HITRANS

Investment in Lifeline Rural Roads
Individual Scheme Appraisals – Kennacraig to Brodick
September 2004

Halcrow Group Limited

HITRANS

Investment in Lifeline Rural Roads
Individual Scheme Appraisals – Kennacraig to Brodick
September 2004

Halcrow Group Limited

Halcrow Group Limited
16 Abercomby Place Edinburgh EH3 6LB
Tel +44 (0)131 272 3300 Fax +44 (0)131 272 3301
www.halcrow.com

Halcrow Group Limited
16 Abercomby Place Edinburgh EH3 6LB
Tel +44 (0)131 272 3300 Fax +44 (0)131 272 3301
www.halcrow.com

HITRANS

Investment in Lifeline Rural Roads
Individual Scheme Appraisals – Kennacraig to Brodick

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed

Contents

List of Tables

1 Introduction (Kennacraig to Brodick)

1.1 ***Background***

1.1.1 HITRANS, the Highlands and Islands Strategic Transport Partnership, commissioned Halcrow Group Ltd to undertake a study to support the campaign for further investment in lifeline rural roads.

1.1.2 The study was split into two stages. Stage One undertook an extensive consultation process to evaluate the issues surrounding lifeline roads including key problems and constraints facing rural communities. The aim of the second stage was to carry out an economic appraisal of nine designated routes in order to bolster the findings of the initial research such as to make an economic case for sustainable increases in investment in lifeline roads.

1.1.3 This report represents part of the second stage of the project. It presents, in full, the economic assessment carried out on the proposed Kennacraig to Brodick road improvement scheme. It does not seek to encompass all the wider issues involved within the study and does not present the methodology. As such it should be read in conjunction with the main 'Investment in Lifeline Rural Roads: Stage Two Final Report'[1].

1.2 ***Report Structure***

1.2.1 **Section 2** presents the contextual background to the scheme. It also assesses the existing road conditions and the proposed scheme enhancements;

1.2.2 **Section 3** presents an assessment of the likely impacts of the scheme;

1.2.3 **Section 4** presents the Transport Economic Efficiently (TEE) analysis;

1.2.4 **Section 5** assess the business survey responses for the Salen to Tobermory route;

1.2.5 **Section 6** presents the Economic Activity Locational Impact (EALI) analysis; and

1.2.6 **Section 7** presents the conclusions.

---

[1] Halcrow (2004)

2 Background (Kennacraig to Brodick)

2.1 *Contextual Background*

2.1.1 This is a multimodal route which links Arran with the Mull of Kintyre and the Ferry port of Kennacraig. Figure 1 presents a map of the route.

2.1.2 The B8001 provides the critical link across the north of Kintyre that allows access from the port at Claonaig to not only the Islay ferry [Kennacraig] but also the ferries at Tarbert and Tayinloan, serving Portavadie and Gigha, respectively. In addition it provides access to the A83 to Lochgilphead and beyond.

2.1.3 A ferry service operates between Claonaig and Lochranza, with up to nine services per day in each direction, depending upon the time of year. Bus services link with the ferries providing onward transportation from Claonaig to Kennacraig and Tarbert, and from Lochranza to Brodick.

2.1.4 The A841 provides the main arterial route from Lochranza, in the north of Arran, to Brodick, the main centre on the island. Ferry services also operate from Brodick to Ardrossan on the mainland.

2.2 *Local Economy*

2.2.1 The Scottish Census Results On-Line (SCROL) data (2003) presented in Section 4.4 indicates that Arran has an estimated population of 5,058 permanent residents [postcode KA27]. Whilst a significant proportion of these residents, in particular those in the south west of the island, may not make regular use of the A841 the route still has a relatively high catchment area. Over 2,000 residents are located in and around Brodick, while Corrie and Lochranza are estimated to have 300 and 225 residents, respectively.

2.2.2 Population data for the north of the Mull of Kintyre is relatively aggregate in nature. The postcode area PA29 is estimated to have a population of 2,438, however this encompasses quite a wide geographical area. The communities along the B8001 itself are small in size with only around an estimated 100 residents. The main settlement in the north of Kintyre is Tarbet with a population of around 2,000.

