15 DISCUSSION AND RECOMMENDATIONS

The STAG (Scottish Transport Appraisal Guidance) process has been followed for this study, involving the community and other stakeholders at relevant stages as recommended by the guidance and to ensure that the process was informed by local input.

15.1 KEY ISSUES

The main issues identified by stakeholders at the beginning of the study were:

- a belief that Bressay is not currently conducive to business expansion or new development;
- that employment based on Bressay is heavily reliant on the ferry;
- that it is unclear whether there are real constraints on the economic development of Lerwick at the current time, from lack of suitable land for development, as different perceptions were given by different people;
- some people considered that there were difficulties over land ownership in Lerwick and about the affordability of available land;
- that it was unclear whether opening up Bressay to development (by providing a fixed link) would be positive for Lerwick in the future or have a negative impact by, for example, leaving vacant properties on the Mainland;
- that previous debate over a long time period was detrimental to developments in the harbour area and was difficult for local residents;
- the lack of decision about the link (not the nature of the link itself) means that owners of land are not selling land and this is a barrier to development;
- a fixed link could provide opportunities to sustain the Bressay community but the design of this link would have to ensure that LPA would be able to continue to ‘manage, maintain, and regulate the Port and Harbour of Lerwick, including the undertaking to improve and deepen the harbour area’ in the interest of industries operating in the harbour, so as to ensure their business potential can be achieved;
- the overall cost of the current service to travellers is considered to be high. The ferry has to be used to access most opportunities off the island and can be expensive to visitors staying on Bressay;
- it was recognised that it is important to consider how any new infrastructure could affect the environment including in terms of carbon emissions and in retaining remote biologically diverse areas of the island and of neighbouring Noss;
- some stakeholders considered that a fixed link could lead to a loss of island identity and associated social benefits, such as knowing everyone in the community; feeling and being safe; and using the ferry as a social hub;
- there is heavy reliance on Lerwick and Mainland by Bressay residents for employment, services, leisure and learning as opportunities are relatively limited on the island itself;
- ferry timetable constraints sometimes deny access to opportunities available on the Mainland (eg social activities; shift working etc);
- there is a lack of accessibility for those residents without access to a vehicle and who are unable to walk to the ferry as public transport and taxi provision is limited on Bressay and is not always convenient;
- there is an ageing population on Bressay and associated with this are difficulties in being able to provide adequate services: residents may not always get the service they need or equality of community care as service as compared with the rest of Shetland as services have to be planned to fit with the ferry timetable;

- there are some ongoing problems with recruiting staff for community posts because living in Bressay carries extra travel costs as compared with living in Lerwick;
- there are difficulties in accessing Bressay out-of-hours, unless the ferry is called out in a blue-light emergency;
- there is a lack of integration between the ferry service and bus services on the Mainland;
- some stakeholders queried whether the current service is sustainable and whether in terms of Shetland's finances the inter-island ferry service is sustainable in the long-term compared to fixed links; and
- the unresolved decision about a fixed link is resulting in other aspects of the community's development not being addressed, for example road improvements and public transport provision.

These issues were confirmed throughout the study and were used to underpin the team's understanding of problems with the current transport provision between Bressay and the Shetland mainland.

15.2 OBJECTIVES FOR THE STUDY

Strategic workshops assisted in the development of local planning objectives (see Chapter 4), and, with the help of the community, a long list of options was identified for further consideration (see Chapter 5).

15.3 FINDINGS OF STAG PART 1 APPRAISAL

These options were then appraised against the identified planning objectives. At an early stage the following options were sifted out:

- **Causeway**:
    - It was considered that this option could cause significant problems to operation of Lerwick Port, and the economic activities that it supports. For example the port would be split in two, not enabling boats to move around easily; requiring two sets of tugs to operate; and constraining activities such as decommissioning;
    - there were also safety issues: for example the lifeboat would be on one side, unable to quickly reach incidents in the other direction, and build up of shipping in one area, rather than another; and
    - there were environmental issues, as it would cause silting of harbour and increased fuel used of boats moving from one side of the harbour to the other, around Bressay.

- **Transporter Bridge**:
    - This option was rejected because of the increased journey time associated with it; potential constraints of use in poor weather; constraints on harbour activities; and potential visual impact.

- **Helicopter Service**:
    - This option would be unable to take vehicles; unable to take many passengers or much freight and could have associated safety issues. It was recognised that the option could be used in combination with other options, but was likely to be too expensive to be sustainable.

The remaining options were taken through the Part 1 STAG appraisal. The following options were considered to sufficiently meet national and local planning objectives and were carried forward to more detailed appraisal (Part 2 STAG):

- Option 1: Drill and Blast Tunnel (see Section 7.3)
- Option 2: High Level Bridge (see Section 7.4)
- Option 3: Reconfigured Ferry Service (see Section 7.5)
- Option 4: Do Minimum (Existing Ferry Service, used for comparative purposes) (see Section 7.6)
- Additional: Public Transport Measures (see Section 7.8)

In all options walking and cycling measures have been taken into account.

The following options were eliminated as a result of the findings of the Part 1 STAG appraisal:

- **Chain Ferry**
    - This option would require higher levels of capital investment than the existing ferry service (operating the ferry and back up for overhaul/maintenance). Slipways would need to be constructed on either side at a new location and operational costs would not be significantly lower than the existing service (manning levels would be similar to current operation to ensure the ability to safely evacuate a vessel in an emergency situation);
    - the Maritime and Coastguard Agency (MCA) code of practice will only consider issue of a certificate allowing a chain ferry to operate in Category A-C waters[91]; Bressay Sound is categorised as a Category D water;
    - the ferry could cause a level of disruption to Lerwick Harbour operations, depending on the frequency of service, because the Master of the ferry generally has to ascertain that the way is clear, before leaving shore, and vessels less than 50m long have to give way to the ferry when it is crossing. Mariners also have to be warned not to pass directly in front of the chain ferry and the draught behind the ferry can also be restricted by the chain;
    - the location would have to be from the Point of Scatland or Greenhead, in order to function effectively. The crossing time would be approximately three minutes, but the overall journey time would be slower, as the link would not be so central, and there would be additional time for embarking and disembarking. The Point of Scatland is being developed and land for a slip is now constrained;
    - information from Sandbanks, via Tor Point, has highlighted the need to have an appropriate system of chains such that they would not get destroyed on the sea bottom, or interfere with boats using the Sound. This would require substantially more dredging of the navigation channel than for other options, to create a graded edge in order to prevent abrasion of the chain on the edge of the dredge channel. This would increase the costs of the option significantly;

[91] Category A: narrow rivers and canals where the depth of water is generally less than 1.5m; Category B: wider rivers and canals where the depth of water is generally more than 1.5m and where the significant wave height could not be expected to exceed 0.6m at any time; Category C: tidal rivers and estuaries and, large, deep lakes and lochs where the significant wave height could not be expected to exceed 1.2m at any time

  - the ferry must travel in a straight line, along the chain, limiting manoeuvrability. The service could also be adversely affected by sea conditions, particularly waves; and
  - there are some safety issues, because chain ferries have no means of steerage if the chain were to break.

