
Bressay Link
STAG 1 Report

February 2008

Report

ZetTrans

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Report

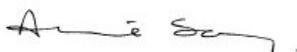
ZetTrans

Bressay Link STAG 1 Report

For and on behalf of
Natural Capital Ltd.

Approved by: Dr Annie Say

Signed:



Position: Director

Date: 15 February 2008

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Thanks are extended to everyone who gave up time to assist with this study.

1 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report is the STAG 1 (Scottish Transport Appraisal Guidance) Report for the Bressay Link. It sets out the process that has been followed in the appraisal to date; the findings from different stages in the process; and discusses and makes recommendations on the way forward.

1.2 BACKGROUND AND HISTORY TO THE STUDY

Options for linking Bressay to Mainland Shetland have been considered by Shetland Islands Council (SIC) since at least the 1970s and the need for securing the option that, on balance, best meets the aspirations of stakeholders has been subject to much debate. This included the Council's decision to build a bridge and the effects of this on other land uses, navigation and reliability of the new link.

In 2005, ZetTrans became Shetland's Regional Transport Partnership, concluding the consultation and development of Shetland's Transport Strategy¹. Within this strategy, ZetTrans acknowledged there was a need to draw a line under the previous debate over the proposed 'Bressay Bridge' and to revisit this issue with a fresh pair of eyes.

'there is a need to draw a line under the previous debate over the proposed 'Bressay Bridge' and to revisit this issue with a fresh pair of eyes. ZetTrans acknowledges this and proposes to initiate a 'Bressay Link' study examining all possible future options to provide an efficient link between Bressay and Lerwick, whether this is in the form of an improved ferry service, a bridge or a tunnel. This study will be undertaken in accordance with Scottish Transport Appraisal Guidance (STAG) and will be taken forward by ZetTrans in co-operation with SIC and LPA.'

A joint working group, the Bressay Link Group, was set up in June 2007² to oversee the process. The group includes representatives from ZetTrans, Shetland Islands Council (SIC), Lerwick Port Authority (LPA) and Bressay Community Council.

This group agreed to a study *'To identify means of providing sustainable efficient transport links between Bressay and Mainland Shetland for the long-term and identify the most appropriate measures to carry forward to implementation for the benefit of Shetland as a whole.'*

This study is being led by ZetTrans in co-operation with the Bressay Link Group, in accordance with Scottish Transport Appraisal Guidance (STAG) (see Section 1.4). Specific expertise is being provided by:

- Anderson Solutions (economic)
- Donaldson Associates (tunnelling)
- Halcrow (engineering and bridge)
- Natural Capital (facilitation skills and environmental).

¹ This strategy was produced by ZetTrans, and submitted to the Scottish Executive for approval in March 2007

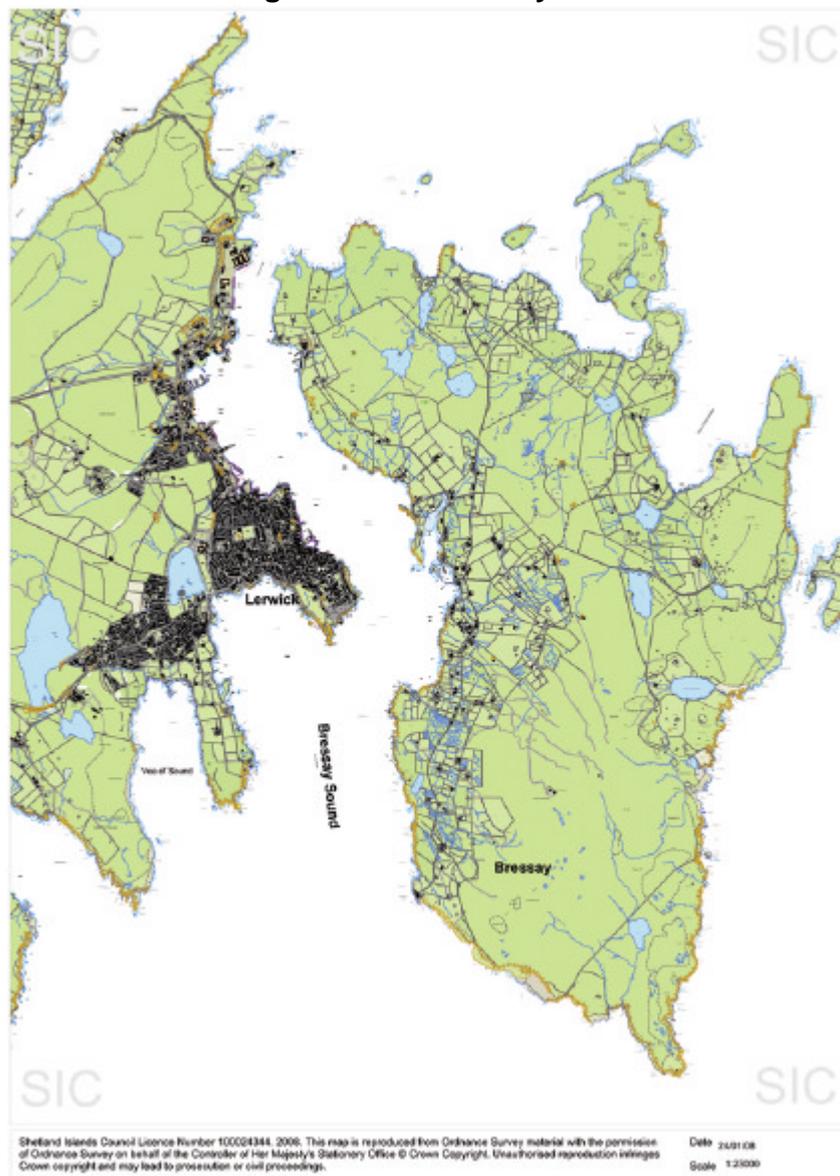
² Approved by Infrastructure Committee, June 2007

1.3 STUDY AREA

The Shetland Islands are the most northerly local authority area in the UK, 298 miles (480km) north of Edinburgh and 211 miles (340km) north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000³, of which approaching 8,000 of these live in Lerwick, the main town⁴.

Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies off the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400⁵. This main study area, see Figure 1.1, is shown, although wider issues, such as access to the rest of Shetland and to the rest of the UK, have also been taken into account.

Figure 1.1: Main Study Area



³ Census, 2001

⁴ Shetland Islands Local Plan, June 2004

⁵ Shetland Islands Local Plan, June 2004

Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals from 7am-11pm (1pm on Fridays and Saturdays) and on a more frequent basis at peak times (see Section 3.5.2).

Shetland was central to the North Sea oil boom, and over the last 30 years this has been a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer⁶. The study found that access to employment, skills, services and social activities was key to a person's feeling of wellbeing

Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy is having to adapt to these changes. The decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in Scotland. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.

1.4 SCOTTISH TRANSPORT APPRAISAL GUIDANCE (STAG)

STAG is the Government standard for appraisal of transport services and infrastructure projects and provides a framework to use for the objective consideration of options against Government and local objectives. Since July 2003 it has been a requirement of the Scottish Executive⁷ that all projects for which it provides support or approval are appraised in this way. Consultation and participation with all stakeholders is important throughout.

Box 1: The Scottish Transport Appraisal Guidance (STAG): Process and Appraisal Criteria

The STAG planning and appraisal process is:

- Stage 1 - Analysis of present and future problems and opportunities (see Section 4)
- Stage 2 - Setting objectives (see Section 5)
- Stage 3 - Generation of options (see Section 6)
- Stage 4 - Initial sifting of options (see Section 6)
- Stage 5 - Broad appraisal (see Section 7)
- Stage 6 - Detailed appraisal
- Stage 7 - Reporting
- Stage 8 - Implementation
- Stage 9 - Monitoring and evaluation

The study, to date, covers Stages 1-5.

⁶ Study into Deprivation and Social Exclusion in Shetland, 2006

⁷ Now Scottish Government.

1.5 STAKEHOLDER INVOLVEMENT

Consultation and participation with all stakeholders is important throughout the STAG process. During this study, every effort has been made to enable individuals, communities, services, businesses and other stakeholders to be involved, as appropriate.

1.6 SOURCES OF INFORMATION

Sources of information for this report include maps, planning documents and a wide range of reports completed for various previous studies. These are listed for reference in Annex A, and specific sources are listed for each baseline section in Section 3. Consultations have informed all work to date and key consultations are summarised in Section 2.

1.7 STRUCTURE OF REPORT

Following this introduction, there are seven further sections, as follows:

- **Section 2:** Methodology, providing an overview on how the study has been undertaken, to date, and each of the tasks completed.
- **Section 3:** Baseline Information, providing information on current transport provision and the topics covered by the Government's five transport objectives.
- **Section 4:** sets out the Issues, Problems and Opportunities that have been identified, highlighting what current and potential future problems the link should seek to address.
- **Section 5:** presents the study Objectives, setting out Government and relevant local objectives and the planning objectives developed for the link.
- **Section 6:** Option Generation and Sifting of Options, lists the initial long-list of options which was identified and the findings of the assessment of these against the planning objectives. Those options that met insufficient objectives to move on to Part 1 STAG appraisal are identified.
- **Section 7:** presents the Broad Appraisal of options against the objectives. This section includes the STAG Part 1 Appraisal Summary Tables (AST).
- **Section 8:** Discussion and Recommendations, which draws together the findings of the work, to date, and makes previous recommendations for the next steps for the study.

The following annexes support the above:

- **Annex A:** Supporting Documents
- **Annex B:** First Stage Consultation Report
- **Annex C:** Bressay Link: STAG Strategic Issues and Objectives Workshop Report
- **Annex D:** Bressay Link: Option Generation and Initial Appraisal Workshop Report

2 METHODOLOGY

This section sets out how the study, to date, has been undertaken at each stage and how stakeholders were involved in the tasks. This part of the study is up to Stage 5 (see Box 1). The findings of further tasks will be reported in a subsequent report, once completed.

2.1 BRESSAY LINK GROUP

The Bressay Link Group was established (see Section 1.2) to monitor and guide the study by:

- being consulted about the proposed approach for each stage of STAG;
- reviewing the proposals, providing feedback and, when appropriate, endorsing the proposals; and
- reviewing and commenting on the output of each stage and confirming that the output can be fed into the next stage of the process.

2.2 STAGE 1 - ESTABLISHING THE ISSUES, PROBLEMS AND OPPORTUNITIES

The STAG process is underpinned by a good understanding of the issues connected with current transport provision between Mainland Shetland and Bressay. Several tasks were undertaken to achieve this, designed to enable stakeholders to express their views and be fully involved in the STAG process. Findings from this stage are set out in Section 4 and a full report can be found at Annexes B and C.

Issues, problems and opportunities were identified by⁸:

2.2.1 Task 1.1: Involving Residents

Bressay Residents:

- Each household on Bressay was sent an Information Sheet about the study and a public meeting, attend by 65-70 people, was held on 25th September 2007, in the Bressay Hall, outlining the study, how the community could get involved and explaining the questionnaire;
- Questionnaires were distributed, using the Council Tax register⁹. SIC staff working in the study area were informed about the study and the questionnaire and asked to provide assistance, if required, to any clients;
- Young people living on Bressay, who attend the Anderson High School, were invited to a session at the school on October 10th, to discuss the issues and complete the questionnaire. 19 young people attended;
- A workshop was held with 15 primary 4-7 at the Bressay Primary School on October 8th 2007, to hear the views of this age group; and
- An open day was held on October 8th 2007, in the Bressay Hall, with displays of Bressay transport links in the past and aerial views of the harbour and Bressay in 2006. About 40 people came along for a cup of tea and discussion. In the evening a public discussion was held, attended by 55-60 people.

⁸ For all meetings and workshops, a note was provided, and agreed by each of the consultees.

⁹ There were problems associated with this method, detailed in the First Stage Consultation Report, Annex 2

Lerwick Residents:

- A public meeting was held on 1st October, 2007, outlining the study and how people could respond. 9 people attended; and
- A discussion, open to anyone, was held at Lerwick Community Council meeting on 15th October 2007.

The Rest of Shetland Residents:

- People were informed about the study through the local media, website, adverts and displays in key locations and were invited to respond by letter or email and through their Community Council representatives.

2.2.2 Task 1.2: Involving Service Providers in Shetland

- Service Providers, including National Health Service (NHS) (Board and GP practices), Highlands and Islands Enterprise (HIE) Shetland, emergency services, utility providers, and representative bodies, were informed of the study and invited to respond by email, writing, or via a face-to-face meeting or formal telephone call;
- Of 39 contacted, 26 responded; and
- In addition
 - A meeting was held with NHS Board and senior management team on 16th October 2007;
 - a workshop was held on 9th October, with all Executive Directors and Heads of Service of Shetland Islands Council invited to attend;
 - a face-to-face meeting was held with the NHS nurse who lives and works on Bressay, which is a non-doctor island; and
 - the SIC ferry crew on the route were informed of the study early on, and a discussion meeting was held with 12 crew on 7th October.

2.2.3 Task 1.3: Involving Businesses and Business Representatives

- All Bressay businesses were informed by letter. A face-to-face meeting or telephone interview was held with each of them; and
- Businesses based on the Shetland Mainland who currently make use of the ferry service to Bressay and/or operate in the port of Lerwick were informed and invited to a face-to-face meeting or telephone interview. The list was compiled from a list used for consultation by the Lerwick Port Authority (LPA) in 2004 and the SIC Roads Service in 1999. Also included were business that may consider new opportunities arising as a result of any outcome of this study. This group of consultees included freight operators.

2.2.4 Task 1.4: Involving the Government and Transport Scotland

- These were informed, by letter, about the study. A formal telephone conversation was held, providing further information and answering any questions about the study.

2.2.5 Task 1.5: Involving Elected Representatives

- MSPs (constituency and list), MP and MEPs were informed of the study by letter, and invited to respond;
- Councillors of Shetland Islands Council were informed of the study, by letter, and of the various means for providing comment and input. In addition a

study progress report was discussed at the Council's Infrastructure Committee on 16th October 2007; and

- All Community Councils in Shetland were informed and invited to respond individually and a discussion was held at the Association of Shetland Community Councils on 6th October 2007.

2.2.6 Task 1.6: Involving Community Groups

- A list of community groups, both on Bressay and those on the Mainland known to use or be impacted on by the transport link was compiled by the Community Learning and Development Worker for the area. They were all informed about the study and invited to respond. Follow up phone calls were made, but no responses were received.