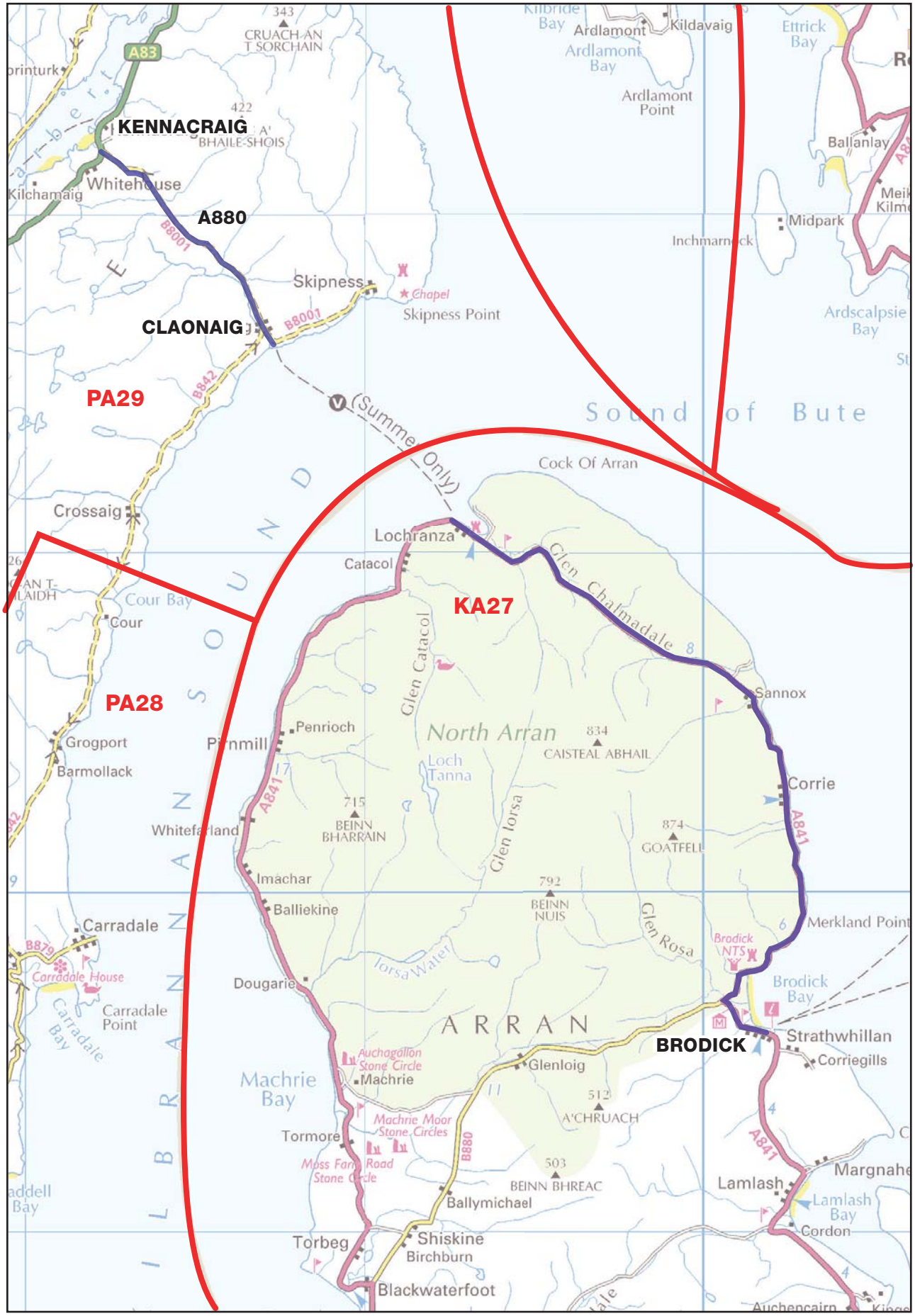


Figure 1: A880 KENNACRAIG TO CLAONAIG & LOCHRANZA TO BRODICK

2.2.3 The level of employment levels on Arran is estimated at just over 2,344 with the majority of jobs in the tertiary sector. Just under 950 jobs are estimated to be within Brodick, with a further 220 and 100 in Corrie and Lochranza, respectively.

2.2.4 Within the postcode area PA29 in north Kintyre the level of employment is 2,438, although as with the population data only a small proportion of this will be within the communities along the B8001.

2.2.5 Unemployment levels within Arran are estimated at 4.2%. In the north of Kintyre a lower rate of 3.5% is estimated. These compare to the rate for the Scotland as a whole of just under 4%.

2.2.6 The indices of deprivation presented in Table 4.3 of the main report imply that the combined area of Arran and north Kintyre is more affluent than Scotland as a whole. However, it is generally recognised that these data can be distorted by the relatively high levels of car ownership that typify communities within the Highlands and Islands of Scotland. The remote nature of the island communities and low levels of public transport services result in private car ownership becoming a necessity.

2.2.7 An alternative approach to assess economically and socially disadvantaged parts of the Highlands and Islands is the Fragile Areas definition. A full description of this can be found in Section 4.4.8 of then main report, but in summary, it uses 12 criteria across three categories: geographic, demographic and economic, to assess whether a region can be considered economically and socially disadvantaged. Whilst Arran is not classified as a 'Fragile Area' the Mull of Kintyre is considered to meet the criteria.

2.2.8 Arran is a popular tourist destination, with the sector constituting a large proportion of total employment on the island. In addition there are a number of successful enterprises within the manufacturing industry, including a distillery at Lochranza.

2.2.9 The Mull of Kintyre supports a range of industries including tourism, forestry, fishing and agriculture. It has recently become synonymous with the development of renewable energy in the form of wind turbines.

2.3 ***Existing Road Conditions***

2.3.1 The B8001 from Kennacraig to Claonaig is currently all single-track road with an average carriageway width of only 3 metres. Passing places are provided every 200 metres, on average, and generally the condition of the road surface is relatively poor. There are no restriction orders on either width or weight however the practicalities of a single-track road mean that not all vehicles can use the route with ease.

2.3.2 The A841 from Lochranza to Brodick is all double-track road. The average carriageway width is around 5 metres and there is a 38 tonne weight restriction. The condition of the road surface is extremely poor, with cracking and subsidence a frequent problem. The drainage along the route is also in a poor state of repair leading to severe flooding at times. The road is subject to constant repair work resulting in lane closures.

2.3.3 The traffic count data provided be Argyll & Bute Council indicated that the average two-way, 24-hour traffic flow across the year on the B8001 is 475 vehicles. It is estimated that the majority of this traffic will be traversing the entire route from Kennacraig to Claonaig. All of these trips are estimated to travel along the section of the scheme upgrade. This generates a two-way, 24-hour trips flow for the route of 475 vehicles.

2.3.4 The traffic count data provided be North Ayrshire Council indicated that the average two-way, 24-hour traffic flow across the year on the A841 is 2,625 vehicles. The count was taken just north of Brodick. It is estimated that only a proportion of this traffic will be traversing the entire route from Brodick to Lochranza due to the presence of intermediate destinations. Some 50% of these trips have therefore been estimated to travel along the section of the scheme upgrade. This generates a two-way, 24-hour trips flow for the route of 1,313 vehicles.

2.4 ***Proposed Improvement Scheme***

2.4.1 The proposed scheme upgrade across the entire route is relatively significant in scale with an estimated scheme cost in the region of £6.2M. This breakdown into £2.5M worth of improvements to the B8001 and £3.7M for the A841. Given a scheme length of 7.1km on the B8001 and a scheme length of 21.5km on the A841this gives estimated costs per km of £0.35M and £0.17M, respectively.

2.4.2 The proposed scheme works on the B8001 include substantial widening across almost the entire route as well as some realignment works. The aim is to increase the average carriageway width from 3 metres up to 3.5 metres, as well as to improve the condition of the road surface.

2.4.3 The works on the A841 will entail substantial re-surfacing alongside drainage works. Some widening will also take place along with improvements to sightlines and structures work. Safety aspects will be examined at known hazard spots, with barriers and improved parapets on structures installed. Pedestrian footpaths and lay-bys will also be installed at appropriate locations.

3 Assessment of Scheme Impacts (Kennacraig to Brodick)

3.1 ***Impact on Journey Times and Reliability (Kennacraig - Claonaig)***

3.1.1 Data provided by Argyll & Bute Council indicates that average speeds on the B8001 from Kennacraig to Claonaig are currently around 21km/hr. This reflects the fact that the whole of the route is single-track and in poor condition.

