the existing rail line to Levenmouth. The scheme has an estimated cost benefit ratio of 1.31 and net present value benefits of £79.8m (at 2010 prices), excluding the likely wider economic benefits, which could be significant, given that the scheme has the potential to provide a step change in the economic performance of a large population area. As well as helping to regenerate economic activity this will provide a gateway to significantly boost tourism and the visitor experience in Levenmouth and North East Fife.

A secondary component (Option A) of enhanced, supported bus services to improve accessibility in the local area and encourage modal shift is identified as a potential 'quick-win' measure and would provide some additional long-term benefits, including improvements to some local public transport journeys not directly served by the rail option. This option should therefore be viewed as complementary in supporting the main preferred option to re-open the rail line.

The Study Area

The Levenmouth area has a population of around 38,000, which makes it the 25th largest settlement in Scotland¹. It comprises an amalgamation of coastal and inland settlements centred on the core urban centre of Leven and the surrounding settlements of Methil, Buckhaven, Methilhill, Windygates and Kennoway, as shown in Figure 1.

The area provides a gateway to a large part of the East Neuk in north-east Fife, whose residents are therefore also affected by any transport issues which affect the Levenmouth area.

¹ <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/special-area-population-estimates/settlements-and-localities/mid-2012>



Figure 1. Levenmouth Study Area – Study Brief ²

A wide range of consultation was undertaken throughout the appraisal process, including:

- engagement with key stakeholders via a half-day ‘Problems and Opportunities’ workshop with Fife Council, Transport Scotland and SEStran;
- one-to-one meetings, phone discussions and/or written correspondence with representatives from key stakeholder groups including Transport Scotland, Network Rail, Savills, Wemyss Estates Management, Stagecoach, Levenmouth Rail Campaign, Abellio (ScotRail) and statutory environmental consultees (Scottish Natural Heritage (SNH), Scottish Environmental Protection Agency (SEPA) and Historic Scotland);
- Engagement with the local business community via an online questionnaire and liaison with Fife Chamber of Commerce; and
- Engagement with the general public via an online questionnaire and drop-in events in the local community.

Problems, Opportunities, Issues and Constraints

The key problems, opportunities, issues and constraints within the study area can be summarised as follows:

Problems

- **Need for economic development to attract businesses and new residents:**
 - The **levels of deprivation and unemployment** within Levenmouth are **above the national average** and greater than most other areas of Fife; The area remains within the top 20% of most deprived communities in Scotland, with several areas within the top 5% most deprived, as set out in the most recent SIMD data.

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- Fife Council and many of the stakeholders consulted as part of this Study believe that the difficulties accessing the area from Edinburgh and beyond is creating a barrier to attracting inward investment to the area;
 - The large journey times to central Edinburgh (typically well in excess of 1½ hours) by public transport and/or the need to interchange, limits the attractiveness of the area to attracting new residents who need to make regular trips to the Central Belt.
- **Access to services by public transport:**
- **Car ownership is lower than the Scottish average** with 38% households in Leven, Methil, Methilhill and Buckhaven not having access to a car compared to a national average of 31%, while almost a half of Levenmouth’s datazones are among the 20% most deprived in Scotland and several are in the 5% most-deprived. As a result, there is a **particular dependence on affordable public transport** within the Levenmouth area;
 - Approximately 50% respondents to the public consultation reported dissatisfaction with the ability of current public transport services to provide **access to employment, education and other opportunities**; and
 - Inward and outward **commuting** is predominantly undertaken by **private car**, suggesting that those without access to a private car are being disadvantaged in the local job market.
- **Unattractive public transport leading to “unsustainable” travel choices:**
- Access to the rail network from the Levenmouth area currently involves interchange, primarily at Markinch or Kirkcaldy stations. The lack of a direct service to these more-distant locations, the lack of integration between bus and rail services at the interchange stations and the higher cost of the separate bus + rail tickets is contributing to a high car mode share for these long-distance journeys; and
 - Current rail fares between the area and Edinburgh are much higher (£/mile) than the Scottish average, particularly to/from Markinch station³.
- **Significant HGV traffic to/from the area, particularly the movement of whisky and whisky-related products to the Diageo distillery at Cameron Bridge and bottling plant in Leven;**

Opportunities

- **Bus service enhancements:**
- Stagecoach has provided **investment in the bus network** within Levenmouth. This includes the upgrade of vehicles and roll-out of measures to improve facilities and journey experience, including the introduction of journey planning/information apps and one-ticketing arrangements.
- **Increasing public transport choice:**

³ The current standard return fare to Edinburgh is £5 more expensive than expected, based on other Central Belt stations and this excess fare is greater than any of the 94 stations included in our analysis