2.2.7 Task 1.7: Providing Feedback

- Feedback was provided at community meetings in Bressay on 31st October and Lerwick on 1st November, providing an opportunity for further discussion and agreement that all issues had been captured, and noted correctly.
- The First Stage Consultation Report was issued to Bressay residents and those stakeholders who responded, inviting feedback over a two-week period.

2.2.8 Task 1.8: Strategic Workshop

- A workshop was held in November 2007 (see Section 2.3), which allowed strategic discussion about issues and some further issues to be highlighted.

2.3 STAGE 2 - DEVELOPING PLANNING OBJECTIVES

A workshop was held in November 2007. The purpose was to provide an opportunity to better understand the strategic issues surrounding the Bressay Link and to develop draft objectives for the Scottish Transport Appraisal Guidance (STAG) appraisal. These planning objectives are set out in Section 5 and a full workshop report can be found at Annex C. Around 25 people attended, representing a broad range of agencies in Shetland and members of the Bressay Link Group. A list of attendees is included in the workshop report.

2.4 STAGES 3 & 4 - OPTION GENERATION AND SIFTING

A second, smaller workshop, was held in December 2007. The purpose of this was to refine and agree the planning objectives, develop a long-list of options, and appraise these options, in order to sift out those options that were unable to offer significant potential to achieve the planning objectives and produce a shorter-list of options for broad appraisal. Section 6 provides information on the options generated and those options sifted out. Again, all key sectors in Shetland attended and a workshop report can be found at Annex D.

A community meeting was held in Bressay on 14th January 2008, to which all residents and other stakeholders were invited. The purpose was to inform them of progress, in particular the planning objectives, long-list of options and sifting process. This also provided an opportunity for questions to be raised and discussed.

2.5 STAGE 5 - BROAD APPRAISAL

The STAG Part 1 Appraisal Summary Tables (ASTs) were prepared for each of the remaining options. This was undertaken by the project team, using the information provided during the initial consultation, professional expertise and work undertaken at the 'Option Generation and Initial Appraisal' Workshop (see Annex D). Each table provides basic information about the option and considers its impact in relation to the planning objectives and the Government's five transport objectives (accessibility, economy, environment, integration and safety). In doing so, an indicative assessment is made of the scope and scale of the benefits and impacts associated with each option. AST tables are set out in Section 7.

As a result of this work, recommendations have been developed and proposed for implementation of STAG 2 (see Section 8).

3 BASELINE INFORMATION

3.1 INTRODUCTION

This section provides baseline information about the study area, in relation to the topic areas covered by the Government's five transport objectives of economy, environment, safety, access and integration. The information will be further expanded and informed by consultation and site visits in the more detailed stage of appraisal (STAG 2).

3.2 ECONOMY

3.2.1 Sources of Information

The following sources of information have been used to inform the understanding of the baseline:

- First Stage Consultation Report, Bressay STAG study, October 2007
- DTZ Pida Consulting (2004), Economic Impact of a Bridge to Bressay
- A B Associates (2007) Economic Impact Assessment of Lerwick Harbour on the Shetland Economy

3.2.2 Bressay¹⁰

The main sources of employment on Bressay are the fish-processing factory at Heogan and public sector jobs, including the ferry, the primary school and an island nurse. There are a number of small businesses and self-employed, including a Hotel, four farms, a sound and lighting company and a Bed and Breakfast/Spa facility. In addition there are a number of crofts.

Most residents commute to the Shetland Mainland for work.

3.2.3 Lerwick Harbour

Lerwick Harbour is the most northerly British commercial port, and the principal port for Shetland. Lerwick Port Authority (LPA) is the harbour authority. The harbour facilities enable the port to operate in a number of areas:

- Fishing Centre: various support services, including fuel, engineering, electronic repair, slipway, net manufacture and repairs, wire rigging, refrigeration gases, high capacity quayside ice plan and fish meal and fish oil processing;
- Oil Service Base: deep water berthing, decommissioning, total waste management, drill cuttings recycling, heavy lift capability, engineering, project support, laydown areas, open storage, warehousing and environmental services;
- Freight Facility: serving different types of cargo, including general, bulk, specialised and refrigerated cargo; containers, roll-on and roll-off; and
- Visitors' Gateway: for yachts, cruise ships etc.

¹⁰ First Stage Consultation Report, Bressay STAG study, October 2007

The harbour has three main levels of impact on the Shetland economy¹¹:

- Businesses and communities in Shetland depend on the harbour to enable essential supplies to come to Shetland, and for exports to leave;
- It generates business due to the movement of goods and people through the Port. This includes businesses providing a service to the transport operators; and
- The Port Authority is a business that impacts on the economy through its own expenditure. In 2006 it employed 45 people and generated £11.4m gross output in the local economy.

In 2006, it was estimated that 149 businesses and 1138 jobs are directly dependent on the harbour, with an estimated value of output of £192m. The gross impact was calculated at 2242 jobs and £311m of output.

3.3 ENVIRONMENT

3.3.1 Sources of Information

The following sources of information have been used to inform the understanding of the environmental baseline:

- Bressay Bridge Environmental Statement, Shetland Islands Council, 2003;
- Shetland Island Local Plan, Shetlands Island Council 2003;
- SEPA Flood Map: www.sepa.org.uk/flooding/mapping/;
- www.scottishairquality.co.uk;
- www.scottishgeology.com;
- [www.sepa.org.uk/RiverQualityClassification\(2005Data\)](http://www.sepa.org.uk/RiverQualityClassification(2005Data).htm); and
- www.jura.rcahms.gov.uk/PASTMAP/Map.

3.3.2 Policies and Plans

3.3.2.1 National Planning Context

Scottish Planning Policies (SPPs), provide statements of Scottish Government policy on nationally important land uses and other planning matters. A key objective within these documents is to guide policy formation and decision-making toward the goal of sustainable development. They also provide a statutory framework for future proposals and projects to ensure quality and to safeguard the environment. The NPPGs are supported by Planning Advice Notes (PANs), which provide good practice and other relevant information specific to the NPPG.

National planning policy documents relevant to the link, include the following:

- SPP 1: The Planning System
- SPP 15: Planning for Rural Development
- SPP 17: Planning for Transport
- Scotland's Transport Future: The Transport White Paper
- Travel Choices for Scotland: Strategic Roads Review
- Trunk Road Biodiversity Action Plan: Review for Discussion
- Scotland's Transport: Delivering Improvements

¹¹ A B Associates (2007) Economic Impact Assessment of Lerwick Harbour on the Shetland Economy, January 2007

- PAN 42: Archaeology, The Planning Process and Scheduled Monument Procedures
- PAN 51: Planning and Environmental Protection
- PAN 56: Planning and Noise
- PAN 57: Transport and Planning
- PAN 58: Environmental Impact Assessment
- PAN 60: Planning for Natural Heritage
- PAN 68: Design Statements
- PAN 69: Planning and Building Standards Advice on Flooding
- PAN 75: Planning for Transport
- NPPG 5: Archaeology and Planning
- NPPG 17: Transport and Planning
- NPPG 14: Natural Heritage January 1999 and PAN 60: Planning for Natural Heritage
- NPPG 18: Planning and the Historic Environment
- Scottish Environment Protection Agency (SEPA) Policy 19: Groundwater Protection Policy for Scotland
- SEPA Policy 26: Policy on the Culverting of Watercourses

3.3.2.2 Local Planning Context

Local planning policy covering the area is set out in the Shetland Local Plan. In the local plan the pursuit of sustainable development emerges as a key driver in the formation of local planning policy. The plan also reiterates the key issues facing Shetland and recognises the need to promote integrated transport, a strong and stable economy and access for all¹². There has been long ongoing discussions about the link to Bressay over many years. Current plans recognise the proposal for a bridge. The Council now recognise the need to re-examine local issues and needs to identify the most appropriate link in the 21st century (see Section 1.2).

3.3.2.3 Bressay

SIC reaffirm its commitment to the construction of a bridge in the Bressay Community Council Area Statement of the Shetland Local Plan. The statement recognises that there will be a need to control development on Bressay following the construction of a bridge and that the existing road infrastructure on the island will need to be upgraded. It notes that the bridge would create the opportunity for a bus route to serve Bressay but that some ferry jobs may be lost.

Proposal 2 in the Bressay Community Area Statement states *'The council proposes to construct a bridge connecting Bressay to the Shetland Mainland at Lerwick. The land required for the construction of the bridge and improved approach roads will be safeguarded in the Bressay and Lerwick proposals maps.'*

3.3.2.4 Lerwick

The Lerwick Community Council Area Statement notes the need for development on Mainland and Bressay to be strictly controlled following the construction of the bridge.

¹² Shetland Island Local Plan, Shetlands Island Council 2003

3.3.3 Geology

The geology of Shetland is varied and rather complex, principally as a result of a large number of major north-south running faults, including the northward continuation of the Great Glen Fault, which has brought a large number of different rock types together in a narrow zone (Scottish Geology, 2007).

Land on both sides of the Sound is underlain by Devonian sedimentary rocks, chiefly Middle Old Red Sandstones and conglomerates. Conglomerates predominate on the Lerwick side and sandstone is more pronounced on Bressay. Layers of siltstone of less than 1m thick are present within the sandstone. The sandstones contain pebbles and feldspars and have a sparse carbon cement, and the rock strength ranges from moderately weak to moderately strong.

Easter Rova Head Geological Site of Special Scientific Interest (SSSI) ⁽¹³⁾ is the closest statutory designation to the proposed site. The site, located at grid reference (HU 474453), is some 3.5 hectares (ha) in area and is described as the location of '*excellent exposures of very coarse conglomerates of middle Devonian age*' ⁽¹⁴⁾. The red coloured conglomerate is exposed in cliff faces, and comprises boulders of up to two feet in diameter. The site is important because it illustrates depositional processes.

3.3.4 Agriculture and Soils

The soils in the area comprise boulder clays, which are disturbed or covered over in some areas by development and associated activities such as in the port and overlaid by peat on Bressay. The soils are of low agricultural value. At the northern end of Lerwick there are small fields of semi-improved grass grazed by sheep, but the area is largely paved over or occupied by buildings, car parks or hard standing. On Bressay, semi-improved fields near to the coast are used for low quality, low intensity, rough grazing. Areas of peat are wet and acidic, and are of low nutrient status.

Peat deposits on Bressay of up to 2.5m have been recorded near the coast. Peat depths are greatest in hollows and valleys. Elsewhere on Bressay the overburden comprises boulder clay and glacial deposits, largely a sandy and stoney drift with a high proportion of pebbles and some larger boulders, drift depths reaching 3m.

3.3.5 Water Quality, Drainage and Flood Defence

3.3.5.1 Introduction

There are no significant watercourses in the area in which new infrastructure could be provided. At the Point of Scattland the land falls from about 75m above Ordnance Datum (AOD) at the top of the Hill of Greenhead, then slopes at about 1 in 10 from 22m at the highest point on Main Gremista Road to about 8m AOD, before falling more gently to the shore.

On Bressay the land slopes from a high point of 50m on the Hill of Cruester, and falls gently at a gradient of about 1 in 20 between Annfield and the shore. There

¹³A site notified by SNH under the provisions of the Wildlife and Countryside Act (1981) and amendments as being of national nature conservation or geological importance

¹⁴ Easter Rova Head SSSI citation

are five wells marked on the 1:25,000 scale OS map, near Heogan on Bressay, but there are no significant surface water courses.

3.3.5.2 Groundwater

Bressay and the east side of Mainland consist of moderately permeable rock, as defined on the Ground Water Vulnerability Map ⁽¹⁵⁾. These rocks are overlain by low permeability deposits of peat and boulder clay. As such the area has a low vulnerability and any contaminants are unlikely to penetrate the groundwater.

There are various small effluent discharges evident along the shoreline adjacent to the Lerwick Fish Traders fish processing plant. There is a discharge at Rova Head to the north, and another at the fish processing plant at Heogan on Bressay.

3.3.5.3 Flood Risk

The SEPA flood map shows no areas at risk of fluvial flooding on either Bressay or Lerwick but also shows extensive areas at risk of coastal flooding on both islands¹⁶. Most notably, the A969 through Lerwick, industrial areas to the North of Lerwick and Leiraness on Bressay are at risk of coastal flooding.

3.3.5.4 Water Quality

The water quality in Bressay Sound is generally high and of good quality, although there are some local areas where discharges affect this. There is a discharge from the fish processing plant at Heogan on Bressay and the water around the pier is affected (see Section 3.3.5.2). SEPA is aware of this and may control the discharge at some time in the future. The coast around this area is locally downgraded. Similarly small discharges from the fish processing plant at the Point of Scattland locally affect the Mainland shore, and there is a discharge further north at Rova Head. Bressay Sound has peak tidal flows in the order of 4 knots and is therefore an area of high natural dispersion.

There are no beaches identified in the Bathing Waters (Classification) (Scotland) Regulations, 1991¹⁷ within 5km of the site, although there are many small beaches and inlets which may occasionally be used for bathing.

3.3.6 Biodiversity, Flora and Fauna

There are no statutory natural heritage sites which would be directly affected by any link between Mainland Shetland and Bressay. The closest designated site is the East Rova Head designated for its geological interests (see Section 3.3.3). The Isle of Noss, which lies off the east coast of Bressay, some 6 km from the Sound, is designated as a Special Protection Area (SPA)¹⁸, National Nature Reserve (NNR)¹⁹ and SSSI for its seabird interests.

¹⁵ British Geological Society (1988) Hydrogeological Map of Scotland Scale 1:625,000. BGS and Association of Inspectors and River Inspectors of Scotland (1995) Groundwater Protection Strategy for Scotland. ADRIS

¹⁶ SEPA Interactive Flood Map, 2008. <http://www.sepa.org.uk/flooding/mapping/>

¹⁷ Recognised bathing waters to ensure the protection of public health and amenity through the control of pollution and the regulations of water quality (particularly microbiological contamination)

¹⁸ A site designated under the European Directive on Conservation of Wild Birds (79/409/EEC) (known as the Birds Directive) to protect birds that are considered rare or vulnerable within the European Community and all regularly occurring migratory birds. Enacted in the UK through the Wildlife and Countryside Act (1981) and amendments and the Conservation (Natural Habitats &c) Regulations (1994)

¹⁹ A site designated under the Wildlife and Countryside Act (1981) and amendments or the National Parks and Access to the Countryside Act (1949) and are notified as SSSI

An otter survey undertaken in June 2003 indicated that there is an otter holt to the north of Bressay (near Turra Taing). Anecdotal records suggest otter may be seen anywhere in Shetland and thus it can be assumed that otter may at times frequent the area of the proposals. Otter are protected under the Wildlife and Countryside Act, 1981 and amendments, the Nature Conservation (Scotland) Act 2004 and the Conservation (Natural Habitats &c) Regulations, 1994.