3.1.2 The Council believes that the upgrade of the 7.1km section will allow a much smoother progression of traffic along the route. The general widening of the route and realignment will help reduce vehicle conflicts. The Council estimates that average journey times between Kennacraig to Claonaig could be reduced by 5 minutes. This would translate to a journey time of 15 minutes against the current 20 minutes. This represents a 25% reduction in a average journey time.

3.1.3 The estimated improvement in journey time would translate to an average speed across the route of just over 28km/hr. This represents a realistic target given the scale of the investment and type of works.

3.1.4 Improvements in journey time reliability are also expected as a result of the reduction in traffic conflicts. The stop-start nature of trips along the route would be removed and therefore variations in journey times should be significantly reduced. It is estimated that 'average delay' (as described in Section 3.4.15 of the main report) could fall by as much as 3 minutes per trip.

3.1.5 Vehicle operating costs are anticipated to fall marginally as a result of higher average speeds along the route and improved road surface conditions. Non-fuel costs would fall as a result of less wear and tear on vehicles through improved road surfacing. Overall vehicle operating costs (as described in Section 3.4.7 of the main report) have been estimated to fall by around 4.5 pence per existing trip.

3.2 ***Impact on Journey Times and Reliability (Lochranza - Brodick)***

3.2.1 Data provided by North Ayrshire Council indicates that average speeds on the A841 from Lochranza to Brodick are currently around 55km/hr.

3.2.2 Given that the road is already double-track the Council don't believe that the upgrade of the 21.5km section will have a significant impact upon journey times

per se. They estimate that average journey times between Lochranza and Brodick could be reduced by 2 minutes. This would translate to a journey time of 23 minutes against the current 25 minutes. This represents an 8% reduction in an average journey time.

3.2.3 Some additional benefits will also be derived from journey time reliability, in particular less frequent road closures. The removal of the problem of frequent flooding along with the requirement to undertake constant repairs will ensure that more consistent journey times can be achieved. This is a particularly important factor given that the route provides access to ferry services at both ends. 'Average delay' is anticipated to fall by 0.5 minutes per trip.

3.2.4 Vehicle operating costs are not anticipated to fall significantly as average speeds along the route will remain relatively constant. However, non-fuel costs will fall as a result of less wear and tear on vehicles through improved road surfacing. Overall vehicle operating costs have been estimated to fall by around 2.5 pence per existing trip.

3.3 ***Diversionary Impacts***

3.3.1 The route along the B8001 and the A841 from Kennacraig to Brodick is not considered to offer an alternative route to trips between any given origin–destination pairs. As such the proposed upgrades to the route are considered unlikely to have any impact on traffic diverting from other routes to take advantage of the reduced journey times and improved reliability on the B8001/A841.

3.4 ***Generated Traffic***

3.4.1 Section 3.4 of the main report provides details of the methodology undertaken to assess the likely levels of generated traffic. To summarise, within the TEE analysis a journey time elasticity of -0.2 has been applied i.e. a 10% reduction in journey time will result in a 2% increase in traffic flows through generated trips. This approach has been taken in order to incorporate a measure of generated traffic within the TEE analysis. A wider assessment of the impact of the schemes on economic activity and subsequent traffic generation is undertaken within the EALI analysis.

3.4.2 Applying a –0.2 elasticity to the forecast journey time saving on the B8001 of 25% along with a base flow of 475 vehicles, gives a forecast traffic generation of 24 trips per day.

3.4.3 Applying a –0.2 elasticity to the forecast journey time saving on the A841 of 8% along with a base flow of 1,313 vehicles, gives a forecast traffic generation of 21 trips per day.

3.5 ***Accident Reduction Impacts***

3.5.1 There are no reported accidents along the B8001 within the last five years (see Table 4.6). Along the A841 data was only available over a ten-year period. This indicated that two fatal, 17 serious and 33 slight accidents occurred over the period.

3.5.2 Historical evidence tends to indicate that a large proportion of 'damage only' accidents are often not reported. Furthermore, data suggests that 'damage only' accidents make up a high proportion of accidents on single-track roads[2]. It is therefore feasible that a number of unreported slight accidents may have occurred during the period.

3.5.3 Never-the-less, the level of accidents on the B8001, reported and unreported, is not likely to be significant and hence there is little potential for scheme benefits arising from accident reduction. There is considerably more potential along the A841.

3.5.4 The A841 scheme improvements should help to improve the level of safety on this stretch of road. Currently vehicles have a tendency to travel in the centre of the road due to the poor condition/subsidence along the edges. This can lead to vehicles having to serve out of the way of on-coming traffic. The resurfacing of the road should reduce this problem. In addition, the drainage works will help reduce the amount of standing water on the roads and ice during the winter months. Part of the scheme proposals is also to include VSF barriers and improved parapets on structures at know hazard locations. Provision of footways will help improve pedestrian safety.

[2] J.C. Tomlinson & A.M. Ross, "Accidents on Single Track Roads" 1988

Table 3.1: Summary of Scheme and Estimated Impacts (Kennacraig to Brodick)

Description of Scheme Upgrade	Widening, resurfacing and small-scale structural works Estimated scheme costs = £6.2m Scheme cost per km = £0.22M	
Impact on Journey Times	It is estimated that journey times along the combined sections of each route could improve by an average of 7 minutes Estimated existing JT = 20 + 25 = 45 min Estimated post-scheme JT = 15 +23 = 38 min	
Diversionary Impacts	**Competing routes** None	**Estimated diversion** Zero
Generated Traffic	Assumed journey time elasticity of –0.2 ***B8001:*** 25% reduction in JT = 5% increase in traffic ***A841:*** 8% reduction in JT = 1.6% increase in traffic	
Accident Reduction Impact	***B8001:*** No reported accidents within last 5 years ***A841:*** Significant levels of reported accidents Scheme should improve safety levels	

4 Transport Economic Efficiency Analysis (Kennacraig to Brodick)

4.1 ***TEE Analysis***

4.1.1 As described above, the pre- and post-scheme average journey time data indicate that journey time savings may result from this scheme. Furthermore journey time reliability is also expected to improve with less unexpected delays.

4.1.2 On the B8001 the estimated 5-minute journey time saving, along with the reduction in 'average delay' of 3 minutes, translates to an existing user benefit of just over 4.5 pence per vehicle trip plus 91 pence per person trip. With the base volume of vehicle trips at 475 and vehicle occupancy of 1.41 this gives a central forecast for existing user benefits of £230k per annum.