- There is an **existing, but largely out-of-use, rail line** between Thornton North Junction and Leven. The line is operational at present between Thornton North Junction and Earlseat to support coal extraction activity. The non-operational section includes track-bed as well as available land for a station at Leven and potentially Cameron Bridge. The line is safeguarded in the Mid-Fife Local Plan. Re-instating the full operation of the rail line would require consideration of the structural integrity of existing assets such, as the Leven Railway Bridge, along the line.
- **Rail freight:**
 - **Freight** in the Levenmouth area is accounted for almost entirely by road, with some waterborne freight transportation taking place. Freight options are particularly important for the Levenmouth area as the economy is based predominantly on industry and manufacturing activities that, by their nature, involve long-distance import/export activities to/from the area. Diageo is a key employer in the area, employing over 1,200 individuals. Discussions with Diageo and their haulier WH Malcolm noted previous interest and ongoing activity to investigate **rail freight opportunities** to support site operations at Cameron Bridge and Leven.
- **Low Carbon Investment Park:**
 - Investment proposals for a **Low Carbon Investment Park**, located in Buckhaven, form part of the Levenmouth Strategic Development Area and include allocations for industrial and commercial land. The site would be funded under the Scottish Government's Tax Incremental Financing (TIF) initiative.
- **Active Travel and Leisure Tourism:**
 - The location of Levenmouth presents the opportunity to harness the **coastal setting**. In particular, the proximity of the area to the **Fife Coastal Path**, as well as **local golf courses**, could be capitalised upon better in order to help raise the profile of the area in terms of attractiveness to visitors from wider Fife and further afield. National Cycle Network (NCN) routes 76 and 1 serve Markinch and offer the scope to provide a link from the Levenmouth area to the NCN, supporting initiatives to attract visitors. Proposals for a new long distance walking route, the **Fife Pilgrim Way**, are also under development and provide a further attraction in close proximity to the study area.

Issues

- **Levenmouth Strategic Development Area:**
 - There are major future land-use proposals for the area. This includes the **Levenmouth Strategic Development Area**, which comprises proposals for 1,650 new houses, 15ha business land, a new link road between the A915 and Fife Energy Park, as well as community and educational facilities. An increase in population would place **additional demand** on the existing road and public transport networks in the Levenmouth area, the wider Fife area, and the city-region beyond.

- **Leven to Thornton Rail Line:**

- The integrity of the track bed and structures along the existing but-largely-out-of-use rail line between Thornton and Leven would need to be checked (eg as part of a GRIP3 process), before the costs of re-instating passenger rail services can be estimated accurately.

Constraints

- **Bawbee Bridge and Leven Railway Bridge:**

- There is currently an **18 tonne weight restriction** on **Leven Railway Bridge**, which has an impact on the routing of HGVs and heavier buses in the area – this constraint needs to be borne in mind when considering HGV routing strategies and/or the introduction of heavier buses to the services which operate across this bridge.

