Shetland Inter-Island Transport Study

Strategic Business Case - Options Appraisal Report

On behalf of **Shetland Islands Council**

Project Ref: 35580 | Rev: SC | Date: November 2016

Office Address: 3rd Floor, Exchange Place 3, 3 Semple Street, Edinburgh EH3 8BL
T: +44 (0)131 297 7010 E: scotland@peterbrett.com

Document Control Sheet

Project Name: Shetland Inter-Island Transport Study

Project Ref: 35580

Report Title: Strategic Business Case - Options Appraisal Report

Date: 24 November 2016

	Name	Position	Signature	Date
Prepared by:	Stephen Canning	Associate – Transport Planner	SC	13/06/2016
Reviewed by:	Dr Scott Leitham	Senior Associate	SL	17/06/2016
Approved by:	Dr Scott Leitham	Senior Associate	SL	17/06/2016
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
V3.0	19/07/16	First full draft taking account of all SIC comments	SC	SL	SL
V4.0	07/10/16	Draft final report taking account of SIC comments and updated fixed links material	SC	SL	SL
FINAL	24/11/16	Final report taking account of SIC comments	SC	SL	SL

Peter Brett Associates LLP disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Peter Brett Associates LLP accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Peter Brett Associates LLP 2016

Contents

1 Introduction 9
1.1 This Report 9
1.2 The Shetland Inter-Island Transport Network 9
1.3 Project Overview 10
1.4 Appraisal Methodology 11
1.5 Consultation 18
2 Vessels 20
2.1 Vessel Replacement Strategy 20
2.2 Vessel Characteristics – Key Assumptions 22
2.3 Phasing & Cascade of Vessels 25
2.4 Assumptions and Packaging of Capital & Revenue Options 26
2.5 Other Investment Related to the Ferry Service 26
3 Air Infrastructure Options 27
3.1 Overview 27
3.2 Accountable Management 27
3.3 Current and Potential Aircraft 28
3.4 Navigational Aids 35
3.5 Mainland Airfield 38
3.6 Use of Existing Assets & Resources 41
3.7 Appraisal of Capital Options 42
4 Bluemull Sound 49
4.1 Capital Investment Timeframe 49
4.2 Identified Problems 49
4.3 Appraisal of Capital Options 52
4.4 Appraisal of Revenue Options 60
4.5 Annual Operating Cost Estimates 63
4.6 Public Consultation – Prioritisation 64
4.7 Rationale for Selection / Rejection 67
5 Bressay 69
5.1 Capital Investment Timeframe 69
5.2 Identified Problems 69
5.3 Appraisal of Capital Options 70
5.4 Appraisal of Revenue Options 75
5.5 Annual Operating Cost Estimates 77
5.6 Public Consultation – Prioritisation 79
5.7 Rationale for Selection / Rejection 81
6 Fair Isle 83
6.1 Capital Investment Timeframe 83

6.2 Identified Problems 83
6.3 Appraisal of Capital Options 85
6.4 Appraisal of Revenue Options 92
6.5 Annual Operating Cost Estimates 95
6.6 Public Consultation – Prioritisation 97
6.7 Rationale for Selection / Rejection 98
7 Foula 100
7.1 Capital Investment Timeframe 100
7.2 Identified Problems 100
7.3 Appraisal of Capital Options 102
7.4 Appraisal of Revenue Options 106
7.5 Annual Operating Cost Estimates 110
7.6 Public Consultation – Prioritisation 110
7.7 Rationale for Selection / Rejection 112
8 Papa Stour 113
8.1 Capital Investment Timeframe 113
8.2 Identified Problems 113
8.3 Appraisal of Capital Options 114
8.4 Appraisal of Revenue Options 117
8.5 Annual Operating Cost Estimates 121
8.6 Public Consultation 122
8.7 Rationale for Selection / Rejection 122
9 Skerries 124
9.1 Capital Investment Timeframe 124
9.2 Identified Problems 124
9.3 Appraisal of Capital Options 126
9.4 Appraisal of Revenue Options 130
9.5 Annual Operating Cost Estimates 135
9.6 Public Consultation 136
9.7 Rationale for Selection / Rejection 137
10 Whalsay 138
10.1 Capital Investment Timeframe 138
10.2 Identified Problems 138
10.3 Appraisal of Capital Options 141
10.4 Appraisal of Revenue Options 146
10.5 Annual Operating Cost Estimates 150
10.6 Public Consultation – Prioritisation 151
10.7 Rationale for Selection / Rejection 153
11 Yell 155
11.1 Capital Investment Timeframe 155
11.2 Identified Problems 155

11.3 Appraisal of Capital Options 156
11.4 Appraisal of Revenue Options 160
11.5 Annual Operating Cost Estimates 164
11.6 Public Consultation – Prioritisation 165
11.7 Rationale for Selection / Rejection 167
12 Financial Summary 168
12.1 Introduction 168
12.2 Bluemull Sound 168
12.3 Bressay 169
12.4 Fair Isle 170
12.5 Foula 171
12.6 Papa Stour 172
12.7 Out Skerries 173
12.8 Whalsay 174
12.9 Yell 175
List of Abbreviations 176

Figures

Figure 1.1: Shetland Islands Council Ferry Routes 9
Figure 3.1: Cessna 208 Caravan 31
Figure 4.1: Bluemull Sound Annual Revenue Cost Estimates 64
Figure 4.2: Unst – Prioritisation of Enhancements 65
Figure 4.3: Unst – Other Issues Raised (Frequency) 66
Figure 4.4: Fetlar – Prioritisation of Enhancements 66
Figure 4.5: Fetlar – Other Issues Raised (Frequency) 67
Figure 5.1: Bressay Annual Revenue Cost Estimates 79
Figure 5.2: Bressay – Prioritisation of Enhancements 80
Figure 5.3: Bressay – Other Issues Raised (Frequency) 81
Figure 6.1: Fair Isle Annual Revenue Cost Estimates 96
Figure 6.2: Fair Isle – Prioritisation of Enhancements 97
Figure 6.3: Fair Isle – Other Issues Raised (Frequency) 98
Figure 7.1: Foula – Prioritisation of Enhancements 111
Figure 7.2: Foula – Other Issues Raised (Frequency) 111
Figure 8.1: Papa Stour Annual Revenue Cost Estimates 122
Figure 9.1: Skerries Annual Revenue Cost Estimates 136
Figure 10.1: Whalsay Annual Revenue Cost Estimates 151
Figure 10.2: Whalsay – Prioritisation of Enhancements 152
Figure 10.3: Whalsay – Other Issues Raised (Frequency) 153
Figure 11.1 Yell Annual Revenue Cost Estimates 165
Figure 11.2: Yell – Prioritisation of Enhancements 166
Figure 11.3: Yell – Other Issues Raised (Frequency) 167

Tables

Table 1.1: Bottom-Up Fixed Link Cost and Appraisal Cost Estimates 14
Table 2.1: Candidate Vessels 23
Table 2.2: Estimated Vessel Costs 24
Table 3.1: Air Capital Options from SIITS Pre-Appraisal Report 43
Table 3.2: Air Capital Options – Appraisal against Objectives 44
Table 3.3: Air Capital Options – Appraisal against STAG Criteria 45
Table 3.4: Outcome of Appraisal, Air Services 47
Table 4.1: Fetlar Transport Problems 50
Table 4.2: Unst Transport Problems 51
Table 4.3: Bluemull Sound Capital Options – Appraisal against Objectives 55
Table 4.4: Bluemull Sound Capital Options – Appraisal against STAG Criteria 57
Table 4.5: Bluemull Sound Revenue Options – Appraisal against Objectives 61
Table 4.6: Bluemull Sound Revenue Options – Appraisal against STAG Criteria 62
Table 4.7: Bluemull Sound Revenue Costs 63
Table 4.8: Outcome of Appraisal, Bluemull 68
Table 5.1: Bressay Transport Problems 69
Table 5.2: Bressay Capital Options – Appraisal against Objectives 73
Table 5.3: Bressay Capital Options – Appraisal against STAG Criteria 74
Table 5.4: Bressay Revenue Options – Appraisal against Objectives 76
Table 5.5: Bressay Revenue Options – Appraisal against STAG Criteria 77
Table 5.6: Bressay Revenue Costs 78
Table 5.7: Outcome of Appraisal, Bressay 82
Table 6.1: Fair Isle Transport Problems 83
Table 6.2: Fair Isle Capital Options – Appraisal against Objectives 88
Table 6.3: Fair Isle Capital Options – Appraisal against STAG Criteria 90
Table 6.4: Fair Isle Revenue Options – Appraisal against Objectives 93
Table 6.5: Fair Isle Revenue Options – Appraisal against STAG Criteria 94
Table 6.6: Current Fair Isle Operating Costs 95
Table 6.7: Outcome of Appraisal, Fair Isle 99
Table 7.1: Foula Transport Problems 100
Table 7.2: Foula Capital Options – Appraisal against Objectives 104
Table 7.3: Foula Capital Options – Appraisal against STAG Criteria 105
Table 7.4: Foula Revenue Options – Appraisal against Objectives 107
Table 7.5: Foula Revenue Options – Appraisal against STAG Criteria 108
Table 7.6: Outcome of Appraisal, Foula 112
Table 8.1: Papa Stour Transport Problems 113
Table 8.2: Papa Stour Capital Options – Appraisal against Objectives 115
Table 8.3: Papa Stour Capital Options – Appraisal against STAG Criteria 116
Table 8.4: Papa Stour Revenue Options – Appraisal against Objectives 118
Table 8.5: Papa Stour Revenue Options – Appraisal against STAG Criteria 120
Table 8.6: Papa Stour Revenue Budget 2015-16 121
Table 8.7: Outcome of Appraisal, Papa Stour 123
Table 9.1: Skerries Transport Problems 124
Table 9.2: Skerries Capital Options – Appraisal against Objectives 128
Table 9.3: Skerries Capital Options – Appraisal against STAG Criteria 129
Table 9.4: Skerries Revenue Options – Appraisal against Objectives 131
Table 9.5: Skerries Revenue Options – Appraisal against STAG Criteria 133
Table 9.6: Skerries Costs 135
Table 9.7: Outcome of Appraisal, Skerries 137
Table 10.1: Whalsay Transport Problems 138
Table 10.2: Whalsay Capital Options – Appraisal against Objectives 143
Table 10.3: Whalsay Capital Options – Appraisal against STAG Criteria 144

Table 10.4: Whalsay Revenue Options – Appraisal against Objectives 147
Table 10.5: Revenue Options – Appraisal against STAG Criteria 149
Table 10.6: Whalsay Costs 150
Table 10.7: Outcome of Appraisal, Whalsay 154
Table 11.1: Yell Transport Problems 155
Table 11.2: Yell Capital Options – Appraisal against Objectives 158
Table 11.3: Yell Capital Options – Appraisal against STAG Criteria 159
Table 11.4: Yell Revenue Options – Appraisal against Objectives 161
Table 11.5: Yell Revenue Options – Appraisal against STAG Criteria 163
Table 11.6: Yell Sound Costs 164
Table 11.7: Outcome of Appraisal, Yell 167
Table 12.1: Summary of Ferry Options Costs – Bluemull Sound 168
Table 12.2: Summary of Ferry Options Costs – Bressay 169
Table 12.3: Summary of Ferry Options Costs – Fair Isle 170
Table 12.4: Summary of Ferry Options Costs – Foula 171
Table 12.5: Summary of Ferry Options Costs – Papa Stour 172
Table 12.6: Summary of Ferry Options Costs – Skerries 173
Table 12.7: Summary of Ferry Options Costs – Whalsay 174
Table 12.8: Summary of Ferry Options Costs – Yell 175

Appendices

Appendix A: Sumburgh versus Tingwall

Appendix B: Fixed Links Paper

Appendices C-J: Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings

Appendix C: Bluemull Sound

Appendix D: Bressay

Appendix E: Fair Isle

Appendix F: Foula

Appendix G: Papa Stour

Appendix H: Skerries

Appendix I: Whalsay

Appendix J: Yell

Appendix K: Harbour Costings

This page is intentionally blank

1 Introduction

1.1 This Report

1.1.1 This Report forms the second part of the Strategic Business Case for the Shetland Inter-Island Transport Study (SIITS). It follows the '*Strategic Business Case - Pre-Appraisal Report*' which developed and sifted a range of options, in response to a combination of network wide and island specific problems, issues and opportunities. The two reports taken together form the full Strategic Business Case. A PowerPoint based summary of the main findings is provided alongside this report.

1.2 The Shetland Inter-Island Transport Network

1.2.1 The Shetland inter-island transport network, which consists of a combination of ferry and air services, connects nine islands[1] with Shetland mainland, either directly or via another island. These lifeline connections support the economies of Shetland's island communities as well as providing personal accessibility to employment opportunities and access to key services such as education, health and leisure opportunities. A map of the ferry network is shown below, with air services additionally operating to Fair Isle, Foula, Papa Stour and Skerries (currently suspended), predominantly from the hub airport of Tingwall, which lies to the west of Lerwick:

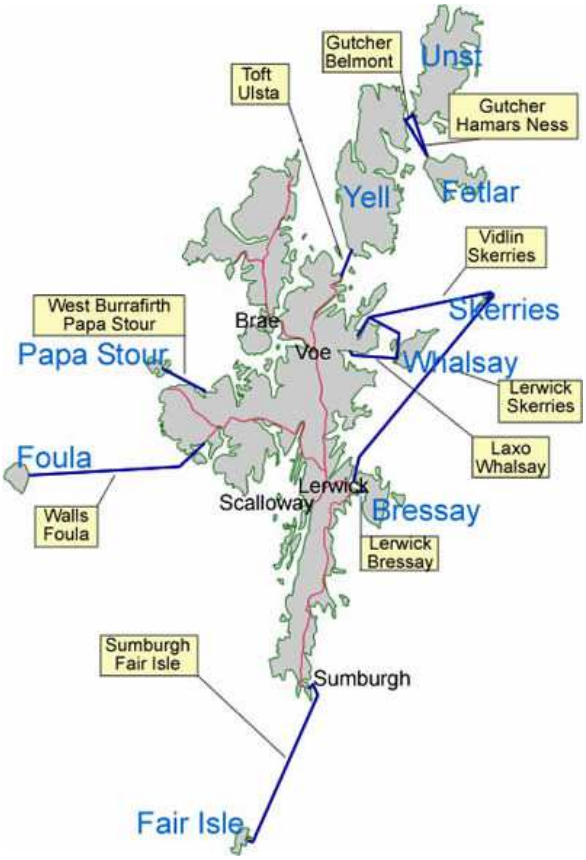


Figure 1.1: Shetland Islands Council Ferry Routes

[1] Bressay, Fair Isle, Fetlar, Foula, Papa Stour, Skerries, Unst, Whalsay and Yell.

1.2.2 The inter-island transport network has been supported in both capital and revenue terms by the Council over many years, with the inter-island ferry network in particular acknowledged to be of a very high standard. Whilst this remains the case, ageing assets, escalating costs and a reduction in the funding available at the local authority level has led to a need to consider the future of the inter-island transport network at the strategic level. To this end, the Council, in partnership with Highlands & Islands Enterprise and Transport Scotland, commissioned the Shetland Inter-Island Transport Study (SIITS), with a view to developing and appraising options for the future of the inter-island transport services.

1.3 Project Overview

1.3.1 The purpose of this phase of the Shetland Inter-Island Transport Study (SIITS) is to undertake a proportionate Scottish Transport Appraisal Guidance (STAG) based options appraisal across the internal Shetland air and ferry network. The overall approach to this options appraisal is to analyse each island in turn considering current and future connectivity needs in the light of the current provision of vessels, harbours, services, aircraft, airstrips and human resources. This island-level analysis is however set within a network-wide context to ensure a consistency of approach across the Shetland Islands.

1.3.2 The output of this process is a **set of capital and revenue options for each island**, which have been subjected to a proportionate initial appraisal process. The intention is that this subset of options will be taken forward to a more detailed analysis leading to the selection of a preferred option in each case. Given the network coverage (serving nine islands), the analysis and outputs of the appraisal is **proportionate** to the wide geographic nature of the study.

1.3.3 It is important to note that the air and ferry services provide lifeline connections where there is no alternative should the service fail. This study is ultimately concerned with developing a long-term strategy to provide certainty and ensure the financially sustainable continuity of services in line with the needs of each of the island communities.

Business Case Context

1.3.4 Transport Scotland has published 'Guidance on the Development of Business Cases' (January 2016). There are three main stages to this:

- Stage 1 - Scoping: Strategic Business Case (SBC) – analyses a variety of options which tackle the problems, issues and objectives identified;
- Stage 2 – Planning: Outline Business Case (OBC) – identifies the Preferred Option; and
- Stage 3 – Procurement: Final Business Case (FBC) – undertaken during procurement phase.

1.3.5 Overall, the Business Case development process comprises the H.M. Treasury so-called 'five-case model' as follows:

- The Strategic Case – making the case for change;
- The (socio) Economic Case – optimising value for money in terms of economic, social and environmental impacts;
- The Commercial Case – commercial viability;
- The Financial Case – financial viability; and
- The Management Case – achievability.

1.3.6 The STAG process is seen as forming the substantive part of the **SBC**. In this context, STAG (and hence this study) will provide the SBC for the future development of Shetland Inter-Island transport links.

1.3.7 The STAG also provides key inputs to the Strategic and (socio) Economic cases of the OBC, where these will be revisited / refreshed if necessary. A parallel workstream is being undertaken by Shetland Islands Council (SIC) and Transport Scotland which will ultimately inform the Commercial, Financial and Management cases and this material can be brought together to form the OBC. The OBC is therefore analogous to a Transport Connectivity Plan for Shetland.

1.3.8 Any individual element of this Connectivity Plan / OBC will ultimately require an FBC prior to any investment being made.

1.3.9 This study therefore provides the Strategic Business Case for the future of Shetland Internal Air and Ferry services. It will also consider the case for fixed links where appropriate. A broad investment timescale for each island will be included as part of the analysis.

1.4 Appraisal Methodology

Overview

1.4.1 This section establishes the approach to the appraisal, setting out how STAG has been applied in the context of this study. There were a number of challenges in the application of the guidance in this context and it is necessary to set these out here and explain how they have been addressed.

Ensuring a Proportionate Approach

1.4.2 This section sets out how a number of the challenges presented by the study scope and scale have been addressed.

Study Scale

1.4.3 The principal challenge with this study is that it is attempting to appraise options for nine very different islands in a consistent and coherent fashion. Given the scale of the study and its strategic nature, the study inputs and appraisal do not provide the level of depth that a 'stand-alone' STAG study would provide. Indeed, we have drawn on previous work undertaken in Shetland to help inform this study. As set out in the previous chapter, there will need to be further development of the shortlist of options at the OBC stage.

Case for Investment

1.4.4 A STAG appraisal is generally commissioned on the basis of one or more 'problems' which are seen to be inhibiting the performance of the transport network, with a consequential impact on the local, regional and / or national economy. The identified problems form the basis of the objectives, which in turn are used as part of the appraisal of options.

1.4.5 SIITS follows this approach in principle but is also a wider strategy for the future of the inter-island transport network. It therefore considers islands where the options are generally more focussed on asset replacement at life expiry, rather than necessarily being investment to address a specific transport problem. It may therefore be that what will emerge as the 'preferred option' for a certain island in the OBC actually does little to contribute incrementally towards the objectives and STAG criteria (these may already be being met by the current service), rather it ensures continuity of service through asset replacement, without which the island economy would be unable to function.

Timescales & Phasing

1.4.6 Linked to the above point, it should be borne in mind that SIITS is taking a 30 year view of the future of inter-island transport in the Shetland Islands. For a subset of the islands under consideration, capital investment may not be required immediately, although all assets will need to be replaced in the medium-term at the latest (with some assets requiring urgent replacement). The study sets out a phased approach to investment in the options which at this stage are considered appropriate for each of the islands. However, given the longevity of the study horizon, it will be important to revisit and confirm that the options remain the most appropriate in the OBC, particularly for medium to long-term options.

1.4.7 It should be noted that this study does not include consideration of the costs of maintaining existing assets. However, shoreside infrastructure will need to be replaced at life expiry and there may be a need for vessel life extension works. However, the costs included in this study are only for enhancements to existing infrastructure.

Do Minimum & Reference Case

Capital Options

1.4.8 Two options for defining the 'Do Minimum' for capital investment were considered:

- Option 1: Maintain and continue to operate the existing assets until life expiry. The appraisal would factor in the increasing costs and risks associated with continuing to operate these assets. However, there would come a point where they simply could not continue to be operated and the service would cease. This approach, which is akin to a 'Do Nothing', was the position adopted by Transport Scotland in the Forth Replacement Crossing (FRC) appraisal.