4.1.3 On the A841 the estimated 2-minute journey time saving, along with the reduction in 'average delay' of 0.5 minutes, translates to an existing user benefit of 2.5 pence per vehicle trip plus 25 pence per person trip. With the base volume of vehicle trips at 1,313 and vehicle occupancy of 1.41 this gives a central forecast for existing user benefits of £179k per annum.

4.1.4 Section 3.2 above describes the assessment of potential 'diversionary benefits' deriving from the scheme. It concluded that there was unlikely to be any diversion to theB8001/A846 route after the scheme upgrade.

4.1.5 Section 3.3 above describes the assessment of potential 'generated trip' benefits deriving from the scheme. On the B8001 the central forecast of 24 trips per day translates into a generated user benefit of £6k per annum. On the A841 the central forecast of 21 trips per day translates into a generated user benefit of £2k per annum.

Table 4.1: TEE Results (Kennacraig to Brodick)

Base Trip Matrix (vehicle trips/day)	Average Journey Time Savings	Existing User Benefits (£k/yr)	Diversionary Impact (trips/day)	Diversionary User Benefits (£k/yr)	Generated Trips (trips/day)	Generated User Benefits (£k/yr)	Total Users Benefits (£k/yr)
475	5	230	0	0	24	6	**236**
1,313	2	179	0	0	21	2	**181**
-	-	**409**	**0**	**0**	**45**	**8**	**417**

4.1.6 Overall total user benefits are therefore estimated to be in the region of £417k per year.

4.2 ***TEE Sensitivity Testing***

4.2.1 Sensitivity tests have been carried out on the TEE results in order to illustrate the potential variation in scheme benefits. The central forecasts are based on the data inputs as described above.

4.2.2 The low forecasts assume that only half the estimated journey time-savings are actually achieved by the scheme. So rather than journey times along the B8001 falling from 20 to 15 minutes the low forecast assumes a journey time of 18 minutes. Along the A841, rather than falling from 25 to 23 minutes, the low forecast assumes a journey time of 24 minutes. In addition the base trips/day are assumed to be 25% lower. This impacts upon 'existing-user' benefits, 'diversionary-user' benefits and 'generated-user' benefits. Furthermore, the journey time elasticity applied to estimate generated traffic is assumed to be only –0.1.

4.2.3 The high forecast assumes an additional 20% reduction in journey times is achievable over-and-above that within the central forecast. So the journey time along the B8001 is assumed to fall 14 minutes and on the A841 to just under 23 minutes. In addition the base trips/day are assumed to be 10% higher. Furthermore, the journey time elasticity applied to estimate generated traffic is assumed to be –0.3

Table 4.2: TEE Benefits (£k/yr) – Central, Low, High Forecasts (Kennacraig to Brodick)

Central Forecast	Low Forecast	High Forecast
417	**155**	**558**

4.3 ***Present Value of TEE Benefits***

4.3.1 Table 4.3 indicates the present value of the TEE benefits over 30 years for the central, low and high forecasts.

Table 4.3: Present Value of Benefits (£M) - Central, Low, High Forecasts (Kennacraig to Brodick)

Central Forecast	Low Forecast	High Forecast
8.2	**3.2**	**11.6**

* assumes 3.5% discount rate

5 Business Survey (Kennacraig to Brodick)

5.1 ***Business Survey Data***

5.1.1 Section 5 of the main report describes the objective and methodology for undertaking the business survey. It further discusses the sample obtained and its representation of local business. In addition it presents the results at an aggregate level, across all schemes, in order to evaluate general trends.

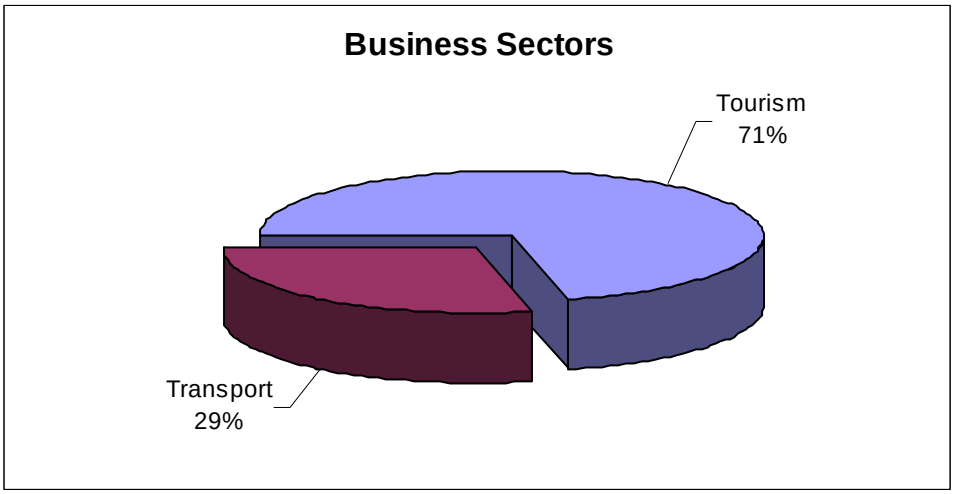
5.1.2 The section below presents the results for those businesses that will be directly affected by the proposed Lochranza to Brodick scheme. Whilst the overall sample size achieved (7 firms) does not allow for statistically significant analysis to be undertaken, it does provide an insight into how the scheme may affect local firms.

5.1.3 The results have been used to inform the analysis in Section 6 evaluating the economic activity and locational impacts of the scheme.

Type of Business (Lochranza to Brodick)

5.1.4 The majority of businesses surveyed along the Lochranza to Brodick route reported to be 'tourism' related organisations (71%), with a further 29% within the 'transport' sector. None of the respondents were in the 'fishing', agriculture', forestry' or 'other' sectors.

5.1.5 The sample does not include any primary industry firms however there is a large proportion of 'tourist' firms in Arran and the north of Kintyre, which the sample reflects. The responses by sector are presented graphically below.



Turnover (Lochranza to Brodick)

5.1.6 The table below summarises the annual turnover of firms surveyed in each of the business sectors. Three respondents quoted a turnover of less than £500k a year. One 'transport' firm reported an annual turnover of between £1m and £5m, one 'tourism' firm reported an annual turnover of between £500k and £1m, whilst one firm within the 'tourism' sector reported a turnover in excess of £5m.