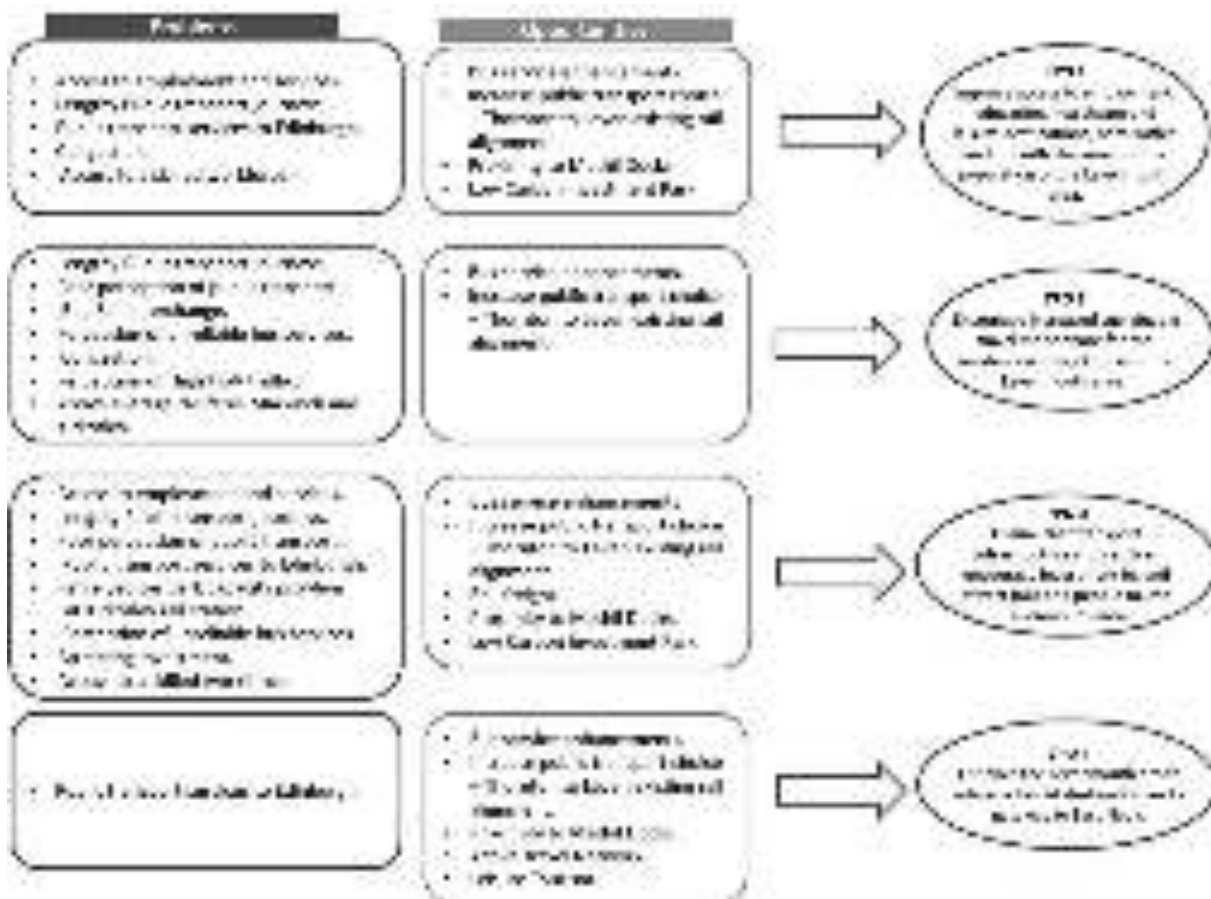
- **Environmental:**

- The environmental component on the STAG Study identified a number of minor constraints which would need to be taken into consideration when considering any additional transport infrastructure between Leven and Kirkcaldy, but none of these are sufficient to influence the choice of solution to the identified problems.

Transport Planning Objectives

The analysis of the problems, opportunities, issues and constraints, public and stakeholder consultation activities and consideration of the wider national, regional and local policy setting informed the development of the following study objectives:

- TPO 1 – Improve access to employment, education, healthcare and leisure destinations, both within and outwith the area, for the population of the Levenmouth area;
- TPO 2 – Encourage increased sustainable travel mode share for the residents and workforce of the Levenmouth area;
- TPO 3 – Ensure that transport infrastructure and services encourage investment in, and attract jobs and people to, the Levenmouth area; and
- TPO 4 – Enhance the Levenmouth area’s role as a tourist destination and a gateway to the East Neuk.



Problems, Opportunities and Transport Planning Objectives Linkage

Option Generation and Sifting

Eight separate options to improve sustainable transport access to and from the Levenmouth area and a number of variants of these were identified and appraised at the Initial Appraisal Stage. The options considered bus, rail and water based interventions to improve the transport offering to and from the area.

Options were appraised in terms of their performance in relation to:

- the study Transport Planning Objectives (TPOs) listed above;
- the main STAG criteria (Environment, Safety, Economy, Accessibility and Social Inclusion and Integration); and
- deliverability (in terms of technical & operational deliverability) and public acceptability.

The Initial Appraisal recommended two Options should be taken forward to the Detailed Appraisal (in addition to the Do Minimum option of retaining the existing public transport services). A significant number of variants of these two core options were tested, particularly for Option B, before finalising these specifications. The key features of these two options are summarised in Table E1.

Table E1: Option Development Summary

OPTION	OPTION DEVELOPMENT SUMMARY
A – Bus Enhancement	<p>Three additional buses purchased and used to improve the bus connections between the Buckhaven and Methil area and Markinch Station and Glenrothes</p> <p>Markinch rail fares adjusted by -£1 one-way (-£2 return) to address some the ‘excess rail fare’ problem and encourage increased use of Markinch Station.⁴</p>
B – Rail Provision	<p>Re-opening of the rail line between Thornton North Junction and Leven;</p> <p>Passenger stations at Leven and Cameron Bridge.</p> <p>Freight provision at Cameron Bridge.</p> <p>Hourly rail service based on the diversion of the existing Edinburgh to Glenrothes with Thornton terminating service to Levenmouth. Operating costs assumes an extended layover at Leven can be addressed through timetable changes and thereby negate the requirement for additional rolling stock and associated cost implications.</p> <p>Fare structure as per the current Markinch rail fare.</p>

Options were tested against a Do Minimum scenario, including:

- Queensferry Crossing;
- Signalisation of Redhouse (A92/A921) and Gallatown (A915/A921) roundabouts;
- Standingstone Road/Windygates Road Junction Signalisation; and
- Kirkcaldy and Dysart - Redhouse roundabout to Standing Stane Road Link.