- **Immersed Tube Tunnel:**
  - The capital costs involved in building this option would be high compared to a drill and blast tunnel, because of the depth of dredging the trench required (up to 18m) and the cost of transporting tunnel sections to Shetland or of constructing holding ponds locally to construct the sections in Shetland;
  - there is a potentially greater environmental impact, particularly during construction, because of the activities required to facilitate construction;
  - there is a high degree of risk in floating or craning in sections of tunnel in Shetland's climate and sea conditions; and
  - in excess of 250,000m^3 of rock would be removed and need to be disposed of with associated high costs (and if no reclamation site were found potentially adverse environment impacts).

- **Opening Bridge:**
  - Operational costs would be higher than for other fixed link options, due to required maintenance and manpower costs;
  - it would place some constraints on the current activities of Lerwick Harbour, for example, it would have to be opened to allow any pelagic fishing boats to pass through;
  - access would be unpredictable: from when the bridge begins to open it would require up to 30 minutes wait (opening and closing time of 5-15 minutes each way and time for the vessel to pass through). The frequency of opening is not known, but the unpredictability to those using the link could present access issues and could prevent integration with other transport services, including external connections. There would be a deterioration in level of provision of access for emergency services at these times; and
  - under certain extreme weather conditions opening would be prevented.

15.4 FINDINGS OF STAG PART 2 APPRAISAL

15.4.1 Options for Appraisal

The options appraised at STAG 2 are as follows (further details are provided in Chapter 7):

- **Option 1: Drill and Blast Tunnel**: Option covers the construction of a tunnel by drill and blast techniques in the rock beneath the Sound of Bressay on an alignment between Point of Scatland and Hoegan. The tunnel would allow bi-directional traffic movement with provision for a 2m cycle way/footpath and a 1.05m hard shoulder.

- **Option 2: High Level Bridge**: This option covers a high level bridge with an airdraft of 60m above MHWS over a 260m wide channel. The bridge would also be provided with wind shielding. It would allow two directional traffic and

would have a 2m combined footway/cycleway on one side and a 0.6m wide verge on the other.

- **Option 3: Reconfigured Ferry Service:** This option is for an enhanced ferry service, which includes a lengthened operational day and some increase in the frequency of sailings at certain times of day to address issues raised in consultation about access and integration. The service would operate:

    - Sunday to Thursday: 0545 (depart Bressay) to 2400 (depart Lerwick) – 18.5 hour service;
    - Friday and Saturday: 0545 (depart Bressay) to 0145 (depart Lerwick) – 20.25 hour service;
    - In addition there would be an improvement in the service on a Sunday morning, returning to that prior to the introduction of Sunday maintenance and drill period.

Fare levels are considered to be a major issue by those using the ferry and thus Option 3 has been considered on the basis of three fare levels:

    - Retaining the current fare structure;
    - removal all fares;
    - a more sophisticated structure reflecting issues raised during the first stage of consultation (see Section 7.5.3 for more information).

- **Option 4: Do Minimum (Existing Ferry Service, used for comparative purposes)**:
- The first service of each day departs Bressay at 0700 hours, and departs Lerwick at 0715 hours.
- Monday to Thursday there are twenty-one crossings each way, in the main on an hourly basis, but more frequently at peak times, including lunch time.
- On a Friday and Saturday there is an additional service at 2330 and 0045 departing Bressay and 2359 and 0100 departing Lerwick.
- On a Sunday there are fewer crossings during the morning, compared to other days, to enable maintenance and drill period.
- Passenger costs are as follows:

    - Adult – return: £3.30
    - 10 return journey ticket: £15.80
    - Children, up to 16 – return: £0.40
    - 10 return journey children's ticket: £2.80
    - Concessionary SIC Pass Holders – no charge

- Vehicle costs (fares include driver) are as follows:

    - Motorcycles – return: £6.00
    - Vehicles up to and including 5.50m – return: £7.80
    - 10 return journey ticket: £62.00

- Limited post car service.

- **Additional: Public Transport Measures**
- Timetabled along main route, with options to phone on for service from the more minor routes (see Chapter 7 for maps and descriptions).

In all options the importance of walking and cycling measures has been taken into account.

15.4.2 STAG 2 Appraisal

The options have been appraised against the Government's five transport objectives for environment, safety, economy, accessibility and integration. A detailed assessment has been made of the fit of each option with the Government and the local planning objectives and the scope and scale of the benefits and impacts associated with each option have been considered.

A summary of the key findings is provided below (more detailed information can be found in Chapters 8 -13 and in Annex M).

15.5 ENVIRONMENTAL SUMMARY

This section presents the key findings from the environmental appraisals.

15.5.1 Planning

- The Bressay Link (all options) broadly complies with National and Regional Planning goals. Current local planning policy relates to a bridge as a link to Bressay. This would require to be re-considered if a different option was taken forward.

15.5.2 Land Use

- It has been estimated that vehicle trips would double in the first few years after construction of a fixed link (Option 1 or Option 2), to approximately 650 per day. This traffic would cause changes in flows on existing roads. On some roads flows would increase and on others flows would decrease. There could be increased pressures on car parks in Lerwick.
- Options 1 and 2 would impact on properties in and around the Gremista Industrial Estate but could remove traffic from the centre of Lerwick (from where the current Bressay ferry operates). Option 3 could lead to increased levels of traffic in Lerwick centre and therefore could impact on the properties in and around the spur Jetty. Option 4 would have little immediate impacts on properties in the centre of Lerwick however if ferry traffic increased over time there could be an increasing impact on properties in the area.
- The increases in traffic associated with fixed links could affect cyclists using the quiet roads on Bressay. The detailed design of all links including specific improvements to Heogan Road would consider cyclists and walkers further (see Section 7.8).
- Option 1 (tunnel) would require demolition of an old LPA shed but is unlikely to impact significantly on other land uses in the area[92]. The excess material from construction could potentially be used to reclaim an area of shallow water at the Bight of Gremista marina alongside the tunnel access road and adjacent to the quay beside Shetland Catch subject to necessary consents.
- Construction of Option 1 (tunnel) would provide opportunities for environmental enhancements of a degraded area of the port with removal of dumped materials and demolition of the old property.
- Construction of a tunnel under the Sound would place some restriction on very deep dredging in the future but not on the planned -10m below CD dredge. LPA has confirmed that this is acceptable because all existing quays would