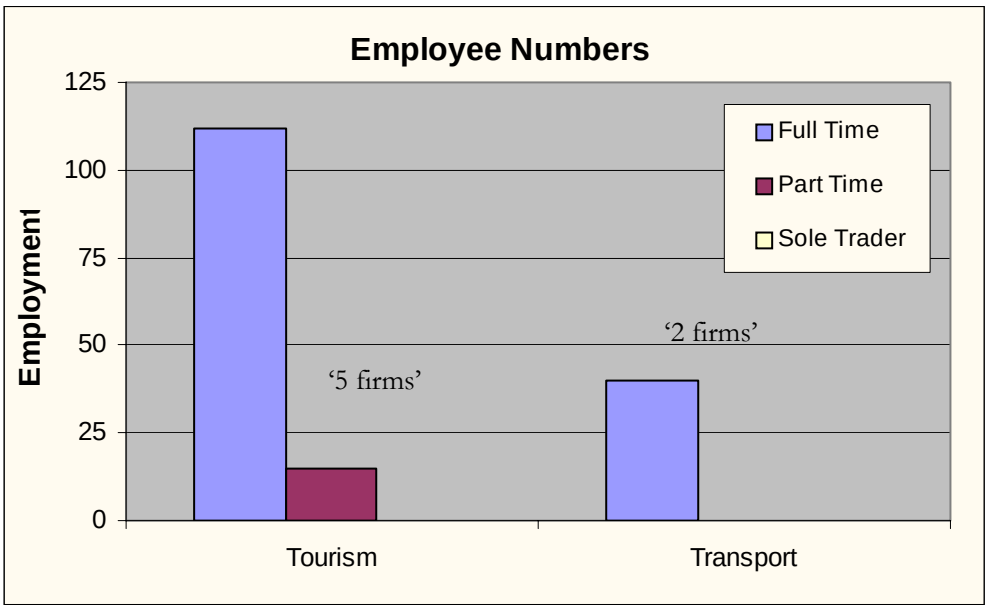
Turnover	**Sector**		
	Tourism	**Transport**	**Total**
0 - 50k	1	0	**1**
50k - 250k	2	0	**2**
250k - 500k	0	0	**0**
500k - 1m	1	0	**1**
1 - 5m	0	1	**1**
> 5m	1	0	**1**
No response	0	1	**1**
Total	**5**	**2**	**7**

5.1.7 Firms along the Lochranza to Brodick route were asked about their expectations for future turnover. All the businesses consulted expect to witness an increase in turnover over the next three years.

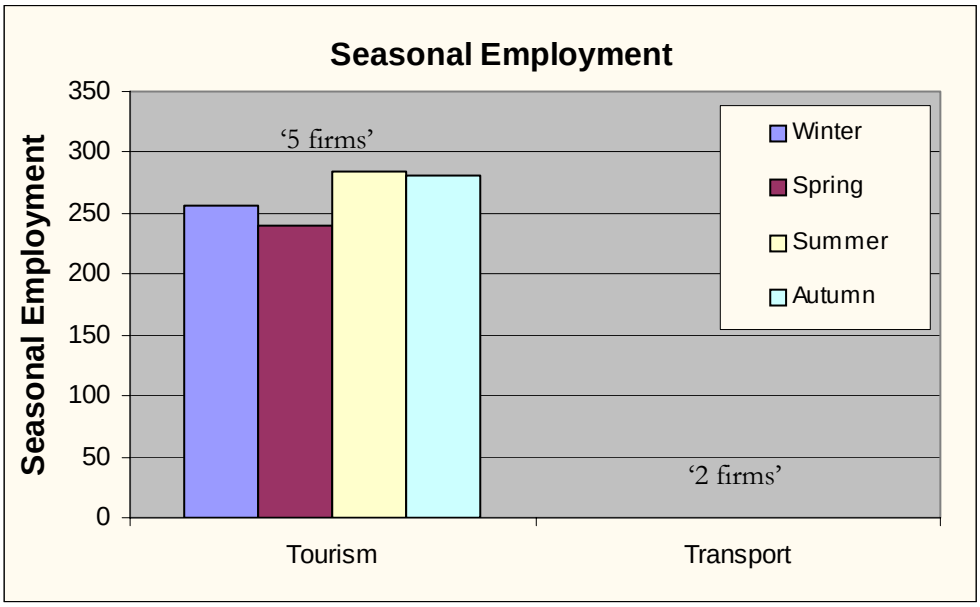
Employment (Lochranza to Brodick)

5.1.8 In line with the data on turnover the majority of the businesses who responded employ a relatively small work force. Around 57% of firms employ less than ten staff; 1 firm reported they employ around 40 staff; another had 96 employees.

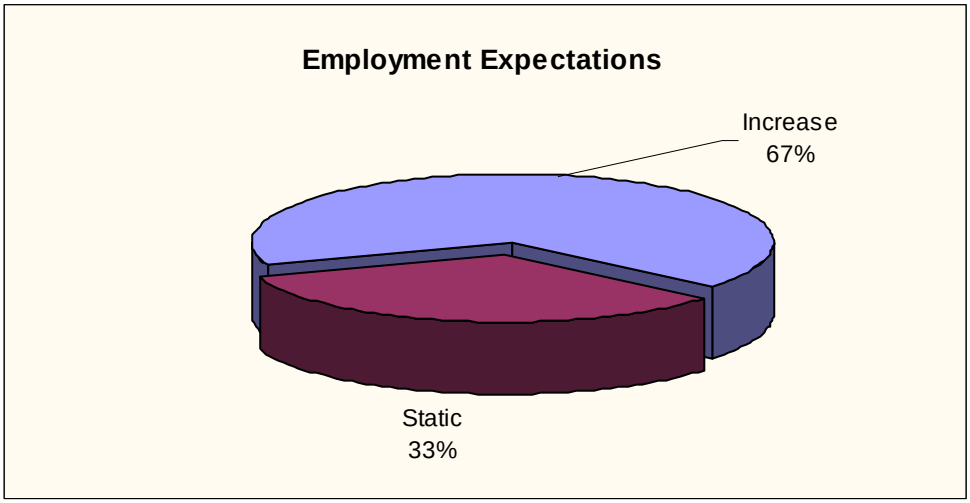
5.1.9 In total around 152 full-time and 15 part-time employees are represented. The histogram below presents the employment data by sector including the number of sole traders. The majority of full time employment was within the 'tourism' sector (112), with 40 employees in the 'transport' sector.



5.1.10 The split of seasonal employment across sectors is shown in the following diagram. The results highlight some of the seasonal variations inherent within the 'tourism' sector.



5.1.11 The employment expectations of firms over the next three years are highlighted in the diagram below. Most firms (67%) expect employment levels to increase, while 33% expect employment to remain constant. None of the respondents expect to see a decrease in staff numbers.