Other marine mammals recorded from the Bressay Sound include grey seal, which is protected under the Conservation of Seals Act, 1970 and pilot whale and harbour porpoise, protected under Wildlife and Countryside Act, 1981 and amendments, the Nature Conservation (Scotland) Act 2004 and the Conservation (Natural Habitats &c) Regulations, 1994. The UK is a signatory to the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS), (1994) which is seeking to work towards the prevention of disturbance of sea mammals, especially from acoustic sources.

Various bird species recorded from Bressay Sound are protected including red throated diver, great northern diver, and long tailed duck²⁰. Skylark is recorded on Bressay and is a red list²¹ species.

The main channel of Bressay Sound is dredged so there is unlikely to be any significant habitat interest in this area. The surface comprises a thin layer of sand and gravel over bedrock, and is a disturbed environment.

3.3.7 Landscape

The area near the Sound affected by any link lies within the Bressay and South Mainland Coast Landscape Character Area (LCA)²² and is part of the Farmed and Settled Voes and Sounds Landscape Character Type (LCT). This LCT is subdivided into Developed Areas (covering Lerwick and the industrial fringe to the north) and Nucleated Settlements (covering Bressay).

Farmed and Settled Voes and Sounds are described as enclosed coastal waters and productive agricultural land, where pasture and rough grazing are the dominant land covers. There has been a long tradition of greater settlement in these areas, and larger settlements are included.

Developed Areas (Lerwick): dominated by large scale development, where there is now little evidence of former vegetation or landscape character. Built elements dominate. The cultural heritage of Lerwick should be protected, and the landscape quality of the immediate environs should be safeguarded from development. Part of Lerwick is designated as a Conservation Area reflecting its cultural heritage importance and sensitivity.

Nucleated Settlements (Bressay): areas of settlement including residential development and public buildings, located around harbour facilities, set within rough grassland and heather moorland.

²⁰ Protected under Schedule 1 of the Wildlife and Countryside Act (1981) and amendments. Divers also listed under Annex 1 of the EC Wild Birds Directive 79/409/EEC

²¹ A species whose population or range is rapidly declining, recently or historically or of global conservation concern. (RSPB et al (2002) The Population Status of Birds in the UK)

²² Shetland Landscape Character Assessment, Review Number 93, SNH, 1998

The Bressay and South Mainland Coast LCA is described as gently undulating landform predominantly less than 50m AOD, with a geology of old red sandstone overlain with boulder clay and glacial drifts. There is a concentration of better quality agricultural land with significant improved grassland.

3.3.8 Visual Amenity

3.3.8.1 Views from Lerwick

Views of Bressay Sound and any link between the Mainland and Bressay are possible from many locations. In Lerwick there are numerous receptors of high sensitivity to change. Views of Bressay Sound are available from houses and hotels (mainly two storey) in Lerwick, Holmsgarth, Garthspool, Freefield, North Ness, Central Lerwick, The Knab and Lerwick waterfront and from the windows of buildings which are not obscured by other buildings. At shore level, from piers and quays, views are open, interrupted only by moored and passing boats. Such commercial facilities would be of lower sensitivity to any change. There are a number of residential properties and tourist facilities, including the new Shetland Museum, the Bod of Gremista Museum and various hotels (such as the Queens Hotel) with views to the Sound at or near the waterfront which are of high sensitivity.

3.3.8.2 Views from Bressay

Clear views to the Sound are possible from properties at Heogan, Maryfield, Glebe and Ham and scattered properties in between and from hills including Hill of Setter, Hill of Cruester and Ward of Bressay. Most receptors on Bressay are residential or tourists and therefore of high sensitivity to change. Industrial workers at fish processing plants on the island plant would be of lower sensitivity.

3.3.8.3 Views from The Sound

Most receptors in Bressay Sound are of low sensitivity to change, as they are largely fishermen, sailors and seafarers who pass through the area. Tourists on cruises are of moderate sensitivity to any change, as they will be moving on elsewhere.

3.3.9 Cultural Heritage

The gardens at Gardie House on Bressay (GR HU 488 421) are in the Inventory of Historic Gardens and Designed Landscapes²³ and the house is itself is a Grade A Listed building.

Shetland is rich in archaeological remains, with over 6000 sites currently on record. There are no Scheduled Ancient Monuments (SAMs) or listed buildings within the immediate vicinity of the proposals. There are various scheduled monuments and listed buildings and the effects on the setting of these resources would have to be considered by any proposals.

²³ The Inventory of Historic Gardens and Designed landscapes is a systematically obtained list of 275 of the more important historic gardens and designed landscapes in Scotland published by Historic Scotland in 1987

3.3.10 Noise and Vibration

3.3.10.1 Lerwick

Sensitive receptors which could be affected by noise are concentrated in the more densely populated Lerwick side of the Bressay Sound and include residential properties as well as Shetland College of Further Education. The industrial area of Lerwick Port and associated businesses extends along much of the water's edge from Victoria Pier northwards. These commercial properties provide some screening of activities in the Sound for residential properties behind. Key current sources of noise include traffic and port-related activities (including the Bressay ferry terminal) as well as a range of activities in Lerwick itself.

3.3.10.2 Bressay

There are a number of scattered residential properties along the Bressay side of the Sound which could be affected by any construction works and all are either single or two storey crofts and cottages.

Noise sources currently include road traffic, boats, the sea, the wind and activities at the fishmeal factory and on crofts and the ferry terminal at Maryfield.

3.3.10.3 Air Quality

Existing air quality in the area is good. It is currently influenced by:

- traffic emissions;
- emissions from sea borne traffic;
- odours from fish processing plants; and
- a small sewage outlet on the Lerwick shore by which locally affects air quality.

The Scottish Air Quality web database ²⁴ was searched, and recent monitoring data held for the Lerwick monitoring station show Low (0 – 99 µgm⁻³) levels of Ozone for December 2007. No other air pollutants are currently monitored and there are no local air quality management areas on Mainland Shetland or on Bressay. When assessed in 2005, concentrations of all seven pollutants covered by the National Air Quality Strategy ²⁵ were predicted to be below levels that would impact on human health.

3.4 SAFETY

3.4.1 Sources of Information

The following sources of information have been used to inform the understanding of the baseline:

- SIC Roads Service;
- Northern Constabulary; and
- First Stage Consultation Report, Bressay STAG Study, October 2007

²⁴ www.scottishairquality.co.uk

²⁵ DEFRA (was DETR) (2000), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Working Together for Clean Air. DETR, London

3.4.2 Road Safety

At the current time most sections of road in Bressay are single track, with passing places. Road traffic accidents are lowest on these types of road. In the years 2003-2007 there has been an average of eight road traffic incidents recorded each year²⁶. Residents report that they are able to walk on the roads²⁷, but there is demand for footways and other safety improvements²⁸.

Bressay is exempt from the need to have vehicles pass an MoT test, as long as they stay on the island.

There are complications with off-loading vehicles at Lerwick: there are hold-ups when turning on to the main road from the ferry²⁹. However, there are no known accidents as a result.

3.4.3 Maritime

The existing ferry service travels across the main shipping lane in Lerwick Harbour. The Master of the vessel liaises with Port Control, to ensure the safety of all vessels.

SIC ferry service has in place well planned arrangements for maintenance, repair and operation, to ensure safety of the vessel, the crew and her passengers.

3.4.4 Community Safety

The number of non-road traffic incidents recorded by the Northern Constabulary has increased from 39 incidents a year in 2003, to over 50 incidents in the years 2005, 2006 and 2007³⁰. This includes routine matters, such as Firearms Certificate renewals.

3.5 ACCESS

3.5.1 Sources of Information

The following sources of information have been used to inform the understanding of the baseline:

- SIC bus and ferry timetables; and
- SIC ferry service and roads service

3.5.2 Ferry Service

- 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 less crossings during the morning, compared to other days, to enable planned maintenance.

²⁶ Northern Constabulary Road Traffic Incident figures recorded

²⁷ First Stage Consultation Report, October 2007

²⁸ SIC Roads and SIC Ferries

²⁹ First Stage Consultation Report

³⁰ Northern Constabulary Road Traffic Incident figures recorded

- Passenger costs are as follows:
 - Adult – return: £3.20
 - 10 return journey ticket: £15.40
 - Children, up to 16 – return: £0.40
 - 10 return journey children’s ticket: £2.60
 - Concessionary SIC Pass Holders – no charge
- Vehicle costs (fares include driver) are as follows:
 - Motorcycles – return: £5.80
 - Vehicles up to and including 5.50m – return: £7.60
 - 10 return journey ticket: £60.60

3.5.3 Bus Service

Monday to Saturday a Post Car, operated by the Royal Mail, is available to passengers (subject to room being available).

- This departs the PO at Mail at 0900 arriving at the ferry terminal at 0915, returning to the PO.
- It departs the PO again at 0935, arriving Noss Sound at 1112, returning to the PO for 1120.
- It departs the PO again at 1122, arriving/departing the Lighthouse at 1215.
- Costs are as follows: Post Office to Ferry £0.60; Post Office to Heogan £1.05; Ferry to Lighthouse £2.40; Ferry to Noss £3.25. There is no charge for concessions (OAP/Disabled national bus pass).

A shopper service operates two days a week

- On Mondays it departs the ferry terminal at 1338, collecting passengers at Voeseide, Fullaburn/Glebe, the Public Hall and Voehead Road. It uses the 1400 ferry to Lerwick, with drop off/collection points at the Esplanade, Sommerfield and Coop. It returns passengers on the 1630 ferry to Bressay.
- On Saturdays it departs the Bressay ferry terminal at 1008, returning at 1430.
- This costs £0.90 (adult single), excluding ferry. There is no charge for concessions (OAP/Disabled national bus pass).

3.5.4 Emergency Service

In an emergency:

- During ferry operational hours, emergency services (fire, ambulance, police and coastguard) call the Coastguard, who calls the Master (using VHF or mobile), who then responds as necessary. Emergencies take precedence over timetabled services;
- Out-of-hours emergencies are dealt with by the Coastguard phoning a mobile carried by the duty Master; and
- Alternative means are available, appropriate to the conditions.

3.5.5 Other Services

A volunteer Red Cross driver is able to convey the elderly/infirm to medical appointments. There are two licensed taxi vehicles, both owned by the same operator. These vehicles are used for the school transport runs.

3.6 INTEGRATION

3.6.1 Sources of Information

The following sources of information have been used to inform the understanding of the baseline:

- SIC bus and ferry timetables; and
- First Stage Consultation Report, Bressay STAG Study, October 2007

3.6.2 Internal Transport to Bressay

The internal transport services that operate on Bressay (the bi-weekly shopper service) and the Post Car are fully integrated with the ferry service.

3.6.3 Bus Transport to Elsewhere in Shetland

- There is an approximate 20-50 minute wait between ferry services arriving in Lerwick and hourly Lerwick (North or South) bus services;
- In general there is good integration between the Lerwick bus services and departures from Lerwick to Bressay;
- Buses from Scalloway, some including Burra, integrate well with ferry services to Bressay in the morning/lunch time, but less well later in the day;
- Buses to Scalloway, some including Burra, integrate well with ferry services from Bressay in the morning, but less well later in the day;
- Few ferries from Bressay integrate with bus services to the South Mainland, including Sumburgh airport. Integration from the South Mainland, to Bressay is better, particularly in the afternoon;
- Bus services from Walls integrate with ferry services to Bressay. There are some feeder services from Sandness and Dale of Walls to Walls services;
- The bus service from Aith to Lerwick connects with a ferry service to Bressay. The return from Bressay does not integrate. This applies to feeder services from Skeld; and
- Integration with bus transport to the North Mainland, including Vidlin, Brae and Hillswick, and the North Isles is infrequent;

3.6.4 Other Modes of Transport

- Access to Sumburgh, via bus is the same as for the South Mainland (see Section 3.6.3);
- Access to the early flights leaving Sumburgh to Inverness, Edinburgh and Aberdeen requires an overnight stay on Mainland Shetland; and
- Access from Sumburgh, via bus is the same as for the South Mainland (see Section 3.6.3). The bus meeting the last flights from Sumburgh to Lerwick is not integrated with the ferry service to Bressay.

4 ANALYSIS OF ISSUES, PROBLEMS AND OPPORTUNITIES

Information on the issues, problems and opportunities associated with the Bressay Link was obtained from a consultation exercise carried out with the Bressay community, businesses and services, and from businesses and services operating on Mainland Shetland, as well as from individuals and representatives elsewhere in Shetland. This is outlined in Section 2.2 and the full report at Annex 2. Additional information was provided at the 'STAG Strategic Issues and Objectives' Workshop (see Annex 3).

4.1 CURRENT SERVICE

- The service is described as reliable and relatively unaffected by weather. The service is felt to be frequent and the journey short;
- It is centrally located, making it convenient; and
- It provides a social hub.

4.2 ISSUES ASSOCIATED WITH THE CURRENT LINK

Feedback from Tasks 1.1 to 1.7 (the consultation exercise and Strategic Workshop) indicated the following key findings:

4.2.1 Economy

- Lack of economic development opportunities on the Isle and the high costs of accessing employment, services, recreation and learning may be accelerating an ageing and possibly declining population. But to what extent is this a Shetland-wide issue?;
- Are there constraints on the economic development of Lerwick at the current time, and/or would opening up Bressay for development have a negative impact on Lerwick? – is more land required, e.g. for harbour developments;
- In terms of potential economic growth, there is a need to consider the impact of fixed links on local marine engineering companies that receive regular work from SIC ferry services; and
- Employment based on Bressay is heavily reliant on the ferry – it is biggest employer.

4.2.1.1 Business Constraints

- Loss of time planning and waiting for ferry, with direct and indirect impacts on businesses operating from Bressay and other Shetland businesses using service. Cost of transport of products, plant, vehicles etc on ferry adds to costs; and
- Belief that Bressay is not currently conducive to business expansion or new development: e.g. restricts visitors choosing to stay on Bressay; and
- Previous debate was detrimental to harbour developments.