- Option 2: Assume that capital assets are replaced on a like-for-like basis at the point of life expiry (nominally assumed to be 30 years).

1.4.9 It should be noted that the choice of Do Minimum impacts only on the absolute rather than the relative performance of options in the appraisal – i.e. any option compared to the equivalent of a 'Do Nothing' would perform relatively better than when compared to a like-for-like replacement.

1.4.10 After detailed consideration, we have assumed the **Do Minimum in relation to capital options is like-for-like replacement at life expiry**.

1.4.11 The Reference Case and Do Minimum are considered to be one and the same in the context of this study as there is no committed investment in the air or ferry service at present (although there is a commitment in the Islands Prospectus to consider the funding needs of inter-island transport).

Revenue Options

1.4.12 The Do Minimum and Reference Case in relation to revenue options are assumed to be continuation of present day funding (although not necessarily using the same funding mechanism as that applied currently).

1.4.13 However, the Council has raised an important wider question which has to be accounted for. A declining funding position led to the Council reducing the ferries budget from 2013. The main impact of this was a reduction in weekend services on the main Ro-Ro routes and the withdrawal of through night manning on Yell Sound. Feedback from communities suggests that this had a negative impact in terms of accessibility, social inclusion and the viability of the isles as places to live, work and carry out business. The Council therefore notes that the pre-

cuts revenue funding position could be considered as an alternative Do Minimum. Indeed, the Council has expressed concern that even the current level of service cannot be sustainably delivered with the revenue resource available from financial year 2017/18 onwards.

Fixed Links

1.4.14 The potential for the construction of fixed links across Shetland has been considered over the years, with options for Bressay, Bluemull Sound (Unst – Yell), Whalsay and Yell developed to different levels of detail. Whilst fixed link options are considered in this appraisal, it is important to set out the wider context for such connections at the outset.

Initial Cost Estimates

1.4.15 Much of the debate around fixed links has centred on their cost *vis-a-vis* two-three cycles of ferry replacement & operation. The case which has been made is that, in addition to the connectivity benefits it would bring, in the longer-term, a fixed link would be a lower cost option than continuing to operate ferry services. The development of up-to-date cost estimates was therefore a key first step in the study.

1.4.16 The initial step in this process was the development of a Fixed Links Working Paper, which was prepared by Donaldson Associates in late 2015. This paper reviewed the previous technical and costing work undertaken for the four proposed fixed links and set out for each the:

- the levels of supporting technical information available;
- the completeness (or otherwise) of any engineering design;
- the level of due process as per H.M. Treasury requirements, regarding risks & uncertainty and whether a project risk register, quantitative risks assessment and risk mitigation had been prepared; and
- costs / cost ranges.

1.4.17 The proposed Bressay fixed link was the most well-developed of the four in terms of design, risk mitigation and costs, and in particular, ground investigation work had been undertaken there. The costs of this fixed link were therefore used as the basis of *pro-rata* cost estimates for the proposed Bluemull Sound, Whalsay and Yell Sound fixed links, where there is considerably less technical certainty / underpinning design work.

1.4.18 The initial cost estimates were therefore all based on the November 2008 Bressay price and factored up to November 2015 prices using a series of industry indices. Contingency and optimism bias were then applied as set out in the H.M. Treasury Green Book to provide out-turn cost estimates.

Bottom-Up Costs

1.4.19 In order to provide an entirely fresh and more robust perspective, the Council and the study team took the view that the engagement of tunnelling contractors in a 'bottom-up' costing exercise, providing up-to-date (i.e. 2016) costs would be beneficial to the process. Therefore, in May 2016 SIC further commissioned Donaldson Associates to engage with the market place and secure up-to-date cost estimates for the proposed fixed links. The resulting paper is included in Appendix B.

1.4.20 Donaldson Associates approached a number of UK tunnelling contractors and one Norwegian tunnelling contractor and asked whether they would provide independent 2016 cost estimates for the four proposed fixed links. After some negotiation, one UK contractor and one Norwegian contractor agreed to provide 'bottom-up' cost estimates for the Bressay fixed link only, based on the design produced by Donaldson Associates in 2008.

1.4.21 All the contractors who were approached declined to offer cost estimates for the other fixed links due to the absence of geological and other technical engineering information. The typical cost per metre for providing a fitted-out running tunnel based on the Bressay design was then applied on a pro-rata basis to the nominal lengths of the other three fixed links.

1.4.22 In relation to the Bressay tunnel, contingency of 10% and optimism bias of 12.6% were applied. The figures are moving towards their lower bounds due to the significant amount of technical development work which has previously been undertaken on the Bressay fixed link. This is in contrast to the other fixed links, which include contingency of 20% and optimism bias of 66% (i.e. fully unmitigated) due to their high level of technical uncertainty.

1.4.23 The table below provides the resulting **cost** and **appraisal cost** estimates for each fixed link (the latter including contingency and optimism bias). Estimates are provided for a tunnel without secondary lining and for a tunnel with 1/3 secondary lining (to provide an indication of the cost implication of providing a secondary lining in the tunnel). Note that it is a HM Treasury Green Book requirement that it is the appraisal costs which are used in appraisal.

Table 1.1: Bottom-Up Fixed Link Cost and Appraisal Cost Estimates

	Cost Estimate: Unlined		Cost Estimate: 1/3 Length Lined		Appraisal Cost: Unlined (Contingency & OB Applied)		Appraisal Cost: 1/3 Lined (Contingency & OB Applied)	
	UK 2016 Bottom-Up (£m)	***NOR 2016 Bottom-Up (£m)***	***UK 2016 Bottom-Up (£m)***	***NOR 2016 Bottom-Up (£m)***	***UK 2016 Bottom-Up (£m)***	***NOR 2016 Bottom-Up (£m)***	***UK 2016 Bottom-Up (£m)***	***NOR 2016 Bottom-Up (£m)***
Bressay	£21.1	£16.8	£22.5	£17.8	£25.9	£20.6	£27.5	£21.8
Bluemull Sound	£71.2	£56.8	£75.9	£60.0	£132.5	£105.7	£141.0	£111.6
Yell Sound	£95.6	£76.3	£101.8	£80.5	£177.9	£141.9	£189.4	£149.8
Whalsay	£108.1	£86.3	£115.1	£91.0	£201.0	£160.4	£214.1	£169.3

Note that these costs exclude items that are not directly part of the tunnel such as portals, connecting road links, land acquisition, further ground investigation and design fees.

1.4.24 The costs set out in the table above are quoted in the island-specific appraisal of options which follow in the succeeding chapters. It is important to bear in mind that there remains a significant lack of certainty over the costs for Bluemull Sound, Yell Sound and Whalsay due to the absence of supporting technical information, principally ground investigation (which is accounted for in the optimism bias).

1.4.25 It is important to note that resources required to undertake the ground investigations which would allow the level of optimism bias associated with the Bluemull Sound, Whalsay and Yell Sound fixed links to be reduced to a level equivalent with Bressay would be significant. The estimated cost for each of the three crossings ranges from £2.5m to £5.0m.

Funding Fixed Links

1.4.26 The costs of the proposed fixed links are just one aspect of the overall discussion surrounding such potential connections. Fixed links have high-up front costs with the benefits accruing over a long period of time (typically assumed to be 60 years in appraisal). This contrasts with ferry and air infrastructure, which tends to have a lower up-front capital cost, albeit there will be perhaps two cycles of replacement over a 60 year period.

1.4.27 The consequence of this is that, where a fixed link is identified as an economically and socially beneficial option (i.e. it has a positive benefit-cost ratio), there remains a question of how it can be funded within existing budgets and the opportunity cost (i.e. other projects not taken forward as a result of spending on the fixed link) of pursuing such a project. This is a key point in the Shetland inter-island context – even where it can be demonstrated that a fixed link is an economically and socially beneficial option, there would remain a question over how such a project would be funded.

1.4.28 Historically, the discussion of fixed links in Shetland was premised on local authority funding. However, the new financial position, and indeed the driver of this study is that the Council cannot sustainably fund the *current* capital and revenue needs of the inter-island transport services. As it is not currently conceivable that the Council will have access to the scale of funds necessary for the construction of fixed links, any case for future funding of fixed links will in all probability have to be made at the national level.

1.4.29 These connections will therefore be competing for funding with other national transport schemes, and would have to be developed in the context of Scottish Government policy and priorities. In addition to competition at the national level, there would also potentially be competition from other fixed link proposals within Scotland.

1.4.30 These points suggest that it would be challenging for a fixed link to be progressed within the lifetime of this study horizon, within the current policy context. The ferry assets in Shetland are, in a number of cases, in need of replacement in the short term. Even if a commitment is made on a fixed link (and getting to this stage could take many years and involve significant investment), the process of obtaining consents, design and construction is lengthy and at least one further cycle of ferry replacement would be required in the interim.

1.4.31 A frequent point also made to support fixed links is that they are less expensive in the long-run because they offset successive rounds of ferry / air replacement and the annual net operating costs associated with these services. Whilst this may be true in arithmetic cash terms, it is important to reiterate that fixed links have a very large upfront cost and thus there is a significant *opportunity cost* associated with them. This is in contrast to successive rounds of ferry & air replacement where the costs occur at various points in the future and are thus significantly discounted (see the next section).

Other Issues

1.4.32 The safety and environmental impact of any fixed link would require very detailed analysis. In addition, if a causeway or bridge was to be pursued, a review of the impact on existing sea lanes would also be required.

1.4.33 Employment in the delivery of air and ferry services is important to a number of the islands and fixed links could impact negatively on this.

1.4.34 There would also be a need for some form of air / ferry contingency in the event of a fixed link being out of commission due to an incident or maintenance.

1.4.35 The above points clearly demonstrate the scale of the challenges that would be faced in pursuing a fixed link even if the appraisal shows that such a link would be positive to one or more of the isles. This is not to rule out fixed links in principle but to highlight the range of funding and timing issues which would have to be addressed in developing these proposals.

Progressing the Fixed Link Debate

1.4.36 This study takes a view on whether the four suggested fixed links should be pursued from a strictly appraisal perspective. However, the case for fixed links and their potentially transformative impact on the islands in question is one that goes beyond conventional appraisal.

1.4.37 There is therefore a wider question as to whether there should be a fixed links policy at a national level. This issue goes beyond the remit for this piece of work and is for the wider consideration of SIC and ZetTrans.

1.4.38 In this context, there are periodic review processes which determine the Scottish Government's priorities for investing in transport projects across the country. The most recent of these was the Strategic Transport Projects Review[2], published in 2008. This Review is scheduled for an update in the near future, in parallel with a review of the National Transport Strategy.

Costs Assumptions and Discounting

1.4.39 In the analysis which follows in this report all costs quoted are in 2016 prices (unless otherwise stated). No discounting has been applied unless stated.

1.4.40 Single year costs have been used at this stage with the exception of the analysis of fixed links where a 60 year discounted cost-benefit analysis has been undertaken. This means that no assumptions have been made regarding the future trajectory of air and ferry costs, e.g. employee costs, fuel prices etc.

1.4.41 A full 60 year discounted appraisal of all options will be developed in the subsequent more detailed OBC. This will also fully account for optimism bias which at this stage for infrastructure projects would be 44%. Ferry prices are not subject to optimism bias in STAG. Fixed link projects begin with an optimism bias figure of 66%. In the tables which follow, optimism bias is not included unless otherwise stated. The purpose of including costs at this stage is to provide a broad order of magnitude of the costs associated with each option. These costs would be further refined for the preferred option at the OBC stage.

1.4.42 Note that as the air services are currently provided via a tendered contract, detailed analysis of the costs associated with the air service is not available. This limits the extent to which the potential cost of providing additional flights can be quantified at this stage.

1.4.43 For the costing of revenue options, the Council has provided the incremental crewing cost of running additional sailings by route on a *pro-rata* basis. These rates have been provided based on four cost variants as follows:

- normal hourly pay rates;
- overtime pay rates;
- unsocial hours pay rates; and
- overtime at unsocial hours pay rates.

1.4.44 In addition, the following assumptions have been made:

- Fares revenue associated with additional sailings is 70% of average yield, i.e., it is not reasonable to assume that increasing sailings by 50% would increase fares revenue by 50%
- There is a 'new vessel effect' of 3% on carryings.
- Where an option increases capacity on a route where there are known constraints, an uplift of 5% in carryings is assumed.

[2] http://www.transport.gov.scot/strategic-transport-projects-review

Harbour Drawings

1.4.45 For each ferry option developed for each island, an indicative drawing and commentary is provided on potentially necessary harbour works. The drawings do not consider investment required to maintain the current assets – any investment suggested is in relation to either rectifying known issues with current infrastructure or in terms of developing / scaling-up to alternative vessel sizes, vessel numbers, overnight positioning etc.

1.4.46 At this SBC stage, the harbour drawings are relatively generic and further detailed design work will be required at the OBC stage. The detailed design will be very much driven by vessel design / specification.

1.4.47 Detailed budget costings have not been fully considered at this stage. The indicative costs provided (which are an order or magnitude based on a series of list assumptions), have been obtained using approximate rates based on Beckett Rankine's experience and information from similar developments within Shetland. These broad costs would require refinement at the OBC stage.

1.4.48 Fees related to design consultancy, surveys and possible required consents / licences have been included as 15% of the total construction costs. Optimism bias and contingency are not included in the costs.

Approach to Environmental Appraisal

1.4.49 The environmental appraisal of the inter-island transport options has followed an approach based on Scottish Transport Appraisal Guidance (STAG). The key stages of the approach involved:

- collation of environmental baseline information including on constraints and designations;
- preparation of environmental constraints plans using a GIS (Geographical Information System);
- analysis of options information (including infrastructure plans) prepared by the study team for each group of island services;
- environmental appraisal of the options;
- reporting of the appraisal;
- consultation with Shetland Islands Council, Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES) on the initial assessments; and
- updates of the appraisals taking account of consultation feedback.

1.4.50 The key environmental constraint and designation data have been primarily drawn from a desk-based review of publicly accessible data sets (e.g. from Scottish Natural Heritage, Historic Environment Scotland etc), from information provided by the local authority, Ordnance Survey mapping and reference to the Local Development Plan (LDP) and associated proposals maps. Information on the emissions profile of the existing fleet of ferries and aircraft was also compiled as part of the preparation of the study's environmental working paper[3]. The key baseline datasets were then presented in the Appraisal Summary Tables (ASTs), which are included as an appendix for each island.

1.4.51 A series of environmental constraints plans were also prepared using GIS to map the principal environmental designations and constraints. These plans were used to inform the appraisal of

[3] Environmental Working Paper (Task 1: Vessels and Aircraft). This note also included baseline information on emissions and fuel use and a review of relevant environmental legislation for ferries and aircraft

options through constraints analysis of the physical infrastructure proposed for airfields and ferry terminals with nearby constraints.

1.4.52 The appraisal of options was generally based on the Part 1 level of STAG appraisal, with some development of the detail where further information was available. Since a large number of options required appraisal, the environment team grouped options with similar characteristics and set out a series of assumptions for each group of options to allow for a consistent appraisal process. These assumptions typically related to vessel fuel efficiency, routes for ferry services, locations of harbour works etc.

1.4.53 The appraisal also took into account information provided by the team on the characteristics of existing and potential future ferries and aircraft, which was drawn from various technical reports prepared during the study by the marine and aviation specialists. The appraisal was undertaken for each of the environmental sub-criteria, taking account of baseline sensitivities and identifying a predicted impact level based on the seven-point scale from STAG adopted for the study. The findings of the appraisal are recorded in the ASTs, which are included in appendices referenced in each island chapter.

1.4.54 Consultation was undertaken by the project team on the draft set of transport options in August / September 2016 through a series of public exhibitions and through provision of information on options for comment by the statutory environmental consultees. Feedback received from these consultations was incorporated into the final reporting of the option appraisal.

1.5 Consultation

1.5.1 The options developed were presented to the public at a series of island-based 'drop-in' public engagement sessions during week beginning 29 August 2016, as follows (the figures in brackets are the approximate attendance):

- Monday 29 August: Whalsay (45);
- Tuesday 30 August: Bressay (30);
- Wednesday 31 August: Foula (20) and Fair Isle (22); and
- Thursday 1 September: Yell (45), where the Exhibition also covered Unst and Fetlar.

1.5.2 An exhibition in Out Skerries scheduled for 2 September was cancelled at the last minute due to a death on the island. SIC subsequently independently visited Out Skerries, Unst, Fetlar and Papa Stour.

1.5.3 In each venue a series of bespoke island-specific display boards were exhibited and the public were able to view these at their leisure and discuss issues with the study team, Council Officers and Elected Members. The material outlined the purpose of the study, the current inter-island service, the problems identified and the options being considered.

1.5.4 The events were well attended, as noted above, with a good proportion of the population of each island attending. A *proforma* was available in hard copy which provided the opportunity for the public to comment on the material presented. The material and form was also available online for a period of three weeks following these events where people could view the slides and complete the *proforma*.

1.5.5 The *proforma* asked people to comment on:

(i) any problems associated with the current inter-island air and ferry services – used to validate or otherwise the problems identified by the study and those highlighted at an earlier stage via Community Councils; and

(ii) the options proposed for the future of inter-island air and ferry services, and the initial '*take forward*' / '*reject*' decision presented at the Exhibition – this information has fed into the '*public acceptability*' element of the appraisal.

1.5.6 They were then asked: '*If additional running air and / or ferry operating hours were to be made available, what would be the priorities to improve the service from your perspective?*' and asked to tick up to three of the following 'generic' options (air options for Outer Isles only):

- Air: Departures at the same time each day
- Air: A daily service to / from Lerwick for school children
- Air: Additional Sunday services
- Air: More inter-island connections
- Air: More frequent services across the current operating day
- Air: Greater availability of seats for public
- Ferry: Departures at the same time each day
- Ferry: A daily service to / from Lerwick for school children
- Ferry: Earlier first sailings from the island
- Ferry: An early evening (eg 20:00) sailing to the island
- Ferry: A late evening (eg 22:00) sailing to the island
- Ferry: Additional Sunday services
- Ferry: First sailing from the island
- Ferry: First sailing from the mainland
- Ferry: Longer operating period for Summer timetable
- Ferry: More direct rather than indirect services
- Ferry: More inter-island connections
- Ferry: More frequent services across the current operating day
- Other: Please Specify

1.5.7 The purpose of this exercise was to identify firm priorities in terms of the future services for each individual island which will provide evidence to focus future use of resources. The results from this are outlined in the chapters which follow. Note that the results from this process encapsulate the improvements to connectivity people prioritise – there may be more than one way of delivering these improvements in terms of assets and timetables.

1.5.8 The completed *proformas* provide a wealth of views and qualitative and quantitative information. This information can be used in the ongoing appraisal of the options and eventual service planning, and has been provided in full to the Council.

1.5.9 Note that the Skerries community provided a separate bespoke response in place of the public *proformas*. In addition, insufficient *proformas* were returned from Papa Stour (given the very low population) to make a meaningful analysis.

2 Vessels

2.1 Vessel Replacement Strategy

2.1.1 A key part of the appraisal has been an independent assessment of vessel options for each route. The ferry service meets the lifeline need of the majority of islands. Ensuring an appropriate vessel replacement strategy is fundamental to the economic wellbeing and long-term sustainability of these communities.

Vessel Berthing Systems

2.1.2 This research undertaken by our maritime team has noted that the current 'Norwegian' system of drive through ferries and automated locking type linkspans (on the main routes) represents global best practice and should be continued and developed where possible.

2.1.3 In this appraisal, it is therefore assumed that, where this operating system is currently in place, it will be carried forward for the next 30 years and no other system is considered further.

Categorisation of Waters & Class of Vessels

2.1.4 There are four categories of waters designated by the UK Maritime & Coastguard Agency (MCA) are as follows:

- Category A: Narrow Rivers and canals where the depth of water is generally less than 1.5 metres.
- Category B: Wider rivers and canals where the depth of water is generally 1.5 metres or more and where the significant wave height could not be expected to exceed 0.6 metres 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 1.2 metres at any time.
- Category D: Tidal rivers and estuaries where the significant wave height could not be expected to exceed 2.0 metres at any time.

2.1.5 These categorisations apply specifically to the operation of Class IV, V and VI Passenger Ships and also determine which waters are not regarded as 'open sea' for the purposes of regulations made, or treated as made, under Section 85 of the UK Merchant Shipping Act 1995. Three Council ferry routes come within categorised waters; namely Toft - Ulsta, Belmont - Gutcher and Lerwick - Bressay, which all come under Category D. All other routes are considered open sea. This has a bearing on the vessels required for these routes.

2.1.6 Where economically and financially practical, vessels should meet the same Class rules of construction instead of the present regime which has differences of classifications for different routes, weather or time of year. This causes management problems and is limiting in operational terms. As a result, at present some vessels are largely confined to their present trading routes.