Detailed (Part 2) Appraisal

Each option was assessed against:

- the four TPOs
- The standard STAG criteria (Environment, Safety, Economy, Integration, and Accessibility and Social Inclusion);
- Implementability - technical, operational, financial and public acceptability;
- Cost to Government; and
- Risk.

Table E2 summarises the outcome of the Detailed Appraisal. This illustrates that, with the exception of the environment sub-criteria, both options have either neutral or positive impact on the TPOs and STAG Criteria. In all cases (apart from Environment), **Option B** is predicted to have a greater benefit than **Option A**.

⁴ Note that this would require Transport Scotland involvement to make the relevant changes to the ScotRail franchise

A summary of the performance of each option is discussed further in the section below.

Table E2: Summary of Detailed (Part 2) Appraisal

OPTION		A	B
Transport Planning	TPO 1 – Accessibility	✓	✓✓
	TPO 2 – Sustainable Travel	✓	✓✓
	TPO 3 – Investment	✓	✓✓
	TPO 4 – Tourism	✓	✓✓
Government Objectives	Environment	-	x
	Safety	✓	✓✓
	Economy	✓✓	✓✓✓
	Integration	✓✓	✓✓
	Accessibility & Social Inclusion	✓✓	✓✓

Key:

- ✓ -- Minor Positive Impact ✓✓ -- Moderate Positive Impact ✓✓✓ -- Major Positive Impact
- X – Minor Negative Impact xx – Moderate Negative Impact xxx – Major Negative Impact

Summary of Environmental Appraisal

The findings of the environmental appraisal indicate that **Option A** has the least potential for significant adverse environmental impacts, since it does not involve any new development work and the changes in bus services associated with the option are not predicted to have significant net effects on traffic-related environmental effects such as traffic noise and air quality.

Option B involves 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. **Option B** has 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 and freight rail operations. However, with mitigation, it is predicted that these effects would be unlikely to be significant.

The outputs of demand forecasting indicate that **Option B** has greater potential compared to **Option A** to remove freight and car traffic from the road network as a result of modal shift. This option therefore has greater potential for beneficial impacts on roadside noise, local air quality and greenhouse gas emissions, depending on the degree to which modal shift is achieved and the nature and frequency of the rail operations.

Overall, **Option A** is predicted to result in neutral environmental impact and **Option B** to result in a Minor Negative Impact on the Environment, taking account of all the aspects that have been assessed.

Summary of Safety Appraisal

Both options show benefits to safety in terms of accidents and security considerations. The benefits for **Option A** are relatively minor. In comparison, **Option B** scores a moderate benefit due to both the greater car-km and HGV-km removed from the roads for the accidents appraisal, as well as the security benefits brought about by the provision of new rail stations, which will be required to provide minimum (or better) standards of security measures as part of their design.

Summary of Economy Appraisal

Transport Economic Efficiency (TEE)

The TEE analysis, includes consideration of the net benefit to transport users. The analysis captures benefits to the operator through increased fares and indirect tax revenues resulting from, for example, fuel sales, and monetised carbon and accident savings associated with a change in veh-km.

Table E3: Option A Benefits (2010 Prices, discounted)

BENEFITS	TOTAL
Consumer	£32M
Operator	£0M ⁵
Accidents	£0.9M
Greenhouse Gases	£0.3M
Indirect taxation	-£1.4M
Present Value Benefits (PVB)	£31.7M*

Note: *Total value correct. Small differences due to rounding.

Table E4: Option B Benefits (2010 Prices, discounted)

BENEFITS	TOTAL
Consumer	£82.1M
Operator	£10.2M
Accidents	£4.1M
Greenhouse Gases	£7.4M
Indirect taxation	-£24.1M
Present Value Benefits (PVB)	£79.8M*

*Total value correct. Small differences due to rounding.

⁵ Benefit calculation assumes a grant subsidy payment designed to cover the gap between the increased bus operating costs and the additional fare-box revenue.

Option A and **Option B** have a positive impact in terms of benefits as shown in Tables E3 and E4 respectively. The benefits associated with Option B would however be more than double those of Option A.

EALI

Investment in the local transport infrastructure and services to improve access to employment, markets, and supply chains provides the opportunity to increase the attractiveness of the Levenmouth area for business activity, investment and employment opportunities. The Economic Activity and Location Impact (EALI) considers the net national and local impact of options on the economy, taking into account gainers and losers across different aspects.

Option A offers specific improvements in access to some of the most deprived areas of Levenmouth, including settlements south of the River Leven. It strengthens links to key employment sites at Cameron Bridge, Fife Energy Park, and the Levenmouth Strategic Development Area, including housing and new educational facilities. The score for this option is a moderate positive, based on the expected impact on economic activity and looking at locational impacts.