4.2.1.2 Housing

- Lack of decision not nature of link means owners of land are not selling land and this is a barrier of development;
- Inadequate space for housing – where is demand for housing from?; and
- There is a need to take pressure off Lerwick and sustain outer communities

4.2.1.3 Opportunities

- A fixed link could provide opportunities for economic development:
 - Existing Bressay businesses could expand
 - New business could become established;
- There is the potential for harbour developments, although there are no immediate requirements to do so;
- Potential knock-on benefits to Mainland businesses of economic growth and house building;
- A fixed link could provide opportunities to sustain the community;
- A fixed link could provide opportunities for housing: the land is seen to be desirable;
- This would have to ensure 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 interests of industries operating in harbour, and ensure their business potential can be achieved;
- Lerwick Port is a large employer in Shetland and has no public funding;
- Development of fixed dry dock is being considered (may come in future); and
- Capacity of Services to cope with further development? What are the capabilities?

4.2.1.4 Tourism

- Bressay has rich heritage/archaeological interests that could support tourism. To what extent would tourism (locals and elsewhere) be improved or disadvantaged by a fixed link: a fixed link could provide greater circulation of people and more convenient access for those with a car, but the novelty of accessing an island could be lost; and
- Accommodation take up is low (though enquiries high).

4.2.1.5 Current Fare Levels

- The overall cost to travellers, in general, is high, which has to be paid despite necessity of using the service to access most opportunities;
- Cost of short distance is same as other longer ferry crossings yet don't have all the same facilities;
- Additional business costs (Bressay and Mainland based) particularly freight/machinery, not readily passed on to customers; and
- To what extent would reducing fares and amending the timetable alleviate current problems? Would it be sufficient to enable Bressay to be a sustainable community in the long-term?

4.2.2 Environment

- Importance of understanding: for example, how would carbon emissions change? How would sheep and cattle be affected? Importance of retaining remote biologically diverse areas of the island;
- Impacts of climate change on Lerwick/Bressay Harbour; and
- Importance of understanding the health impacts of different options (e.g. currently opportunities for walking).

4.2.3 Safety

- 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; and
- Ferry acts as a buffer to crime and as a means to getting children home on last ferry!

4.2.4 Access

- Heavy reliance of Bressay on Lerwick and Mainland for employment, services, leisure and learning;
- Examples of restricted access to opportunities available on the Mainland;
- Length of daily service restricts early morning and late evening needs and limited Sunday service;
- Lack of accessibility for those residents without access to a vehicle and unable to walk to the ferry, e.g. to health services, some single households not wishing to be housed on Bressay
 - Twice weekly shoppers bus provided but no Dial a Ride
 - Lack of taxi service to and on Bressay
 - Taxi for school run
 - Post bus will take passengers;
- Lack of promotion of ferry service, for example to visitors;
- More people living on Bressay could lead to improved social interaction;
- Emergency – ferry is used, provides very effective service and often it is the ferry that has to wait for the ambulance; and
- Would a fixed link improve or exacerbate social exclusion? At the moment people who access the ferry can easily get by foot to central Lerwick, this may not be the case with a fixed link, depending on location and frequency of public transport. Yet the ferry (particularly the cost) currently prohibits access to employment and opportunities. The Isle status of cars means private transport is cheaper now than it would be with a fixed link and people can drive without a full licence: some older people do not have a full licence and may not take a test.

4.2.4.1 Service Delivery

- Ageing population and difficulties in being able to provide adequate services: residents are not getting the service they need or equality of community care as service has to fit with ferry timetable. Problems with recruiting;
- Difficulty of accessing Bressay out-of-hours, unless able to call an emergency;
- People not always available locally to provide services;
- Time lost/inefficiencies/resources for providing services;
- Drop of 20% in school numbers over 10 yrs;
- Future of Bressay Schools – could increase in size ('third school for Lerwick') or close and combine with Lerwick;
- Growth more viable if have fixed link – due to growth in population in Bressay and access from Lerwick residents; and
- Health services – emergency appointments not accessible.

4.2.5 Integration

- Lack of integration between the ferry service and bus services on the Mainland.

4.2.6 Long-term Impacts

- Is the current service sustainable? In terms of Shetland's finances: how sustainable is the inter-island ferry service in the long-term compared to fixed links? What is best use of resources?;
- Unresolved decision about a fixed link, resulting in other aspects of the community's development not being addressed and house sites seldom available; and
- What would be the impact of doing nothing?

4.2.7 Strategic Direction

- There is a need for robust plans to be in place: for land use (including wildlife protection) and service delivery. At the moment there is a lack of knowledge about the plans of the Council and other services if there is to be a fixed link. For example: land use planning (industrial and/or housing), long-term planning of service delivery, the school estate, and roads, for example;
- There are housing shortages in central areas of Shetland: to what extent could a fixed link to Bressay assist with this? How could it be planned for? To what extent, if any, is it already being addressed through developments outwith Lerwick? What would the impact be on the current population drift to central areas and the Council's commitment to decentralisation?;
- If a large amount of capital expenditure is going to be spent on the transport link then it is important all the potential benefits are pursued in terms of savings in delivery of services, and housing, industry and harbour developments;
- Other areas of Shetland may be better suited to have a fixed link/the first fixed link; and
- There will be impacts on other areas of Shetland and other projects if funding is used for this project.

5 OBJECTIVES

STAG facilitates the appraisal of transport policies, plans and programmes to meet a particular need using agreed objectives about the desired outcome. The objectives for this scheme, outlined below, are derived from national and local government objectives, chosen to be value-led SMART objectives (specific, measurable, achievable, realistic, time-linked), as promoted in STAG. The strategic Government objectives have underpinned the scheme appraisal and the more specific local objectives have driven the decision making throughout the study.

5.1 GOVERNMENT OBJECTIVES

The Government's policy framework for Scotland was originally set out in the Transport White Paper, Travel Choices for Scotland, in 1998. It focussed on developing policies that meet three themes:

- a strong economy;
- a clean environment; and
- an inclusive society.

To help assess the potential value of proposals to improve transport at a national or local level within this framework, the Government identified five appraisal objectives:

- to protect the built and natural **environment**, especially the environment of people;
- to improve **safety**;
- to support sustainable economic activity and seek good value for money (**economy**);
- to ensure that all decisions are taken in the context of the Executive's integrated transport policy (**integration**); and
- to improve access to facilities for those without a car and to reduce severance (**accessibility**).

This was superseded by the 2004 Transport White Paper, Scotland's Transport Future. This set out bold ambitions for transport with the aim of *"an accessible Scotland with safe, integrated and reliable transport that supports economic growth, provides opportunities for all and is easy to use; a transport system that meets everybody's needs, respects our environment and contributes to health; services recognised internationally for quality, technology and innovation, and for effective and well maintained networks; a culture where fewer short journeys are made by car, where we favour public transport walking and cycling because they are safe and sustainable, where transport providers and planners respond to changing needs of businesses, communities and users, and where one ticket will get you anywhere"*.

This set five high level objectives for transport in Scotland. They are to:

- promote **economic growth** by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- promote **social inclusion** by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;

- protect our **environment** and improve **health** by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- improve **safety** of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and
- improve **integration** by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

The 2004 Transport White Paper provided the vision and objectives for Scotland's National Transport Strategy (NTS) published in 2006. Since publication of the NTS, the administration of the Scottish Executive has changed and it is now under Scottish National Party (SNP) leadership and has changed title to the Scottish Government. The SNP has recently set out high-level objectives³¹ that apply across all aspects of society, not just transport. These high level objectives are that Scotland should be:

- Wealthier and Fairer;
- Healthier;
- Safer and Stronger;
- Smarter; and
- Greener.

These high level objectives have been mapped against the previous administration's objectives and are a good fit with the same key aims.

5.2 LOCAL OBJECTIVES

5.2.1 Shetland's Priorities and Targets

These were approved by Shetland's Community Planning Board and Shetland Islands Council, in 2007³².

"We will continue to increase the Quality of Life in Shetland:

- *We will increase employment opportunities, by 1,000 fulltime equivalents by 2025, and increase average personal and household income by 10% above 2005 in real terms.*
- *The Shetland economy is becoming more diversified. However there is a need to accelerate this process in order to provide a secure future. Key to this is increasing the opportunities for employment in the private sector. By stimulating the economy we will increase the sustainability of our community's critical services.*

In order to ensure people are able to stay where they want, and move here:

- *We will increase the supply of housing to 12,000 by 2025.*

Currently centralisation forces are in play. This is pressurising delivery of services in central areas, whilst delivery of services in more remote areas is requiring increased subsidy:

- *We will place more effort on stimulating demand for living in the remoter areas of Shetland by ensuring that the ratio of jobs to people and housing is the same*

³¹ <http://www.scotland.gov.uk/About/purposestratobjs>

³² Shetland Community Plan. Available: www.shetland.gov.uk/communityplanning/

Some will want to live in and around Lerwick to enjoy the benefits of a busy thriving town others will prefer the alternative attractions of rural and remote locations. Different challenges will apply in different areas, and will require different solutions.

To make sure we are all able to enjoy living in Shetland as fully as possible:

- *We will be internationally renowned by ranking in the top 5% on a European stage. To ensure that equal opportunities exist for all, no matter an individual's age, race, gender, faith, sexual orientation or disability and to decrease inequalities. Shetland already ranks highly in Scotland for social welfare, health and safety. However, we are aiming to be high ranking on an international stage. We also recognise that not everyone in Shetland shares this good experience.*

Shetland has a very attractive natural environment and a good reputation for caring for it, we will enhance that and:

- *We will be world renowned for being clean and green islands, decreasing our CO2 emissions by 30% by 2020*

Overall the retention of existing residents and attraction of new and returning population will depend on success across the above factors that affect quality of life. By maintaining and enhancing a society that appeals to people who are already here and in faraway places:

- *We will increase the population of Shetland to 25,000 by 2025."*

5.2.2 Shetland's Transport Strategy

Shetland's Transport Strategy has not yet received Ministerial approval. However, implementation is underway and a number of elements are relevant to this piece of work³³:

"In developing the Inter-Island strategy there have been some key challenges to consider, such as the limited amount of available capital and the pressures to reduce current levels of spending. There is also the over-riding requirement to secure the availability of existing links in the face of ageing vessels which are potentially becoming non-compliant, and the number of ferry terminals now requiring significant structural upgrading or replacement.

This element of the Strategy has considered the potential of developing fixed links, and the ongoing delivery of the inter-islands air service.

Work on appraising strategic alternatives has confirmed the desirability of developing a fixed links strategy for Shetland – principally for the benefits accruing from reduced revenue burdens, but also facilitating improved accessibility and wider opportunities for service delivery efficiencies. The principal links to be considered are between Lerwick and Bressay, Mainland Shetland and Yell, Yell and Unst, and also Mainland Shetland and Whalsay.

In considering previous work, ZetTrans has reviewed the outcome of a number of independent inter-island sub-sea tunnel feasibility studies. This has confirmed that there is the potential requirement for significant levels of capital funding for such projects, indicating the necessity for external funding support.

³³ Shetland Transport Strategy, pages 47-48

The work also confirmed that there is still a large variance between “appraisal costs” (i.e. accounting for the high levels of uncertainty and risk which would currently be associated with any projects in Shetland) and reported “out-turn costs” from sub-sea tunnelling experience in Faroe /Norway. If costs using the former are assumed, continued ferry operation is the lesser cost, and hence more cost efficient option, over 60 years. However, if the lower costs are assumed, directly based on Faroe/Norwegian experience, there is a much stronger case for constructing tunnels.”

The Strategy includes the following interventions of relevance to this study:

- **FL1:** ZetTrans supports the principle of developing fixed links between Shetland Mainland, and the main offshore islands of Bressay, Yell, Unst and Whalsay.
- **FL2:** ZetTrans and SIC are committed to undertaking a ‘Bressay Link’ STAG assessment examining future options for a link to Bressay, considering a range of options including the continued operation of a ferry service, and the development of fixed links in the form of a bridge or tunnel.
- **FL3:** In the short-term, ZetTrans proposes to commission a study to confirm the robustness of business cases for fixed links between Yell and Unst (Bluemull Sound), Shetland Mainland and Yell (Yell Sound), Shetland Mainland to Whalsay and Shetland Mainland and Bressay, with particular emphasis on agreeing with regulatory bodies the appropriate standards and specifications that would apply.
- **FL4:** Any engineering feasibility studies into potential fixed links infrastructure will include an assessment of any potential environmental impacts, such as effects on biodiversity (including all designated sites and protected species), cultural heritage, the landscape, the water environment and other relevant issues
- FL3 and 4 are due to report in March 2008.

5.2.3 Local Plan³⁴

To plan for the proposed bridge link to the mainland and Lerwick.

- To seek ways to diversify the Bressay economy;
- To help sustain and enhance the natural and built environment; and
- To maintain a viable rural community.

5.2.4 Lerwick Port Authority’s Key Strategic Objectives

The key strategic objectives of the Authority are:

- The management, maintenance and regulation of Lerwick Harbour;
- To continuously improve its environmental performance;
- To invest in new port facilities where a need is identified. To diversify its portfolio of investments and sources of income, especially where this also supports and strengthens its core harbour activity;
- To attract new businesses and ensure the continued satisfaction of existing customers and users, and to defend the port against unfair competition and anti-competitive practices;

³⁴ Available: <http://www.shetland.gov.uk/developmentplans/documents/BressayCommunityStatement.pdf>

- To maximise quality and value for money in all its services through continually endeavouring to make its operations cost-effective, efficient and streamlined while maintaining high standards;
- To maintain existing buildings, plant and equipment and harbour facilities in a safe and serviceable order; and
- To operate safely with particular regard to ensuring compliance with any new legislative requirements within required timescales.

5.2.5 Planning Objectives for Bressay Link

Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland

Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency

- **Ec1:** To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.
- **Ec2:** To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion
- **Ec3:** To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities
- **Ec4:** To provide a link which is affordable for users
- **Ec5:** To provide a link which is sustainable for funders and value for money

Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network

- **Ac1:** To provide and maintain an accessible, efficient, cost effective transport network for Bressay
- **Ac2:** To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland
- **Ac3:** To provide a link which does not restrain opportunities for housing in Bressay
- **Ac4:** To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.

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

- **Env1:** To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island
- **Env2:** To provide a link that seeks to minimise carbon emissions and the use of finite resources
- **Env3:** To promote a link that can accommodate current and future patterns of development and land use in Bressay

Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff

- **S1:** To ensure the link continues to maintain and enhance community safety and health

- **S2:** To ensure the link does not compromise maritime safety or road safety

Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport

- **Int1:** To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities
- **Int2:** To promote a transport link that facilitates the delivery of other committed plans and strategies

6 OPTION GENERATION AND SIFTING OF OPTIONS

A long-list of options was generated by combining possible solutions put forward during the initial consultation phase (see Annex B) and additional options proposed at the 'Option Generation and Initial Appraisal' Workshop (See Annex D).