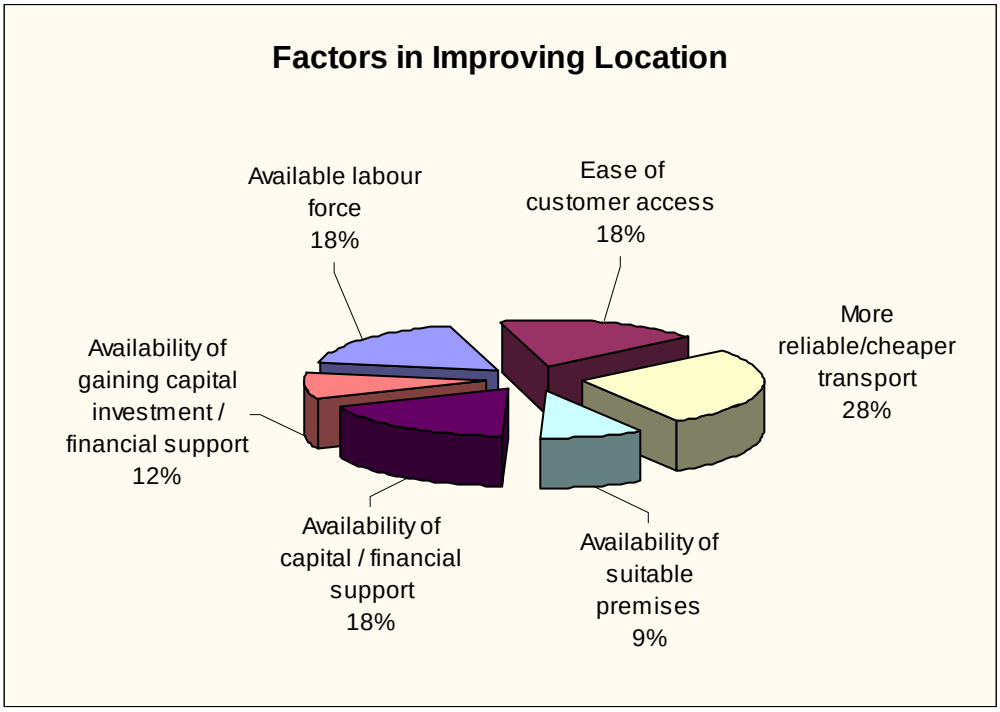


5.1.12 In comparison to expectations of turnover, firms generally predict a lower rate of growth in employment inputs than output. This indicates that firms expect to be able to obtain better utilisation of their current input capital.

Geographic Flexibility (Lochranza to Brodick)

5.1.13 Businesses were asked about the feasibility of relocating as a measure of the geographically flexible of their operation. Only one company reported a high probability of relocating with the majority expecting to remain in their current location. This indicates the low level of geographical mobility among firms based along the Lochranza to Brodick route.

5.1.14 The diagram below highlights the relative importance of key factors in improving the location as a place to do business. Reliable/cheap transport is considered to be the most important factor, followed by available labour force and ease of customer access.

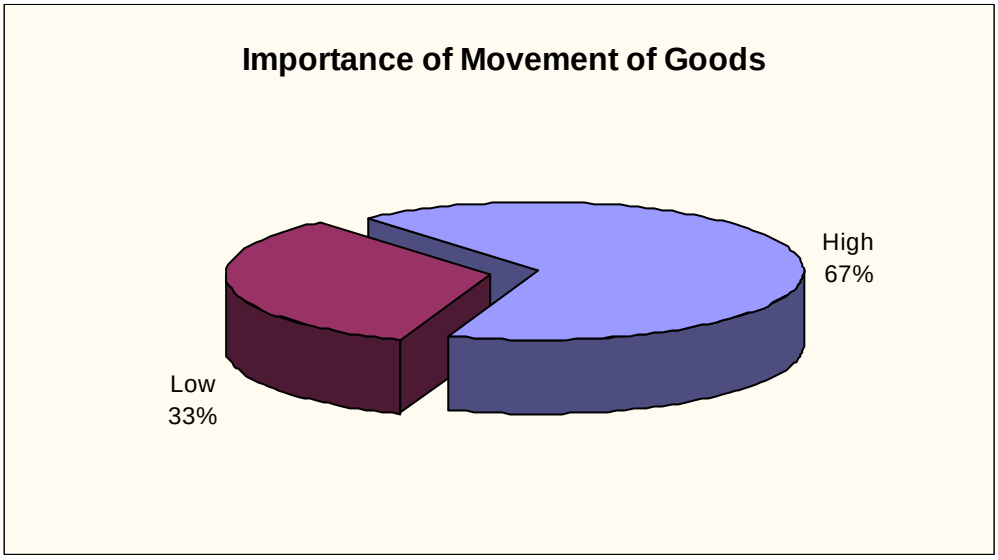


Transport (Lochranza to Brodick)

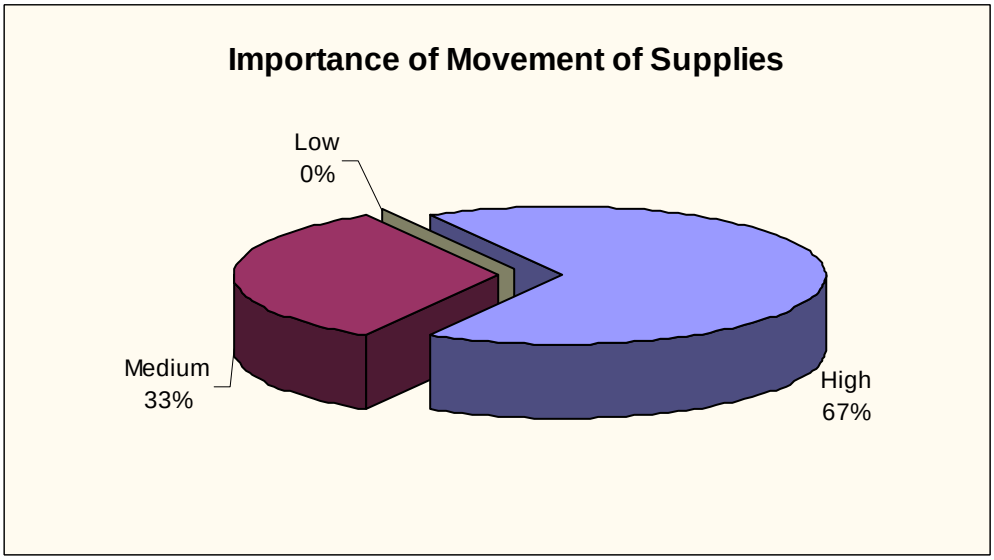
5.1.15 In order to gauge the significance of transportation within a firms operation, respondents were asked to rate the importance of the movement of goods and supplies to their business.