[92] Two businesses use the shed and other businesses in the locality could be affected by short term disruption due to construction

have to be replaced if the harbour were dredged to below –10m which would be impractical.
- Option 2 (high level bridge) could impact on existing or future harbour activities but has been designed (air draught of 60m) to accommodate large vessels which might wish to pass through Bressay Sound in the future (see Section 7.4). The Port Entry Light could be affected by construction and mitigation would be required.
- Construction of Option 2 would have potential to disrupt some harbour activities during the works. Construction could also impact on ongoing operations at Lerwick Fish Traders during the works and would require relocation of a Liquid Petroleum Gas (LPG store).
- Construction of Options 1 and 2 would result in the change of use of some land currently used for grazing (crofting) to facilitate construction of the connecting roads.
- Option 3 (reconfigured ferry) and Option 4 (Do Minimum) would be unlikely to change the land use in the area unless new infrastructure was built at either terminal or additional car parking provided.

15.5.3 Agriculture and Soils

- No prime agricultural land would be affected by the proposals.
- Small areas of semi improved fields used for grazing near Gremista and Heogan would be lost to facilitate construction of the access roads.
- The increased traffic associated with a fixed link could impact on some stock movements across the road.
- Options 3 and 4 would have little impact on agriculture and soils unless new infrastructure was built.
- Further work is required to identify the location of any made ground which could be affected at the edge of the harbour by Option 1 (tunnel). SEPA confirmed this (April 2008). The detailed design would be required to mitigate any potential adverse effects.

15.5.4 Geology

- No designated sites or important geological resources would be affected by any option.
- Option 1 (tunnel) would require removal of 124,000m^3 of rock (168,000m^3 bulk volume). LPA has indicated that it could re-use this material (subject to receiving necessary consents) in harbour reclamation.

15.5.5 Water Quality, Drainage and Flood Defences

- There would be impacts on water quality during construction of Option 1 if land were reclaimed at the edge of the marina and adjacent to Shetland Catch. Effects would be short term and controlled by carefully designing the works including appropriate mitigation and implementation of best construction practices on site.
- Construction of the high level bridge Option 2 would result in impacts on water quality during construction particularly during construction of any temporary causeways or cofferdams because of increased loads of suspended solids and other pollutants. Implementation of best site management practices would reduce the significance of effects but some impacts could not be avoided. Bressay Sound has high natural dispersal characteristics which would aid recovery on completion of construction. If this option was taken forward modelling of the effects of the bridge on currents and dispersion would be required.

- Construction of the tunnel could result in some impacts on ground water but it is not considered at this stage that these would be significant.
- The Lerwick tunnel portal (Option 1) would be built in an area at risk of flooding. Reclamation of land with spoil from the tunnel could help to achieve this. Further work would be required to identify the extent of the risk and necessary mitigation as part of the detailed design.
- Any spillages of diesel and other pollutants from the ferry and/or vehicles using it in Option 3 (reconfigured ferry service) could impact on the water quality of the harbour but this is unlikely to be significantly different from at present and with stringent operating practices this risk would continue to be carefully controlled.
- Option 4 (Do Minimum) would have no additional impacts on water quality.

15.5.6 Landscape

- A tunnel (Option 1) would result in minimal long-term effects on the wider landscape. In the locality of the portals themselves and along the routes of the proposed access roads serving the tunnel, localised impacts on the landscape would result, particularly on Bressay. On the Lerwick side, these have potential to be positive though enhancing currently degraded areas.
- A high level bridge (Option 2) would result in long-term effects on the wider landscape, as it would be apparent across a wide area for the duration of its life span. It would form a new feature and landmark, rising above the industrial areas at the Point of Scatland and extending to the rural landscape of Bressay.
- In the locality of the landfalls and along the routes of the proposed access roads serving the bridge localised impacts on the landscape would result, particularly on Bressay. On the Lerwick side, these have potential to be positive though enhancing currently degraded areas.
- The effects of Option 3 (the reconfigured ferry service) would be unlikely to have significant impacts on the landscape, as the ferry is already part of the character of the area.
- The Do Minimum option (Option 4) would result in no significant change in current levels of impact.

15.5.7 Visual Amenity

- A tunnel (Option 1) would result in minimal long term visual impacts in the wider area. In the locality of the portals and along the routes of the proposed access roads serving the tunnel, localised visual impacts would result, but some of these have potential to be positive through enhancing currently degraded areas.
- A high level bridge (Option 2) of the scale proposed would result in wide scale visual impacts across north facing areas of Lerwick, from the west side of Bressay and the flanks and tops of surrounding hills which face towards the proposed bridge. If the design was of aesthetic merit, it may be considered by some to be a positive new landmark in Shetland. Viewers would vary in their feelings towards the new bridge depending upon their like or dislike of the structure.
- The cable stay towers of the bridge (Option 2) would be visible from a very long distance from the site.
- In the locality of the landfalls themselves and along the routes of the proposed access roads serving the bridge, more localised visual impacts would result. Some of these have potential to be positive through enhancing currently degraded areas.

- The effects of Option 3 (reconfigured ferry service) would depend upon the nature and scale of the proposals, but would be unlikely to have significant visual impacts as people are already accustomed to seeing the existing ferry.
- If more boats were introduced with any option, for example smaller boats for passengers only, then these would provide increased activity and visual interest at the existing Spur Jetty.
- The Do Minimum option (Option 4) would result in no significant change in current levels of impact.

15.5.8 Biodiversity

- None of the options would directly affect any site designated for its nature conservation interests.
- Fixed links could facilitate access of polecat ferrets to the Isle of Noss and its important bird communities. This risk would need to be considered further and taken into account in the detailed design of a tunnel or bridge (Options 1 and 2).
- Option 2 (high level bridge) could result in collisions between eiders and other seabirds with the structure (see Annex B).
- Construction of fixed links (Options 1 and 2) could disturb important wildlife including cetaceans (sea mammals) and otter which are European Protected Species (EPS). Specific mitigation would require to be developed to reduce the level of impact. Additional ferry services (Option 3) are considered unlikely to disturb otter because they would be habituated to the current service and also much other traffic in the Sound.
- The fixed link options both involve the construction of new approach roads and upgrade of the existing Heogan road on Bressay which could disturb some breeding waders. Pre-construction surveys would be required to identify any specific mitigation requirements including timing of the works.
- Option 4 (Do Minimum) would have no additional effects on biodiversity as compared with the current situation.