Box 2: Long List of Options

- Chain ferry
- Reconfigured ferry service (existing vessel)
- Passenger ferry (or also a ferry service)
- Water taxi
- Electric ferry
- Hydrogen ferry
- Ferry: cheaper to funders and users (less crew etc), less passengers, more frequent
- Improve public transport: Bus links; Taxi; demand responsive; Mini bus etc
- Helicopter service
- Transport subsidy to local people
- Increase provision for cyclists and pedestrians
- Tunnel (drills and blast bore etc)
- Immersed tube
- Causeway (and pier/energy generation)
- Opening bridge
- Causeway and tunnel (north end)
- High level bridge
- Transporter bridge

The current service is included in the appraisal, as a baseline with which to compare other options (Do Minimum).

The workshop participants discussed and screened the options and decided which met the planning objectives sufficiently well to be worthy of further consideration (broad appraisal).

Table 6.1 sets out the findings of the initial appraisal against the planning objectives, and those options that were sifted out because it was considered that they were unable to offer significant potential to achieve the planning objectives. The following options were sifted out:

- **Helicopter service:** unable to take cars; unable to take many passengers/freight; safety issues; could be used in combination with other options, but too expensive.
- **Causeway:** significant problems to operation of Lerwick Port, and the economic activities supported. 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;
 - Safety considerations: 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.

- Environmental issues: 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:** increased journey time; potential weather constraints; constraints on harbour; negative scenic value; safety issues of operation.

Table 6.1: Findings of Initial Appraisal of Options versus Planning Objectives

Option	Description	Comment	Meets Planning Objectives?
1	Chain ferry		✓
2	Reconfigured ferry service (existing vessel)	All options (which would be considered in detail at STAG2)	✓✓
3	Passenger ferry (or also a ferry service)	May be in combination with other options (e.g. passenger ferry)	✓✓
3a	Water taxi	Included in 3	Yes if in combination with another link option
4	Electric ferry	Need more information and to be considered as a ferry option-may be worthy of consideration as a ferry replacement option in future	Yes but to be considered as ferry option
5	Hydrogen ferry	Need more information and to be considered as a ferry option-may be worthy of consideration as a ferry replacement option in future	Yes but to be considered as ferry option
6	Ferry – cheaper to funders and users (less crew etc), less passengers, more frequent	See No. 2	✓✓
7	Improve public transport: Bus links, Taxi, DRT, Mini bus, etc	To be considered with all options	✓✓
8	Helicopter service	Not considered a viable alternative to ferry	✗
9	Transport subsidy to local people	Only considered a viable option in combination with other options e.g. reconfiguration of ferry service-could be considered as a sensitivity test at later stage	✗? Only viable with other options
10	Increase provision for cyclists and pedestrians	To be considered with all options	✓✓
11	Tunnel (drills and blast bore etc)	All options to be considered further	✓✓
12	Immersed tube	Also in combination with part causeway	✓✓
13	Causeway (and pier/energy generation)	Doesn't meet safety objectives (access north for lifeboat) Option would not meet LPA objectives Environmental impacts?	✗
14	Opening bridge	Worthy of some further consideration although LPA has reservations	✓/?
15	Causeway and tunnel (north end)	Include with no 11	Yes but to be considered as tunnel option
16	High level bridge	Worthy of some further consideration although LPA has reservations	✓/?
17	Transporter bridge	Not considered worthy of further consideration because of constraints to harbour and not as efficient as current provision	✗

7 BROAD APPRAISAL

This section provides information on all those options taken forward to broad appraisal; and the STAG Part 1 Appraisal Summary Tables (ASTs). This also includes appraisal against do minimum, as a baseline.

7.1 OPTIONS CONSIDERED FOR BROAD APPRAISAL

At this stage, these options are considered in terms of the capital and revenue costs associated with development, but do not consider any associated infrastructure, such as road improvements.

Option 1 – Reconfigured Ferry Service (existing vessel)/ Reconfigured Ferry

This option would include an enhanced ferry service, which could include length of operational day, frequency of sailings, revised fare structures and alternative crewing arrangements. Electric or hydrogen ferries could be considered for replacement vessels in the future. It is assumed this option would retain the existing crossing.

Option 2 – Passenger Ferry/Water Taxi

This option considers a, potentially, smaller vessel, carrying passengers only. It enables exploration of a versatile service, with central accessibility, in combination with other link option(s). Consideration would be made of electric or hydrogen vessels. It is assumed this option would retain a central location.

Option 3 – Public Transport Improvements

This option includes bus, taxis and other vehicles capable of providing a flexible and demand responsive transport system within Bressay, integrated with travel options on Mainland Shetland. This option will be considered alongside other options.

Option 4 – Improved provision for walkers and cyclists

This option includes sustainable travel opportunities, including walking and cycling, within Bressay and integrated with travel options on Mainland Shetland. This option will be considered alongside other options.

Option 5 – Chain Ferry

Chains or cables attached to both shores, are used to guide or propel a ferry across. There are a number of chain ferries in operation in the UK, all located on the South coast of England including Poole Harbour, Dartmouth and Cowes on the Isle of Wight. The advantage of the chain ferry is that the chain helps to keep the ferry in position in strong cross currents. The Poole Harbour ferry operates at the mouth of the harbour in currents exceeding 6 knots.

Vessels less than 50m long have to give way to the ferry when it is crossing. Mariners 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 Poole Harbour crossing, at approximately 365m, is similar in length to a crossing of the Bressay Sound at Point of Scotland or Greenhead. The Poole Harbour crossing takes just under 3 minutes. A crossing of Bressay Sound at North Ness or the existing ferry route is considered too great for the operation of a chain ferry.

Modern chain ferries are generally powered by diesel electric motors and they generally operate from slipways rather than Ro-Ro terminals although mooring facilities are also required for berthing the vessel when not in use.

Repair and maintenance of the vessel is generally undertaken in situ given the difficulties of dismantling the chains and towing the vessels.

Option 6 – Drill and Blast Tunnel³⁵

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 Scotland and Heogan. The tunnel would allow bi-directional traffic movement, with a separate cycleway/footpath.

Option 7 – Immersed Tube Tunnel

A tunnel constructed by excavating a trench and placing precast concrete sections in and backfilling. At this stage it is not known which exact location would be most suitable, but it is assumed to be to the north of the current link. This option could include an option which is part causeway and part tunnel. The tunnel would allow bi-directional traffic movement, with a separate cycleway/footpath.

Option 8 – Opening Bridge

An opening bridge with a clear width between supports of at least 200m. It is assumed that the bridge crossing location would be from Point of Scotland to Heogan on Bressay. The bridge would open by two separate halves of the bridge swinging through 90 degrees. When closed the bridge would provide an air draft above mean high water of between 10m and 15m to enable smaller vessels to pass. The bridge would carry a carriageway for two lanes of traffic and a footpath. The bridge could not carry services other than that required to power and light the bridge. The time for the bridge to fully open from closing the barriers would be between 5 and 15 minutes.

Option 9 – High Level Bridge

A high level fixed bridge having an air draft above mean high water springs of at least 40m and a clear width between supports of at least 200m. It is assumed the bridge crossing location would be from Point of Scotland to Heogan on Bressay. The bridge would carry carriageway for two lanes of traffic and a footpath. The bridge would incorporate windshielding and could also carry services serving the island. The bridge would be of box girder or cable supported type.

7.2 STAG 1 APPRAISAL SUMMARY TABLES

Each table provides basic information about the option and considers its impact in relation to the planning objectives and the Government's five objectives (accessibility, economy, environment, integration and safety). In doing so, an indicative assessment is made of the scope and scale of the benefits and impacts associated with each option.

The scoring system used for each option is set out below:

³⁵ The team tunnelling expert has advised that in the Bressay Sound the most suitable option would be drill and blast, and thus a bore tunnel has not be considered further.

Table 7.1: STAG Part 1 Appraisal Criteria for use against Government Objectives

Major Benefit	+++
Moderate Benefit	++
Minor Benefit	+
No Benefit/Impact	0
Minor Negative	-
Moderate Negative	--
Major Negative	---

Table 7.2: STAG 1 Appraisal Summary Table: Do Minimum

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Do minimum	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	This assessment is against the current service, providing a baseline against which to assess options.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: approx £25,000/year for both terminals
			Annual revenue support: current cost of service estimated to be £1.365,000 for 2008-09
			Present Value of Cost to Govt.: estimated to be £1.040,000 for 2008-09 (local and national)
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not applicable at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ³⁶ . Approaching 8,000 of these live in Lerwick, the main town ³⁷ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ³⁸ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ³⁹ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of well being.		

³⁶ Census, 2001³⁷ Shetland Islands Local Plan, June 2004³⁸ Shetland Islands Local Plan, June 2004³⁹ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>The current operation does not constrain the current activities of Lerwick Harbour or the plans of the Lerwick Port Authority (LPA). The do minimum would not ensure long-term sustainability of the Bressay community as evidence suggests that current transport arrangements are a hindrance to population stability and economic development on Bressay. Fare levels, given Bressay's reliance on Mainland Shetland for employment and training, services and social activities are not affordable to users. Establishing sustainable and affordable transport links throughout Shetland is a key priority of ZetTrans, and more work is required to understand what capital and revenue costs are available in the long-term from local and national sources, particularly in a climate of financial savings and ongoing efficiencies.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>The current operation constrains the Bressay community's access to employment, services and recreation, both through the operational day (7-11pm) and frequency (hourly except at peak times) and the cost. This includes access to shift work at the Bressay factory and elsewhere. This means the community does not have the same level of access as other communities in Shetland. A lack of public transport within Bressay makes access to the ferry link difficult for those without private transport. However, the central location of the link in Bressay and Lerwick is of value. At the current time there are constraints on housing: opportunities for private housing as landowners can be reluctant to sell land at the current time of uncertainty over the link and cost of construction; and opportunities for social housing, because of a lack of demand to be housed on Bressay because of real and perceived access issues. The current service is generally felt to be adequate for emergency services but there is a barrier to providing necessary out-of-hours assistance.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of</p>	<p>The do minimum would have no additional impact on the environment and island heritage or patterns of land use. More information is required on the current operation's carbon footprint and resource use for use in comparisons with other options.</p>

finite resources Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay		
Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety		The do minimum would have no additional impact on maritime, road or community safety or health, although it does hinder access to indoor exercise facilities (Clickimin) and to health facilities, for example.
Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies		The do minimum provides limited integration to other transport services, in particular it is unable to enable Bressay residents to access the early morning flights from Sumburgh, without an overnight stay on Mainland Shetland. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.
Rationale for Selection or Rejection of Proposal:	Due to issues of access and opportunities, there is a need to implement one or more of the nine options below, as the do minimum is unable to address the issues raised by stakeholders nor provide an affordable, efficient, flexible and sustainable transport link between locations in Bressay and Mainland Shetland.	

Implementability Appraisal	
Technical:	No technical difficulties.
Operational:	Current operation until at least 2012, when some capital investment may be required. Long-term replacement of ferry.
Financial:	Service currently difficult to afford for many users (Bressay residents and businesses), and issues over long-term sustainability of revenue funding from national and local government. Issues over capital replacement costs in the future.
Public:	Do minimum would not be acceptable to the community of Bressay, primarily due to issues of access and associated cost (fare levels).

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	0	No change unless in the future the ferry was replaced by a vessel using new technologies which could reduce its carbon footprint.
Safety:	0	No change to safety of users.

Economy:	--	No change to employment opportunities or access to employment opportunities, however, evidence suggests an increasingly constrained local economy under current service levels.
Integration:	-	No change to transport integration. However, evidence suggests this lack of integration is constraining the community in some areas.
Accessibility & Social Inclusion:	0	No change to accessibility for users, including value of centrally located service. However, evidence of difficulty in accessing terminal on Bressay and barriers (operational day, frequency and cost of fares) to access jobs, services and other facilities.

Table 7.3: STAG 1 Appraisal Summary Table: Option 1 Reconfigured Ferry Service

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland's Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 1 – Reconfigured Ferry Service (existing vessel)/ Reconfigured Ferry	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	This option would include an enhanced ferry service, which could include length of operational day, frequency of sailings, revised fare structures and alternative crewing arrangements. Electric or hydrogen ferries could be considered for replacement vessels in the future.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: not known at this stage
			Annual revenue support: not known at this stage
			Present Value of Cost to Govt.: not known at this stage (all above dependent on configuration)
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁴⁰ . Approaching 8,000 of these live in Lerwick, the main town ⁴¹ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁴² . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁴³ . The study found that access to employment, skills, services and social activities was key to a person's feeling of wellbeing.		

⁴⁰ Census, 2001⁴¹ Local Plan, June 2004⁴² Local Plan, June 2004⁴³ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>If the ferry operation was reconfigured to a longer operating day, greater frequency and reduced fares (perhaps only for Bressay residents) feedback from consultation suggests that this would assist with the long-term sustainability of the community by increasing opportunities for economic development on the island and providing opportunities to access improved employment opportunities. A more frequently run ferry would require greater management of vessels in that area of the harbour, to ensure navigational safety, but would be manageable. As long as the option to reconfigure and/or replace the existing ferry did not require substantial changes to terminals, there would be no other impact on the operations of Lerwick Harbour. Such an impact would be small. The likelihood is that this option would require increased revenue from funders, with capital spend when a replacement is required.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>An enhanced ferry service would improve the Bressay community's access to employment, services and recreation, both through the operational day (7-11pm) and frequency (hourly except at peak times) and the cost. This includes access to shift work at the Bressay factory and other shift work and opportunities. This would assist the community to have the same level of access as other communities in Shetland. A lack of public transport within Bressay makes access to the ferry link difficult for those without private transport. However, increased frequency of sailings may enable greater provision of public transport, and the central location of the ferry link in Bressay and Lerwick would be retained. An improved service could provide opportunities for private housing, removing uncertainty over the link and possibly bring down construction costs; and demand and opportunities for social housing. An enhanced service would ensure access for emergency services and out-of-hours assistance. The only access constraints would be poor weather (this could be overcome by installing engines of higher power output) and possible capacity issues at certain times of day.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island</p>	<p>An enhanced ferry service is unlikely to have additional adverse impact on the island's environment, heritage or patterns of land use. However, increased operation and increased access for vehicles would increase emissions. Increased public transport facilities on Bressay could help reduce traffic generation. New technologies may provide some benefits (hydrogen or electric power) but more information is required to confirm this.</p>

<p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	
<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>Improved access could lead to increased use of vehicles and associated community and road safety issues. However, increased frequency could remove the vehicle dash to the 8.30am ferry. There might be negative health impacts as it would be easier for vehicles to use the route, rather than users walking or cycling, however, access to indoor sports activities would be improved. Some navigational safety issues with increased crossings (see above).</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>This option would improve integration with other transport services. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option will be considered at Part 2. The option is strong in terms of access, integration and possible economic sustainability of the Bressay community. However, more information is required on revenue and capital investment required in the long-term, in order to be able to fund such an enhanced service (lower resident fares, longer operational day, increased crossings).</p>

Implementability Appraisal	
<p>Technical:</p>	<p>No apparent technical difficulties, continuation of existing expertise.</p>
<p>Operational:</p>	<p>No apparent operational difficulties, continuation of existing expertise.</p>
<p>Financial:</p>	<p>Potentially significant issues in terms of operational and maintenance costs, which could affect long-term affordability.</p>
<p>Public:</p>	<p>Highly acceptable to some Bressay residents particularly if more affordable but expectations over those desiring a fixed link would have to be managed.</p>

Government's Objectives for Transport		
<p>Objective</p>	<p>Assessment Summary</p>	<p>Supporting Information</p>
<p>Environment:</p>	<p>-/+?</p>	<p>Increase in emissions and use of finite resources. Use of new technologies (e.g. hydrogen or electricity from renewable sources) could reduce impact and provide benefits.</p>

Safety:	0/+	May lead to increased traffic, and associated problems on Bressay and Mainland Shetland, and navigational problems would have to be well managed. However, access for emergency services and out-of-hours care would be enhanced.
Economy:	++	Increased opportunities for economic development on Bressay (existing and new/relocated businesses) and access to employment elsewhere. Possible reductions in business costs.
Integration:	++	Potential for increased integration and retention of central location of service.
Accessibility & Social Inclusion:	++	Improvements in access to employment, services and facilities, and for service delivery in Bressay. Retention of central location. Further benefits could be delivered by improving public transport provision on Bressay.