2.1.7 These restrictions may cover:

- Where the ship operates - a ship with a Class VI(A) certificate can operate no more than three miles from land.

- When a ship operates - a ship with a Class VI certificate cannot operate in winter or at night; the ship will not be a qualifying ship.

- How many passengers may be carried - a ship with a Class VI(A) certificate cannot carry more than 50 passengers.

2.1.8 Current ferries that have been issued with these certificates are only certificated for navigation at sea if they are operating in accordance with the restrictions set out in their trading certificate. This means that a ship with a Class VI certificate is not certified as seagoing if it is operational in winter or at night, although a Class VI(A) allows for operation with lower passenger numbers. Circumventing these restrictions requires a Class II(A) vessel (ships engaged on voyages of any kind other than international voyages, which are not ships of Classes III to VI (A)).

2.1.9 More recently EU class has come into force (although the MCA classification can still apply in domestic waters) and new builds should comply with the EU directive for the relevant class listed below:

- EU Class A means a passenger ship engaged on domestic voyages other than voyages covered by Classes B, C and D.

- EU Class B means a passenger ship engaged on domestic voyages in the course of which it is at no time more than 20 miles from the line of the coast, where shipwrecked persons can land, corresponding to the medium tide height.

- EU Class C means a passenger ship engaged on domestic voyages in sea areas where the probability of exceeding 2.5m significant wave height is smaller than 10% over a one-year period for all-year round operation, or over a specific restricted period of the year for operation exclusively in such period (e.g. summer period operation), in the course of which, it is at no time more than 15 miles from a place of refuge, nor more than 5 miles from the line of the coast, where shipwrecked persons can land, corresponding to the medium tide height.

- EU Class D means a passenger ship engaged on domestic voyages in sea areas where the probability of exceeding 1.5m significant wave height is smaller than 10% over a one-year period for all-year round operation, or over a specific restricted period of the year for operation exclusively in such period (e.g. summer period operation), in the course of which, it is at no time more than 6 miles from a place of refuge, nor more than 3 miles from the line of the coast, where shipwrecked persons can land.

2.1.10 The winter restriction of passenger numbers (between October and April) placed on all but the EU B vessels can be up to around 33% and is in force irrespective of the sea state. When considering looking at new vessels, these restricted vessels should be avoided where economically and financially practical and EU B vessels should ideally be the way to proceed as this will ensure a consistent lifeline service all year round.

Route Hierarchy

2.1.11 In terms of volumes and scale, the Shetland inter-island ferry network can perhaps be thought of in three main tiers, shown below together with the vessels currently deployed:

- Tier 1:
  - Yell Sound (2 * 65m / 31 pcu vessels)
- Tier 2:
  - Bluemull Sound (1 * 33m / 14 pcu vessel & 1 * 30m / 10 pcu vessel)

- Bressay (32m / 19 pcu vessel)
- Whalsay (1 * 34m / 12 pcu vessel & 1 * 36m / 18 pcu vessel)

- Tier 3 (Ro-Ro):
  - Skerries (35m / 9 pcu vessel)
  - Papa Stour (24m / 6 pcu vessel)
- Tier 3 (Lo-Lo):
  - Fair Isle (18m / 1-2 pcu vessel)
  - Foula (10m / 1 pcu vessel)

2.1.12 The current fleet therefore comprises a range of different, although to a large extent interchangeable, vessels which have emerged in response to evolving designs over time and the bespoke requirements of some routes. Some of these vessels have restricted categorisations which place seasonal restrictions on passenger numbers and / or class of waters in which the vessel can operate.

2.1.13 In broad terms, when considering the future of the ferry network over the next 30 years, there are perhaps two main strategies which could be adopted.

- **Strategy 1**: Replace vessels on a piecemeal and minimum cost / specification basis with vessels which are sometimes bespoke to individual routes. This would maintain the restrictions associated with all of the current non-Class IIA / EU B vessels (on Bluemull Sound, Bressay and Whalsay (MV *Hendra*) and the current cargo vessel (Papa Stour) and workboats (Fair Isle and Foula). Larger versions of the existing vessels could be commissioned to cater for any capacity restrictions.

- **Strategy 2**: Work towards a vessel replacement programme that offers broadly interchangeable vessel types with a Class IIA / EU B certification (unless this is clearly disproportionate, in which situation a bespoke vessel would be procured). A fleet of interchangeable vessels would provide interchangeability between routes / crew etc and would also potentially give rise to scale economies in terms of the capital and ongoing revenue costs. It is worth noting that the ship construction requirements of a passenger ship of Class III or lower are less than that of a Class IIA / EU B, an issue which would factor into the cost-benefit ratio, which would be calculated in the subsequent OBC.

2.1.14 Strategy 1 may represent a lower cost option in the short term, when taking into account additional stability criteria, sub divisions etc associated with EU B vessels. However, in the long run, Strategy 2 would save costs on maintenance, allow widespread substitution of vessels on different routes, allow crew training to be modular and generic, and enable similar scale and consistency benefits in terms of landside infrastructure.

2.1.15 The vessels review **recommends a move towards Strategy 2** for the SIC network where this is appropriate and proportionate. Bespoke vessels will be adopted for other routes where Strategy 2 would clearly be disproportionate, Foula and Fair Isle for example.

2.2 Vessel Characteristics – Key Assumptions

2.2.1 In the light of this, a number of 'generic' vessel types have been considered and it is helpful to consider this in the context of the defined 'tiers' above. These generic vessel types are broadly consistent in design with SIC's newest vessels, the MV *Daggri* and MV *Dagalien* as follows.

- EU B / Class IIA 35m double ended (varying pcu and passenger capacity).

- EU B / Class IIA 40-45m double ended (22 pcu / maximum 96 passengers), based on a 'scaled down' *Daggri* / *Dagalien* design.
- EU B / Class IIA 60-65m double ended (31 pcu / maximum 144 passengers), *Daggri* / *Dagalien.*
- EU B / Class IIA 70-75m double ended (50 pcu / maximum 220 passengers), based on a 'scaled up' *Daggri* / *Dagalien* design provided by Remontowa.

2.2.2 It should be noted that the passenger numbers above are the assumed maximum. There would be flexibility with any new vessels to reduce the passenger certification to reduce crew at periods of low demand. For example, the passenger certificate on the MV *Daggri* and MV *Dagalien* could be reduced from 144 to 96 to reduce the crew complement by one.

2.2.3 The strategy would be to allocate these vessels to Tier 1 and 2 routes with Tier 3 routes potentially using these or bespoke vessels. The table below shows each route and vessel together with the 'candidate' vessels to be considered in the context of either a like-for-like replacement (LfL) or where greater capacity is required now or in the future (indicated as +50% although this need not be precisely +50%). As well as length overall (LOA) for the current vessels Gross Tonnage (GT) and fuel consumption (in litres per hour) are shown for reference.

2.2.4 Note that, in this case, a 'like-for-like' vessel would provide a similar carrying capacity to the current vessel. In practice, modern design standards would likely mean that the vessel would be of greater dimensions and hull form than the current vessel.

Table 2.1: Candidate Vessels

	Current Vessels					Candidate Vessels				
Route	**Class EU / MCA**	**Tier**	**Current Vessel**	**LOA(m) /pcu**	**Fuel Cons (l/hr)**	**Small / Bespoke**	**TYPE 1 35m / 15 pcu**	**TYPE 2 40-45m / 22pcu**	**TYPE 3 60-65m / 31pcu**	**TYPE 4 70-75m / 50pcu**
Bluemull	C / IV (winter) & VI or VI(A) in summer	2	Bigga	33 / 14	95	×	LfL	+50%	×	×
Bluemull	C / IV (winter) & VI or VI(A) in summer	2	Geira	30 / 10	95	×	LfL	+50%	×	×
Bressay	NA / IV	2	Leirna	32 / 19	34	✓	✓	✓	+50%	×
Fair Isle	Workboat	3	Good Shepherd	18 / 1	69	✓	×	×	×	×
Foula	Workboat	3	New Advance	10 / 1	29	✓	×	×	×	×
Papa Stour	NA / VIIIA	3	Snolda	24 / 6	101	✓	+50%	×	×	×
Skerries	EU B	3	Filla	36 / 9	225	✓	+50%	×	×	×
Whalsay	C / IV (winter) & VI or VI(A) in summer	2	Hendra	34 / 12	95	×	LfL	+50%	×	×
Whalsay	B (restricted)	2	Linga	36 / 18	150	×	LfL	+50%	×	×
Yell	EU B	1	Dagalien	65 / 31	204	×	×	×	LfL	+50%
Yell	EU B	1	Daggri	65 / 31	204	×	×	×	LfL	+50%

Note – it is assumed that, where practicable, vessels will be designed with the ability to retrofit ramp-based mezzanine decks.

2.2.5 In the chapters which follow, these vessel types are considered in the context of the options appraised for each island. Where a bespoke vessel is thought to be appropriate for the route, the outline specification of this vessel is discussed separately.

Capital Costs

2.2.6 The capital costs of new vessels (shoreside infrastructure will be considered separately) have been developed from a number of sources, as follows:

Table 2.2: Estimated Vessel Costs

Generic Vessel Type	Estimated Cost	Source
Type 1 – 35m	£5.5m	Study estimate, based on scaled down version of Type 3 and comparison with other vessels of similar dimensions.
Type 2 – 45m	£7.0m	Study estimate, based on scaled down version of Type 3 and comparison with other vessels of similar dimensions.
Type 3 – 65m	£10.7m	Remontowa Yard
Type 4 – 75m	£14.75m	Remontowa Yard

Annual Operating Costs (Revenue Budget)

2.2.7 Fuel consumption and berthing charges are both key elements of the annual operating costs for operating the ferry service. Whilst fuel cost is an external cost to the Council, the berthing charge is an 'internal' SIC charge (with the exception of the Wednesday Skerries service and the summer alternate Thursday Fair Isle service where a charge is paid to Lerwick Port Authority & Hay's Dock). Berthing charges are therefore excluded from the analysis which follows.

2.2.8 The Type 1 to Type 4 vessels noted above are modelled on the MV *Daggri* / *Dagalien* type vessel, known as the B600. At this stage, we do not have accurate estimates of the potential fuel consumption figures for these vessels. For the purpose of making an initial high level estimate of the annual operating costs associated with these vessels, we have assumed the following values taken as proportions from the current MV *Daggri* / *Dagalien* values:

- TYPE 1: Fuel consumption = 173 litres per hour (85% of *Daggri*).
- TYPE 2: Fuel consumption = 184 litres per hour (90% of *Daggri*).
- TYPE 3: Fuel consumption = 204 litres per hour (present day *Daggri*).
- TYPE 4: Fuel consumption = 224 litres per hour (110% of *Daggri*).

2.2.9 When estimating the annual operating costs in subsequent chapters, the following simplifying assumptions have been made:

- New vessels are assumed to be based on the latest technology / design and would be more efficient than the vessels they replace, with lower maintenance costs.
- Fuel costs have been assumed to increase on a *pro-rata* basis with additional sailings.
- Where options involve existing crew working longer hours, these costs have been estimated based on current terms and conditions; where options involve e.g. a doubling of crew, it is assumed that crew costs are increased on a *pro rata* basis.
- 'Other' costs are assumed fixed. *Note that this is a simplifying assumption as there would be a difference in docking costs when a vessel that can be slipped in Shetland is replaced with one that has to be docked on the mainland, usually every second year (additional cost of around £30k per docking).*

- Terminal expenditure is assumed fixed.
- Fares income has been assumed to remain constant unless the route has known capacity problems which will be relieved by additional capacity – a small increase in demand / fares revenue has been assumed in this case.
  - These assumptions can be updated but have been included to provide an initial indication of the annual operating / revenue costs associated with each broad option.

Crew & New Vessels

2.2.10 Shetland Islands Council operates a grade-specific pay scale for their marine staff, with no differentials by vessel or route. There would therefore be no additional staff costs in terms of wages, employer contributions etc when moving between the generic vessels set out above.

2.2.11 However, vessels with a higher certification do require a corresponding increase in crew certification, which is based on the tonnage and classification for deck crew and power for engineers. There are therefore crew training costs when moving between vessel types.

2.2.12 Crew will also require induction training on all new or cascaded vessels, so there is a fixed cost in moving to any new tonnage.

2.3 Phasing & Cascade of Vessels

Vessel Mix

2.3.1 In order to keep the appraisal manageable, the multiple vessel replacement options developed generally consider the parallel replacement of the existing vessel(s) with an assumed ferry mix (e.g. two identical ferries or one small, one medium, one large etc). These assumptions help to ensure the appraisal is not over-complicated by considering numerous various options around the one theme – for example, with a three vessel solution, options could include 3 * like-for-like; 3 * smaller; 3* larger; 1 * small, 1* LfL, 1* large; 2 * small, 1 * large; retention of current two vessels and 1 * large; and so on. The vessel mix has a limited impact on the results of the appraisal (with the exception of cost) and it is thus practical to appraise the options based on an assumed vessel mix here.

2.3.2 Clearly, the OBC and latterly the FBC will need to consider these in-principle options in much more detail (and at the time of commissioning).

Vessel Cascade

2.3.3 The options appraisal generally assumes that vessel replacement is only undertaken at the point of life expiry (unless otherwise stated). With limited and specified exceptions, we have not considered cascade options.

2.3.4 This is a further simplifying assumption and it may be that when it comes to developing the OBC and FBC, cascade will be an option and should be considered at this stage.

Phasing of Vessels

2.3.5 All multiple vessel options also assume that two or three new vessels arrive on the route at the same time. This is again a simplifying assumption to support the appraisal. Feedback from the Council suggests that it is generally cheaper to build vessels sequentially and phase them in gradually. This option would be considered in the OBC / FBC.

2.4 Assumptions and Packaging of Capital & Revenue Options

2.4.1 It should be noted that in setting out both the capital and revenue options, we have made a series of assumptions to ensure that the number of options presented and appraised is manageable. There are potential variations within options which would be considered at a more detailed operational planning stage (potentially as part of the OBC / FBC).

2.4.2 We have also presented a series of capital and revenue options for each island. In the analysis, we have married each capital option with each relevant revenue option to show the broad scale of costs. This format has been adopted for simplicity but it should be noted that, in most cases, the revenue options are not mutually exclusive and could be introduced together.

2.5 Other Investment Related to the Ferry Service

2.5.1 In addition to the capital investment needs of the ferry service in terms of vessels and port & harbour infrastructure, there are wider capital investments which, whilst not enhancing connectivity, would improve the delivery and public perception of the ferry service overall. These include:

- Facilities in Shetland to allow all ferries to be taken out of the water for survey and repair, reducing the money and time costs of sending vessels south for maintenance. There would be an offsetting revenue stream associated with this investment.
- Facilities to store spare propulsion units in Shetland where maintenance and survey work can be carried out.
- Replacement booking offices where required.
- Facilities to allow all required training and revalidation to be carried out in Shetland. There would be an offsetting revenue stream associated with this investment.

3 Air Infrastructure Options

3.1 Overview

3.1.1 The Shetland inter-island air service offers connections between Tingwall on the mainland and the islands of Fair Isle, Foula, Papa Stour and Skerries (currently suspended) and is thus a key component of the inter-island transport network. Whilst ferry related options can generally be considered on a route-by-route basis, most of the air options have to be considered on a network basis. Air-based options which are specific to individual islands, both revenue and capital options are considered in the island specific chapters.

3.1.2 There are five main issues which dictate the nature of the Shetland air service. These are:

- accountable management;
- the aircraft used and potential alternatives to those currently used;
- the location of the mainland airfield and base of the service, currently Tingwall;
- navigational aids to widen the operational envelope or improve reliability; and
- the level of intensity of use of the current assets.

3.1.3 Each of these issues is considered in turn below.

3.2 Accountable Management

3.2.1 In the Aviation Baselining Report, it was highlighted how the current use of unlicensed airfields and local airstrip trusts is likely to be unsustainable in the longer term, the recommendation being that the Council should prepare a coordinated migration plan for those airfields that are considered for long term retention in service.[4] Foula, Papa Stour and Skerries are currently unlicensed, as is Whalsay, although it is not currently used for scheduled flights

3.2.2 The institutional context in which the current air service operates gives rise to both risks for the Council and operational restrictions on the service. This is particularly the case in Skerries where the air service has been discontinued due to the absence of Rescue & Fire Fighting Services (RFFS) and in Papa Stour, where the service is limited to two rotations per week. Whilst the Fair Isle and Foula services continue to operate without significant restriction, there is no guarantee that this will continue, a key risk given the role of the air service as the lifeline mode for these islands.

3.2.3 It appears clear that, if the air service is to play a major role in the future of the inter-island transport service, capital investment will need to be supplemented by ongoing revenue spending to provide a more formalised operating environment. Two key elements of this are airfield licensing and the provision of RFFS equipment and services.

Airfield Licensing

3.2.4 It is our view that Shetland Islands Council should move towards a position of licensing all of the airfields used by the inter-island air service. Whilst this gives rise to significant upfront and ongoing costs, it would help to de-risk the operation and provide more flexibility in relation to how the service is operated. It is estimated by Northpoint Aviation, based on figures provided

[4] SIITS Aviation Baseline Report (Northpoint Aviation, 2016), pp. 13-22.

by Shetland Islands Council that the process of licensing the airfields could cost around £50k per airfield. An enhanced management resource in SIC is also likely to be required.

3.2.5 This cost is however just for covering the administrative process. There will however be a range of physical issues that need to be resolved in securing and maintaining licensed status. These include:

- Landscaping and associated works required to ensure the airfield meets the licensing standards. These works are required for a number of reasons, including the removal of obstructions from the runway approach and take-off & climb surfaces, removal of buildings etc from transitional surfaces, infilling of material to create safe gradients adjacent to the runway etc.
- Development of a robust safety management system to ensure the effective and safe management of the airfield, airfield operations and the RFFS.
- Development of a system for communicating airfield information, including airfield weather conditions to aircraft. A radio services and associated air traffic equipment, however basic, are essential requirements for the safe operation of flights. The equipment, training in its use and operation and appropriate maintenance clearly give rise to resource issues.
- Licensed airfields also have very specific requirements for the provision and maintenance of RFFS equipment.

3.2.6 Whilst likely a costly process, airfield licensing is a pressing consideration and it is recommended that this issue begins to be attended to with a short to medium term-strategy towards full licensing of all selected airfields. This step would likely be a precursor to any expansion of the air service (and potentially continuation of the air service to certain airfields).

Rescue and Fire Fighting Services

3.2.7 Skerries, Papa Stour and Foula have had human resource issues connected with their RFFS teams, and the fire tender in Foula suffers from lack of garage protection. The situation became so challenging at Skerries that the air service was suspended in November 2015. All of the other islands to which air services operate could also face similar challenges in the future. Local recruitment, in service training and retention all present challenges, whilst there are logistical issues with providing these services with mainland based staff. Ownership and maintenance of plant, vehicles and equipment is a particular challenge in remote islands. A Shetland wide approach may prove appropriate.

3.2.8 If SIC took overall responsibility, they could design a ‘career’ path for island firefighters that perhaps could be combined with other roles, including within the ferry service, to deliver a reliable job that was valued and sought after by islanders (that said, having the same people crewing the ferry and providing RFFS cover is problematic when both functions are required at the same time). Unfortunately, this may require additional resourcing in terms of pay and conditions, or a redesign of key Council functions on islands to solve various responsibilities in new ways. It is not deemed satisfactory that island air services which have been supported by significant historic and current investment are then suspended owing to lack of local RFFS cover.

3.3 Current and Potential Aircraft

Shetland Islands Council Aircraft

3.3.1 The Council took the decision in the early 2000s to acquire their own inter-island aircraft, both to modernise and reduce the average age of the aircraft operating on the network, and to facilitate a tender process for the operation of the service where several operators could realistically compete to supply the service under dry lease arrangements. In 2006, Shetland

Islands Council[5] acquired two Britten-Norman Islander aircraft, one directly and one through Shetland Leasing and Property Developments Ltd. (SLAP) with slightly different specifications.

3.3.2 G-SICA was manufactured in Romania under licence by IRMA[6] and was delivered in September 2007 and is a Britten-Norman BN2B-20 Islander.

3.3.3 G-SICB, which is also a BN2B-20 version Islander, was delivered in July 2006, and was previously operated as G-NESU where it undertook work for Northumbria and North East Police by Police Aviation Services (PAS). G-SICB, because it was modified for previous tasks by PAS and because it has several coats of paint is a slightly heavier example, and hence its performance characteristics are more inhibited.

3.3.4 The current schedule can be completed satisfactorily with one aircraft, so in essence the second aircraft is a reserve which allows aero-engineering (main checks are undertaken off the Shetland Islands) and unscheduled withdrawals from service to avoid disruption. This allows continuous frontline aircraft availability in all but highly exceptional circumstances.