15.5.9 Cultural Heritage

- Options 1 and 2 would impact on the setting of the Bod of Gremista Category B Listed museum building. The effects of Option 1 could be positive by tidying up a currently degraded area in the locality of the Lerwick portal. Options 3 and 4 would have no impact on the Bod of Gremista.
- Option 2 (high level bridge) could have an effect on the setting of cultural heritage resources across a wide area.
- Impacts of the fixed links and their access roads on the cultural heritage interests in Gremista and Heogan would be low but would be taken into account during construction.
- Options 3 and 4 would have no significant impact on the cultural heritage in Lerwick or Bressay.
- Option 4 (Do Minimum) would have no additional effects on cultural heritage.

15.5.10 Noise and Vibration

- Noise and vibration would be created during construction of either fixed link option (Options 1 and 2) or any new ferry infrastructure if required (Option 3) and is likely to be significant at some locations over short periods but could be managed through implementation of mitigation measures to reduce the magnitude of the impacts.

- During operation, both fixed link options would remove traffic and therefore noise impacts from the current quay in Lerwick and potentially from Lerwick centre itself. Similarly, the existing road from Maryfield to the Heogan Road on Bressay would experience a reduction in traffic levels and associated noise. On both the Lerwick (western) landfall and Bressay (eastern) landfall of the fixed links there would be increased traffic movements in the area (Gremista Industrial Estate and Gremista Road and Heogan Road) and associated noise and vibration impacts. It would be anticipated that operational noise would be greater from the high level bridge option (Option 2) than the tunnel option (Option 1) because it would all be open to the environment.
- A fixed link would increase ease of access between Bressay and Lerwick with associated increases in traffic. Noise levels could increase on the island as a whole but this would not be anticipated to be significant, as flows would be spread throughout the day with concentrations in the peak periods but flows would remain relatively low.
- The reconfigured ferry service could lead to a small reduction in traffic and associated noise as the enhanced service could result in more foot passenger movements rather than car movements, although there would be increased noise from the increased ferry movements.
- Option 4 (Do Minimum) would not significantly increase or reduce noise emissions.

15.5.11 Air Quality

- Option 1 (tunnel) and Option 2 (high level bridge) would lead to increased levels of traffic and therefore potentially localised reduction in air quality in Gremista and Heogan but could remove traffic and therefore relieve congestion and improve air quality in some areas of Lerwick centre and Maryfield. Impacts are not considered to be significant because flows would still be comparatively low as compared with for example the Scottish mainland.
- Option 3 (reconfigured ferry service) could lead to decreased levels of congestion as traffic for the ferry service would be spread out over a longer period of time as compared to the present situation.
- The increased level of service with Option 3 would result in increased levels of emissions from the ferry vessels unless vessels with new technology were introduced in the future with potential for decreased emissions.
- Option 4 (Do Minimum) would not significantly increase or reduce air quality.
- Option 1 (tunnel) would have the smallest carbon footprint of the three options.

15.5.12 Addition: Improved Public Transport

- All options for improved public transport have potential to encourage modal shift with subsequent benefits in terms of noise and air quality.

15.6 SAFETY

15.6.1 Road and Maritime Safety

- There are currently high levels of road and maritime safety, although some drink driving issues were highlighted in the first stage of consultation.
- There are currently low levels of community safety incidents and low levels of fear of crime.
- There would be increased levels of vehicle use on the roads to and from the fixed link options, but the current low severity and quantity of accidents means that it would be unlikely for any increase of significance.

- There would also be an increase in traffic levels with Option 3 (reconfigured ferry service), particularly around the Lerwick terminal, where there are already some issues associated with off-loading (see Section 3.2) however, this is unlikely to have a significant impact on current road safety.
- Inclusion of enhanced public transport measures with Options 1-3 could assist with reducing current road incidents if their use was taken up.
- There is risk of more serious effects from fire in a tunnel (Option 1). The risk of accidents in a tunnel however has been demonstrated to be less than on the connected road network[93].
- There are risks of marine incidents with the high level bridge (Option 2) and construction at height in the Shetland weather could be challenging.
- The Do Minimum is generally considered to be adequate, in terms of emergency service provision, however, there is an issue around non blue-light emergency out-of-hours access which has been identified in consultation, which would not be resolved by the reconfigured ferry (Option 3).
- The fixed link options (Options 1 and 2) would enable non blue-light out-of-hours access and, in some circumstances, enable people to be driven to A&E, rather than have to wait for an ambulance. Provision would have to be put in place for Option 2, high level bridge, to mitigate against potential weather disruption.

15.6.2 Security

- It is difficult to quantify the likely impact on incidents of crime, as the figures are currently low and inconsistent in comparable areas.
- The importance of people's perceptions of how security might change with different options (for example, joy riders and the need to lock doors with fixed link options), and their feelings of being safe are considered as important. In the main, people's feelings, whether for negative or positive change as a result of different options, are bound up with their overall desire or not, for a fixed link.
- The ferry options provide opportunities to meet people, being a social hub and provide constraint to open access into Bressay.
- In summary there is little change in impact on Safety, in relation to the four options. The current low levels of road traffic incidents would be likely to remain with any option, although in the long-term developments resulting from a fixed link could lead to increases. The level of this cannot be quantified at present.

15.7 TRANSPORT ECONOMIC EFFICIENCY

- A TEE analysis of the proposed options has been undertaken in accordance with STAG, comparing the options with the Do Minimum (current ferry service). Net Present Values (NPVs) and Benefit Cost Ratios (BCRs) have been calculated for each option to provide a measure of economic worth and value for money.
- Table 15.1, below, provides a summary of the capital and operational costs for each of the options over a 60 year period, in compliance with Government guidance.
- The capital costs in the table include the cost of any infrastructure required over the 60 years, including any road improvements (e.g. construction of fixed link, or three replacement ferries and one replacement berthing structure and

[93] Ongoing work by Faber Maunsell for SIC

two replacement link spans). The operating costs cover the annual cost of operating the option, over 60 years.