Table 7.4: STAG 1 Appraisal Summary Table: Option 2 Passenger Ferry/Water Taxi

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 2 – Passenger Ferry/Water Taxi	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	This option considers a, potentially, smaller vessel, carrying passengers only. It enables exploration of a versatile service, with central accessibility, in combination with other link option(s). Consideration would be made of electric or hydrogen vessels.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: not known at this stage
			Annual revenue support: not known at this stage
			Present Value of Cost to Govt.: not known at this stage (all above dependent on configuration)
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁴⁴ . Approaching 8,000 of these live in Lerwick, the main town ⁴⁵ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁴⁶ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁴⁷ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁴⁴ Census, 2001⁴⁵ Local Plan, June 2004⁴⁶ Local Plan, June 2004⁴⁷ Study into Deprivation and Social Exclusion in Shetland, 2006

<p>Economic Context:</p>	<p>Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.</p>
<p>Planning Objectives</p>	
<p>Objective:</p>	<p>Performance against planning objective:</p>
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community. Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities Ec4: To provide a link which is affordable for users Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would need to be considered alongside other options – as a stand-alone option it would prevent movement of vehicles or freight. Alongside other options it would help to sustain the population and provide some opportunities for economic growth and employment, in particular for those businesses benefiting from foot passengers and for those able to access employment and leisure activities by foot, cycle or ongoing public transport. Therefore some of the benefits accrued would be dependent on other forms of public transport being in place. There may need to be greater management of vessels in that area of the harbour, to ensure navigational safety, but this would be manageable and impacts on the operations of Lerwick Harbour could be controlled. Affordability to users would depend on fare levels. Implementation of this option would require additional funding from funders, depending on the extent to which the Council operates the service or the degree of subsidy required.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland Ac3: To provide a link which does not restrain opportunities for housing in Bressay Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>There is potential to use this option alongside other options (chain ferry, reconfigured ferry or fixed link) in order to ensure an accessible central link and/or extend the length of the operational day and level of services, providing possible efficiencies of other options. This could enhance the Bressay community's access to employment, services and recreation, could include access to shift work at the Bressay factory and elsewhere, and provide a useful route for visitors. This would assist the community to have the same level of access as other communities in Shetland. To fully meet objectives this option would also require improved public transport within Bressay. The improved accessibility provided could improve demand and opportunities for social housing and enable callouts for out-of-hours and possible emergency assistance, along with other measures. Poor weather may prevent sailing at certain times, probably more than with the current ferry service.</p>
<p>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 Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p>	<p>This option is unlikely to have additional impact on the island's environment, heritage or patterns of land use. A centrally located passenger ferry/water taxi would encourage less use of vehicles than under some other options, but more would need to be understood about the carbon footprint and resource use of the vessel and of the options with which it was linked.</p>

Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay		
Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety		This option would have little or no impact on community, road or maritime safety, and have the potential to improve health, by encouraging more walking and cycling and provide a rapid response service.
Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies		This option would have the potential to improve integration with other transport services. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.
Rationale for Selection or Rejection of Proposal:	Whether or not this proposal is selected for consideration at Part 2 depends on which other options were selected. It should remain a possible option if fixed links and/or ferry services remain, as it has the potential to provide a useful contribution to ensuring accessibility and integration objectives alongside other options that do not perform so well in these areas and could enable efficiencies with other options.	

Implementability Appraisal	
Technical:	No apparent technical difficulties.
Operational:	No apparent operational difficulties, but value in exploring private operation.
Financial:	More information required, especially with regard to likely usage.
Public:	Public acceptability would depend on other options implemented.

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	-/0/+?	The increased service frequency may increase use of fuels. The option, if using new technologies, may provide overall benefits.
Safety:	0	Limited impact on maritime, road and community safety.
Economy:	+	Limited economic impact, but increased opportunity for tourist access and development, including for those living elsewhere in Shetland, and access for Bressay residents to employment opportunities.

Integration:	++	This option provides opportunities for integration with other transport modes, including walking and cycling.
Accessibility & Social Inclusion:	++	Alongside another option or options, this proposal could provide a more flexible, round-the-clock service, maintaining or enhancing the central location of the current service.

Table 7.5: STAG 1 Appraisal Summary Table: Option 3 Public Transport Improvements

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland's Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 3 – Public Transport Improvements	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	This option includes bus, taxis and other vehicles capable of providing a flexible and demand responsive transport system within Bressay, integrated with travel options on Mainland Shetland. This option will be considered alongside other options.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: not known at this stage
			Annual revenue support: not known at this stage
			Present Value of Cost to Govt.: not known at this stage (all above dependent on configuration)
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁴⁸ . Approaching 8,000 of these live in Lerwick, the main town ⁴⁹ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies on the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁵⁰ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁵¹ . The study found that access to employment, skills, services and social activities was key to a person's feeling of wellbeing.		

⁴⁸ Census, 2001⁴⁹ Local Plan, June 2004⁵⁰ Local Plan, June 2004⁵¹ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland’s traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour’s current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would need to be considered alongside other options in order to help sustain the population and provide some opportunities for economic growth and employment, by improving access to employment and business on Bressay and employment opportunities on the Mainland for Bressay residents, particularly those without access to a private vehicle. There would be no impacts on the operations of Lerwick Harbour. Affordability to users would depend on fare levels. Implementation of this option may require additional funding from funders, depending on the extent to which the Council operates the service or the degree of subsidy required.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>It will be necessary to use this option alongside other options (chain ferry, reconfigured ferry or fixed link) in order to ensure a transport system for residents and visitors that provides access to employment, services and facilities. The improved accessibility provided could improve demand and opportunities for housing.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland’s unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>This option is unlikely to have additional impact on the island’s environment, heritage or patterns of land use. However, if the system put in place was appropriate it could decrease people’s reliance on vehicles.</p>

<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>This option would have no impact on community, road or maritime safety, and have the potential to improve health, if combined with hearts and mind measures to encourage walking.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>This option would have the potential to improve integration with other transport services. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option is selected for consideration at Part 2, since all options across the Sound require improved public transport if they are to be meet access, environment and integration objectives appropriately.</p>

Implementability Appraisal	
Technical:	No apparent technical difficulties.
Operational:	No apparent operational difficulties, dependent on availability of transport operators.
Financial:	More information required, but likely to be affordable to Council.
Public:	High level of public acceptability.

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	++	An appropriate system has the potential to reduce use of private vehicles, and thereby reduce carbon emissions.
Safety:	0/+	Slight improvement on safety, due to better safety record of both buses and taxis.
Economy:	+	Positive impact on the economy by: improving residents ability to access employment opportunities both within Bressay and on Mainland Shetland; improving those living elsewhere to access employment on Bressay, as well as tourist opportunities.
Integration:	++	Ability to enhance integration with other services and to reduce social exclusion.
Accessibility & Social Inclusion:	+++	Significant positive impact on improving people's accessibility to employment, services and facilities, on Bressay and Mainland Shetland.

Table 7.5: STAG 1 Appraisal Summary Table: Option 4 Improved Provision for Walkers and Cyclists

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 4 – Improved provision for walkers and cyclists.	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	This option includes sustainable travel opportunities, including walking and cycling, within Bressay and integrated with travel options on Mainland Shetland. This option will be considered alongside other options.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: not known at this stage
			Annual revenue support: not known at this stage
			Present Value of Cost to Govt.: not known at this stage
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁵² . Approaching 8,000 of these live in Lerwick, the main town ⁵³ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁵⁴ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁵⁵ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁵² Census, 2001⁵³ Local Plan, June 2004⁵⁴ Local Plan, June 2004⁵⁵ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would need to be considered alongside other options, and would have little perceivable impact on sustaining the population or providing opportunities for economic growth or employment. There would be no impacts on the operations of Lerwick Harbour. The cost to users would be the equivalent of a passenger fare, depending on whether a charge was made for cycles and any measures required would be at minimal relative cost to funders. This option would provide better facilities for tourists, that has the potential to be marketed.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>It will be necessary to use this option alongside other options (any of chain ferry, reconfigured ferry, fixed link and public transport) in order to ensure a transport system for residents and visitors that provides access to employment, services, recreation and facilities.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>This option would have no additional impact on the island's environment, heritage or patterns of land use. However, if the system put in place was appropriate it could decrease people's reliance on vehicles with associated benefits from reduction in emissions.</p>

<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>This option would have no impact on community or maritime safety, but could detriment road safety of users if not properly designed and managed. It would improve health.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>This option would have the potential to improve integration with other transport services. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option is selected for consideration at Part 2, since it is able to promote sustainable transport options at limited financial cost to users or funders.</p>

Implementability Appraisal	
Technical:	No apparent technical difficulties.
Operational:	No apparent operational difficulties, care required to ensure safety is maintained.
Financial:	Limited financial resources required.
Public:	High level of public acceptability.

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	++	Reduction in carbon emissions and finite resource use as a result of decreased use of vehicles. Potential to improve health.
Safety:	0	No impact on safety, if appropriate measures were put in place.
Economy:	0/+?	Unlikely to impact directly on economy, although improvements in health improve employability and performance. Benefits for tourists.
Integration:	0/+?	Small enhancement.
Accessibility & Social Inclusion:	+	Improvements to access other modes of transport.

Table 7.6: STAG 1 Appraisal Summary Table: Option 5 Chain Ferry

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 5 - Chain Ferry	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	Passenger/vehicle carrying vessels plying between two points and connected at both points by chains or cables. Examples include Plymouth Sound and Dartmouth. It is assumed that this option would be from The Point of Scotland to Heogan.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: Estimated to cost similar/slightly less to existing ferry replacement
			Annual revenue support: £40-70,000 based on Cowes
			Present Value of Cost to Govt.: not known at this stage
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁵⁶ . Approaching 8,000 of these live in Lerwick, the main town ⁵⁷ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies on the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁵⁸ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁵⁹ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁵⁶ Census, 2001⁵⁷ Shetland Islands Local Plan, June 2004⁵⁸ Shetland Islands Local Plan, June 2004⁵⁹ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland	
Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community. Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities Ec4: To provide a link which is affordable for users Ec5: To provide a link which is sustainable for funders and value for money	<p>This option may be able to improve the long-term economic prospects of Bressay. It is unable to operate along the route of the existing ferry, instead operating from The Point of Scatland or Greenhead. Although the crossing may take three minutes (length of the Poole Harbour operation) there would be additional journey time on either side, centre to centre, in addition to embarking/disembarking time. There would be potential to increase service frequency, but with no substantial decrease in operational costs (manning levels would be similar to current operation to ensure the ability to safely evacuate a vessel in an emergency situation). A chain ferry would have an impact on the operations of other vessels in the harbour: the master of the ferry generally has to ascertain that the way is clear before leaving shore and, following a marine accident in Poole Harbour in 2001, 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.</p> <p>There would be a need to have a clear piece of land either side to enable the vessel to be pulled fully out of the water: they generally operate from slipways rather than Ro-Ro terminals. Evidence suggests lower operating costs than the current service (primarily through fuel savings, as similar crewing levels are required). However, greater capital investment would be required for vessels (a primary vessel and back-up (in situ or for times of overhaul)), as well as slipways on each side (existing terminals not suitable for use) and mooring facilities.</p>
Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland Ac3: To provide a link which does not restrain opportunities for housing in Bressay Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.	<p>This option has the potential to increase the operational day length and frequency of access to opportunities and improve equality of access for the Bressay community and others' access to the island, depending on operational configuration and improvements to the public transport system on Bressay. However, there may be an increased overall length of journey, which may also compromise access for emergency services. The service could be adversely affected by sea conditions, particularly waves and poor visibility when ferry service may not be possible, as chain ferries are not manoeuvrable, restricted to moving in a straight line. Using a slipway can lead to passengers getting wet feet.</p>
Environment: Protect our environment and improve health by building and	Unlikely to have additional impact on the environment and island heritage or patterns of

<p>investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>land use. Considered likely to have a lower carbon footprint than the current service, on the basis of information known at this time.</p>
<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>Unlikely to have an impact on community safety or health, but compromise in maritime safety, because it may cause complications in the operations of the harbour. The ferry has no means of steerage if the chain were to break, as happened with the Dartmouth Ferry in 2005, when the ferry was washed out to sea. 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; Bressay Sound is categorised as a Category D water.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>This option provides the opportunities for a longer operational day, to integrate with other services. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options on other committed plans and strategies.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option will not be considered at Part 2: higher levels of capital investment would be required compared to the existing service, without a significant decrease in operational costs; the increased journey time and loss of central location would not provide significant improvements in accessibility, in addition to operational constraints from sea conditions, particularly waves or in times of poor visibility. There would be a level of disruption to harbour activities, particularly if the ferry were to operate a shuttle service. There would also be safety issues as there is no steerage if the chain were to break. A Chain Ferry would not be certified by the MCA in Bressay Sound.</p>

Implementability Appraisal	
<p>Technical:</p>	<p>No apparent major technical difficulties, although no examples of chain ferries operating in similar locations. The chain would have to be dismantled in order to undertake any maintenance.</p>
<p>Operational:</p>	<p>Operational constraints in poor sea conditions and safety issues if the chain were to break. A Chain Ferry would not be certified by the MCA in Bressay Sound.</p>
<p>Financial:</p>	<p>Higher level of capital investment required, relative to existing ferry option, with minimal decrease in revenue expenditure.</p>
<p>Public:</p>	<p>Acceptability would depend on service improvements provided, fare levels, location and integration with other transport services.</p>

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	0	Possible reduction in emissions, but possible increase use and distance driven by vehicles.
Safety:	-	Possible compromise to maritime safety, and operational issues if the chain were to break.
Economy:	+	Operational improvements and fare reduction might provide opportunities for economic growth and access to additional employment opportunities for the population.
Integration:	+	Potential for improved integration with some services, with operational improvements. Due to the location, additional measures would need to be put in place, for the benefits to be accrued by all.
Accessibility & Social Inclusion:	+	Potential for improved access, with operational improvements in length of day and fare levels, but higher chance of operational downtime because of sea conditions. A less central service may lead to a decline in accessibility, unless additional measures are put in place.