Risks Connected with Current Aircraft

3.3.5 If an aircraft is well maintained it can continue operation for an extremely long time especially as so many components can be changed under maintenance. The limiting factors over the next 30 years with the current aircraft may be more do with:

- Withdrawal of manufacturer support and this could also relate to key components such as the engines that the aircraft uses. However, this is considered a low risk outcome as the aircraft is still widely used around the world, which provides a strong demand to underpin commercial support. The company has produced in excess of 1,250 aircraft, making it Europe's most prolific aircraft manufacturer. The BN2 series of aircraft are currently in daily use with some 500 companies and organisations in over 120 countries. The same applies for spare parts and components.
- Pilot shortage does not present such a risk from current perspectives. Many pilots value and enjoy what they term 'real flying' as opposed to the indicator monitoring they perform in more sophisticated aircraft. Also certain pilots are attracted to the human scale and interaction that a small aircraft offers. Lifestyle pilots seem positively attracted to these services. Indeed, one operator who also operates other aircraft types did report that there was a waiting list for their BN2 service.
- Human resources may however offer some challenges in that aero engineers may not be attracted to maintain older equipment as time progresses. Indeed, attracting and retaining engineers in Shetland with the nearby oil industry (notwithstanding the current position of that industry) has provided a particular challenge. Some attention may well need to be applied to this risk to avoid difficulty.
- AvGas, the fuel used by the BN2 Islanders, does present a risk into the future but with 250,000 engines requiring this fuel around the world and with the US Federal Aviation Administration pondering solutions, it appears that the risk is being attended to. Nevertheless, above inflation cost increases are a possibility, and costs connected with migration to a new comparable fuel source are also likely within the next 30 years.
- The base airframe is the key component that cannot be changed and this can be subject to corrosion (the maritime environment being particularly prone to it) or metal fatigue especially as a result of multiple landings over its lifetime. Deep maintenance checks do manage these risks. However, as an aircraft gets older, a surprise discovery of corrosion or fatigue (usually small micro cracks) becomes a possibility, and it is likely that at least

[5] Technically G-SICA is leased from *Shetland Leasing and Property* Developments Limited (*SLAP*), a subsidiary company of Shetland Charitable Trust.
[6] Intreprinderea de Reparatii Material Aeronautic

one of the airframes would need to be retired (and potentially replaced) during the next 30 years.

3.3.6 Our research (see below) suggests that there would be significant costs in moving away from the current islander fleet in the short-term, with little in the way of corresponding benefits. Whilst there is longer term risks associated with continuing with the BN2 Islanders, these cannot be quantified at this stage, but with prudent review of these issues it should be possible to migrate to other air service solutions in the light of options current at the time.

Key Points: The Shetland Britten-Norman Islanders are ideally suited to what is required of them. The risk of early challenges to the viability of the BN2 Islander is considered low. However, options for the replacement of the airframes will need to be seriously evaluated midway through the strategy period.

Potential Alternative Aircraft

3.3.7 This section considers potential alternative aircraft assessed as part of the study.

Cessna 208 Caravan

3.3.8 In November 2015, the European Aviation Safety Agency (EASA) recommended approving commercial single engine turbine (SET) operations and once this is passed by the European Parliament will become EU law (anticipated to be before the end of 2016).

3.3.9 This type of aircraft will still require operators to develop and have an approved safety and operational case for such services, which in any specific time limited and pressurised tender process is very difficult / impossible.

3.3.10 Legislation permitting Single Engine (Turbine) commercial flights is expected to be adopted, according to Cessna, throughout Europe by the end of 2016. Within this, it is likely that something like a 15 minute risk period per flight could be accepted so the aircraft can cross open water. The new provisions in all likelihood will expect operators to be able to glide and navigate to safe landing areas (aerodromes or simple fields of sufficient size without obstacles) in the event of an engine failure. Taking account of the en-route availability of Sumburgh and any identified and surveyed fields, it should be possible to devise a compliant route, but agreement with the CAA would be involved. It would still require an in depth risk assessment of operating a single engine aircraft down the spine of Shetland Mainland and across the sea between Sumburgh and Fair Isle, with its longer stretch of intervening water and of the routes to the other islands. The risk assessment would probably recommend a life-raft was carried on the aircraft. Insurance premiums for such operations are another unknown.

3.3.11 The Cessna 208 does require slightly longer runways than the BN2 Islander, which may well require costly upgrades at Skerries and Papa Stour in particular. The aircraft also has lower cross wind limits because of its design (20kts as opposed to the Islander's 30kts) which would be a significant drawback in Shetland with its single runways and consistently strong winds.

3.3.12 The aircraft type uses jet fuel which is currently cheaper than AvGas, but the increased fuel consumption of a turbine will nullify any potential savings.

3.3.13 A significant drawback to operating a turbine engined aircraft on the Shetland inter-island service is the very short sector times. Turbine engines suffer fatigue related to the number of cycles (starts and shutdowns) they perform rather than in relation to the total time they are running, which is the case with the piston engine used by the Islander. However, the Cessna 208 is a popular parachute jumping platform and they do perform well in the typically short missions (10-15 minutes several times each hour) and high cycles that this entails. Engine overhaul costs for turbine engines are said to be around five to six times those of piston

engines. This problem is mitigated somewhat by the use of propeller brakes, which allow the turbines to stay powered whilst the propeller is stationary. The turbine would still need to be shut down whilst refuelling though and the cyclical costs would still be significantly higher than a piston engine in an equivalent power range.

3.3.14 More modern avionics and aircraft systems (generators, hydraulic pumps, controls etc) tend to be more sophisticated and hence more expensive than piston engine technology. Maintenance costs can therefore be expected to be significantly more than a piston BN2.

3.3.15 Although EASA has established that these aircraft have demonstrably higher engine reliability than some currently operated twins, there is still the potential for understandable consumer resistance to such a development. If these aircraft were to be introduced, a prior information dissemination and familiarity type campaign would seem prudent.

3.3.16 Cost is also a significant consideration. A standard Cessna 208 has a 9 passenger capacity although certificated versions up to 14 seats exist. A version of the 208 is also available with increased baggage capacity in a belly pannier. A new C208 costs in the region of $2.5 million, and 10 year old models still cost around $2 million.

3.3.17 Operationally, the aircraft require something like 500m for take-off and so would likely require a major and costly runway lengthening at Out Skerries (365m), if this is possible, and Papa Stour (440m), and some safety assessments, adjustment and licensing at Fair Isle (508m) and Foula (548m), where runway lengths are close to the minimum.

Figure 3.1: Cessna 208 Caravan

DHC-6 Twin Otter

3.3.18 The Scottish Government has recently acquired two new DHC-6 Twin Otters, which could feasibly permit some form of standardisation across the Scottish network. The aircraft has good STOL[7] performance and is now being manufactured again by Viking of Vancouver (albeit largely unchanged from an early design) and can carry 19 passengers. The DHC-6 Twin Otter is a Canadian 19-passenger aircraft and was developed by de Havilland of Canada. Over 600 were made before production ended in 1988 and in 2006 Viking Air announced its intention to offer a series 400 Twin Otter. In the following year they announced that, with 27 orders and options in hand, they would be restarting production. Their first new aircraft was delivered in July 2010.

3.3.19 The current operator, Directflight made the following observations:

[7] Short take-off and landing

- Use of a Twin Otter (or any similar aircraft) on the Shetland inter-island service would involve a substantial revision to the PSO and the funding needed to sustain it.
- Though the DHC-6 Twin Otter is billed as a STOL aircraft and does indeed have very good performance, in order to operate to commercial air transport standards, many of Shetland's airfields would need costly lengthening, regrading and widening. Even Fair Isle would require some extension by an estimated 100 – 150m (exact dimensions would be subject to a detailed analysis), plus other infrastructure improvements such as RFFS CAT3 (applicable at all operating locations). The other strips would require considerable work to bring them to licensed standards. The DHC-6 is classed as a complex motor powered aircraft (because it has more than 1 turboprop engine) and as such cannot use 'landing sites' such as unlicensed airstrips which are accessible to the BN2. Effectively, this means that all destinations served by a DHC-6 would need to be licensed aerodromes and at present only Fair Isle is compliant in this regard.
- Presuming the home base of the inter-island Service remained as Tingwall, the hangar would require adaption to accommodate these aircraft.
- Tingwall only has limited quantities of JET-A1 sufficient to top up Air Ambulance or SAR flights and a larger bowser or modified fuel farm would be required to service the increased demand. If a DHC-6 service were based at Sumburgh hangarage would also need to be found, which is difficult currently.
- Passenger demand for an aircraft of greater capacity than the BN2 seems justifiable for Fair Isle only on rare occasions and perhaps Foula on very rare occasions.
- The drawbacks associated with turbine engines discussed previously apply to the DHC-6.
- The systems which accompany turbine installations, generators, hydraulic pumps, controls etc are also more sophisticated and hence expensive than piston engine technology. For example, the maintenance costs of a turbine Islander are estimated at least twice that of a piston BN2. Jet fuel is cheaper than gasoline, but the increased fuel consumption of a turbine cancels out those savings.
- The airframe is very expensive to purchase either used or new (a 1979 model still commands over $2.5 million and a new version [Viking DHC-6-400] costs around $7.3 million plus delivery charges etc). It is also an expensive airframe to maintain with costs estimated to be around 3-4 times that of a BN2. The direct operating costs are obviously proportionately higher.
- A further direct operating cost would probably be that for the second pilot. The aircraft is certified as a single pilot aircraft, but both current UK operators (Loganair and Isles of Scilly Skybus) operate them with two pilots for sound reasons. Directflight would perform a risk assessment prior to pronouncing any policy on pilot numbers. If multi-crew operation was held to be preferable, the present pilots could potentially be dual rated on the BN2 and the DHC-6 or solely on the DHC-6. However, there would inevitably be a need to recruit additional pilots.

The TecNam P2012 Traveller

3.3.20 The Italian designed TecNam intends to roll-out its P2012 Traveller in 2016. This concept aircraft illustrates what a next generation BN2 Islander aircraft might look like. The aim was to design a modern 11-seat aircraft with state-of-art equipment, using latest technologies to reduce costs, including simple and easy to access airframe & systems. The P2012 will be powered by twin piston engines with alternative fuel versions.

3.3.21 This is the sort of aircraft innovation that Scottish air service operators should closely monitor.

Seaplanes

3.3.22 In parts of the USA (Alaska in particular) and Canada the seaplane continues in use as a regular mode of transport. Scotland ostensibly is equally suitable for seaplanes with 120 populated islands and over 30,000 freshwater lochs.

3.3.23 One Scottish operator, Loch Lomond Seaplanes (LLS), operates two amphibians, Cessna 208 Caravan, on charter and sightseeing flights around the west coast. They are thought to be investigating expanding their services elsewhere in the British Isles, and there are equivalent initiatives in Ireland, Croatia and Greece. However, LLS withdrew from scheduled passenger flying because of the potential costs imposed by EU denied boarding compensation strictures, combined with its relatively low operational reliability. They now restrict their offer to chartering and sightseeing flights.

3.3.24 Canada's Harbour Air operates the world's largest all-seaplane fleet with over 50 aircraft. The route network is extensive and the primary route connects Vancouver with Victoria on Vancouver Island, a distance of approximately 50nm. Two of the world's largest seaplane operators are in the Maldives, Maldivian Air Taxi and Trans Maldivian, which both offer connecting flights from the International Airport at Male to more than 40 resort islands.

3.3.25 The in-flight performance of a seaplane is impacted by the additional weight and drag of the floats. The seaplane will be slower than the regular landplane increasing journey times by approximately 10%. The aircraft's carrying capacity would also be reduced.

3.3.26 With regard to landing areas, a plane could conceivably operate from a Mainland Voe or possibly the Sound of Bressay, which would remove the cost of operating Tingwall, but assuming some of the runways were retained because of no acceptable water sites on the Outer Isles, then an amphibian version, as opposed to float version, with both floats and wheels would be required which has a heavier weight penalty yet again.

3.3.27 The costs of maintaining an amphibian (airworthiness and infrastructure) together with the crosswind limitations on even extended/resurfaced outer island strips capable of taking that configuration make it impractical in the Shetland environment.

Rotary Solutions

3.3.28 The PSO for the air services to the three Aran Islands in Southern Ireland requires a total subsidy of nearly €2 million to run the flights as well as the three aerodromes on the Aran Islands and the Connemara Regional Airport in Indreabhán (Inverin). Aer Arann Islands (the islander and airport operator) employs approximately 38 full-time and two part-time staff, to run these services. A new contract was recently tendered by the Irish Department of the Arts Heritage and the Gaeltacht in 2014 with a 30% discount cap imposed on current spending intentions, apparently at €900,000 per annum for the air service component on its own.

3.3.29 Rather surprisingly the tender was awarded to a rotary company (Executive Helicopters). They proposed offering a twin engine helicopter with 8 plus passenger capacity (the type is currently confidential because of award review currently underway). Executive Helicopters claimed that the proposed helicopters for the routes would have a greater passenger capacity than the existing Aer Arann Islander aircraft and would have similar luggage/cargo capacity and can fly in a greater range and variety of weather conditions. They noted that the new helicopter service would provide a reliable, faster, more efficient service to Galway city under the terms of the public service tender.

3.3.30 Helicopters are the air transport of choice to other Irish offshore islands such as the Tory Island service[8] off the Donegal coast, and Executive Helicopters has been operating helicopters in the west of Ireland for almost 20 years '*without any problems whatsoever*'.

3.3.31 Helicopters are also better placed to deal with deleterious situations such as rapidly deteriorating weather, as they have the option to either slow down or land, whereas the fixed wing aeroplane has to seek a suitable diversion airfield. It was noted that safety statistics demonstrate that helicopters are every bit as safe as fixed wing aircraft.

3.3.32 However, there was a considerable backlash to the proposed award. Such was the outcry that the tender award was postponed and a one year standstill and review was instituted, which at the time of writing was still underway.

3.3.33 The Isles of Scilly also enjoyed a 45 year air link with Penzance provided by British International Helicopters until October 2012. In 2014 local MP Andrew George and Graham Cole, the chairman of AgustaWestland, the Anglo-Italian helicopter company with a production facility in Yeovil '*jointly expressed*' their optimism over a potential re-establishment of the helicopter service. AgustaWestland previously said it would offer the first of its AW 189 helicopter (carrying up to 19 passengers) off the production line at a cheap rate to encourage someone to set up a commercial service to Scilly.

3.3.34 There is also a rotary PSO to Værøy in the Lofoten Islands in Norway, which is the most isolated island in the peninsular chain. The service flew over 9,000 passengers in 2014.

3.3.35 These developments raise several instructive aspects for the Shetland inter-island transport environment. A rotary solution might be competitive when the total cost of maintaining airfields, rather than helipads is considered, although helicopters cost considerably more per hour to fly than the BN2 islander.

[8] Run by the Local Health Board but also taking members of the public in winter months using a helicopter from Irish Helicopters (part of the PDG Group with its HQ in Inverness)

Summary

3.3.36 This research has confirmed that the BN2 Islander remains the most appropriate aircraft to operate the Shetland inter-island service. It would at present be impractical and very costly to move away from these aircraft and the benefit stream is likely to be very low.

3.3.37 The above sections have set out some potential alternative aircraft which could be considered in the longer-term, potentially when aircraft replacement needs to be considered around halfway through the strategy period. However, it is likely that, by this time, technology will have moved on again and the issue should be revisited then.

3.4 Navigational Aids

3.4.1 The current Shetland inter-island air services operate on the basis of Visual Flight Rules (VFR), which constrains the operation to the hours of daylight. This is a particularly key issue in the Shetland Islands where the hours of daylight are short in winter. Navigational aids, including the Global Navigation Satellite System (GNSS) and runway lighting amongst other things offer the potential to extend the length of the operating day. The viability of each of these navigational aids was considered here.

Global Navigation Satellite System

3.4.2 GNSS antennas on aircraft can pick up signals generated from a constellation of satellites and uses the difference in the time of travel of radiowaves from four satellites to fix the position of the receiver and get an accurate value for time. Based on classical mechanics, the principles underlying GNSS are simple, but the system is formidably complex in practice, the main problem being timing errors. It is impossible to put a single figure on the accuracy of GNSS as it depends on several ever-changing factors, many of which affect the ionosphere, the biggest single source of error. Current systems have a way of alerting users that GNSS is underperforming for any reason. The potential is that GNSS can be used to supplement visual navigation (VFR), IFR[9] and night time navigation. This would be without the need for ground based navigational aids which are expensive to install and maintain.

Recent Scottish Experience

3.4.3 HIAL recently received a 70% grant to undertake GNSS approvals for three of its airfields. This has required a safety case and operational procedure to be developed for each airfield and CAA approval for the submission. HIAL used Cyrrus to manage the project and actually used Hebridean Airways' BN2 Islanders to undertake much of the 'field' calibration work. Barra, Tiree and Campbeltown are either currently approved or near approval.

- The approval delivers managed approaches to 200 feet altitude at strips of 500 metres in length (since 2012) and this reduces the pilot's decision height considerably in IFR conditions.
- The Garmin database coding[10], flight validation and CAA approvals cost between £12k and £20k depending on the location. The timeline for database coding and flight validation is approximately three months. The consultancy, design, hazard identification & safety cases cost approximately between £24k and £38k with a delivery timeline around 4-6 months. The timeline for CAA Approvals is elastic and has varied from 18 months to more than 24 months mainly because of resource issues within the CAA.

[9] Instrument Flight Rules

[10] Garmin charges are going up significantly and they only give quotations when the designs are finalised

- One needs to allow approximately six months from CAA approval to allow NATS AIS[11] to assess the work required to meet one of their AIRAC[12] cycles, and for the charts to be published in the Aeronautical Information Publication.
- The cost of the GNSS unit for a BN2 aircraft is approximately £10k and Hebridean Airways has it installed on both their west coast aircraft. It was established that the onboard equipment needs revalidated each year at an approximate cost of £750.

3.4.4 HIAL has now been successful in receiving further EU funding to roll out GNSS approvals to all their airfields. Hebridean Airways now has four years of experience using the equipment, although few of the airfields they operate into have approved approaches.

3.4.5 Overall, it can be concluded that GNSS provides the prospect of permitting IFR flying in the Shetland environment, which could improve despatch reliability and additionally supplement current VFR flying from a safety perspective. Further feasibility studies will be required, but a source of some experience already exists within Scotland.

Operator Feedback

3.4.6 Whilst introducing GNSS based approaches in the Shetland Islands appears feasible, we have sought feedback from the current operator on this issue.

3.4.7 The operator does not believe that operating into the islands using GNSS approaches is a rational or safe concept. They note that the company can already operate under Visual Flight Rules to/from the islands at 500 feet above mean sea level (AMSL) in 3,000 metres visibility. Given the runway elevations and surrounding topography of the island strips, the company does not believe GNSS approaches would allow any significant descent below 500 feet AMSL. Directflight note that, on all island runways, the limit would probably be much higher due to high ground on or adjacent to the approach path, or on or adjacent to the departure route following an unsuccessful approach.

3.4.8 The company also points out that use of a GNSS approach to land at an island below current weather limits would require personnel on the island to be trained as official weather observers and may require some form of approach and runway lighting system. Directflight note that although these could probably be achieved with considerable effort, there remain the safety case considerations of single-pilot operations. It was explained that it is a much more demanding flying environment when considering operating into the islands under Instrument Flight Rules (most probably non-visually on instruments), as in the majority of these cases it would be in windy, rainy and turbulent conditions. It was further explained that conducting a GNSS approach in cloud in these conditions in a single-pilot operation, where there is no monitoring pilot would, in the view of Directflight, be a step too far.

3.4.9 The VFR limits currently operated by Directflight offer what they believe are a sensible margin of safety when operating into the island strips. They note that if GNSS approaches were to be introduced, the operator would probably reduce their maximum acceptable wind limits to compensate for the increase in risk associated with the single-pilot GNSS approach. The only weather where the company see it as potentially workable would be low visibility & low wind speeds (i.e. foggy weather) which usually affects the whole of the area including Sumburgh, in which case the service would probably be grounded anyway as there would be no diversion airfield.

Key Point: GNSS may offer an opportunity for the Shetland Islands. However, the current operator has raised a number of concerns surrounding the operating environment which could negate any benefit. It is not therefore possible at this stage to take a definitive view on the

[11] National Air Traffic Services Aeronautical Information Service

[12] Aeronautical information regulation and control

implementability of GNSS, but we do believe it should be explored further given the relatively low costs and potential benefits and its application in other parts of Scotland.

Runway Lighting

3.4.10 Runway lighting offers improved decision heights for pilots in poor visibility or in night-time conditions. However, wiring up a runway can be expensive.