Option B offers potential benefits related to enhanced connectivity with a number of areas across Levenmouth. Particular benefit is produced by improving links to Edinburgh. Linkages between the national rail network and the local area may have a wider strategic benefit, as well as the immediate local and wider economy in Fife. Key considerations in terms of rail freight include the provision of benefits to large-scale industry in the area, in particular Diageo operations. The addition of a rail freight link for the area may open up the type and scale of industry that can operate in the Levenmouth area potentially impacting on inward and external investment levels. Furthermore, while consultation with Abellio ScotRail noted that there are no current plans to provide a Fife-based train crew/stabling facility, if a Fife-based rail depot was reconsidered in the future, the branch line to Leven could provide a potential location in close proximity to the main line. A depot in the area could be expected to generate local employment opportunities and would provide potential additional timetable-related benefits, both to existing Fife rail services and the additional rail services being appraised here.

Fife Council have subsequently produced a report entitled ‘*The Levenmouth Railway – Economic Vision*’ which includes their estimates of a number of wider economic benefits which were not quantified within the STAG appraisal being reported here. This Fife Council report has been attached as Appendix N of the main STAG report.

Overall, the predicted benefits of **Option A** are scored as ‘Moderate’ while the predicted benefits of **Option B** are scored as ‘Major’.

Summary of Integration Appraisal

Overall, the options positively contribute to integration across transport, land use, and policy. **Options A** and **B** are scored to offer moderate benefits overall.

Benefits are likely to be associated with service and ticketing integration, especially for **Option A**, which improves existing bus/rail connections by timetable enhancements and branding, with further integration of ticketing and information. **Option B** benefits 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 modes.

For Land Use Integration, **Option A**, which includes improvements to integration of bus and rail from Leven town centre, with a branded bus service, as well as the areas of Methil, Methilhill, Buckhaven, and Windygates, would provide improved access to the Energy Park and the Cameron Bridge (Distillery and Hospital) employment areas. There is no new infrastructure associated with this option and, as such, there is no associated land-take that requires consideration. The service could be routed to serve future development at the Levenmouth SDA.

Option B integrates well with the existing land use and future development proposals identified in the area. Land has been safeguarded for the re-opening of the rail line, which would help to mitigate the travel demand impact of future development proposals in the area.

In relation to Policy Integration, **Option A** and **B** would promote and encourage sustainable travel and align with national, regional and local transport policy as well as wider policy drivers such as movement towards a lower carbon transport network. The options, would support wider policy drivers. For example, the **Options** would support social and economic prosperity and **Option B** would provide added benefit of helping to support inward investment and job creation in the local area as well as the transfer of road based freight to other modes.

Summary of Accessibility and Social Inclusion Appraisal

The options score well across the Accessibility and Social Inclusion appraisal criteria, each achieving a moderate positive scoring.

Option A would enhance connections to Methil, Windygates and Buckhaven, while boosting access to the rail network at Markinch and to Glenrothes town centre. The local routing of this service maximises its accessibility, helping to facilitate non-car access to key services and facilities. **Option A** improves access to areas with some of the highest levels of the problems noted above, such as Methil and Buckhaven. Fare re-balancing at Markinch as part of this option may improve improved access to the wider rail network for proportions of the community, in terms of affordability.

Option B would help improve accessibility, providing a direct link to the wider rail network from the Levenmouth area at Cameron Bridge and Leven and increasing the catchment area within commuting distance. It can be expected that commuters from the wider area, including the East Neuk, would be attracted to use the rail services with stations incorporating Park and Ride facilities. Interchange at Inverkeithing would provide connection with Fife Circle services to access Dunfermline and other destinations in west Fife. Services to the north, including Aberdeen, Dundee and Perth would be achieved via Kirkcaldy.

Summary of Transport Planning Objectives Appraisal

For TPO 1, which centred on improving access to employment, education, health and leisure, **Option B** offers moderate benefit while **Option A** shows minor benefit. Similar impacts are expected in relation to TPO 2 with regard to promoting mode shift towards sustainable mode share. The difference in scoring reflects the expected wider catchment of rail supported by Park and Ride facilities at Cameron Bridge, in particular.

In relation to TPO 3, **Option A** scores a minor impact in terms of attracting inward investment. **Option B** is expected to have a large benefit in terms of attracting inward investment, primarily as a consequence of the rail-freight potential this option would bring to the area and support to current and new business activity.

In relation to the tourism TPO 4, **Option A** scores a minor benefit as it offers a longer distance connectivity benefit to the central Levenmouth area. **Option B**, as well as supporting local and regional access, provides the opportunity for a direct rail link from the area to Edinburgh, including the airport (via the Edinburgh Gateway Station on opening) and therefore scores a moderate benefit in terms of attracting tourists to the area. Tourism marketing initiatives would serve to help encourage tourist travel to the Levenmouth/East Neuk area and complement investment in the local transport network.