Table 7.6: STAG 1 Appraisal Summary Table: Option 6 Drill and Blast Tunnel

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 6 – Drill and Blast Tunnel	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	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 Heogan. The tunnel would allow bi-directional traffic movement.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: £20 to £25 million
			Annual revenue support: £50,000 to £100,000
			Present Value of Cost to Govt.: not known at this stage
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁶⁰ . Approaching 8,000 of these live in Lerwick, the main town ⁶¹ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies on the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁶² . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁶³ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁶⁰ Census, 2001⁶¹ Local Plan, June 2004⁶² Local Plan, June 2004⁶³ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would assist in the ensuring the long-term sustainability of the Bressay community, and enhance business opportunities on Bressay and access to employment opportunities elsewhere. However, there would be a negative impact due to the loss of ferry jobs based on the island, which unless jobs could be found elsewhere on the ferry service, would not be compensated for by jobs associated with the maintenance requirements for the tunnel. There would be no long-term impact on the current operations of Lerwick Harbour or its future expansion although there would be disruption to land during construction. To ensure no future constraint on depth, advance dredging to future proof may be required. There could be impacts to the harbour during construction and these would have to be managed to reduce their impact. There would be high levels of capital investment required, but running costs would be relatively low.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>This option would provide flexible, 24-hour access to and from Bressay, providing equality of access for the Bressay community, particularly for those with access to a private vehicle. There would also be ease of access for emergency services and out-of-hours services. The cost to users would depend on whether tolls would be included. Opportunity for private and social housing would only be restricted by availability of land and the Local Development Plan. The option may not be attractive to cyclists and walkers, although provision could be included. There would be limited temporary restrictions whilst dangerous fuels were transported.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>The level of access provided by this option could lead to negative impacts on the natural, cultural and social heritage of the island, unless land use planning were put in place, such as strong planning control measures. The link could also lead to increased use of vehicles, increasing carbon emissions. However, more information about traffic predictions is required to fully understand the impact. Construction of the tunnel could have impacts to properties and land uses and the tunnel portals may have a negative visual impact unless carefully designed. There could be operational impacts from fans used to ventilate the tunnel (increased emissions etc). The link itself would not be visible, assisting with retaining the island feel.</p>

<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>The levels of access provided by this option could lead to a real and/or perceived deterioration in community safety. Measures would have to be put in place to accommodate additional vehicles and ensure road safety. There would be no compromise to maritime safety.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>The level of access provided by this option would ensure improvements in integration with other modes of transport for those with access to a private car. For those currently reliant on public transport services, walking and cycling, integration would be compromised if additional measures were not put in place. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option will be considered at Part 2. This option is strong in terms of possible economic benefits it can provide, and in terms of access and integration, subject to additional measures being put in place. The effects on existing land uses would need to be assessed.</p>

Implementability Appraisal	
<p>Technical:</p>	<p>No apparent technical issues with implementability of tunnel, although may be some land use constraints on the Lerwick side.</p>
<p>Operational:</p>	<p>No apparent operational difficulties. Care is required to ensure safety is maintained with transport of dangerous loads.</p>
<p>Financial:</p>	<p>Significant financial resources required.</p>
<p>Public:</p>	<p>May not be acceptable to those who wish to retain the ferry service, or who do not like tunnels, depending on implementation of other options.</p>

Government's Objectives for Transport		
<p>Objective</p>	<p>Assessment Summary</p>	<p>Supporting Information</p>
<p>Environment:</p>	<p>0/+</p>	<p>Some impacts during construction (on landuses; generation of waste from tunnelling, noise and vibration etc), but tunnels generally have a low environmental impact. Option may generate traffic and tunnel would require ventilation, both with potential for increasing emissions. More information required on predicted traffic flows and operational requirements to confirm this. May stimulate further development with potential for impacts.</p>
<p>Safety:</p>	<p>0</p>	<p>No impact on safety, providing movement of dangerous loads is carefully managed.</p>

Economy:	++	Levels of access would provide greater economic stability for Bressay. Fixed link would provide access to land for business and residential development.
Integration:	++	Access provided would enhance integration opportunities, particularly for those with private vehicles. However, the benefits would not be accrued by all, unless other measures were put in place.
Accessibility & Social Inclusion:	++	Levels of access would be enhanced, but other measures would have to be put in place to ensure no deterioration in access for some. This option would not be affected by weather.

Table 7.7: STAG 1 Appraisal Summary Table: Option 7 Immersed Tube Tunnel

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 7 – Immersed Tube Tunnel	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	A tunnel constructed by excavating a trench and placing precast concrete sections in and backfilling. At this stage it is not known which exact location would be most suitable. This option could include part causeway and part tunnel.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: dredging to 20m would cost £8-9 mn alone, making costs £30-35mn
			Annual revenue support: £150,000 to £200,000
			Present Value of Cost to Govt.: not known at this stage
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁶⁴ . Approaching 8,000 of these live in Lerwick, the main town ⁶⁵ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies on the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁶⁶ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁶⁷ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁶⁴ Census, 2001⁶⁵ Local Plan, June 2004⁶⁶ Local Plan, June 2004⁶⁷ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland’s traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour’s current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would assist in the ensuring the long-term sustainability of the Bressay community, and enhance business opportunities on Bressay and access to employment opportunities elsewhere. However, there would be a negative impact due to the loss of ferry jobs based on the island, which would not be compensated for by maintenance required. There would be no long-term impact on the current operations of Lerwick Harbour or its future expansion although there would be disruption to land during construction. To ensure no future constraint on depth, advance dredging to future proof may be required. There could be impacts to the harbour during construction and these would have to be managed to reduce their impact. There would be high levels of capital investment required, but running costs would be relatively low, although higher than for a drill and blast.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>This option would provide flexible, 24-hour access to and from Bressay, providing equality of access for the Bressay community, particularly for those with access to a private vehicle. There would also be ease of access for emergency services and out-of-hours services. The cost to users would depend on whether tolls would be included. Opportunity for private and social housing would only be restricted by availability of land and the Local Development Plan. The option may not be attractive to cyclists and walkers, although provision could be included. There would be limited temporary restrictions whilst dangerous fuels were transported.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland’s unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>The level of access provided by this option could lead to negative impacts on the natural, cultural and social heritage of the island, unless land use planning were put in place, such as strong planning control measures. The link could also lead to increased use of vehicles, increasing carbon emissions. However, more information about traffic predictions is required to fully understand the impact. Construction of the tunnel could have impacts to properties and land uses depending on where the location was and the tunnel portals may have a negative visual impact unless carefully designed. There would also be impacts during construction that would affect water quality and could affect other activities in the harbour (e.g. fish related) and could result as impacts on</p>

	habitats and species at either coast. It is likely that effects would be short term and could be controlled. However, 160-170 cubic metre of material would be produced, with nowhere to easily use/dispose of this quantity locally. There could be operational impacts from fans used to ventilate the tunnel (increased emissions etc). The link itself would not be visible, assisting with retaining the island feel.
<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff</p> <p>S1: To ensure the link continues to maintain and enhance community safety and health</p> <p>S2: To ensure the link does not compromise maritime safety or road safety</p>	The levels of access provided by this option could lead to a real and/or perceived deterioration in community safety. Measures would have to be put in place to accommodate additional vehicles and ensure road safety. There would be no compromise to maritime safety.
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport</p> <p>Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities</p> <p>Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	The level of access provided by this option would ensure improvements in integration with other modes of transport for those with access to a private car. For those currently reliant on public transport services, walking and cycling, integration would be compromised unless additional measures were put in place. There is insufficient integration of plans and strategies to be able to fully understand the impact of different options, including do minimum, on other committed plans and strategies.
Rationale for Selection or Rejection of Proposal:	This option will not be considered at Part 2. This option is strong in terms of possible economic benefits it can provide, and in terms of access and integration, subject to additional measures being put in place. However the capital and operational costs are higher than for a Drill and Bore Tunnel; technically more difficult to construct with Shetland's location and climate (increasing levels of risk) and with higher environmental impacts. The effects on existing land uses would need to be assessed.

Implementability Appraisal	
Technical:	Technical issues in terms of construction and Shetland's climate, in addition to use/disposal of material locally. Unable to include part causeway option, as there would be insufficient width in the channel to reach the required depth to the tunnel in this location.
Operational:	No apparent operational difficulties. Care is required to ensure safety is maintained with transport of dangerous loads.
Financial:	Significant financial resources required, and higher than for other fixed link options.
Public:	May not be acceptable to those who wish to retain the ferry service, or who do not like tunnels, depending on implementation of other options.

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	0/- with -- during construction	Some impacts during construction (on landuses; noise and vibration etc, water quality) and unable to easily dispose of quantity of material locally. Option may generate traffic and tunnel would require ventilation both with potential for increasing emissions. More information required on predicted traffic flows and operational requirements to confirm

		this. May stimulate further development with potential for impacts.
Safety:	-	Issues around safety of operation for Lerwick Harbour during construction.
Economy:	++	Levels of access would provide greater economic stability for Bressay. Fixed link would provide access to land for business and residential development.
Integration:	++	Access provided would enhance integration opportunities, particularly for those with private vehicles. However, the benefits would not be accrued by all, unless other measures were put in place.
Accessibility & Social Inclusion:	++	Levels of access would be enhanced, but other measures would have to be put in place to ensure no deterioration in access for some. This option would not be affected by weather.

Table 7.8: STAG 1 Appraisal Summary Table: Option 8 Opening Bridge

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 8 – Opening Bridge	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	An opening bridge with clear width between supports of at least 200m. It is assumed that the bridge crossing location would be from Point of Scotland to Heogan on Bressay. The bridge would open by two separate halves of the bridge swinging through 90 degrees. When closed the bridge would provide an airdraft above mean high water of between 10m and 15m to enable smaller vessels to pass. The time for the bridge to fully open from closing the barriers would be between 5 and 15 minutes.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: £20 to £30 million
			Annual revenue support: £100,000 to £200,000
			Present Value of Cost to Govt.: not known at this stage
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not known at this stage
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁶⁸ . Approaching 8,000 of these live in Lerwick, the main town ⁶⁹ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁷⁰ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁷¹ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁶⁸ Census, 2001⁶⁹ Shetland Islands Local Plan, June 2004⁷⁰ Shetland Islands Local Plan, June 2004⁷¹ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland's traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour's current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would assist in the ensuring the long-term sustainability of the Bressay community, and enhance business opportunities on Bressay and access to employment opportunities elsewhere. There would be a negative impact due to the loss of ferry jobs based on the island, to some extent compensated for by bridge operators. However when the bridge was swung, there would be delays to access, which could often be difficult to predict. It would constrain current activities of Lerwick Harbour and its future expansion, impacting on the local and Shetland economy. There may also be delays in opening due to bad weather. There would be high levels of capital investment required, but running costs would be relatively low.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>This option would provide flexible, 24-hour access to and from Bressay, providing equality of access for the Bressay community, particularly for those with access to a private vehicle. However, there would be unpredictable problems with access when the bridge was open, and more would need to be understood as to the frequency and length of time required when the bridge would be inaccessible, particularly in relation to emergency services. The cost to users would depend on whether tolls would be included. Weather would constrain operations to open the bridge, leading to access issues within the harbour and may also exacerbate access to and from the island.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland's unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>The level of access provided by this option could lead to negative impacts on the natural, cultural and social heritage of the island, and on land use planning were put in place, such as strong planning control measures. The link could also lead to increased use of vehicles, increasing carbon emissions. However, more information is required to fully understand the impact. Depending on the design of the bridge, it may have a negative visual impact.</p>

<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>The levels of access provided by this option could lead to a real and/or perceived deterioration in community safety. Measures would have to be put in place to accommodate additional vehicles and ensure road safety. Maritime safety would be compromised: in terms of operation of the bridge opening; the real and/or perceived risk to shipping of there being a structure in the water; and from falling objects.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>The level of access provided by this option would ensure improvements in integration with other modes of transport for those with access to a private car. For those currently reliant on public transport services, walking and cycling, integration would be compromised unless additional measures were put in place. This option does not integrate well with the plans of the LPA and in other areas there is insufficient integration of plans and strategies to be able to fully understand the impact of different options.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option will not be considered at Part 2. This option is strong in terms of possible economic benefits it can provide, but access and integration provided would be unpredictable in nature, with associated impacts. Operational costs are higher than for other fixed link options.</p>

Implementability Appraisal	
<p>Technical:</p>	<p>No apparent technical issues with implementability, although may be some land use constraints on the Lerwick side.</p>
<p>Operational:</p>	<p>Operation of the bridge would have to be coordinated with shipping movements. Operation of the bridge could be restricted in very high winds. A back up operating system would be required in the event of mechanical or electrical failure.</p>
<p>Financial:</p>	<p>Significant financial resources required, capital and relatively higher operational costs.</p>
<p>Public:</p>	<p>The unpredictability of access and integration would make public acceptability low, and unacceptable to those who wish to retain the ferry service, or do not like bridges, depending on implementation of other options. Option would affect operations of Port.</p>

Government's Objectives for Transport		
<p>Objective</p>	<p>Assessment Summary</p>	<p>Supporting Information</p>
<p>Environment:</p>	<p>0/-</p>	<p>Some impacts during construction (on landuses; harbour uses, water quality etc). Option may generate traffic with potential for increasing emissions. More information required on predicted traffic flows and any operational requirements to confirm this. May stimulate further development with potential for impacts.</p>
<p>Safety:</p>	<p>-</p>	<p>Issues around safety of operation and of use, both for users of the link and of Lerwick Harbour. Less vulnerable to wind than other bridge option.</p>

Economy:	+?	Levels of access would provide greater economic stability for Bressay, but unpredictability of access would remain an issue, which may have an impact. In addition there would be a negative impact on the operations of Lerwick Harbour and knock-on effect to local economy.
Integration:	+?	Access provided would enhance integration opportunities, particularly for those with private vehicles. However, the benefits would not be accrued by all.
Accessibility & Social Inclusion:	+?	Levels of access would be enhanced, but unsure extent of reliability, considering possible weather, shipping and operational constraints.