Table 15.1: Summary of Capital and Operational Costs for each Option over 60 years, expressed in today's Prices

	Tunnel	Bridge	Reconfigured Ferry (existing fare structure)	Current Ferry (Do Minimum)
Capital Costs	£26,339,000	£51,480,000	£27,780,000	£27,750,000
Operating Costs/annum	£195,000	£195,000	£1,095,364	£934,385
Total Operating Costs over 60 years	£11,700,000	£11,700,000	£65,721,840	£56,063,100
Total Actual Costs	**£38.0M**	**£63.2M**	**£93.5M**	**£83.8M**

- Table 15.2 summarises the findings of the economic appraisal. In the model all costs and benefits for each option are expressed in current day prices to allow for like for like comparison. The figures below are for the reconfigured ferry, using the existing fare structure. Two further scenarios were also modelled: no fares and a sample new fare structure.
- Options 1-3 have been compared throughout the STAG process, with the Do Minimum. This is the current ferry service projected forwards for the next 60 years, taking account of any new infrastructure requirements during that time. In the economic model the Do Minimum is only used for comparative purposes and is not appraised itself. The costs and benefits of the current service are therefore taken as zero and the costs and benefits of the three other options are compared against this.
- Net Present Value (NPV) is a measure of the quantifiable benefits minus costs. A positive NPV and Benefit Cost Ratio (BCR) demonstrate better value than the current situation.

Table 15.2: Summary of Costs and Benefits for each Option, as generated by Transport Economic Efficiency Model (TEE) (including public transport)

	Tunnel	Bridge	Reconfigured Ferry (existing fare structure)	Current Ferry (Do Minimum)
Present Value of Transport Benefits	£19,447,016	£19,379,131	£0	0
Present Value of Cost to Government	-£2,613,631	-£41,901,088	-£3,630,566	0
Net present Value (NPV)	£16,833,385	-£22,521,957	-£3,630,566	0
Benefit-Cost to Government Ratio (BCR)	**7.44**	**0.46**	**0**	**0**

- Table 15.2 demonstrates that Option 1, the drill and blast tunnel, is the only option with a positive economic case. Including optimism bias at 66% and contingency of 20%, this option was found to have a BCR of 7.44 which means that for every £1 invested by the public sector a benefit of £7.44 is generated. In addition this option has an NPV of £16.8M.
- A number of sensitivity tests were undertaken but none of these were found to impact on the main conclusions from this work. These tests were to:
    - assume no additional trips were generated;
    - assume a ferry lifespan of 25 and 30 years; and
    - assume optimism bias on all options (including the ferry) of 66%, 44% and 0%.
- Taking optimism bias down to 44% or removing entirely significantly increases the economic case for the tunnel option, as there would be no overall cost to the Government of the scheme: the cost savings made with this option outweigh the capital costs.
- When the ferry lifespan was increased to 25 and 30 years the BCR for the tunnel decreased to 3.44 and 2.75 respectively.
- The BCRs of other options were less than 1.
- In conclusion, from an economic welfare perspective Option 1 the tunnel is the option that should be taken forward.

15.8 ECONOMIC IMPACT

- The research and analysis suggests that the economic development need for any improvement to the transport option is highly localised within Bressay and for those businesses and services that operate in Bressay. It is not expected that the construction of a fixed link or a reconfigured ferry service would generate new benefits or opportunities at a Shetland wide level, at least in the foreseeable future.
- The fixed link options best address the local needs identified in this process. However, both fixed links would have positive and negative economic impacts. In the analysis of potentially negative impacts both are expected to have construction related impacts on those in the immediate vicinity, and for the tunnel option the apparently inevitable demolition of one building which is owned by the LPA. However, the bridge option is anticipated to generate the greatest negative impact of all the options as there are concerns that once operational it would present an ongoing barrier to marine related activity and potential economic growth, and there are fears that the new design would lead to a more frequent loss of access than is currently experienced with the ferry service due to high winds. Therefore the fixed link options are appraised to best address need, and the tunnel option performs the best as it is expected to create negative impact only during the construction period.
- If the fixed link options, and the tunnel in particular, had performed significantly worse than the ferry service in the financial analysis summarised in Chapter 3, it is likely that more focused research would have been required. This would have been required in order to explore whether the value of the benefits identified in a qualitative manner in this analysis would outweigh any additional investment required, particularly as many of the expected benefits to Bressay may occur at the expense of other areas in Shetland.
- However, the TEE analysis shows that the tunnel option significantly outperforms not just the other options for change but also the Do Minimum option in terms of both the anticipated cost over the 60 appraisal period and the quantified return in terms of community value expected from the investment. Therefore the tunnel is appraised as the best performing option in both the TEE and EALI appraisal.

- There would be winners and losers through the introduction of a tunnel but it is expected that the strength of the local economy would absorb many of the negatives, and overall a tunnel would reduce fragility for the community of Bressay and improve the competitiveness of Bressay as a place to live and work. This would help to sustain the community for the foreseeable future.
- However, to maximise economic activity and land impacts and to protect Bressay from inappropriate development, the potential approval of a drill and blast tunnel must be accompanied by appropriate land-use planning and infrastructure development.
- In addition, the negative economic impacts created by the uncertainty surrounding the transport link suggest that to enable the community of Bressay to address its challenges and develop appropriately, there is a need for a decision at the earliest appropriate date.

15.9 ACCESSIBILITY

- In terms of convenience of access and drive time, the fixed link options would be able to provide 24 hour as and when access to opportunities (although there could be some impact on this for the high level bridge (Option 2), due to potential weather disruption).
- The reconfigured ferry service (Option 3) would be able to provide a longer period of access, each day, and increased frequency of service, potentially cutting down on waiting time and overall travel time. The restrictions provided by a timetabled service would still apply.
- Provision of public transport for each option would be necessary, if the issues which have been raised during the study are to be met:
    - without public transport provision in the order of 10 return journeys each week day (Sub-Option B), the fixed link options would lead to a significant deterioration of access for those who currently rely on the centre to centre link and on walking, cycling or receiving lifts; and
    - without public transport provision within Bressay, with the reconfigured ferry service (Option 3), the project would not be addressing issues raised about current lack of internal transport and people's ability to access the Bressay ferry terminal.
- Provision of enhanced public transport would enhance accessibility for some residents living close to the bus route and would provide better access for visitors.
- Access issues can only be addressed through the reconfigured ferry service (Option 3) if the fare structure is changed to reflect the Bressay community's high dependence on Mainland Shetland for accessing education, training, work, health and leisure activities. This is more pronounced that in some other Shetland islands where there is greater provision of facilities.
- The fixed link options (Options 1 and 2) could have a negative impact in terms of people's ability to move around Bressay in private vehicles, as there are MOT and driving licence exemptions at present with the ferry.