Cost to Government

Option Costs

Investment costs include all infrastructure and other capital costs incurred by public sector operators that are in addition to the Do-minimum. In line with the remit of this study, the scheme costs reported in the Levenmouth Sustainable Transport Study (Scott Wilson, 2008) provide the basis for the development of the rail option costings for this study. There was no bus option included within the previous Detailed Appraisal study and, therefore, these have been developed specifically for this appraisal.

Investment costs for **Option A** are based on industry standards set out in the *Bus Industry Monitor Report: Bus Industry Performance 2014* (TAS Publications)⁶. The investment costs are based on up to three additional vehicles operating throughout the day in order to cover additional services, including three extra peak hour services to ‘meet’ all peak period rail services to the south (towards Edinburgh) and north (towards Perth and Dundee). During the off-peak, an hourly service frequency is proposed.

The investment costs for **Option B** were developed on the following basis:

- Consistency check of Scott Wilson costs reported in the 2008 study with the scope of Option B;
- Application of Retail Price Indices (215.3 at 2008 Q2 and 259.8 at 2015 Aug) to core capital cost, plus an assessment based on current delivery experience;
- Risks added to core capital cost;
- Application of Network Rail design management fee at 12.5% of total capital cost; and
- Inclusion of rail construction inflation (estimated at 1.3% per annum) over and above base inflation.

The costs associated with each Option are outlined in Table E5. The capital costs include optimism bias at 44% and 50% for **Option A** and **Option B**, respectively. A renewal cost based on vehicle replacement every 12 years is reflected in the costs for **Option A**. **Option B** would be delivered through the leasing of rolling stock, with related costs captured in the annual operating cost.

1.6% increase per annum has been applied to the operating and maintenance costs of the bus and rail services and the new stations, to represent the optimism bias in these operating cost assumptions.

⁶ Costs in Fife are considered to be similar to the ‘shire’ operator category (Table 7).

Table E5: Option Costs (2010 Prices, undiscounted)

OPTION	CAPITAL	OPERATING & MAINTENANCE (PER ANNUM)	ASSUMED YEAR OF OPENING
Option A	£2.9M	£257,000	2017
Option B	£78.4M	£404,000	2022

The equivalent current (2015) capital cost for **Option A** is £3.4M assuming a 2017 year of opening, and £91.1M for **Option B** assuming a 2022 year of opening.

A summary of the costs for **Option B**, in relation to the cost development steps outlined above, is shown in Table E6.

Table E6: Option B - Summary of Investment Costs (2015 prices, undiscounted)

COST ELEMENT	COST
Base Cost	£42.2M
Base Cost + Risk	£49.9M
Base Cost + Risk + Optimism Bias	£74.9M
Base Cost + Risk + Optimism Bias + Network Rail Design Management Fee	£84.3M
Total Cost (inclusive of additional rail inflation)	£91.1M

Grant and Subsidy Payments

Grant and subsidy payments can be made by the Government to private sector operators when revenues do not cover investment and operating costs. As operational costs for **Option A** exceed the expected revenue, this option would require subsidy of £100k per annum (2010 prices, undiscounted), amounting to £3.8M (2010 prices, discounted) in total over the 60-year appraisal period. There would be no grant or subsidy payments required for **Option B** as the additional public transport revenue exceeds the assumed operating cost.

Cost-Benefit Analysis

The economic appraisal has been based on a 60-year appraisal period from the year of opening (2017 for **Option A** and 2022 for **Option B**) and all benefits are expressed in 2010 prices. Monetary values have been discounted to 2010 at 3.5% for 30 years and 3.0% for the remainder of the evaluation period.

Option A and **Option B** would achieve a Benefit-Cost Ratio (BCR) to Government greater than one. The BCR of 5.19 for **Option A** (Table E7) is higher reflecting the low investment and maintenance costs. **Option A** would, however, require ongoing subsidy for the extra operating costs in excess of the additional revenue generated. **Option B** has a lower BCR at 1.31 as shown in Table E8. However, its

impacts are greater (Table E4) and the smaller ratio reflects the higher investment, maintenance, and operating costs and the high (50%) optimism bias factor applied to the rail-related costs.

Table E7: Option A Cost-Benefit Analysis (2010 Prices, discounted)

BENEFIT	TOTAL
Present Value of Transport Benefits (PVB)	£31.7M
Present Value of Costs to Government (PVC)	-£6.1M
Net Present Value (NPV)	£25.6M
Benefit-Cost to Government (BCR = PVB/PVC)	5.19

Table E8: Option B Cost-Benefit Analysis (2010 Prices, discounted)

BENEFIT	VALUE
Present Value of Transport Benefits (PVB)	£79.8M
Present Value of Costs to Government (PVC)	-£61.0M
Net Present Value (NPV)	£18.8M
Benefit-Cost to Government (BCR = PVB/PVC)	1.31

A sensitivity test was undertaken to assess the impact of enhancing the public transport network by investment in bus and rail i.e. taking forward **Option A** and **B** in combination. The sensitivity test reported a BCR of 1.48. The option would serve to provide further increased choice into the public transport network and strengthen access across communities in the Levenmouth area to employment, education, health and leisure opportunities and further build up demand for public transport.