Table 7.8: STAG 1 Appraisal Summary Table: Option 9 High Level Bridge

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		ZetTrans – Shetland’s Regional Transport Partnership 11 Hill Lane Lerwick SHETLAND, ZE1 0HA	
Proposal Name:	Option 9 – High Level Bridge	Name of Planner:	Michael Craigie, Lead Officer, ZetTrans
Proposal Description:	A high level fixed bridge having an air draft above mean high water springs of at least 40m and a clear width between supports of at least 200m. It is assumed the bridge crossing location would be from Point of Scatland to Heogan on Bressay. The bridge would be of box girder or cable supported type.	Estimated Total Public Sector Funding Requirement:	Capital costs/grant: £20 to 30 million
			Annual revenue support: £40,000 to £60,000
			Present Value of Cost to Govt.: not presently known
Funding Sought From: (if applicable)	Scottish Government and Shetland Islands Council.	Amount of Application:	Sum: not presently known
Background Information			
Geographic Context:	The Shetland Islands are the most northerly local authority area in the UK, 298 miles north of Edinburgh and 211 miles north of Aberdeen. Shetland comprises more than 100 islands, 15 of which are inhabited, and the total population is around 22,000 ⁷² . Approaching 8,000 of these live in Lerwick, the main town ⁷³ . Lerwick has developed around Bressay Sound, a sheltered stretch of water between the Mainland of Shetland and Bressay. Bressay lies of the east coast and is 7 miles (11km) long by 3 miles (5 km) wide with a current population of approximately 400 ⁷⁴ . This is the primary study area. Bressay Sound provides a sheltered shipping channel that has provided safe anchorage for vessels for centuries. Currently Bressay is reached from Lerwick by a seven minute ferry crossing that runs at hourly intervals during the days and evenings and on a more frequent basis at peak times.		
Social Context:	Shetland was central to the North Sea oil boom, and over the last 30 years this has had a major impact on the economy and helped to raise living standards. However, a recent study has shown that, although Shetland has a generally high standard of living and quality of life, there are still individuals and households in Shetland who are living in poverty and are unable to access the many opportunities Shetland has to offer ⁷⁵ . The study found that access to employment, skills, services and social activities was key to a person’s feeling of wellbeing.		

⁷² Census, 2001⁷³ Local Plan, June 2004⁷⁴ Local Plan, June 2004⁷⁵ Study into Deprivation and Social Exclusion in Shetland, 2006

Economic Context:	Fishing and agriculture are Shetland’s traditional industries. Since the 1970s, oil has had a significant impact, but is now decreasing and the Shetland economy must adapt to this change. The oil rig decommissioning industry and tourism are areas of potential growth. Shetland continues to have one of the lowest unemployment rates in the country. However, economically active individuals who are unable to find work, tend to move away. The Gross Regional Domestic Product per capita of Shetland is lower than the UK average.
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Planning Objectives	
Objective:	Performance against planning objective:
<p>Aim: To provide an affordable, efficient, flexible and sustainable transport link between Bressay and Mainland Shetland</p>	
<p>Economy: Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency</p> <p>Ec1: To enhance the transport infrastructure between Bressay and Mainland Shetland to ensure the long-term sustainability of the Bressay community.</p> <p>Ec2: To provide a link which does not constrain Lerwick Harbour’s current activities or its future expansion</p> <p>Ec3: To provide and promote a link which supports a stable and sustainable economy and enhances employment opportunities</p> <p>Ec4: To provide a link which is affordable for users</p> <p>Ec5: To provide a link which is sustainable for funders and value for money</p>	<p>This option would assist in ensuring the long-term sustainability of the Bressay community, and enhance business opportunities on Bressay and access to employment opportunities elsewhere. There would be a negative impact due to the loss of ferry jobs based on the island, which would not be compensated for by maintenance required. However it would constrain current activities of Lerwick Harbour and its future expansion, impacting on the local and Shetland economy. There would be additional constraints during construction, as much of this work would be in situ and may require parts of the harbour to be closed. There are likely to be some access issues in high winds, but this is unlikely to impact on economic development. There would be high levels of capital investment required, but running costs would be relatively low.</p>
<p>Accessibility: Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network</p> <p>Ac1: To provide and maintain an accessible, efficient, cost effective transport network for Bressay</p> <p>Ac2: To provide a link which enables the Bressay community equal opportunities to access employment, services and facilities as other communities in Shetland</p> <p>Ac3: To provide a link which does not restrain opportunities for housing in Bressay</p> <p>Ac4: To maintain and improve accessibility and response times for emergency services and other service providers, including out-of-hours needs.</p>	<p>This option would provide flexible, 24-hour access to and from Bressay, providing equality of access for the Bressay community, particularly for those with access to a private vehicle. There would also be ease of access for emergency services and out-of-hours services. On occasions when the bridge was shut for weather, alternative arrangements would have to be in place.. The cost to users would depend on whether tolls would be included. Housing would be restricted by availability of land and the Local Development Plan. At times weather could prevent access to and from the island, but the frequency of this, compared to the current ferry service is currently unknown.</p>
<p>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</p> <p>Env1: To develop a link to Bressay that recognises and protects Shetland’s unique environment and safeguards the natural, cultural and social heritage of the island</p> <p>Env2: To provide a link that seeks to minimise carbon emissions and the use of finite resources</p> <p>Env3: To promote a link that can accommodate current and future patterns of development and land use in Bressay</p>	<p>The level of access provided by this option could lead to negative impacts on the natural, cultural and social heritage of the island, and land use planning were put in place, such as strong planning control measures. The link could also lead to increased use of vehicles, increasing carbon emissions. However, more information is required to fully understand the impact. Depending on the design of the bridge, it may have a negative visual impact on the harbour and its environs. There would be impacts during construction on water quality and other land uses and mitigation measures would be required to mitigate these impacts. Some potential long-term effects on harbour activities from new infrastructure in the sound.</p>

<p>Safety: Improve safety of journeys by reducing accidents and enhancing personal safety of pedestrians, drivers, passengers and staff S1: To ensure the link continues to maintain and enhance community safety and health S2: To ensure the link does not compromise maritime safety or road safety</p>	<p>The levels of access provided by this option could lead to a real and/or perceived deterioration in community safety. Measures would have to be put in place to accommodate additional vehicles and ensure road safety. Maritime safety would be compromised: in terms of the real and/or perceived risk to shipping of there being a structure in the water; and from falling objects.</p>
<p>Integration: Improve integration by making journey planning and ticketing easier and working to ensure smooth connections between different forms of transport Int1: To provide a link which integrates with all Shetland's transport services and infrastructure, including air, ferry, bus, cycling and walking opportunities Int2: To promote a transport link that facilitates the delivery of other committed plans and strategies</p>	<p>The level of access provided by this option would ensure improvements in integration with other modes of transport for those with access to a private car. For those currently reliant on public transport services, walking and cycling, integration would be compromised unless additional measures were put in place. This option does not integrate well with the plans of the Lerwick Port Authority and in other areas there is insufficient integration of plans and strategies to be able to fully understand the impact of different options.</p>
<p>Rationale for Selection or Rejection of Proposal:</p>	<p>This option will be considered at Part 2. This option is strong in terms of possible economic benefits it can provide, and in terms of access and integration, subject to additional measures being put in place. Effects on Lerwick Port would need to be assessed.</p>

Implementability Appraisal	
<p>Technical:</p>	<p>Design options available that could meet technical challenges.</p>
<p>Operational:</p>	<p>No significant operational issues.</p>
<p>Financial:</p>	<p>Significant financial resources required.</p>
<p>Public:</p>	<p>Unacceptable to those who wish to retain the ferry service, or do not like bridges, depending on implementation of other options. Effects on Lerwick Port would need to be assessed.</p>

Government's Objectives for Transport		
<p>Objective</p>	<p>Assessment Summary</p>	<p>Supporting Information</p>
<p>Environment:</p>	<p>-</p>	<p>Some impacts during construction (on land uses; harbour uses, water quality etc). Option may generate traffic with potential for increasing emissions. More information required on predicted traffic flows and any operational requirements to confirm this. May stimulate further development with potential for impacts. Would restrict movements through the harbour for vessels with greater than 40m air draft.</p>
<p>Safety:</p>	<p>-</p>	<p>Possible real and perceived deterioration in community safety and road safety. Issues around safety of operations of Lerwick Harbour.</p>

Economy:	+?	Improved economic opportunities for Bressay and potentially surrounding area and Shetland. However, a negative impact on the operations of Lerwick Harbour and knock-on effect to local economy.
Integration:	++	Access provided would enhance integration opportunities, particularly for those with private vehicles. However, the benefits would not be accrued by all.
Accessibility & Social Inclusion:	++	Levels of access would be enhanced, but other measures would have to be put in place to ensure no deterioration in access for some.

8 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.

8.1 KEY ISSUES

The main issues identified at the outset 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 leaving vacant properties, for example;
- that previous debate over a long time period could be 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 the 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;^[a1]
- 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;
- restricted access sometimes denies 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 an 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.

8.2 OBJECTIVES FOR THE STUDY

Strategic workshops assisted in the development of local planning objectives, and, with the help of the community, a long list of options were identified for further consideration.

8.3 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

objectives and are to be carried forward to more detailed appraisal (Part 2 STAG):

- reconfigured ferry service;
- water taxi/passenger ferry;
- public transport improvements;
- measures to promote walking and cycling;
- drill and blast tunnel; and
- high level bridge

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 AC waters⁷⁶; 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 Scotland 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 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 safety issues, because chain ferries have no means of steerage if the chain were to break, as happened with the Dartmouth Ferry in 2005 when the ferry was washed out to sea.

- **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

⁷⁶ 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.

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
- 160-170,000 cubic metres of rock would be removed. It may not be possible to use and/or dispose of this quantity of material easily locally.

- **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 enable 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.

8.4 RECOMMENDATIONS

The following recommendations are made:

- The following options are considered in more detail:
 - reconfigured ferry service;
 - water taxi/passenger ferry;
 - public transport improvements;
 - measures to promote walking and cycling;
 - drill and blast tunnel; and
 - a high level bridge.
- The detailed appraisal should be undertaken by a team of environmental, economic, technical and health experts and with stakeholder involvement, where appropriate. The team of specialists will be a combination of SIC staff and consultants.
- The options should be considered singly and as bundles of options. For example a reconfigured ferry service or fixed link option, along with improvements to public transport and measures to promote walking and cycling.
- The 'Do Minimum' Option should continue to be appraised alongside these, in order to provide a baseline for comparative purposes.
- Work must continue to progress rapidly to recommend a final preferred option from the STAG process, in order that current uncertainties about the future link are ended. However it is the important that appropriate steps are taken to ensure the process remains rigorous and the findings stand up to scrutiny. Due to the large number of options generated and taken forward to broad appraisal, the study is now due to report in April 2008.
- In addition it is recommended that:

- further consideration is given to the definition of 'affordability' in Shetland by ZetTrans and the Council;
- the Council confirms what available land there is in Lerwick for housing and development and whether there is a shortfall as there appears to be mixed ideas at present;
- the Council considers the strategic land-use transport planning effects of the preferred options as defined by the STAG Part 2 process in the light of their potential impact on Shetland's future (e.g. promoting centralisation/ decentralisation etc).

Annex A

Supporting Documents

Annex A: Supporting Documents

- A B Associates (2007) Economic Impact Assessment of Lerwick Harbour on the Shetland Economy
- British Geological Society (1988) Hydrogeological Map of Scotland Scale 1:625,000. BGS and Association of Inspectors and River Inspectors of Scotland (1995) Groundwater Protection Strategy for Scotland. ADRIS
- DEFRA (was DETR) (2000), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Working Together for Clean Air. DETR, London
- DTZ Piedad Consulting (2004), Economic Impact of a Bridge to Bressay
- Lerwick Port Authority - Key Strategic Objectives. Available: <http://www.lerwick-harbour.co.uk/pdfs/stratbusplan.pdf>
- Maritime and Coastguard Agency, Code of Practice for the construction, machinery, equipment, stability and operation of Chain/wire ferries, carrying passengers and vehicles, Rev 07/02
- Research into Deprivation and Social Exclusion in Shetland. Available: <http://www.shetland.gov.uk/communityplanning/SocialExclusion.asp>
- River Quality Classification (2005 Data). Available: www.sepa.org.uk
- Scottish Environment Protection Agency Interactive Flood Map, 2008. Available: <http://www.sepa.org.uk/flooding/mapping/>
- Scottish Executive (1998) Transport White Paper, Travel Choices for Scotland
- Scottish Executive (2003) STAG: Scottish Transport Appraisal Guidance
- Scottish Executive (2004) Transport White Paper, Scotland's Transport Future
- Scottish Executive (2006) Scotland's National Transport Strategy
- Scottish Government website. Available: <http://www.scotland.gov.uk/>
- Scottish Natural Heritage (1998) Shetland Landscape Character Assessment, Review Number 93
- Shetland Community Plan. Available: www.shetland.gov.uk/communityplanning/
- Shetland Islands Council (2003) Bressay Bridge Environmental Statement
- Shetland Islands Council (2004). Shetland Local Plan. Available: <http://www.shetland.gov.uk/developmentplans/shetlandlocalplan.asp>
- Shetland Islands Council. Shetland Islands Council Corporate Plan, 2008-11
- Shetland Islands Council ferry and bus timetables. Available: www.shetland.gov.uk/transport/
- Shetland Transport Strategy. Available: www.shetland.gov.uk/transport/stp/transportstrategy/documents/RTSAPPROVEDDR_AFT070330.pdf
- www.jura.rcahms.gov.uk/PASTMAP/Map

- www.scottishairquality.co.uk
- www.scottishgeology.com

Annex B

First Stage Consultation Report

Annex C

Bressay Link: STAG Strategic Issues and Objectives
Workshop

Annex D

Bressay Link: Option Generation and Initial Appraisal
Workshop Report

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