- Airfield Ground Lighting (AGL) is a challenging environment in which shocks, vibrations and great changes in temperature (frost or intense heat from the sun and surrounding tarmac) can have a negative impact on the equipment. Currently, the main provision for AGL is still in the form of incandescent lamps using a filament. These suffer from a number of weaknesses, in particular a relatively short average life as filaments are burnt out after 1,000 to 2,000 hours. Another weakness of incandescent lights is their poor spectral emission.
- Precision Approach Path Indicator (PAPI) lights help pilots acquire and maintain the correct vertical approach to an airfield. PAPIs are generally located beside the runway approximately 300 meters beyond the landing threshold of the runway.
- HIAL have been undertaking trials with Battery Operated LED runway lights and even PAPI Lights. LED Lights have a much longer service life; lower power consumption; low maintenance and higher luminosity with good temperature and vibration tolerance, and they have battery operated options that only need re-charged every fortnight or so.

3.4.11 At Campbeltown they are using a company called CALKIT to install their runway lighting. Prices vary inevitably because of specifications such as red white lighting mixes and number of units required, bearing in mind that Campbeltown's runway is almost three times longer than the Shetland island airfields. A Manual Controlled CALKIT LED with 54 White 125cd & 6 Red & 6 Green is coming in at just over £42,000, whilst a radio controlled CALKIT LED with charging unit & desktop charger is just over £58,000. Delivery costs are another significant factor with our correspondent suggesting that arranging one's own dedicated low loader is more cost effective.

The Orkney Experience

3.4.12 Orkney Islands Council has installed PAPI lighting on North Ronaldsay, which allows night time landing. In theory, this helps the whole system as in winter the rest of the programme can be completed in daylight, leaving the Kirkwall – North Ronaldsay – Kirkwall shuttle to finish off the day. However, flying into North Ronaldsay at night is under stricter weather limitations than daylight flying and hence more cancellations are likely. Also at night, frost and snow are more likely, whereas in daylight hours these may well have thawed to allow operations. The standard procedure is that if the weather looks like it will be above limits (which are lowered during night-time as opposed to daytime VFR flying) then the service is brought forward (to 1400 for 10 weeks in 'mid-winter' and 1600 for other winter weeks). Unfortunately, in winter this is a very frequent occurrence, with a conservative estimate of 42% of these flights being brought forward in 2014-15 (and nearer 70% in 2015-16).[13] The high level of disruption to this flight has reduced the overall benefit which it offers to the North Ronaldsay community, as there is much reduced certainty of being able to use these flights.

3.4.13 Whilst more detailed investigation into the potential for runway lighting in Shetland is required, the Orcadian experience suggests that the benefits overall are relatively limited for the cost outlay, given the inability to reliably meet the timetabled service. The scope for benefits in the Shetland Islands may also be somewhat lower, since the existing aircraft and assets are worked less intensively during daylight hours than in Orkney, and thus there may be scope to

[13] OIITS Aviation Baseline Report (Northpoint Aviation, 2016), pp. 43-44.

enhance the service frequency without capital outlay of this nature (i.e. additional flights could be accommodated without runway lighting).

Operator Feedback

3.4.14 The current operator notes that it is doubtful whether the CAA would permit operations on the island strips at night on the basis of safety. It was noted that, during the previous operator's tenure, the only night operations allowed on the island strips were Air Ambulance flights. No regular passenger flights were allowed by the CAA. It was also noted that the surrounding topography of the island strips would demand even more stringent weather limits at night than would already be the case with night flying, which would no doubt lead to many night flight cancellations as per the Orkney experience. Directflight further explained that the Orkney Outer North isles offer a more benign, flatter, flying environment where the risks are lower than in Shetland.

3.4.15 The operator further noted that Tingwall had runway lights before the Air Ambulance crash[14] in 1996, although following that accident, limited approach lights were installed on the runway 02 approach. Following this and the second fatal Air Ambulance crash at night, the Scottish Air Ambulance service ceased operating single-pilot fixed wing Air Ambulance flights day or night, as the risk of single-pilot operations, to unlicensed strips particularly at night, was deemed too high.

3.4.16 It was further noted that, during the winter period, attempting to extend operations by night flying, with reducing temperatures, would also increase exposure to contaminated runway conditions, thus again increasing risk.

3.5 Mainland Airfield

3.5.1 A key issue to be addressed in the context of this study is the future hub airfield for the inter-island air services. Tingwall has, over many years, proven to be a highly effective airfield, offering relatively quick access to Lerwick and a largely dedicated inter-island air service hub (i.e. no competing traffic). However, the airport imminently requires some significant investment in both the runway and other fixed assets. In light of this requirement, and given the excellent facilities available at Sumburgh, it was necessary for this commission to consider the comparative merits of both locations for hosting inter-island services.

3.5.2 This is a complex and nuanced discussion and, in the interests of brevity, only the key points are summarised here. A much more detailed review of the mainland airfield debate is contained in Appendix A. It should be noted that the scope of this commission involved establishing the facts in relation to each airfield, with a final decision on future operations resting with Elected Members.

Tingwall – Pros & Cons

3.5.3 The main pros and cons of using Tingwall as the base for inter-island services are as follows:

- Pros

[14] There is a detailed entry on Wikipedia in relation this accident. To summarise, after successfully transporting a patient to Inverness, the pilot, nurse, and physician were returning to their home base in Tingwall. There was a strong and gusting right crosswind at the runway. The pilot's approach procedure required him to make right turns to line up with the runway. However, these right turns obscured the pilot's view of the runway, and when the pilot made his final right turn, the aircraft had been blown to the left of the runway, too far to make a safe landing. The pilot executed a go-around procedure and attempted another approach. Again, the aircraft was blown far to the left of the runway centreline, and during the final approach turn, the aircraft lost a great deal of altitude, striking the ground 1.5 km short of the runway and approximately 0.3 km to the left of the runway centreline. The AAIB determined that night time visibility of the airport environment was inadequate, especially during right crosswind conditions, and recommended that Tingwall Airport add additional ground lighting to aid pilots' ability to acquire the runway during night time approaches.

- The principal benefit of Tingwall is its geographic proximity to Lerwick, a critical issue for island residents seeking to maximise effective time in Shetland's main settlement. A survey conducted in 2012 assessing the mainland airfield issue and the island consultations undertaken in this study, resoundingly found Tingwall to be the preferred mainland hub.
- Access to the isles is also seen to be better from Tingwall, allowing Lerwick-based contractors, Council Officers etc to more easily access the isles on short day-trips. This was particularly seen to be the case for Foula.
- Tingwall is owned and operated by SIC, and the airfield is largely dedicated to the inter-island air service. This high level of strategic control ensures that the needs of the isles are suitably prioritised and that there is flexibility in the operation (e.g. recovering from periods of inclement weather for example).
- Tingwall is used by a range of other aviation organisations, including the Scottish Ambulance Service, the General Lighthouse Authority etc. The loss of Tingwall would be detrimental for these users, a particularly key issue in terms of providing emergency services to the isles through Sumburgh (given that the hospital is in Lerwick.
- The loss of Tingwall as a diversionary airfield would reduce the options for BN2 Islander pilots in the face of bad weather. The only other licensed airstrips on Shetland are Sumburgh, Scatsta and Fair Isle. Scatsta is some 55 miles from Sumburgh. Usually when Sumburgh is closed, Fair Isle is also closed, especially with fog. Apart from that, diversions would be looking at North Ronaldsay or even Kirkwall. This loss of one diversionary airfield option in the Shetland system could in certain circumstances add an extra level of caution to flight planning and might result in additional cancellations. Procedures would be adjusted to take this reduction in airfields into account.
- There has been significant recent investment in Tingwall, circa £600k over the last six of so years.

- Cons
  - Tingwall requires significant capital investment in the runway, watch tower, runway lighting and airport buildings. It is anticipated that these improvements would cost in excess of £1 million.
  - With onward air connections from Shetland to the Scottish mainland offered from Sumburgh only, there is an element of disconnect for islanders making a connecting trip to / from the Scottish mainland. This is at odds with the situation in Orkney, where easy interchange between the inter-island and onward connections better supports strategic integration. It is nonetheless important to note that this was not raised as a particular issue by stakeholders in the consultation, with few islanders making connecting trips on the same day due to the weather related reliability issues (principally fog) associated with the inter-island service. Evidence from Orkney also suggests that same-day onward connections are very few in number.

Sumburgh – Pros & Cons

3.5.4 The main pros and cons of using Sumburgh as the base for inter-island services are as follows:

- Pros
  - Sumburgh would provide opportunities for island residents to make onward connections to the Scottish mainland, although note the issues raised above in terms of strategic integration.

- The current structure of the schedule makes it difficult, if not often impossible, for the outer islands to receive same-day Royal Mail and newspaper deliveries. These organisations could potentially adapt their sorting practices in Aberdeen to better connect with onward flights from Sumburgh to the outer isles. However this benefit might only be deliverable if services to the island destinations were daily, as it would be difficult for organisations such as the Royal Mail, John Menzies and the *Press & Journal* (who sometimes act independently of Menzies combined newspaper delivery) to change their procedures dependent upon the day of the week.
- There may be opportunities for economies of scope at Sumburgh but the benefits realised would be external to the PSO, which should be the focus in the context of the inter-island services.
- One attraction of the Sumburgh solution is that SIC would pay for both operational services, and future capital (other than the hangar) obligations in their airport charges. SIC would no longer have to concern themselves about future runway or terminal upgrades or migration costs to new technologies. This would all be covered by their user charges. Hence the lumpiness of SIC's aviation budget would subside, after the financing of any new hangar was addressed. SIC could then leave all compliance and infrastructure renewal and upgrade issues to HIAL.

- Cons
  - Required capital costs to migrate the service to Sumburgh would be of a similar order of magnitude to the required upgrades to accommodate the service at Tingwall.
  - Whilst a high quality airport, Sumburgh is 25 miles and some 40 minutes' drive from Lerwick. Journey times are further extended when using public transport. Whilst these times are not particularly large in absolute terms, they are very significant in the context of the limited amount of time on Shetland mainland for islanders, particularly during the winter months when hours of daylight are very limited.
  - A Sumburgh hub would be wholly negative for Papa Stour, Skerries and Foula.
  - If the BN2 Islanders were to be fuelled at Sumburgh, they would need to install a fuel farm similar to that built at Tingwall.
  - SIC would have reduced strategic control at Sumburgh and the interests of the inter-island service would have to be traded-off against the needs of other airfield users.

Costs

3.5.5 When the issue of relocating the mainland airfield was first considered earlier in this decade, the principal driver was a belief that such a move would lower the overall cost base of the air service. However, it was explained above that the capital costs of migrating the service to Sumburgh are broadly equivalent to required investment to ensure the continued operation of Sumburgh. The operating costs at the two airports were also found to be broadly similar.

3.5.6 The key point therefore is that cost (both capital and operational) cannot be considered as the decisive factor in determining the future airfield location.

Conclusion

3.5.7 The analysis contained in Appendix A sets out a finely balanced debate in terms of the relative merits of Tingwall and Sumburgh as the mainland airfield for the inter-island service. However, given that there is little cost advantage in moving airfield, as well as a series of logistical and contractual challenges in doing so, the case for relocating the entire operation to Sumburgh is a challenging one to make.

A.1.1 Moreover, there is a simple maxim in the aviation sector: runways are easy to close (e.g. Plymouth, Manston, Filton) but incredibly difficult to re-open or get built from scratch - witness

Broadford on Skye and Heathrow's third runway. For a nation like Scotland on the periphery of Europe, where aviation will always be an essential lifeline service - socially and economically - closing airports (and implicitly therefore runways) should always be a last resort.

3.5.8 Finally, the consultation undertaken as part of this study robustly highlighted the preference of Tingwall amongst islanders, principally because of the better access to Lerwick, therefore any decision to relocate mainland air operations to Sumburgh would be met with significant opposition from the affected communities. As such, this option would likely fail to meet the 'Public Acceptability' criteria in STAG.

3.6 Use of Existing Assets & Resources

3.6.1 The island specific options, which are reported in subsequent chapters, highlight a number of options in relation to flying the aircraft more intensively, for Foula and Fair Isle for example. This section considers what more can be done with current resources including serving possible new destinations, prefacing the island-specific material.

Crewing and Aircraft Usage

3.6.2 The most notable difference between the current Shetland and Orkney inter-island air service operations is that Orkney's two aircraft accomplish 1,400 flying hours each year, whereas Shetland's two aircraft collectively accomplish around 600 hours each year, including positioning flights to and from Cumbernauld for engineering.

3.6.3 It is noted that three full-time crew are based on Orkney mainland and, with some help from senior management pilots (estimated as 0.5 FTE pilot), provide year round cover, holiday cover and an acceptable level of fast response sickness cover.

3.6.4 On Shetland, three full-time crew are based on the islands (although one crew member does a significant amount of work away from Shetland on other DFL contracts) and can provide year round cover, holiday cover and an acceptable level of fast response sickness cover. On some days, one crew member will cover the whole day; on others the duties are split. It depends largely on the weather and conditions at the time and whether any charters are booked. On the whole, particularly during the summer months, it is a challenge to manage the Flight Time Limitations Scheme (FTLs) around the flexibility of the service, leave and the six (and exceptionally seven) days a week operations. Directflight is considering adding another off-island based pilot (based at Inverness) into the mix, and if this is accomplished should increase the crewing capability of the team quite considerably.

3.6.5 The use of crews is governed by the FTLs which for commercial air transport operations, since February 2016, is now governed by EASA. The scheme is to protect pilots from overwork and fatigue and each operator has to develop their own scheme that complies with some general principles concerning duty periods, maximum number of flights in any duty period, suitable rest periods and rest facilities, appropriate number of days off and recognition that 'on call' is not the same as being fully off-duty. The Islander operations, because of their special characteristics, have evolved some derogations or adaptions to allow greater flexibility in the use of pilots and are better able to cater for delays and changes in schedules, which are at a higher level than in most other scheduled air operations.

3.6.6 This difference in aircraft usage between the two island groups seems to be explicable for several reasons:

- Orkney has more passenger demand, island destinations and a denser timetable than Shetland.
- Orkney has a slightly larger pilot complement (3.5 as opposed to 3 (one of which is not fully dedicated to the inter-island contract)).

- Orkney is prepared to schedule its two aircraft to run concurrently (in the summer months), whilst Shetland only ever runs a timetable that has one frontline aircraft. This, it is speculated, is partly because the Orkney operation has closer and more capable engineering resources at Kirkwall as opposed to the Shetland operation, where significant aircraft issues will require either an engineer to be flown in, or the aircraft to position to Cumbernauld. It is noted that Loganair management argued in a 2010 paper to Orkney Islands Council that the maximum the two aircraft could fly would be 1,200 hours per year, but with some clever scheduling of engineering and no doubt other responses, they extended this to 1,400 hours in 2014.
- It is also speculated that the current Shetland operator is wary of a denser timetable because of the domino effect of earlier delays affecting later flights, which in the Shetland system reportedly affects up to 40% of flights.

3.6.7 Orkney aircrew are in very general terms accomplishing 400 flight hours per pilot per year, with Shetland aircrew operating around 200 flight hours each. This suggests that the timetable could be increased somewhat without crew upgrade implications. Additional flying is possible with the current crew complement if concerns about despatch reliability were reduced. Additional off-island based crew provide another incremental route to increase usage. However, the concern that Shetland flying requires regular operational experience (noted in the SIITS Aviation Baselining Report) suggests that any off--island pilot use needs to be carefully overseen to ensure sufficient local knowledge to protect safety standards.

Operator Feedback

3.6.8 Directflight has replied that if there is shown to be any real demand for additional services, the company could accommodate 'some' more flights in the gaps in the schedule, subject to the proviso that they would wish to be able to serve the schedule with a single aircraft. They note that they would otherwise need another aircraft to cover periods of extended maintenance on the second aircraft, and moreover they believe that they would not be able to fulfil the schedule when breakdowns occur.

3.6.9 Directflight also explained that the knock-on effects of weather delays on a tight and busy flying schedule which occurs on some days would be considerable.

3.6.10 In terms of the comparison to Orkney, Directflight note that the Orcadian service operates from a base with full air traffic control, navigation aids and de-icing and has a bigger engineering workforce employed partly to service other aircraft. It was also reiterated that the Orkney Outer North Isles provide a more benign flying environment than in Shetland.

Key Point: There does appear to be some scope to extend the number of flying hours operated in Shetland, albeit perhaps not to the 1,400 hours operated in Orkney. The extent to which this schedule could be extended is likely to differ between operators depending on the availability of engineering support and a range of other factors. Nevertheless this does appear to present an opportunity to improve connectivity at relatively low cost.

3.7 Appraisal of Capital Options

3.7.1 The SIITS Pre-Appraisal report set out a series of capital options in relation to the air network. The previous sections of this chapter have ruled out a number of these options, as follows,

Table 3.1: Air Capital Options from SIITS Pre-Appraisal Report

Option Themes	Comment
Do Minimum	
Maintain and continue with G-SICA and G-SICB Britten Norman Islanders for the next 30 years.	This option will be taken forward as the 'Do Minimum'.
Theme 1: –2 * like for like	
Replace the two aircraft with new / newer Britten Norman Islanders when life expired	The current Islanders will be suitable for at least a further 15 years, if not longer. The decision as to their replacement should be revisited nearer this time and a review of the market undertaken at this stage.
Theme 2: – 1 * larger capacity aircraft	
Replace the G-SICB with one large capacity aircraft and retain G-SICA	There is no case to replace either of the current aircraft in the foreseeable future. There would be a range of operational issues and considerable costs associated with moving to larger aircraft which cannot be justified at this stage in the Shetland context.
Theme 3: – 2 * larger capacity aircraft	
Replace the G-SICB and G-SICA with two larger capacity aircraft	There is no case to replace either of the current aircraft in the foreseeable future. There would be a range of operational issues and considerable costs associated with moving to larger aircraft which cannot be justified at this stage in the Shetland context.
Theme 4: Linked Option	
Retain G-SICA and G-SICB and supplement with an additional Islander	This option will be taken forward for further consideration.
Retain G-SICA in combination with two new / newer aircraft to provide a fleet of three aircraft	There is no case to replace either of the current aircraft in the foreseeable future.
Theme 5: Rotary Solutions	
Use of helicopters to provide island air services	The current Islanders will be suitable for at least a further 15 years, if not longer. The decision as to their replacement should be revisited nearer this time and a review of the market undertaken at this stage.
Theme 6: Runway Lighting	
Install runway lighting on island airstrips to facilitate take-off and landing after nightfall. A longer year round operating day could be provided.	This option will be taken forward for further consideration.
Theme 7: Navigational Aids	
Install ground and / or air based aids to navigation to facilitate flying in visibility that Visual Flight Rules would prevent. Improved reliability.	This option will be taken forward for further consideration.

3.7.2 The following capital options therefore considered were:

- **Option C1 – Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry (Do Minimum):**
  - This option would involve continuing with the current Britten-Norman Islanders over the length of the strategy period.
  - If it becomes clear during that period that one or both of the aircraft is nearing the end of its operational life, replacements should be considered at that stage.

- **Option C2: Supplement G-SICA and G-SICB with an additional Britten-Norman Islander:**
  - An additional Islander would be leased or purchased and added to the fleet. The timetable would be expanded to take account of this additional capacity.
  - It is likely that at least one more pilot would be required.
- **Option C3: Install runway lighting at all four island airstrips**
  - This option would involve the installation of runway lighting at Fair Isle, Foula, Papa Stour and Skerries (and Unst / Fetlar if re-opened).
  - Further investigation into the type of lighting to be used is required – it is assumed for the purpose of this option that Precision Approach Path Indicator (PAPI) lights would be installed.
- **Option C4: Install GNSS on G-SICA and G-SICB**
  - This option would involve the installation of GNSS and supporting equipment on the current Council Islander fleet.

Appraisal of Capital Options

3.7.3 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

3.7.4 The appraisal considers, at the network level, the potential contribution of the capital options to expand the operating envelope of the air service. The island-specific options are considered in subsequent chapters.

Appraisal against Objectives

Table 3.2: Air Capital Options – Appraisal against Objectives

	Option C1 – Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry	Option C2 – Supplement G-SICA & G-SICB with an additional Islander	Option C3 – Install lighting on all 4 island airstrips	Option C4 – Install GNSS on G-SICA & G-SICB
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓	-	✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	-	✓	✓

	Option C1 – Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry	Option C2 – Supplement G-SICA & G-SICB with an additional Islander	Option C3 – Install lighting on all 4 island airstrips	Option C4 – Install GNSS on G-SICA & G-SICB
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	✓✓	✓	✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓	✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	✓	✓

3.7.5 The key points from the above table are summarised below:

- Continuing with the current aircraft **(Option C1)** would have no impact against any of the objectives as it would represent a continuation of the current situation.
- The addition of a third aircraft to the fleet **(Option C2)** would make a significant contribution to the objectives. It would likely permit two aircraft to be in frontline service at all times, providing a significant increase in capacity, frequency and time on mainland. The provision of an additional aircraft would not increase the service frequency in its own right as additional pilots / flying hours would be required.
- The provision of runway lighting **(Option C3)** and GNSS **(Option C4)** could potentially extend the reliability and operating envelope of the air service, for example permitting continued flying in less clement weather or allowing night landing. This would make a positive contribution to a number of criteria including capacity, frequency and time on mainland. However, the generation of positive impacts would be dependent on the feasibility of reliably delivering the timetabled change in service.