15.10 INTEGRATION

- Both fixed link options (Options 1 and 2) provide 24-hour opportunity to integrate with other transport modes and reduced journey time (although there could be some reduction in level of integration with Option 2 (high level bridge), due to some potential weather disruption).

- There could be a negative impact in terms of the loss of current arrangements regarding freight being able to be transported on the ferry, unless alternative provision was put in place using the public transport network.
- The reconfigured ferry service (Option 3) would be able to provide improved opportunities to integrate with other transport services, including the first flights departing from Sumburgh Airport each morning.
- Adequate provision of public transport both to and from Bressay would have to be made to optimise the benefits provided by any option. These enhanced services would need to be integrated with the rest of Shetland's transport network to be effective.
- Option 3 (reconfigured ferry service) would provide a catalyst for improvements to be made in the facilities at either terminal; the provision of real-time information; and an integrated ticketing system across the network.
- The fixed link options improve disabled peoples' ability to travel more seamlessly than using the current ferry service (Option 4) and provide greater ease in access to specialist appointments.
- There are a number of positive and negative health impacts with all options, however, on balance, the loss of the ability to readily walk and cycle to opportunities, means that the fixed link options (Options 1 and 2) would have a less positive impact than the ferry options (Options 3 and 4). All the proposed options (Options 1–3) would provide improved opportunities to access, for example, to supermarkets (for fresh food), to leisure centres and health appointments.
- There is concern that the potential increased centralisation impacts of a fixed link could further strain delivery of primary health care in central areas of Shetland.
- Land use/transport planning issues are currently under reviewed by SIC Planning Service. First reports highlighting key issues will be available at the end of this year. Any future plan should seek to maximise opportunities for Bressay.

15.11 DISCUSSION

The project aim was to provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland. Three options and the Do Minimum (continuation of the current service provision) have been appraised in detail in accordance with STAG and following best practice guidance. The appraisal of the options in the framework of the aim of the project, the Government objectives and the local planning objectives developed for the study is summarised in Table 15.2.

Table 15.2: Summary Appraisal of Options

Key:
✓✓✓ Good fit with objective
✓✓ Moderate fit with objective
✓ Fit with objective
- Neutral
× Minor non compliance with objective
×× Moderate non compliance with objective
××× Major non compliance with objective

Aim, Government and Local Planning Objectives	Option 1 – Drill and Blast Tunnel	Option 2 – High Level Bridge	Option 3 – Reconfigured Ferry	Option 4 – Do Minimum
Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland	✓✓✓ Tunnel provides 24hour link and with enhanced public access would be improved for all. Option generates traffic but is flexible and affordable	✓✓ Bridge provides 24hour link, apart from in most extreme weather conditions, and with enhanced public access would be improved for all. Option generates traffic and has high cost. Perceived risk to Port activities	✓ Provides improvements in transport provision. High capital and operating costs	× Issues will remain and high capital and operating costs
Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency	✓✓✓ Tunnel provides 24 hour link. Provides opportunities for economic development in Bressay	✓✓ Bridge provides 24 hour link. Provides opportunities for economic development in Bressay, could create perceived constraint on Port activities	✓ Improvement over Do Minimum, but does not meet all issues raised	- No change
Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community	✓✓✓ Tunnel provides 24 hour link. Public Transport measures required to ensure effective link for everyone within the community	✓✓ Bridge provides 24 hour link, apart from in most extreme weather conditions. Public Transport measures required to ensure effective link for everyone within the	✓ Better provision than current service. Public Transport measures required. Option remains susceptible to future changes in ferry fares and prices	× No change so no improvement

Aim, Government and Local Planning Objectives	Option 1 – Drill and Blast Tunnel	Option 2 – High Level Bridge	Option 3 – Reconfigured Ferry	Option 4 – Do Minimum
Bressay community		community		
Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion	✓✓ Tunnel could restrict dredging below -10m in the future (current LPA plans are only to dredge to -10)	× 60m airdraft and 260m main span mitigates main constraints. Perceived constraints remain	✓✓✓ Additional vessel movements, could be incorporated in existing harbour management	✓✓✓ No change
Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities	✓✓ 24 hour access could affect local business on Bressay. This could be positive or negative. Improved opportunities to access employment	✓✓ 24 hour access could affect local business on Bressay. This could be positive or negative. Improved opportunities to access employment for Bressay	✓ Improved access to employment, but still restricted by timetables	×× No change – constraints to access
Ec4: To provide a link which is affordable for users	✓✓ No direct cost, but increase in vehicle operating costs. Improved public transport	✓✓ No direct cost, but increase in vehicle operating costs. Improved public transport	××/✓✓ Would depend on fare structure implemented. Improved public transport	×× Community consider costs are high relative to distance travelled and need to travel
Ec5: To provide a link which is sustainable for funders and value for money	✓✓✓ Sustainable for funders and value for money (capital outlay required)	✓ Sustainable for funders in long term (high capital outlay required)	××× High annual operational cost and additional replacement costs	××× High annual operational cost (less than option 3) and additional replacement costs
Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network	✓✓✓ 24 hour access to and from island. Public transport essential to ensure that social exclusion is not increased	✓✓✓ 24 hour access to and from island. However, could increase social exclusion if adequate public transport measures are not provided	✓ Better provision than current service, dependent on fare structure. Public Transport measures required to address issues	× Inclusive nature of centre to centre link and social hub provided by ferry. However, lack of public transport internal to Isle increases social exclusion
Ac1: To provide and maintain an	✓✓✓ Tunnel provides 24 hour link. Public Transport	✓✓ Bridge provides 24 hour link, apart from in most	✓ Better provision than current service, dependent on	- No change