Implementability

Technical Feasibility

Option A is expected to be technically feasible, however, it would require discussion with public transport operators regarding provision of the services. Fare re-balancing at Markinch for this option, while not representing technical feasibility issues, will also require significant effort in terms of negotiation and agreement and may not be possible within the current ScotRail franchise.

Option B would require re-design and construction of the line to bring it up to passenger rail standard. While this is a major undertaking, the option is technically feasible with a live line having operated previously and known circumstances (subject to full detailed investigation of the existing line were this option taken forward).

Existing maintenance budgets for Leven Railway Bridge involve the propping of the structure, however, the re-instatement of the rail track (as per **Option B**) would preclude this action. In **Option B**, consideration of the structure would form part of the detailed design work undertaken, as would the

consideration of all structures along the extent of the rail line. For the purpose of this appraisal, deck replacement has been assumed as required at Leven Railway Bridge. Any future decking proposals taken forward independent of **Option B** should be progressed with due account of the specification of the new rail line. This should ensure that any future changes to the bridge are aligned to these specifications and provide appropriate flexibility, for example with regard to clearance and headroom.

Operational Feasibility

Option A would be delivered by the existing bus fleet supplemented by new vehicles to serve the additional 44B equivalent services. At present, the X4 vehicles are used across multiple routes. As such, there may be a requirement to review the fleet scheduling so branded vehicles were to operate only on their dedicated route. Continued collaborative working would be required between Fife Council and Stagecoach in the provision of bus services to and from the Levenmouth area.

In terms **Option B**, diversion of the Edinburgh to Glenrothes with Thornton terminating service could require an extended layover at Leven and potentially affect the service frequency at Glenrothes with Thornton. One alternative to overcoming the extended layover would be the removal of a call from an intermediate station. The introduction of this change may not be without challenge and may require a review of the Fife Circle to provide sufficient capacity and suitable evening peak operations. If a rail option were progressed, detailed timetabling would be required in consultation with Abellio and Network Rail in order to understand the resilience within the network to accommodate a rail operation to Leven. If a rail option were progressed, operational considerations and future timetables would need to be advanced in the context of wider changes that would have a direct impact on the operation of a rail service for Levenmouth.

Financial Feasibility

Option A would be relatively low-cost, but the requirement for additional subsidy of the extra buses would be an issue for Fife Council, particularly given the current financial constraints affecting the Council. Rail fare balancing at Markinch would require negotiation with the train operators, to agree the level of reimbursement within the current ScotRail franchise and may have to wait until the relevant franchises come up for renewal.

Option B has significant costs associated with maintenance and operation of the line and changes to rail franchise agreements would need to be considered. Provision of rail freight facilities may incur ongoing associated costs. Maximising the number of freight users would support the viability of the line in terms of costs and benefit from the level of freight movement occurring. Depending on the type of service introduced, operating costs may require subsidy.

Public Acceptability

In terms of public acceptability, **Option A** is expected to receive public support, but **only if** it is integrated with Option B. **Option B** is safeguarded in local development plans, negating much of the additional land take that would be required with the opening of a completely new rail line. Within the local community, comment forms and verbal feedback received at the consultation undertaken in October 2015, noted that there was support for the re-opening of the rail line. The associated connectivity enhancements were viewed to provide benefit in terms of access to employment, education, health, and leisure facilities, as well as stimulating business activity and investment in what is a deprived area. The higher cost of rail fares was raised by some at the public consultation drop-in

events as a potential barrier, especially for parts of the study area where levels of deprivation are particularly high.

Assessment of Key Risks

Risk and uncertainty has been taken into consideration as part of the appraisal process. This has been informed by the preparation of an initial Risk Register highlighting key risks that could impact on option delivery and operation. The register identifies the probability of risks occurring and their level of impact. The register should be updated as options are progressed.

Monitoring and Evaluation

A monitoring and evaluation framework should be constructed and utilised for any options implemented. This is important in order to understand the impacts of options as well as their delivery context. An initial framework is presented for further refinement where options are progressed to detailed design and implementation.

Conclusions

This report has presented the findings of the Levenmouth Sustainable Transport Study undertaken in accordance with STAG.

Option A - Integration of bus services in the Levenmouth Area with existing rail provision at Markinch.

Option A performs positively across the different STAG criteria, showing a moderate benefit to integration and accessibility and social inclusion as outlined above. However, in relation to safety and each of the four Transport Planning Objectives of the study, this option only represents a minor benefit. It is expected to have a neutral environmental impact.