Appraisal against STAG Criteria

Table 3.3: Air Capital Options – Appraisal against STAG Criteria

	Option C1 – Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry	Option C2 – Supplement G-SICA & G-SICB with an additional Islander	Option C3 – Install lighting on all island airstrips	Option C4 – Install GNSS on G-SICA & G-SICB
Environment	-	×	-	-
Safety	-	×	×	✓[15]
Economy	-	✓✓✓	✓	✓
Integration	-	✓✓	✓	✓

[15] This option would record a safety benefit if it can be reliably demonstrated that GNSS can be effective in the Shetland context (see comment in relation to the 'Operational Feasibility' of this option.

	Option C1 – Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry	Option C2 – Supplement G-SICA & G-SICB with an additional Islander	Option C3 – Install lighting on all island airstrips	Option C4 – Install GNSS on G-SICA & G-SICB
Accessibility & Social Inclusion	-	✓✓✓	✓	✓
Established Policy Directives	-	✓✓✓	✓	✓
Feasibility				
Technical Feasibility	*There would be no technical issues associated with this option assuming that no major issues emerge with the aircraft.*	*There would be no technical issues associated with this option.*	*There would be no technical issues associated with this option beyond initial set-up*	*There would be no technical issues associated with this option beyond initial set-up (explained in section above) providing the technology is proven by the current trials in Scotland.*
Operational Feasibility	*There would be no operational issues associated with this option assuming that suitable levels of operational resources continue to be sustainably provided.*	*At least one additional pilot would be required.*	*The tolerances for landing in darkness are significantly reduced, so lighting alone cannot be seen as a panacea for night time flying.*	*Pilot and ground staff training would be required.* *The current operator has raised concerns about the applicability and safety of GNSS in the Shetland context.*
Affordability	*There would be no affordability issues associated with this option.*	*A second hand Islander could be secured for £250k-£500k. The cost of an additional pilot and operating costs would be in addition to this.*	*This option would cost around £300k in total.*	*This option would cost around £100k for the two aircraft.*
Public Acceptability	*This option has not been tested with the public*	*This option has not been tested with the public, but would likely be acceptable providing the service is reliable.*	*This option has not been tested with the public, but would likely be acceptable providing the service is reliable.*	*This option has not been tested with the public, but would likely be acceptable providing the service is reliable.*

3.7.6 The key points from above appraisal against the STAG criteria are:

- The continuation of the current operation **(Option C1)** would have no impact against the STAG criteria but would also have no additional costs.

- From a safety perspective, the addition of a third aircraft **(Option C2)** would record a minor negative due to the increased flying hours and therefore risk. The lighting of airstrips **(Option C3)** could also have a negative safety impact. Whilst this option would extend the operating day, aircraft would be flown visually during the hours of darkness, which has a higher risk than daytime flying. The installation of GNSS **(Option C4)** would have a minor safety benefit in that it would reduce an element of the risk associated with visual approaches particularly in poor weather. That said, the current operator has raised concerns about increased pilot workload and the operation of GNSS in the Shetland environment.

- The addition of a third aircraft **(Option C2)** would have a major positive benefit in terms of economy and accessibility & social inclusion. A significant enhancement to the air service could be transformative to the economies of the Outer Isles, particularly Fair Isle and Foula, so long as the service was reliable and provided sufficient recovery capability during periods of poor weather. The principal benefit of an enhanced air service is that it would assist in tackling the significant capacity constraints associated with the current services (again, particularly to Fair Isle and Foula), supporting increased travel outbound and inbound to the islands. There would be a series of Transport Economic Efficiency (TEE) benefits associated with enhanced frequency, whilst benefits would also emerge in terms of residents, tourists, locally traded services and manufacturing & processing (for Fair Isle) and residents for Foula, Papa Stour and Skerries.

- The enhanced air service would also make a significant contribution to improving both community and comparative accessibility. Island residents would be better able to access key personal services, business opportunities and onward travel connections, whilst travel to the islands would become less problematic. From an integration perspective, this option would clearly support policy integration in terms supporting the economic development of the isles, including local development plans.

- **Option C2** is technically deliverable and would be relatively low cost when compared to some of the ferry options being considered.

- The installation of runway lighting **(Option C3)** and GNSS **(Option C4)** would give rise to a similar range of benefits (assuming the number of connections was scaled up), although the benefits would be of a lesser magnitude than those associated with a three aircraft service.

- Runway lighting **(Option C3)** has not been without its operational difficulties in the Orkney context and it is likely that it would be less beneficial than GNSS, which on the whole appears more reliable and cheaper.

Rationale for Selection / Rejection

3.7.7 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 3.4: Outcome of Appraisal, Air Services

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
Option C1 (Do Minimum): Maintain and continue with G-SICA and G-SICB over the strategy period / until life expiry	✓	This option is retained as the Do Minimum.
Option C2: Supplement G-SICA and G-SICB with an additional Britten-Norman Islander	✘	This option will not be considered further. There is at present insufficient demand for a third aircraft, whilst the current aircraft could be worked more intensively.
Option C3: Install runway lighting at Tingwall and all four island airstrips	✘	This option will not be considered further, except potentially in tandem with GNSS. The experience of runway lighting in Orkney coupled with the safety risks and limited probability of obtaining CAA night flight permissions mean that this option is excluded from further consideration.
Option C4: Install GNSS on the G-SICA and G-SICB	✓	This option should be considered further, as evidence from other new GNSS applications in Scotland become available. It should be noted that the operator concerns about safety and implementability in the Shetland environment would need to be addressed in advance of progressing this

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
		option.

4 Bluemull Sound

4.1 Capital Investment Timeframe

Note – there are significant daily interactions between Fetlar, Unst and Yell. Therefore, in considering options for Fetlar and Unst, we have consolidated these into the current Bluemull Sound arrangement, reporting options jointly for both islands.

- The current Bluemull Sound vessels, MV *Bigga* (primary 'shift' vessel) and MV *Geira* (secondary 'day' vessel) are 25 and 28 years old respectively. Whilst well maintained, the vessels will be approaching the end of their economic life within the next few years. Both vessels also have passenger accommodation below the waterline, a situation which would not be permitted on any new vessel. At present, the MV *Bigga* overnights at Gutcher, on Yell, and the MV *Geira* overnights at the recently constructed facility at Hamars Ness and her crew is Fetlar based.

- Current estimates from Shetland Islands Council suggest that the MV *Bigga* will be withdrawn from service in 2027 (becoming the secondary Bluemull Sound vessel in 2022 and the relief vessel in 2024). The MV *Geira* is estimated to be withdrawn from service in 2025 having been cascaded to relief vessel from 2019.

- Gutcher ferry terminal was constructed in 1972 and, although the linkspan was replaced in 1996, it is one of the generation of smaller linkspans. Investment in this terminal will therefore be required as part of any ferry replacement programme, particularly if moving to larger vessels.

- Belmont ferry terminal on Unst was also constructed in 1972. Like Gutcher, the linkspan was replaced in 1998, although again by one of the generation of smaller linkspans. Investment in the harbour facilities has been made since 1998, but it is likely that asset renewal will be required as part of any ferry replacement programme.

- Hamars Ness ferry terminal was built in 2004, with a large linkspan, equivalent to those used on Yell Sound. A breakwater was added in 2012, providing safe overnight berthing for one ferry. Asset replacement will not be required at this terminal as part of any immediate vessel replacement programme, although infrastructure may need to be renewed towards the end of the strategy period.

4.1.1 For each island / island group, the following package of documents are included in an appendix:

- Appraisal Summary Tables (ASTs);

- indicative harbour drawings, providing high level illustrations of the shoreside investment required to support each option; and

- environmental constraints maps.

4.1.2 The above material for Bluemull Sound is included in Appendix C.

4.2 Identified Problems

4.2.1 A range of 18 potential transport problems was considered for each island. The tables below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '✱' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback

in relation to this issue, or where they have proposed a different severity rating for this problem.

4.2.2 The following transport problems in relation to Fetlar and Unst were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 4.1: Fetlar Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	✗✗	Of the nine islands included in this study, Fetlar has the second longest travel time to Lerwick of islands without an air connection (after Skerries, where the air service is currently suspended). The journey involves two ferry connections and takes around two and a quarter hours by car and two hours and 25 minutes by public transport, assuming all connections are made. The long journey times limit daily interaction with the services and employment opportunities in Lerwick and indeed mainland generally, and this could be one of the causes of the economic challenges which the island has been facing of late.[16]
3	Last sailing / flight[17]	✗	The consultation suggested that the timetable is not seen to be conducive to undertaking social activities in Lerwick.[18] However, even in winter, the first departure from Fetlar is 0655 on weekdays and last departure from Yell is 2250 (or Shetland mainland is 2200) Monday to Saturday, which suggests that the inability to undertake social activities on the mainland is purely a function of distance. Indeed, the Routes and Service Methodology (RSM) found that Fetlar is over-provided in terms of its length of operating day. *The community consultation response noted that late sailings on Bluemull Sound are only available four days per week & are shared with Unst. It was noted that the reduction in late hires has impacted greatly on residents being able to undertake social activities either in Lerwick or more commonly in neighbouring isles.*
7	Frequency / Sailings per Day / Timetable gaps	✗✗	In comparison to neighbouring Unst, Fetlar has a relatively low service frequency, although their service is much better overall than that of other islands of a similar size, both within Shetland and further afield. Nonetheless, frequency is less than the RSM specified level. There is a specific gap in the Monday timetable, with no departures from Hamars Ness between 1300 and 1640 due to lunch break and maintenance and on other weekdays from 1050 to 1430 due to split shifts. The gaps in the timetable in particular can lead to extended periods off-island when undertaking employer or personal business on Yell, Unst or the mainland. *The community consultation response noted that the timetable gaps have resulted in extended periods on-island by visitors & commercial traffic - contractors, deliveries, livestock shipping etc with costs associated with this 'dead' time.*
8	Capacity	✗✗	There is not a notable capacity issue on direct sailings between Hamars Ness and Gutcher, but sailings to and from the island via Belmont can have car capacity issues.[19] This problem combined with the frequency / timetable gaps can impact on the ability to make unplanned trips off-island.
10	Comfort	✗	The accommodation is below the car deck and there is no disabled access / facilities
11	Physical access	✗	The MV *Bigga* and MV *Geira* are both ageing vessels and both have the only passenger accommodation below the waterline. Physical access can therefore be challenging for the elderly and disabled, again an important issue given the ageing demographic of Fetlar.[20]
12	Integration with PT (local bus)	✗✗	There is very limited bus integration at Gutcher for Fetlar residents. Variants of the 24 & 28 services call at Gutcher, with a single service through to Lerwick and four services per day to Ulsta. These services are not timed well for the Fetlar ferry and, with the

[16] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Fetlar to Lerwick – Travel Time & Cost

[17] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

[18] SIITS Consultation Review (Peter Brett Associates, 2015), p. 11.

[19] SIITS Consultation Review (Peter Brett Associates, 2015), p. 11.

[20] SIITS Vessels Review (TMG, 2015), p. 17.

	Service Characteristics	Severity Rating	Why is this a problem or not?
			exception of one service, require a change of bus. This makes public transport an unattractive option overall.[21] The dependence on the private car has a negative environmental impact and increases the cost of travel for islanders, leading to further comparative disadvantage.
13	Integration with PT (strategic)	✗✗	Fetlar has a timetable which allows islanders to easily access NorthLink services from Lerwick. However, residents cannot catch the first morning Edinburgh, Inverness, Aberdeen or Kirkwall flights, although the first flight to Glasgow and the second to Aberdeen are accessible. The inability to catch the first morning flights to various locations means that Fetlar residents cannot carry out a day return visit for meetings, appointments etc, leading to potentially costly overnight stays or increased air fares.
14	Crossing / flight times	✗	The 25 minute crossing time to Gutcher is not unreasonable. However, on indirect sailings via Belmont, the crossing time is extended by 10 minutes plus the time required for marshalling at Belmont. Fetlar generally has two indirect sailings per day, adding significantly to journey times. The increased overall journey times on such sailings increase the already lengthy journeys for accessing a range of business and personal services.
16	Weekday / weekend service variation[22]	✗✗✗	Fetlar has a much reduced service at the weekend. Saturday and Sunday provision is slightly over half of the weekday provision. This limits weekend accessibility to the mainland and the attractiveness of the island for weekend tourists.

Table 4.2: Unst Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	✗✗	Of the nine islands considered in this study, Unst has the third longest journey time to Lerwick without an air connection (after Skerries and Fetlar). The journey involves two ferry connections and takes around two hours by car and two and a half hours by public transport (depending on where on Unst the journey begins), assuming all connections are made. The long journey times limit daily interaction with the services and employment opportunities in Lerwick and indeed mainland generally.[23]
3	Last sailing / flight[24]	✗	The consultation suggested that the timetable is not seen to be conducive to undertaking social activities in Lerwick.[25] However, even in winter, the first departure from Unst is 0630 and last departure on Monday to Saturday from the mainland 2200 or from Yell 2250, which suggests that the inability to undertake social activities on mainland is purely a function of distance.[26]
8	Capacity	✗✗	The consultation and carryings data suggest that peak vehicle capacity can be an issue on the Gutcher – Belmont route. From a passenger perspective, the majority of the capacity issues are on departures from Belmont, with the 0630 and 1740 departures in the summer particularly busy (although this may have changed since the end of the movements of Petrofac workers working at the Sullom Voe gas terminal). With regards to vehicles, the 0825 departure from Belmont is a particularly busy sailing – in summer 2014, this sailing departed with its vehicle-deck utilised at more than 80% on 60 separate days, with the corresponding figure for the winter being 52 days.[27] The shortage of capacity on key sailings means that a passenger may have to delay a desirable journey (with the potential for missed onward connections) or cancel it altogether, particularly where the journey is short notice or discretionary.

[21] http://www.travelinescotland.com/timetableplanner/serviceLookup.do?method=defaultMethod&hss=GViYe282326821

[22] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[23] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Unst to Lerwick – Travel Time & Cost

[24] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

[25] SIITS Consultation Review (Peter Brett Associates, 2015), p. 11.

[26] http://www.shetland.gov.uk/ferries/documents/TimetableWinter2015-16V3.pdf

[27] SIITS Carryings and Utilisation Analysis (Peter Brett Associates, 2015), Gutcher – Belmont Capacity Analysis Table

	Service Characteristics	Severity Rating	Why is this a problem or not?
10	Comfort	✗	The accommodation is below the car deck and there is no disabled access / facilities
11	Physical access	✗	The MV *Bigga* and MV *Geira* are both ageing vessels and both have passenger accommodation below the waterline. Physical access can therefore be challenging for the elderly and disabled, again an important issue given the ageing demographic of the Unst population.
12	Integration with PT (local bus)	✗✗	There is very limited bus integration at Gutcher for Unst residents. Variants of the 24 and 28 services call at Gutcher, with a single service through to Lerwick and four services per day to Ulsta. These services are not in keeping with the much higher frequency ferry service. This makes public transport an unattractive option overall.[28] The dependence on the private car has a negative environmental impact and increases the cost of travel for islanders, leading to further comparative disadvantage.
13	Integration with PT (strategic)	✗✗	Unst has a timetable which allows islanders to easily access NorthLink services from Lerwick. However, residents cannot catch the first Aberdeen, Edinburgh, Inverness or Kirkwall flights, although the first flight to Glasgow is accessible. The inability to catch the first morning flights to various locations means that Unst residents cannot carry out a day return visit for meetings, appointments etc, leading to potentially costly overnight stays.
16	Weekday / weekend service variation[29]	✗	Unst has a reduced service at the weekend. Saturday provision is around two thirds of the weekday provision, whilst there are relatively few connections on a Sunday compared to a typical weekday (although the Sunday service frequency is still very high when compared to other Scottish islands).[30] The consultation suggested this presents something of a problem for Unst residents, although it is clear from the timetable and data that Sunday travel is possible, albeit less frequent.

4.3 Appraisal of Capital Options

Capital Options

4.3.1 The following capital options were identified for the Bluemull Sound:

- **Option C1 (Do Minimum): Replace the MV *Bigga* and MV *Geira* on a like-for-like basis:**
  - The new vessels would be 35m TYPE 1 and would cost in the region of £5.5m each.
  - The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans. The cost would be around £3.5 million at Gutcher[31] and £3.4 million at Belmont[32], £6.9 million in total.
  - The total capital cost of this option would therefore be around **£17.9 million**.
- **Option C2: Replace the MV *Bigga* and MV *Geira* with two larger vessels:**
  - The new 45m TYPE 2 vessels would cost in the region of £7m each.
  - In order to accommodate larger vessels:

[28] http://www.travelinescotland.com/timetableplanner/serviceLookup.do?method=defaultMethod&hss=GViYe282326821

[29] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[30] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Daily Crossings and Capacity –Unst.

[31] See Gutcher Harbour Drawing, Box 2, Like-for-Like option.

[32] *See Belmont Harbour Drawing, Box 2, Like-for-Like option.*

- The berthing structure at Gutcher would need to be replaced, and supplemented by a large linkspan and potentially some minimal dredging. This would cost approximately £4.7m[33].

- The berthing structure at Belmont would need to be replaced, and supplemented by a large linkspan and potentially some minimal dredging. This would cost approximately £4.2m[34].

- A new parking & waiting area would be required at Hamars Ness as well as refendering of the existing structure[35]. This would around £250k.

- The total capital cost of this option would therefore be around **£23.2m**.

- **Option C3: Replace the MV *Bigga* and MV *Geira* with three new vessels**

  - *Note – the assumption is that the three vessels would all be like-for-like replacements for the current vessels but in practice there could be a mix of vessel sizes.*

  - The three new TYPE 1 vessels would cost in the region of £5.5m each.

  - The harbour works would be the same as those required under option C1. However, a decision would also need to be taken on the overnight arrangements and berthing arrangements during breaks for the third vessel, and this could add to the cost of this option. A low cost option could involve the use of the facility at Cullivoe although this would lead to operational inefficiencies.

  - It is assumed here that the third vessel would provide a *pro rata* increase on the number of sailings provided.

  - The total capital cost of this option would therefore be around **£23.4m**, excluding any additional berthing arrangements for the third vessel. This would be accompanied by a significant increase in revenue costs.

- **Option C4: Develop a new harbour at Mid Yell for the Fetlar service**

  - This option would only be taken forward with one of the vessel options outlined above.

  - This option would involve the development of a new harbour at Mid Yell with the majority of Fetlar services running direct from the island to Mid Yell[36].

  - Unst services would continue to operate to Gutcher and, on occasions, via Hamars Ness. The Yell landfall would therefore be split between Gutcher and Mid Yell

  - A new harbour at Mid-Yell would cost around **£6.8m** excluding optimism bias and contingency.

- **Option C5a: Commence an air service from Unst to Tingwall**

  - This option would involve the provision of capital funding to restore the airstrip at Baltasound to a serviceable standard and ongoing revenue funding to support the operation of an air service with appropriate ground support.

[33] *See Gutcher Harbour Drawing, Box 3, Larger Vessel option*

[34] *See Belmont Harbour Drawing, Box 3, Larger Vessel option*

[35] *See Hamars Ness Harbour Drawing, Box 2, Like-for-Like option*

[36] *See Gutcher Harbour Drawing, Box 4, New Harbour at Mid Yell option*

- Current drive times from Unst to Lerwick are in excess of two hours and air services would reduce this journey time substantially.
- The re-opened airfield would need to be fully licensed.
- The estimated capital cost of restoring Baltasound to an operational standard would be around **£100k**. The costs of licensing the airfield would be in addition to this.
- The revenue costs would be dependent on the number of rotations over the week.

- **Option C5b: Commence an air service from Fetlar to Tingwall**
  - This option would involve the provision of capital funding to restore the airstrip at Fetlar to a serviceable standard, and ongoing revenue funding to support the operation of an air service with appropriate ground support.
  - Current drive time from Fetlar to Lerwick is around two and a quarter hours and air services would reduce this journey time substantially.
  - The reopened airfield would need to be fully licensed.
  - The estimated capital cost of restoring Fetlar airstrip to an operational standard would be around **£200k**. The costs of licensing the airfield would be in addition to this.
  - The revenue costs would be dependent on the number of rotations over the week.