5.1.16 The diagram below indicates the importance of the movement of goods. Some 67% of businesses responded that the movement of goods was of high

importance. Furthermore, 43% of those who transport goods were unable to identify an alternative route for the transport of their finished products.



5.1.17 The diagram below indicates the importance of the movement of suppliers. Some 67% of businesses felt that the movement of supplies was of high importance and 71% responded that there was no alternative route for them to import supplies.



5.1.18 Businesses were asked to estimate the percentage of their total costs that are associated with the transportation of goods and/or supplies. Four respondents provided this data with all of them indicating transport costs were between 0% and 20% of total costs.

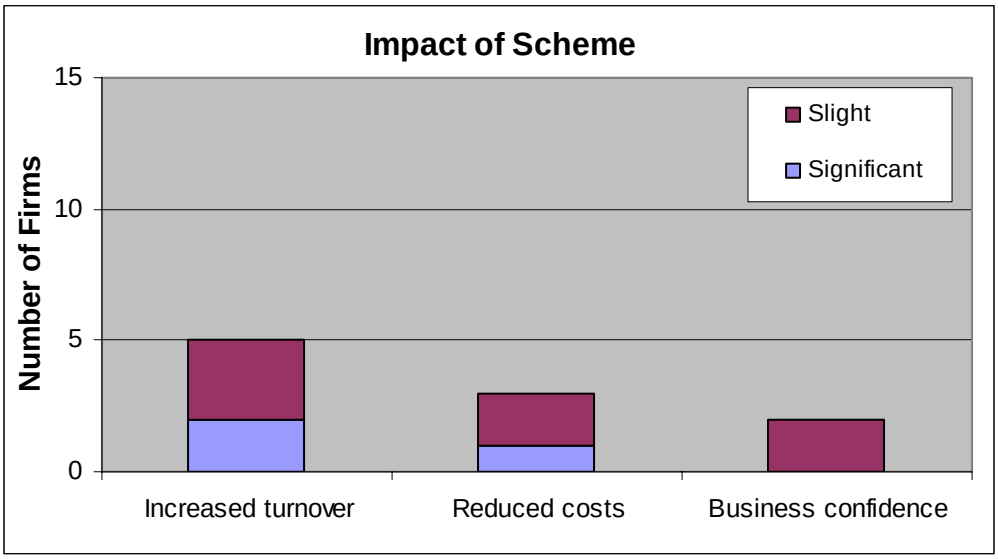
5.1.19 Respondents were asked whether their business currently face any transport constraints. All of the businesses stated that this was the case and that these constraints are considered to be significant.

Scheme Impact (Lochranza to Brodick)

5.1.20 All firms were given a broad description of the type of scheme upgrade proposed along the Lochranza to Brodick route. Respondents were then asked to consider the likely impact of a road improvement upgrade upon their business.

5.1.21 The figure below presents firms perceptions of the likely impact of a road improvement on business confidence, turnover and costs. A total of three firms (43%) expected road improvements to decrease costs, five firms (71%) expected road improvements to increase turnover and two firms (29%) expected a significant boost in business confidence as a result of road improvements.

5.1.22 One company did not expect any impact to their business as a result of a road improvement scheme.



5.1.23 Firms were further asked to quantify impacts of a road improvement upon the level of employment. Some 75% of firms considered that an improvement scheme would have little or no impact upon the number of staff that they employed. However, 25% of respondents perceived a road improvement would increase their employment levels by up to 5%.

Additional Comments (Lochranza to Brodick)

5.1.24 Several respondents raised the point that, while road improvements would be of benefit, one of the main constraints facing their businesses is the current ferry service to the island. The service is reported to be infrequent, especially in winter. Furthermore, ferries are at capacity with insufficient space for all those wishing to travel. This together with the poor state of the roads is seen to discourage visitors. Calmac has recently announced an increase in the frequency of winter sailings from Ardrossan and Brodick.

5.1.25 A further issue noted was the problem with transporting and receiving orders on time and the corresponding effect on profitability.

6 Economic Activity Locational Impact Analysis (Kennacraig to Brodick)

6.1 ***EALI Analysis***

6.1.1 The direct benefits to transport users have been estimated as part of the TEE analysis. However, the enhancements to the Kennacraig/Claonaig to Lochranza/Brodick route may also generate additional benefits in terms of stimulating economic activity at locations served by the route.

6.1.2 The assessment process for determining any potential EALI benefits is not straightforward in the absence of modelling tools. The business survey provides insights into how firms may react to improvements in accessibility. However, the relatively small sample sizes make the translation of this data into quantifiable forecasts unreliable. This section therefore seeks to highlight the likely areas where EALI benefits may be derived from the scheme and provide an indication of their magnitude. A detailed description of the EALI methodology is presented in Section 3.6 of the main report.

Importance of Lifeline Roads to Key Sectors

6.1.3 As part of the Stage One and Workshop phases of this study a key aspect was to identify the main problems, issues and constraints facing firms and organisations within remote communities. More specifically the process involved analysing the importance of 'lifeline' roads to the various industry sectors. One output from this process was the extent to which forestry, fish farming and tourism rely upon the quality of the local and regional road network.

6.1.4 The timber industry is a particular heavy user of lifeline rural roads. The main representative body, the Timber Transport Forum, has an on-going campaign to improve key timber routes. The success of this campaign is reflected in the recent commitment in the Partnerships document (Scottish Executive, 2003) to provide support for roads affected by timber production. The timber industry as a whole in the Highlands and Islands is expected to almost double over the next 10 years, adding considerable pressure to an already unsuitable transport network. Upgrades to lifeline routes serving existing and potential forestry sites are therefore likely to help stimulate economic activity in this sector.

6.1.5 The fish farming sector also stressed the importance of lifeline roads, both in bringing raw materials to the fish farms as well as shipping out produce to domestic and international markets. A high proportion of fish farms are located along lifeline routes and thus the condition and upkeep of these routes is essential. Fish farming within the Highlands and Islands is facing considerable competition from abroad, which has driven down prices. As a result, quick and efficient deliveries are becoming increasingly essential in order for these firms to compete.