In relation to **Option A's** economy scoring and its value for money, the positive BCR reflects the associated low investment and operating costs of this option. However, it should be noted that the economic benefits and monetised benefits of the option are significantly lower than **Option B**. This option would require an annual subsidy to offset the additional operating costs not covered by revenue generated.

While **Option A** would be positive for Levenmouth area, the scale of these benefits are unlikely to be sufficient to have a major, or even a moderate, impact on achieving the objectives set in this study and tackling the significant problems of the Levenmouth area.

Option B - Provision of a rail line along the alignment of the existing, but out-of-use, rail line between Thornton North Junction and Leven.

Option B performs well across the different STAG criteria, showing a moderate benefit to integration, safety, and accessibility and social inclusion as outlined above. It also scores a moderate benefit to each of the four Transport Planning Objectives of the study. It is expected to have a minor negative environmental impact overall.

The higher investment costs in **Option B** result in the scheme providing a lower, yet positive, benefit-cost ratio than **Option A** at this stage. The scheme also scores as being of major positive economic

benefit to the Levenmouth area, with the potential to significantly benefit users and enhance business activity, investment and employment opportunities.

Option B would have a significant positive impact on the Levenmouth area, including tackling the significant problems faced by the area and the delivery of the objectives identified by this study.

In summary, while either option could be progressed independently to the benefit of the Levenmouth area, only **Option B** offers the potential to deliver the study’s Transport Planning Objectives to a significant degree. Therefore, if a single Option was to be chosen to help deliver the TPOs identified for this Study, then we would recommend the rail option (Option B).

However, it should be noted that neither of these two Options preclude the other, so that both could be progressed in parallel. Bus services play an important role in the transport network, particularly in areas of deprivation, and rail would expand the public transport offering and freight connections to markets and suppliers. This would provide additional bus services south of Levenmouth to access local destinations as well as strengthen the bus-rail integration at Markinch to bring forward a ‘quick win’ in the short-term, followed by the more-expansion of the public transport offering to/from Levenmouth through the re-opening of the rail line in the longer-term.

We would strongly recommend that Transport Scotland and Fife Council work together to commission a Level 3 Governance for Railway Investment Projects (GRIP3) design as soon as possible, to address the uncertainties over the timetabling and the costs of the rail infrastructure and to enable the level of optimism bias uplift which is applied to these costs to be reduced (from 50% to 18%).

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For more information visit www.systra.co.uk

SYSTRA Ltd Offices

Birmingham

Second Floor, 37a Waterloo Street
Birmingham B2 5TJ United Kingdom
T: +44 (0)121 233 7680

Dublin

1st Floor, 12/13 Exchange Place,
Custom House Docks, IFSC, Dublin 1 Ireland
T: +353 (0)1 542 6000

Edinburgh

Prospect House, 5 Thistle Street, Edinburgh EH2 1DF
United Kingdom
T: +44 (0)131 220 6966

Glasgow

Seventh Floor, 78 St Vincent Street
Glasgow G2 5UB United Kingdom
T: +44 (0)141 225 4400

London

Seventh Floor, 15 Old Bailey
London EC4M 7EF United Kingdom
T: +44 (0)20 7529 6500

Manchester

25th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 236 0282

Newcastle

PO Box 438, Newcastle upon Tyne, NE3 9BT
United Kingdom
T: +44 (0)191 2136157

Woking

Dukes Court, Duke Street
Woking, Surrey GU21 5BH United Kingdom
T: +44 (0)1483 728051

Selected SYSTRA Group Offices

Abu Dhabi

AS Business Centre, First Floor, Suites 201-213,
Al Ain Road, Umm al Nar, P.O. Box 129865,
Abu Dhabi, UAE
T: +971 2 558 3809

Hong Kong

14th Floor West, Warwick House, TaiKoo Place,
979 King's Road, Island East, Hong Kong, China
T: +852 2529 7037

Lille

86 Boulevard Carnot, 59000 Lille, France
T: +33 (0)3 74 07 00

Lyon

11, rue de la République, 69001 Lyon, France
T: +33 (0)4 72 10 29 29

Marseille

76, rue de la République, 13002 Marseille, France
T: +33 (0)4 91 37 35 15

Mumbai

Antriksh, Unit no. 301, 3rd Floor, CTS Nos.
773, 773/1 to 7, Makwana Road, Marol, Andheri East,
Mumbai 400069, India
T: +91 22 2647 3134

New Delhi

5th Floor Guru Angad Bhawan, 71 Nehru Place,
New Delhi 110019, India
T: +91 11 2641 3310

Paris

72 rue Henry Farman, 75015 Paris, France
T: +33 (0)1 53 17 36 00

Wroclaw

ul. Świętego Antoniego 2/4 Brama B
50-073 Wroclaw, Poland
T: +48 71 73 36 470

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