- **Option C6: Construct a fixed link between Unst and Yell**
  - The working assumption for the purpose of costing in this appraisal is that a fixed link would take the form a dual lane, single bore tunnel with footway between Hill of Troilva and Holga Ness. Other options could be considered but the above was the only option taken forward in the 2008 STAG study.
  - One vessel would require to be retained for Fetlar, which could operate to Gutcher, Belmont or a new harbour at Mid Yell. It is assumed that the current length of operating day would be retained – this would be a three crew operation. If the length of operating day was to be reduced to 14 hours (as RSM suggests), this option would require a two crew operation.
  - This timescale associated with the planning and construction of any fixed link (circa 10-15 years) would prevent any redeployment of the MV *Bigga* and / or MV *Geira*. Indeed, an intermediate vessel solution may be required given the current age of these vessels.
  - A range of capital costs have been provided for a fixed link (see Table 1.1 for more information on the derivation of the below costs):
    - Unlined UK: £71.2m (£132.5m including optimism bias & contingency).
    - Unlined Norwegian: £56.8m (£105.7m including optimism bias & contingency).
    - 1/3 Lined UK: £75.9m (£141.0m including optimism bias & contingency).
    - 1/3 Lined Norwegian: £60.0m (£111.6m including optimism bias & contingency).

Appraisal

4.3.2 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Transport Planning Objectives

Table 4.3: Bluemull Sound Capital Options – Appraisal against Objectives

	Option C1 Replace the MV *Bigga* & MV *Geira* with like-for-like vessels	Option C2 Replace the MV *Bigga* and MV *Geira* with 2 larger vessels	Option C3 Replace the MV *Bigga* and MV *Geira* with 3 vessels	Option C4 Develop a new harbour at Mid Yell for Fetlar service	Option C5a Commence an air service from Unst to Tingwall	Option C5b Commence an air service from Fetlar to Tingwall	Option C6 Construct a fixed link between Unst and Yell
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓	✓✓	✗	✓	✓	✓✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A	N/A	✓	✓	✓
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	-	-	-	✓	✓	-
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	✓✓	✗	✓	✓	✓✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓	✗✗	✓	✓	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on	-	-	-	-	-	-	✓

	Option C1 Replace the MV *Bigga* & MV *Geira* with like-for-like vessels	Option C2 Replace the MV *Bigga* and MV *Geira* with 2 larger vessels	Option C3 Replace the MV *Bigga* and MV *Geira* with 3 vessels	Option C4 Develop a new harbour at Mid Yell for Fetlar service	Option C5a Commence an air service from Unst to Tingwall	Option C5b Commence an air service from Fetlar to Tingwall	Option C6 Construct a fixed link between Unst and Yell
Shetland mainland.							

4.3.3 The key points from the above table are summarised below:

- The Gutcher – Belmont leg of the Bluemull Sound service experiences peak hour vehicle capacity problems, whilst indirect sailings via Hamars Ness can also give rise to capacity issues for both Unst and Fetlar. The replacement of the current vessels with two larger vessels **(Option C2)** or three vessels **(Option C3)** would assist in addressing these issues. A fixed link **(Option C6)** would remove all capacity constraints on the Bluemull Sound. The development of air services to Unst and Fetlar **(Options C5a & C5b)** would provide a small increase in capacity but would not address the car capacity issues on the Bluemull Sound. Finally, the operation of a direct service between Fetlar and a new harbour in Mid Yell **(Option C4)** would impact negatively on capacity as it would remove capacity from the busier Gutcher – Belmont leg of the route.

- A fixed link between Unst and Yell **(Option C6)**, coupled with the high service frequency on Yell Sound could potentially open up commuting opportunities for Unst residents although journey times would still be long. These options would also support the ability to spend four hours or more in Lerwick each day (although this can already be achieved with the current ferry service).

- The provision of a three vessel service **(Option C3)**, allied with additional revenue funding would contribute moderately towards enhancing the service frequency (TPO3). A fixed link **(Option C6)** would also make a positive contribution in this respect, as would air services **(Options C5a & C5b)**, albeit they are very capacity constrained. A new harbour at Mid Yell **(Option C4)** would reduce service frequency unless combined with a three vessel solution.

- A three vessel solution **(Option C3)** would do the most to reduce variations within the timetable, although air services **(Options C5a & C5b)** would make a minor contribution in this respect. A fixed link **(Option C6)** would also remove any timetable related considerations for Unst and provide a direct dedicated service between Fetlar and Gutcher, Belmont or Mid Yell, thus reducing timetable variation overall.

- A fixed link **(Option C6)** would make a marginal improvement to strategic connectivity but connections would still be required across Yell Sound.

- At present, it is possible to spend 4+ hours in Lerwick 7days per week from both Unst and Fetlar. New air services **(Options C5a & C5b)** would open up partial commuting opportunities to Lerwick and would substantially reduce journey times to more easily facilitate part day visits to Lerwick.

Appraisal against STAG Criteria

Table 4.4: Bluemull Sound Capital Options – Appraisal against STAG Criteria

	Option C1 Replace the MV *Bigga* & MV *Geira* with like-for-like vessels	Option C2 Replace the MV *Bigga* and MV *Geira* with two larger vessels	Option C3 Replace the MV *Bigga* and MV *Geira* with three vessels	Option C4 Develop a new harbour at Mid Yell for Fetlar service	Option C5a Commence an air service from Unst to Tingwall	Option C5b Commence an air service from Fetlar to Tingwall	Option C6 Construct a fixed link between Unst and Yell
Environment	✓	✓	✓	✗✗	✗	✗	✗✗✗
Safety	✓	✓	-[37]	-	✗	✗	✗
Economy	-	✓	✓✓	-	✓✓	✓✓	✓✓✓
Integration	-	✓	✓✓	✓	✓✓	✓✓	✓✓✓
Accessibility & Social Inclusion	✓✓	✓✓	✓✓	-	✓✓	✓✓	✓✓✓
Established Policy Directives	✓	✓	✓✓	-	✓	✓	✓✓
Technical Feasibility	*The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans.*	*The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans, whilst some minimal dredging would also be required.* *Refendering & a new parking & waiting area would be required at Hamars Ness*	*As per Option C1. An overnight berth would be required for the third vessel.*	*Requirement for construction of an entirely new harbour – potential delays surrounding consents and planning permission.*	*No issues*	*No issues*	*This option is feasible but there remains high levels of technical uncertainty with respect to ground conditions.*
Operational Feasibility	*Crew induction training would be required*	*Higher crew training costs associated with moving to a higher certification vessel.* *Crew induction training would be required*	*Requirement for additional crew & crew induction training.* *Issue around where third vessel overnights.*	*If packaged with a less than three vessel ferry option, this option would reduce services on the main Gutcher – Belmont crossing*	*Issues include availability of flying hours / aircraft and RFFS cover.* *Airfield would need to be fully licensed, potentially at significant cost.*	*Issues include availability of flying hours / aircraft and RFFS cover.* *Airfield would need to be fully licensed, potentially at significant*	*See Section 1.4 – fixed links.*

[37] Whilst a three vessel solution would provide a safety benefit in terms of accommodation being above the waterline, there would be an increased risk of a close quarter incident with three vessels operating on a relatively short route.

	Option C1 Replace the MV *Bigga* & MV *Geira* with like-for-like vessels	Option C2 Replace the MV *Bigga* and MV *Geira* with two larger vessels	Option C3 Replace the MV *Bigga* and MV *Geira* with three vessels	Option C4 Develop a new harbour at Mid Yell for Fetlar service	Option C5a Commence an air service from Unst to Tingwall	Option C5b Commence an air service from Fetlar to Tingwall	Option C6 Construct a fixed link between Unst and Yell
						cost.	
Affordability	*The total cost of this option in 2016 prices would be around* ***£17.9m****. This is the lowest cost option.*	*The total cost of this option in 2016 prices would be around* ***£23.15m****.*	*The total cost of this option in 2016 prices would be around* ***£23.4m****. There is also a significant increase in revenue costs (see below).*	*A new harbour at Mid-Yell would cost around* ***£6.8m****.* *The cost of new vessels would be in addition to this.*	*Estimated capital cost of restoring Baltasound to an operational standard would be around* ***£100k****.* *Airfield licensing and operational costs would be in addition to this*	*Estimated capital cost of restoring Fetlar airstrip to an operational standard would be around* ***£200k****.* *Airfield licensing and operational costs would be in addition to this*	*See Table 1.1*
Public Acceptability	*There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links.*	*There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. Some support for this option from Fetlar residents.*	*There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. Some support for this option from Fetlar residents.*	*There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. No obvious support for this proposal.*	*Some support was expressed for this proposal.*	*No comments received concerning this option.*	*High levels of support for this option.*

4.3.4 The key points from above appraisal against the STAG criteria are:

- From an environmental perspective, it is anticipated that the ferry options **(Options C1-C3)** would have a minor positive impact through the provision of new and more fuel efficient vessels. The deployment of three vessels **(Option C3)** would erode this benefit to some extent if more sailings were operated. The development of a new harbour at Mid Yell **(Option C4)** would have moderate negative environmental impacts in the short-term based on the marine infrastructure work and the development of a currently undeveloped area. However, provided the works are implemented sensitively taking account of environmental constraints, they are considered unlikely to be significant in the longer term. The reinstatement of air services to Unst & Fetlar **(Options C5a & C5b)** would have a minor negative impact from the increase in aircraft emissions, with the need for a new access road to Fetlar airstrip being a further negative. The provision of a fixed link **(Option C6)** is likely to have a minor negative impact through increasing vehicle kilometres, whilst there will also be potentially significant environmental impacts

associated with construction (further work on the alignment and design would be required to more accurately assess these impacts).

- Each of the ferry options **(Options C1-C3)** makes a positive contribution to safety because new vessels would have passenger accommodation above the waterline. However, there is an increased risk of a close quarter incident with a three vessel solution **(Option C3).** The commencement of air services **(Options C5a & C5b)** would have a marginally negative safety impact as they would add additional journeys which are not currently operated, whilst a fixed link **(Option C6)** would demonstrate the same minor negative through increasing vehicle kilometres. There would also be potential fire risks with a tunnel but it is assumed that the design and safety standards would minimise this risk.

- From an 'Economy' perspective, the provision of two new larger vessels **(Option C2)** would have marginal positive impacts as it would reduce the capacity constraint affecting the main Gutcher – Belmont route as well as triangular services via Hamars Ness. A three vessel solution **(Option C3)**, if aligned with enhanced frequency, would offer TEE benefits (associated with reduced wait times) and moderate EALI / wider benefits through significantly improving access to both the Unst and Fetlar economies. A fixed link **(Option C6)** would have major economic benefits for Unst (less so for Fetlar), in effect making the island an extension of Yell. There is also a question as to whether Fetlar would continue to retain its current length of operating day, or whether it would be reduced to a standard 14 hour day in line with the RSM. Finally, the introduction of air services **(Options C5a & C5b)** would provide TEE benefits through dramatically reduced journey times to / from Tingwall and / or Sumburgh albeit these benefits would accrue to relatively few people. The prospect of a fast link to the mainland could be beneficial to the long term sustainability of Unst.

- From an integration perspective, a three vessel solution **(Option C3)** would contribute positively to transport and policy integration, whilst a fixed link **(Option C6)** could have a transformative effect on Unst as an island, supporting transport integration, policy and, importantly, land-use integration through making the stock of unused houses on the island more attractive (with potential in-migration supporting the island more generally).

- All of the new vessel options would give rise to accessibility and social inclusion benefits. The key benefit would be an improvement in physical accessibility to the passenger lounges on the vessels. The current vessels have passenger accommodation below the waterline, which is very inaccessible for those with a physical disability. This issue is offset by passengers remaining in their vehicles for the crossing (this is permitted as the crossing times are less than 30 minutes), although this still has to be considered a social exclusion impact to some extent. A fixed link further addresses any social inclusion issues associated with e.g. the recently reduced weekend service, being unable to access social activities in Lerwick in the evening etc. Air services **(Options C5a & C5b)** from Unst and Fetlar would provide a marked improvement in accessibility, although for a small number of people.

- The three ferry options are technically and operationally feasible. All of these options would require harbour works, with the three vessel solution **(Option C3)** also potentially requiring an additional overnight berth.

- There remain technical feasibility / risk / cost issues surrounding a fixed link **(Option C6)**, which would require further detailed development work if this option was to be taken forward.

- The lowest cost option is a like-for-like replacement of the current vessels **(Option C1)**, with options of two larger vessels **(Option C2)** and three like-for-like vessels **(Option C3)** being more expensive. A fixed link **(Option C6)** would have the highest up-front cost,

whilst there remains significant cost uncertainty associated with the limited ground investigation which has been undertaken.

4.4 Appraisal of Revenue Options

Revenue Options

4.4.1 The following revenue options were identified for the Bluemull Sound:

- **Do Minimum**
  - Continue with the current level of service.
- **Option R1: Offer an on-request early departure from both Fetlar & Unst, which would allow connection with the first flights from Sumburgh**
  - This service would operate Monday - Friday and would be operated by one vessel. The service would depart Fetlar at 0345 and Unst at 0415. The service would have to be operated by the Gutcher-based vessel MV *Bigga* as it would otherwise block the linkspan. The ship would be manned from 0245 for half an hour turn to, sail from Gutcher at 0315, arrive back at Gutcher at 0430 and secure by 0500.
  - This option would result in a maximum of 52 * 5 = 260 additional return sailings per annum, an increase of 3% over the current timetable. It is assumed that crew would be paid at the unsocial hours' overtime rate. An equivalent sailing across Yell Sound would be required.
  - For the purposes of costing it is assumed that this scenario relates to a 2-vessel solution.
- **Option R2: Offer additional request sailings on Friday and Saturday evenings (through to e.g. 0200)**
  - This option would result in a maximum of 52 * 2 = 104 additional return sailings per annum, an increase of 1% over the current timetable. It is assumed that crew would be paid at the unsocial hours' overtime rate. An equivalent sailing across Yell Sound would be required and has been included in the costs.
  - For the purposes of costing it is assumed that this scenario relates to a 2-vessel solution.
- **Option R3: Operate standard weekday timetable seven days a week**
  - The current standard weekday timetable (operated Tuesday - Friday) would be operated at the weekends (Monday would remain the scheduled maintenance day). This option would result in approximately 968 additional return sailings per annum, an increase of 9% over the current timetable. It is assumed that the crew would be paid at the standard overtime rate plus unsocial allowance for these additional sailings.

4.4.2 It should be noted that the above three options are not mutually exclusive – they can be offered independently or jointly.

Appraisal

4.4.3 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 4.5: Bluemull Sound Revenue Options – Appraisal against Objectives

	Option R1 Offer an on request early departure from both Unst & Fetlar for connections to Sumburgh	Option R2 Offer additional request sailings on Friday and Saturday evenings (to 0200)	Option R3 Operate standard weekday timetable 7-days a week
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	-	✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	NA	NA	NA
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	-	-
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓	✓	✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓✓✓	-	-

4.4.4 The proposal for an early morning departure from Fetlar and Unst to connect with the first flights **(Option R1)** would have a major impact in terms of strategic connectivity. If this service were to be realised, Fetlar & Unst residents would be able to make a day return to the Scottish mainland by air. At the other end of the day, the extension of the Friday and Saturday timetable to 0200 **(Option R2)** would offer a benefit in terms of service frequency, although the off-peak nature of these sailings means there would be little contribution to the other objectives.

4.4.5 The benefit of **Option R3** is an enhanced weekend service, effectively offering the weekday timetable on a Saturday and Sunday. The option would also enhance the overall service frequency from Fetlar and Unst. This option therefore scores well in terms of frequency and the minimisation of timetable variation.

Appraisal against STAG Criteria

Table 4.6: Bluemull Sound Revenue Options – Appraisal against STAG Criteria

	Option R1 On Request early departure from both Unst & Fetlar for connections to Sumburgh	Option R2 Additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 Operate standard weekday timetable 7-days a week
Environment	✖	✖	✖
Safety	✖	✖	✖
Economy	✓	✓	✓
Integration	✓✓	-	✓
Accessibility & Social Inclusion	✓	✓✓	✓✓
Established Policy Directives	✓	✓	✓
Technical Feasibility	-	-	-
Operational Feasibility	*No operational issues but crew overtime & fuel required* *Yell Sound sailing would also have to come forward.*	*No operational issues but crew overtime & fuel required.* *Yell Sound service would also have to be extended.*	*No operational issues but additional crew hours & fuel would be required*
Affordability	*£369k increment to current annual operating costs of £2.19m based on Option C1*	*£307k increment to current annual operating costs of £2.19m based on Option C1*	*£532k increment to current annual operating costs of £2.19m based on Option C1*
Public Acceptability	*There was very little engagement from the Unst public with respect to ferry revenue options.*	*There was very little engagement from the Unst public with respect to ferry revenue options.*	*There was very little engagement from the Unst public with respect to ferry revenue options. Some support for this option from Fetlar residents.*

4.4.6 The key points from above appraisal against the STAG criteria are:

- **Option R1** would have a notably positive impact on transport integration, allowing Fetlar and Unst residents to catch the morning flights from Shetland. The enhanced connectivity would improve community and comparative accessibility, which in turn would promote minor economic benefits. Additional and integrated early sailings across Yell Sound would be required.

- The on-request late night sailings on a Friday and Saturday **(Option R2)** would significantly enhance community accessibility, allowing Fetlar and Unst residents to partake in evening social activities in Lerwick. This would support island life and potentially help promote population retention, which has been identified as a key issue in both islands recently. Additional and integrated late evening sailings across Yell Sound would also be required.

- The operation of the standard weekday timetable seven-days per week **(Option R3)** would provide moderate benefits in terms of weekend connectivity, providing both economic benefits and enhanced accessibility.

4.5 Annual Operating Cost Estimates

4.5.1 In 2015/16 there were approximately 20,600 sailings on the Bluemull Sound serving Unst and Fetlar. The revenue costs and income associated with operating the Bluemull ferry service was as follows:

Table 4.7: Bluemull Sound Revenue Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£1,093,752
Vessel – Fuel	£163,224
Vessel – Maintenance	£574,565
Vessel - Other Costs	£361,585
Vessel Total	**£2,193,126**
Terminal – Maintenance	£76,728
Terminal - Other Costs	£45,101
Terminal Total	**£121,829**
Route Total	**£2,314,955**
Route Income	*-£125,752*
Route Net Cost	**£2,189,203**

4.5.2 In addition to these costs, an internal berthing charge of £352,357 was paid in 2015-16.

4.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Bluemull service costs around **£2.2m** per annum (net) to operate.

4.5.4 An estimate of the annual net revenue budget costs associated with the Capital ('C') and Revenue ('R') options outlined above is shown in the chart below. For brevity, the revenue options are shown in relation to Capital Option C1 only.

4.5.5 The figures shown are the estimated net annual revenue costs associated with each option (although again it should be noted that the options are not mutually exclusive). The figures on the horizontal axis show the overall annual net operating cost for each option.