Aim, Government and Local Planning Objectives	Option 1 – Drill and Blast Tunnel	Option 2 – High Level Bridge	Option 3 – Reconfigured Ferry	Option 4 – Do Minimum
accessible, efficient, cost effective transport network for Bressay	measures required to ensure effective link for everyone within the community	extreme weather conditions. Public Transport measures required to ensure effective link for everyone within the community	fare structure. Public Transport measures required	
Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland	✓✓✓ Tunnel provides 24 hour link to employment, services, and recreation. Public Transport measures required to ensure equality of access	✓✓ Bridge provides 24 hour link to employment, services, and recreation, apart from in most extreme weather conditions. Public Transport measures required to ensure equality of access	✓ Better opportunities than current service, but some restrictions by timetable and cost. Public Transport would improve access to the ferry	× Current service does not meet Bressay's requirement to access opportunities on Mainland Shetland, because of cost and timetable constraints
Ac3: To provide a link which does not restrain opportunities for housing in Bressay	✓✓✓ 24 hour access to the island	✓✓✓ 24 hour access to the island	✓ Improvement over Do Minimum	- No change
Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.	✓✓✓ Tunnel provides 24 hour link, enhancing provision for non-blue light emergencies and others	✓✓ Bridge provides 24 hour link, enhancing provision for non-blue light emergencies and others	- No change. Adequate emergency cover	- No change. Adequate emergency cover
Environment: 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	×× Option would create emissions through traffic generation. Public transport measures are key to delivery of the option. Smallest carbon footprint of three options. Potential decrease in walking and cycling across the link might have negative impact on health	×× Option would create emissions through traffic generation. Public transport measures are key to delivery of the option. Second smallest footprint of options. Potential decrease in walking and cycling across the link might have negative impact on health	×× Increased use of fuel for additional services. Some improvement in public transport. Greatest carbon footprint of the three options	- No change
Env1: To develop a link to Bressay that	✓✓✓ Minimal environmental intrusion	✓ Landscape intrusion from major structure. Piers could	✓✓✓ No change	✓✓✓ No change

Aim, Government and Local Planning Objectives	Option 1 – Drill and Blast Tunnel	Option 2 – High Level Bridge	Option 3 – Reconfigured Ferry	Option 4 – Do Minimum
recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island		affect sedimentation patterns		
Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources	✓✓Link would generate traffic but carbon footprint smallest of options	✓✓ Link would generate traffic. Carbon footprint second smallest of options	✓✓Less traffic generated than fixed link options. High carbon footprint	- No change
Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay	?✓✓24 hour access provided to and from island. Land use planning required to address patterns of development in Bressay, car park needs etc. Decision would resolve current uncertainties	?✓✓24 hour access provided to and from island. Land use planning required to address patterns of development in Bressay, car park needs etc. Decision would resolve current uncertainties	?✓✓ Enhanced access from present service. Decision would resolve current uncertainties	×× No change. Current uncertainties about future link unresolved
Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff	× Tunnel would generate traffic which could lead to increase in accidents. 2m segregated footway/cycleway provided through tunnel. Further consideration required about measures to ensure safety of non vehicular users	× Bridge would generate traffic which could lead to increase in accidents. 2m segregated footway/cycleway provided through tunnel. Further consideration required about measures to ensure safety of non vehicular users	- No change from current provision	- No change
S1: To ensure the link continues to maintain and enhance community safety and health	-/× Unable to determine any potential change in crime. However, community perception of increased fear of crime. Potential decrease in walking and cycling across the link might have negative	-/× Unable to determine any potential change in crime. However, community perception of increased fear of crime. Potential decrease in walking and cycling across the link might have negative	✓✓✓ Ferry provides constraint to open access to Bressay. Ferry enables people to not rely on a private vehicle	✓✓✓ Ferry provides constraint to open access to Bressay. Ferry enables people to not rely on a private vehicle

Aim, Government and Local Planning Objectives	Option 1 – Drill and Blast Tunnel	Option 2 – High Level Bridge	Option 3 – Reconfigured Ferry	Option 4 – Do Minimum
	impact on health	impact on health		
S2: To ensure the link does not compromise maritime safety or road safety	✓✓ Increase in road traffic could lead to increased numbers of accidents. No effects on maritime safety	✓ Increase in road traffic could lead to increased numbers of accidents. Perceived effects on maritime safety	- No significant effects	- No change
Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport infrastructure, including air, ferry, bus, cycling and walking opportunities	✓✓✓ Combination of 24hour access and enhanced public transport provision improves integration	✓✓ Combination of 24hour access and enhanced public transport provision improves integration, apart from in most extreme weather conditions	✓ Better opportunities for integration than current service, but some restrictions by timetable and cost. Improved public transport to access ferry, required	×× Does not integrate well with the wider Shetland transport system, but centre to centre link is an advantage
Int1: To provide a link which integrates with all Shetland's transport services	✓✓ Tunnel provides 24hour access, but reliance on private transport and not centre to centre. Public transport provision required to meet the needs of the whole community	✓✓ Bridge provides 24hour access, but reliance on private transport, apart from in most extreme weather conditions, and not centre to centre. Public transport provision required to meet the needs of the whole community	✓ Better opportunities for integration than current service, but some restrictions by timetable and cost. Improved public transport to access ferry, required	×× Does not integrate well with the wider Shetland transport system, but centre to centre link is an advantage
Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies	?/✓✓ Planning issues paper underdevelopment, but option helps deliver commitments in the Regional Transport Strategy	?/✓ Planning issues paper underdevelopment, but option helps deliver commitments in the Regional Transport Strategy. Does not meet all LPA objectives	- No significant effects	- No change

The key findings of the study can be summarised as follows:

15.11.1 Community

- There are issues relating to the current ferry provision. These are mainly linked to the level of provision and fares.
- The ferry forms an important part of Bressay life.
- The community is dependent on the ferry to access basic facilities on the Mainland (doctor, retail and leisure facilities, childcare provision etc).
- Current public transport provision on the island is very limited.
- Annual spend on ferry fares can be considerable for some members of the community.
- If a fixed link is provided alternative jobs for the ferry crew would be found.
- There is an urgency to make a decision about the link, to relieve uncertainty, in particular for the community of Bressay, and an urgency to address the identified issues relating to the current link.

15.11.2 Environment

- Local planning policy supports a bridge and this would have to be changed if another option is taken forward.
- The ferry options (Options 3 and 4) would impact least on the local environment because no (or only limited) new infrastructure would be required.
- The fixed link options (Options 1 and 2) would generate traffic with associated increases in noise emissions etc.
- The tunnel (Option 1) would have less impact on the environment than a high level bridge because it would have less impact on surrounding land uses and less landscape and visual and related impacts.
- The tunnel (Option 1) would, however, require the demolition of one shed belonging to LPA and would affect the businesses using it, who would have to be relocated.
- No designated sites would be affected by any option.
- The tunnel option would have a smaller carbon footprint than a high level bridge or a reconfigured ferry service.

15.11.3 Safety

- No option has significant benefits or disbenefits in terms of safety although a fixed link may heighten community fears of crime.
- There is risk of more serious effects from fire in a tunnel (Option 1). The risk of accidents in a tunnel however has been demonstrated to be less than on the connected road network[94].
- There would be some risks working at height on a high level bridge (Option 2) in an exposed location during construction.