6.1.6 The tourism industry within the Highlands and Islands is a key employer within the region. Whilst tourist boards generally cite major exogenous variables as drivers for tourism performance the level of accessibility to the regions is an important factor. The condition of lifeline routes, in particular in providing access to ferry ports, is essential in encouraging visitors to access remote areas and thus stimulate economic activity.

6.1.7 Lifeline roads are therefore clearly an important aspect to the successful operation of these three key sectors within remote areas of the Highlands and Islands. Improved levels of accessibility along routes servicing existing or potential new sites for these industries can therefore be seen as likely to have a positive impact upon economic activity.

Kennacraig to Brodick Scheme Impacts

6.1.8 The scheme is not anticipated to result in large journey time savings, particularly on the Arran section of the route. A large proportion of the scheme benefits are expected to be in terms of journey time reliability. This is a critical factor for this route given that the two sections of improvement are bisected by a ferry crossing. More consistent journey times will allow improved efficiency within firms management of deliveries, with less requirement for contingency planning.

6.1.9 Tourism is a major sector of employment within Arran and the route from Lochranza to Brodick provides the main link between the ferry services on the island. Reliability improvements will therefore enhance the road as a recognised tourist route around the islands, thus promoting Arran as a tourist destination.

6.1.10 Kintyre supports a broader range of industries with a strong primary sector, including forestry and fishing. Transportation is an important factor for these firms therefore road scheme enhancements will have a direct impact upon their operations. The B8001 is currently in poor condition and being single-track results

in slow journey times and unreliability. Improvements in the accessibility will allow cost savings amongst firms currently transporting goods via this route.

6.1.11 The business survey responses indicated the following key results:

- The majority of firms are geographically immobile and thus are heavily reliant on the local infrastructure and service provision, rather than being in a position to look for alternative locations to undertake their business;

- A high proportion of firms are reliant upon the A848 for supplies and delivery of goods, whilst all firms stated that the current levels of transport provision create serious constraints to their business operation. Furthermore, that a 'more reliable/cheaper transport network' would be the single most important factor in improving the desirability of the area;

- Over 40% the respondents consider that a road scheme improvement would significantly reduce their transport costs and allow them to expand turnover. In many cases this would also lead to a requirement for an expansion in the workforce, although generally only by a small proportion (up to 5%).

6.1.12 The improvements in journey time and reliability should provide stimulus to all firms operating in and around the B8001 and the A841 by releasing the current constraints to travel. Improved journey time reliability is of particular importance given the high proportion of trips to and from the ferry ports of Claonaig, Lochranza and Brodick. Enhanced accessibility is of significant importance due to the geographical immobility of most of the firms in the region.

6.1.13 The operating efficiency of the primary industries on Kintyre should be enhanced, in particular forestry and fishing, through faster and more reliable transportation of goods to the shipping terminal at Claonaig. This in turn could lead to the expansion of these industries by encouraging additional areas to be developed or new markets/customers to be served via the improved route. The business survey responses indicate that a significant proportion of firms consider that improvements to the road network could enable them to expand their workforce.

6.1.14 Tourism should also benefit both within Arran and Kintyre. Better reliability along the A841 will encourage visitors to Arran to extend their trips and travel on to Kintyre via the Lochranza ferry. Likewise the same is true of the improvements to

the B8001. If coupled with a campaign to promote the route this could have a significant impact upon the local and regional economy.

6.2 ***EALI Conclusions***

6.2.1 The scale of the estimated journey time improvements from the scheme would suggest that the indirect economic benefits may not be significant. However, the improvement in journey time reliability could enhance the stature of the route therefore opening up additional opportunities. A proportion of the benefits will be reflected in terms of maintaining the economic viability of businesses within the island.

6.2.2 The EALI analysis indicates that the following key benefits could be derived:

- Provide stimulus to all firms operating in and around the B8001 and the A841 by improving the reliability of road travel;
- Enhance the operating efficiency of the primary industries on Kintyre, in particular forestry and fishing, through faster and more reliable transportation of goods to the shipping terminal at Claonaig;
- Promote tourism within Arran and Kintyre. Better reliability along the A841 will encourage visitors to the island to extend their trips and travel on to Kintyre via the Lochranza ferry.

6.2.3 Limitations within the data set make it is difficult to accurately assess GDP or employment impacts. The business survey responses suggested that just over a third of the firms considered that the improvements would reduce their transport costs. A significant proportion also considered it would lead to an increase in turnover. Just over a quarter of the firms also felt that the improvement would provide a boost to their business confidence.

6.2.4 In terms of employment impacts the business survey results suggest that the majority of firms would be unlikely to expand their workforce solely in response to road transport improvements. This may be a reflection of the sectoral breakdown of the sample with a large proportion of the firms from the tourism industry and, more importantly, no representation from the primary industries. It could be argued that the primary industries are more likely to benefit from reductions in transport costs. However, even within the primary industries, evidence is limited to the extent to which improvements will encourage widespread economic growth.

7 Conclusions (Kennacraig to Brodick)

7.1 ***Overall Scheme Evaluation Conclusions***

7.1.1 The aim of the Kennacraig to Brodick scheme is to improve the levels of accessibility within both North Arran and North Kintyre. In addition it will enhance the multi-modal route across both regions. The analysis demonstrated that along the A841 on Arran the reliability of the route journey time acts as a transport constraint. In addition the single-track nature and condition of the B8001 on Kintyre further restricts journey times.

7.1.2 Direct transport benefits deriving from the journey time savings are estimated to be significant due to the volume of traffic along the A84. However, it is considered unlikely they would be sufficient to justify the capital costs (£6.2M) by themselves. The present value of benefits over 30 years is estimated to be in the region of £8.2M, although there is significant variation within the low and high forecasts (£3.2M - £11.6M).

7.1.3 Some indirect impacts upon the local and regional economy are also anticipated although it is not expected that they will be substantial. The improved reliability of the route will improve interchange with both the Claonaig to Lochranza ferry as well as the services from Brodick and Kennacraig. This could stimulate some economic activity, in particular amongst the tourist industry. The primary industries within Kintyre could also benefit from the journey time savings enabling them to enhance and expand their operations.

7.1.4 Accident rates along the A848 are relatively substantial in comparison to other routes indicating some potential for accident reduction benefits in this area. The proposed scheme should have some positive safety benefits through resurfacing and along with some specific accident reduction measures.