15.11.4 Economy

- The main economic driver that currently exists for an improved transport solution is the need to enhance the competitiveness and productivity of businesses based in Bressay and those businesses and organisations that trade or provide services in Bressay. There has been no significant need identified in the foreseeable future for Bressay to be opened up to release

[94] Ongoing work by Faber Maunsell for SIC

constraints on economic land for industrial, housing or harbour infrastructure in Lerwick or the surrounding areas.

- The bridge (Option 2) is expected to be a constraint in the harbour which could impact on the competitiveness of the port as a location for activity, particularly decommissioning activity. In addition, the construction of the bridge is expected to cause significant disruption to one of the largest employers in Shetland.
- Construction of a tunnel is also expected to cause disruption, particularly through the demolition of a LPA property which currently has a tenant. However, the impact would be much less than the impact anticipated for the bridge. In addition, due to the condition of the building the project may simply be bringing forward an inevitable outcome.
- Construction of a tunnel under the Sound would place some restriction on very deep dredging in the future but not on the planned -10m below CD dredge. LPA has confirmed that this is acceptable because a dredge to below -10m would require replacement of existing quays which would be very expensive.
- A fixed link option is expected to reduce the fragility of the Bressay economy and encourage investment in the island as both a place to live and work. In addition, the tunnel option provides the best value for money and therefore, for both of these reasons, emerges from the economic appraisal as the preferred option.

15.11.5 Accessibility and Integration

- Fixed link options (Options 1 and 2) provide significant benefits in terms of access and integration because of the convenience of 24 hour access and the costs to users as long as improved public transport measures are included to address the needs of non-vehicular users.
- Enhanced public transport measures would be an essential part of any fixed link option to ensure that access was as possible for those without vehicular transport as at present.
- The ferry provides centre to centre access. This would only be possible with a fixed link for some people with good public transport links.
- A fixed link is likely to be a catalyst for journeys to be made by taxi which could enhance accessibility for some residents and visitors to the island.
- The tunnel provides access at all times. Option 2 (the high level bridge) could have restricted access in times of bad weather even with effective wind shielding.
- It has been calculated that on the basis of the following assumptions: a drive time of 50kmph[95] (tunnel) and 65kmph (bridge), cycling at 30kmph (but some cyclists would have to get off and walk up the incline on each) and walking at 5kmph, the 1200m of fixed link would take the following times to cross:

    - 1.2km @ 50km/hr would take 0.024hrs = 1.44 min = 1 minute and 26.4 seconds
    - 1.2km @ 65km/hr would take 0.018hrs = 1.11min = 1 minute and 6.5 seconds
    - 1.2km @ 30km/hr would take 0.04hrs = 2.4 min = 2 minutes and 24 seconds
    - 1.2km @ 5km/hr would take 0.24hrs = 14.4 minutes = 14 minutes and 24 seconds.

[95] Kilometres per hour

15.11.6 Appraisal

- Option 1, the drill and blast tunnel, is the option, which on balance is most able to address the issues associated with the current Bressay Link and best meets the project objectives. This finding is based on feedback from consultations and also from the detailed studies undertaken for STAG 2. Various sensitivity tests have been undertaken to test these findings in terms of the option's economic value but the findings remain the same.
- Option 1 would provide best value as demonstrated by the cost benefit analysis, and the appraisal of costs to Government over a 60 year appraisal period.
- The construction cost of the tunnel would be £26,339,000; operational costs would be £100,000 each year; the net present value (NPV) would be £16,833,385 and benefit to cost ratio 7.44.
- This finding is different from that made in the original bridge study because the 60m x 260m bridge is considerably more expensive than a bridge with a 40m air draft and 134m span and current standard tunnelling techniques have reduced tunnel costs.

15.11.7 Funding

- It is not clear at this stage how a fixed link could be funded and further work and discussions would be required to clarify this.

15.12 RECOMMENDATIONS

The key recommendations from this study are that:

- Option 1, the Drill and Blast Tunnel is taken forward.
- Public transport enhancement measures should be detailed and put in place to support the fixed link.
- Walking and cycling measures are promoted as part of the package.
- Funding mechanisms are thoroughly researched and thought through for delivery of all proposals. This process should ensure absolute clarity on any potential impacts on SIC resources.
- Short-term measures, such as enhanced public transport provision and a fares review should be taken forward in the short-term to address community needs.
- A working group is established, to include ZetTrans, SIC and LPA representatives to oversee the progression of the tunnel proposals.
- The legal issues surrounding development in the harbour are openly discussed to ensure the final proposals meet all parties' needs and aspirations.
- The legal framework for taking the proposals forward is defined and agreed.
- Land ownership issues are researched and detailed and the findings taken into account in the planning of the next stages of the project.
- Various further research and development work is progressed including:
    - further research on funding opportunities;
    - more work on utilities;
    - undertaking topographical surveys at portals and intrusive ground investigation on Lerwick approaches to allow confirmation of portal locations;
    - checks on extent of made ground at Gremista;
    - confirmation of tunnel design to approval in principle (AIP) stage;
    - reaching agreement with LPA on the shed to be demolished;

  - an environmental impact assessment (EIA) and identification of appropriate mitigation;
  - further research on appropriate levels of public transport provision;
  - checks on likely flood risks at the Lerwick portal;
  - confirmation of areas identified for reclamation in the harbour and identifying necessary consents;
  - effective consultations progressed with relevant statutory agencies, communities and relevant interests groups to ensure full understanding of constraints and opportunities; and
  - identifying timescales for all relevant work.

- As risks are investigated and better understood for the proposals, the level of optimism bias which has been applied (66% for the tunnel and 44% for the approaches) is re-assessed and used to help identify accurate budget figures for all parts of the project – a risk informed approach should be adopted in the development of a budget that is robust and auditable.
- SIC departments work together to identify the implications that a fixed link would present and identify potential issues which require to be addressed.
- Detailed discussions are progressed with affected parties (ferry staff, businesses, landowners and managers) following a Council decision to proceed.
- The SIC's Planning Service and others are engaged in effective pre-application discussions as required by forthcoming legislation.
- The role of the Bressay Link Group is considered and re-defined if found necessary.
- The impacts of major construction projects on Shetland are considered and if necessary that a staggered timetable is agreed.
- Regular updates on progress are given by the project team to SIC, the LPA, the community, the press and to all affected parties.

In addition it is recommended that:

- ZetTrans, in collaboration with the SIC's Ferry Service, should ensure data collection on the inter-island network is improved in order to provide data of a quality suitable for studies of this kind.
- The STAG model is developed for use in other project appraisals.

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