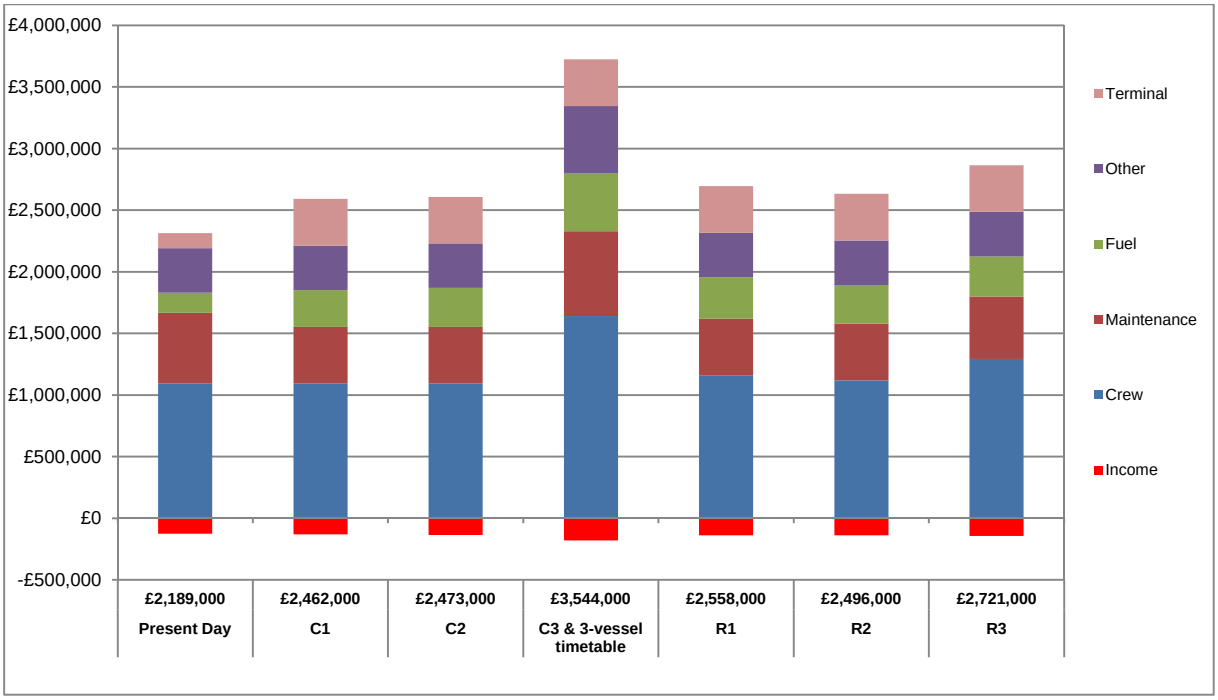


Figure 4.1: Bluemull Sound Annual Revenue Cost Estimates

4.5.6 The main points to emerge from the above are:

- C1: reduced maintenance costs but increased fuel costs compared to the present day
- C2: increased fuel costs associated with larger vessel, crew costs are assumed unaffected, remaining at four. Small increase in fares revenue.
- C3: increase in all costs, by approximately 50%. *Pro rata* increase in fares revenue.
- R1: additional crew and fuel costs for Bluemull and Yell lead to a net increase over C1 of £96k. *Pro rata* increase in fares revenue assumed.
- R2: additional crew and fuel costs for Bluemull and Yell lead to a net increase over C1 of £34k. *Pro rata* increase in fares revenue assumed.
- R3: additional crew and fuel costs for Bluemull and Yell lead to a net increase over C1 of £259k. *Pro rata* increase in fares revenue assumed.

4.6 Public Consultation – Prioritisation

4.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

4.6.2 This list comprised improvements to aspects of connectivity associated with ferry and where appropriate air services. Whist it did not include Fixed Links as an option, there was an 'Other – Please Specify' option. In addition, question 3 on the proforma asked: *'Do you have any comments on the future transport options presented*?' and this provided a further option for views on fixed links to be expressed.

4.6.3 The number of completed questionnaires was 50 from Unst and 7 from Fetlar.

4.6.4 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the 'Other – Please Specify' option. Note that these columns do not sum to 100% as the question allowed three responses.

Unst

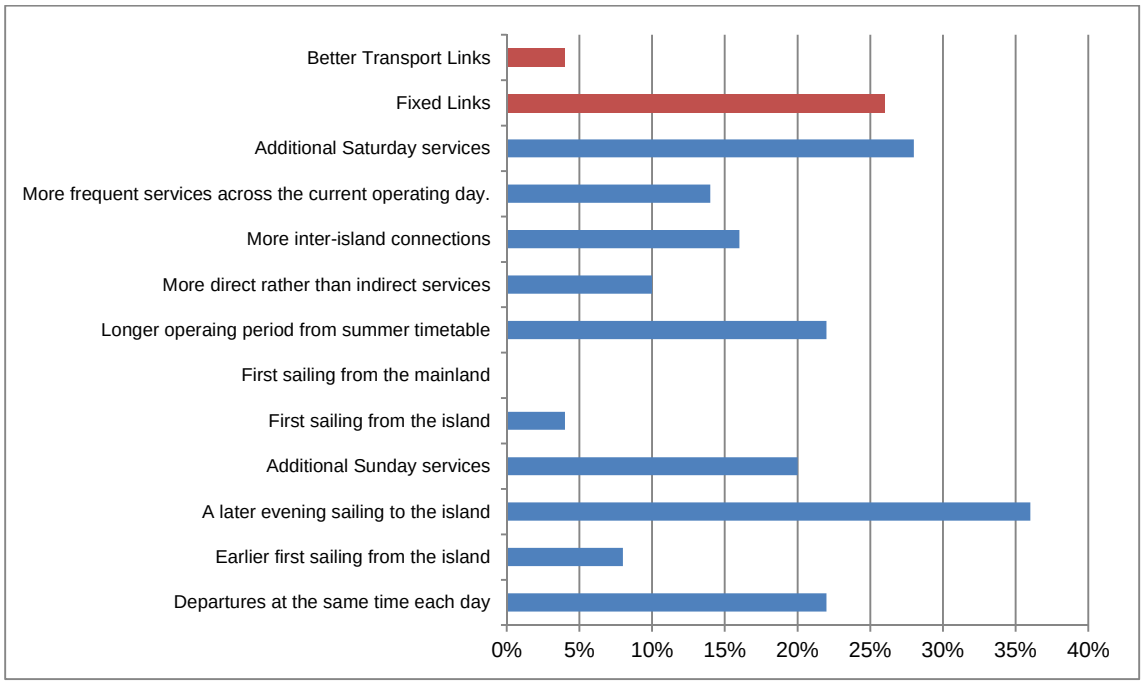


Figure 4.2: Unst – Prioritisation of Enhancements

4.6.5 The top priority for Unst residents was a later evening sailing to the island followed by additional Saturday services. Around 25% of respondents noted Fixed Links at this stage.

4.6.6 When asked for comments on the options, 62% of respondents noted a desire for a fixed link solution.

4.6.7 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

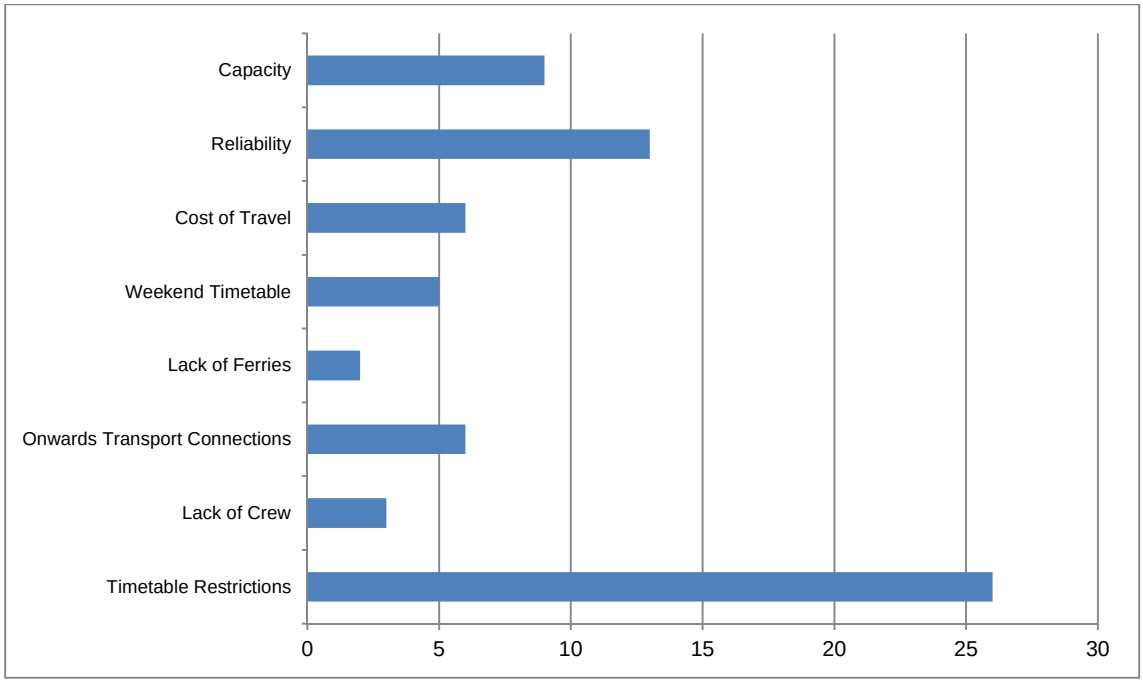


Figure 4.3: Unst – Other Issues Raised (Frequency)

4.6.8 Most of the other issues raised surrounded restrictions imposed by the current timetable, specifically at weekends. Further concerns were raised surrounding reliability of the current vessels and capacity on the current ferry services.

Fetlar

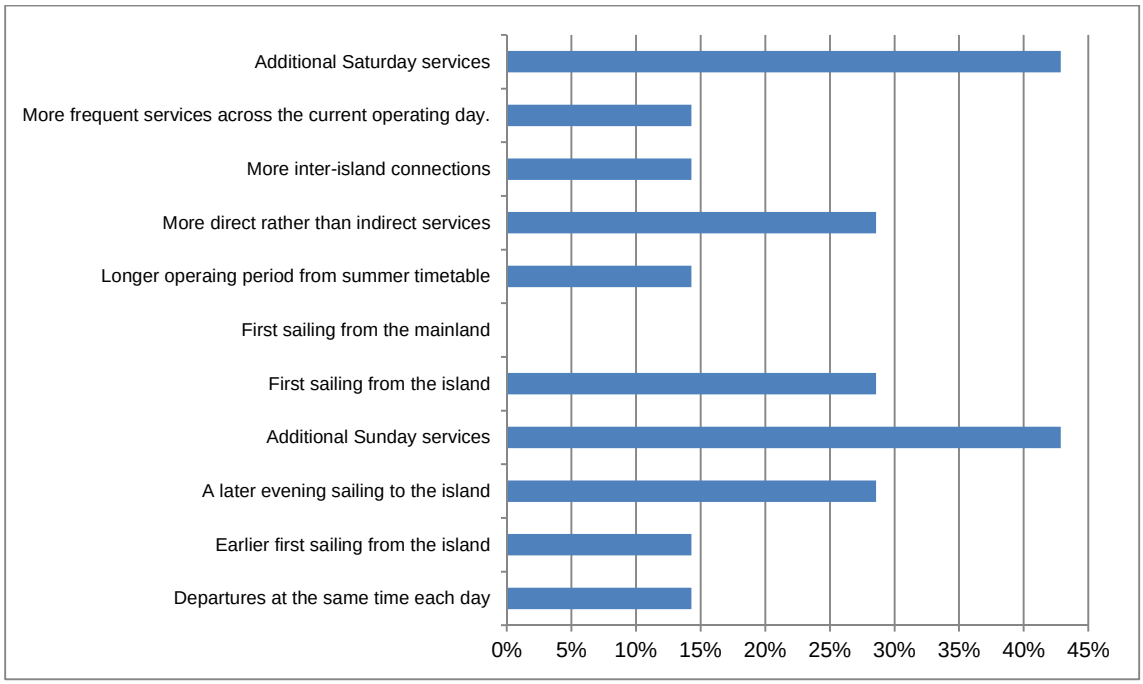


Figure 4.4: Fetlar – Prioritisation of Enhancements

4.6.9 The top priority for Fetlar residents was additional Saturday and Sunday services. A first sailing from the island, a later evening sailing to the island and more services running direct to Gutcher were priorities.

4.6.10 When asked for comments on the options, only one of the seven respondents commented on preference for a fixed link solution.

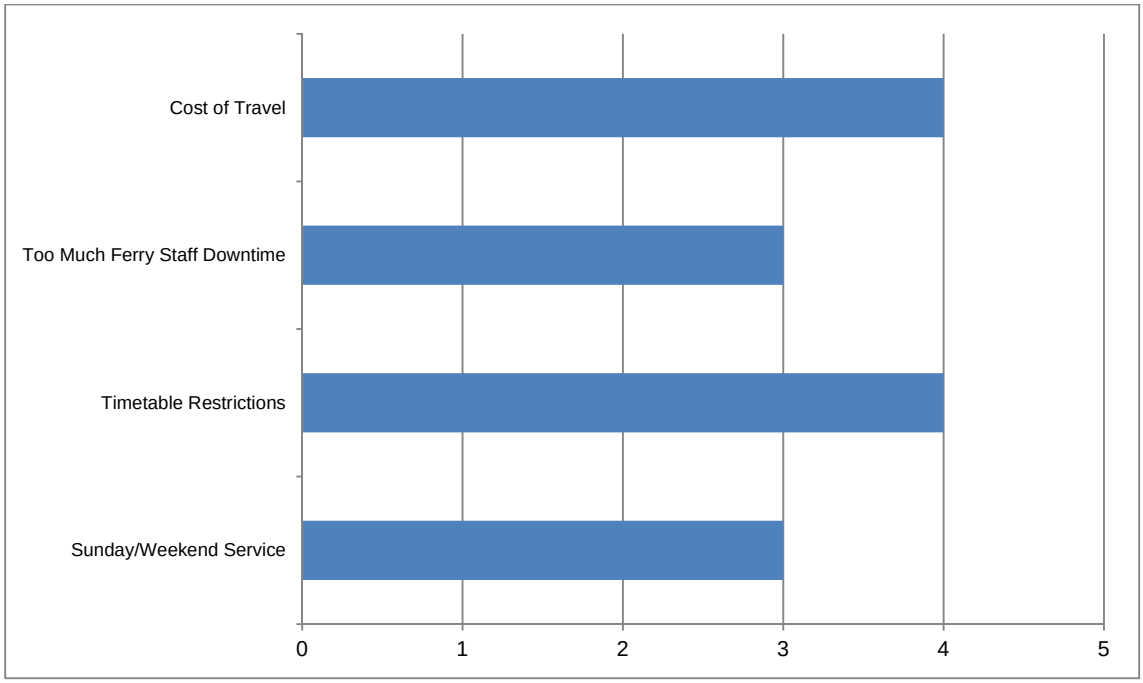


Figure 4.5: Fetlar – Other Issues Raised (Frequency)

4.6.11 Other issues raised by Fetlar residents included issues surrounding timetable restrictions and the cost of travel.

4.7 Rationale for Selection / Rejection

4.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 4.8: Outcome of Appraisal, Bluemull

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
Option C1 Replace the MV *Bigga* & MV *Geira* with two like-for-like vessels – TYPE 1	✓	Further more detailed analysis of supply and demand is required to establish whether 2 * 35m TYPE 1 vessels could meet the requirements of the route. This option could be combined with R1-R3 to extend the operating day / week.
Option **C2** Replace the MV *Bigga* and MV *Geira* with 2 * TYPE 2 larger vessels	✓	2 * larger vessels would alleviate capacity issues on the route. The costs and benefits of this compared to C1 need to be established and quantified. This option could be combined with R1-R3 to extend the operating day / week.
Option **C3** Replace the MV *Bigga* and MV *Geira* with 3 * TYPE 1 vessels	✓	A 3-vessel solution would alleviate capacity issues on the route and provide a step change in the service. The costs and benefits of this compared to C1 need to be established and quantified. An overnight berthing solution for the third vessel would need to be confirmed.
Option **C4** Develop a new harbour at Mid Yell for Fetlar service	✘	This option has been excluded from further consideration for a number of reasons including: the splitting of the Yell landfall; the reduction of capacity on the Belmont – Gutcher route (unless a three vessel solution is taken forward); and the scale of the costs given the very limited benefits.
Option **C5a** Commence an air service from Unst to Tingwall	✓	The potential for this option to transform journey times and exploit opportunities presented by available flying hours and a high quality airfield merit further investigation Community feedback is required on whether this option would attract public support
Option **C5b** Commence an air service from Fetlar to Tingwall	✘	The small population of the island would make this difficult to justify and it would be challenging to maintain a fully licensed airfield, whilst there would be cost and environmental impacts associated with constructing a new access to the airfield. Fetlar residents could benefit from any new Unst air services.
Option **C6** Construct a fixed link between Unst and Yell	✘	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Option **R1** On Request early departure from both Unst & Fetlar for connections to Sumburgh	✘	Whilst this option would improve strategic connectivity, the service would leave Fetlar and Unst in the middle of the night and is therefore likely to be very lightly used. Departures at 0345 (Fetlar) and 0415 (Unst) are unlikely to facilitate a particularly practical day trip to the Scottish mainland. Community feedback is required on whether it is appropriate to reject this option.
Option **R2** Additional request sailings on Friday and Saturday evenings (through to 0200)	✓	This is a relatively low cost option which should be taken forward for further consideration.
Option **R3** Operate standard weekday timetable 7-days a week	✓	This option would see a major ramp up in weekend services. The potential implications in terms of the timetable and crewing resources should be examined in more detail.

5 Bressay

5.1 Capital Investment Timeframe

- The current Bressay vessel, the MV *Leirna*, is 24 years old. The vessel is well-maintained and fit-for-purpose but will likely need to be replaced within the first decade of the strategy period. The MV *Leirna* is a Class IV vessel and can therefore only operate on the short and relatively protected Lerwick – Bressay crossing which is in Category D waters. As such it is not appropriate to consider one of the 'generic' EU B class vessels, and a bespoke vessel is the most proportionate solution for Bressay.

- The current vessel sails approximately hourly across the day with a seven minute crossing time. She overnights in Bressay and the crew is island based.

- Current estimates from Shetland Islands Council suggest that the MV *Leirna* will be withdrawn from service in 2022.

- Lerwick ferry terminal was constructed in the mid-1970s, with a new 'small' linkspan introduced in 1996. The current terminal remains fit-for-purpose for a vessel of the current size, although the replacement of assets would likely be required over the strategy period.

- The replacement of the existing berthing structure and linkspan at Bressay will be required as part of any capital investment on this route.

5.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix D.

5.2 Identified Problems

5.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '✱' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

5.2.2 The following transport problems in relation to Bressay were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 5.1: Bressay Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
2	First sailing / flight	✱	The first sailing from Bressay is 0700, seven days a week. The lack of an earlier sailing reduces the employment opportunities of present and prospective island residents. *The community consultation noted that this should be considered a moderate problem – it was explained that the lack of an earlier sailing seriously reduces the employment opportunities of current and prospective island residents.*
7	Frequency / Sailings per Day / Timetable gaps	×	Bressay residents have a dependency on the AM and PM peak ferries to / from Lerwick to access employment and education. However, the peak frequency of the Bressay - Lerwick ferry is relatively low and detailed analysis of operator carryings

	Service Characteristics	Severity Rating	Why is this a problem or not?
			data suggests that some capacity issues do emerge around the 0830 departure from Bressay and, less frequently, the 1715 from Lerwick.[38] This can lead to people being late for work / school. *The community consultation response noted that since this table has been compiled, an additional return sailing at 0810 / 0820 has been introduced and has addressed the morning capacity issues. The Council explained that this has been offered on an informal temporary basis but has not yet been included within the timetable.*
8	Capacity	××	Linked to point 7 above, car deck capacity on the AM peak departures from Bressay and PM peak departures from Lerwick max out, meaning some vehicles cannot get onto the ferry. This can lead to late arrival into work and education or missed interchange with an onward connection. In terms of the evidence to support this problem, carryings data show that the 0830 departure from Bressay frequently has a vehicle deck utilisation in-excess of 80% (above which a sailing is defined as high utilisation), particularly in the summer months. Some seventy-four 0830 departures sailed over the 80% threshold in summer 2013/14, suggesting capacity on this service, which is key to accessing employment and education, is a problem. This service is less highly utilised in the winter, with >80% sailings typically on a Monday and Tuesday. The 1715 service from Lerwick is relatively highly utilised during the winter (31 sailings >80% utilised).[39] *The community consultation response noted that since this table has been compiled, an additional return sailing at 0810 / 0820 has been introduced and has addressed the morning capacity issues. The Council explained that this has been offered on an informal basis but has not yet been included within the timetable.*
13	Integration with PT (strategic)	×	Bressay is generally well connected with onward transport connections. It is located close to the Holmsgarth ferry terminal, whilst connectivity to Sumburgh is also reasonable. However, Bressay residents cannot catch the first morning flights to Edinburgh, Inverness, Aberdeen or Kirkwall, although the first flight to Glasgow and the second flight to Aberdeen are accessible. The inability to catch the first morning flights to various locations means that Bressay residents cannot carry out a day return visit for meetings, appointments etc, adding to the cost of any given trip. *The community consultation response noted that ferry arrival and bus departures times are not well integrated.*
18	Landside human resources	✱	There are not currently any landside human resource issues, although the ferry is crewed with island-based staff, which could give rise to future crewing availability issues. *The community explained that succession planning is a future concern given the ageing ferry staff, the lack of trained island residents and the housing shortage for potential incoming replacement staff.*

5.3 Appraisal of Capital Options

Capital Options

5.3.1 The following capital options were identified for Bressay:

- **Option C1 (Do Minimum): Replace the MV *Leirna* on a like-for-like basis:**
  - Any 'like-for-like' vessel would need to be slightly larger in anticipation of the continuing trend of vehicles becoming larger. It is estimated that a like-for-like vessel would be around 35m long and would carry around 130 passengers and 20 PCUs. The vessel would hold an equivalent to the current MCA Class IV certificate. Fitting the vessel with an azimuth propulsion system would allow an element of interchangeability and consistency with other vessels in the fleet.

[38] SIITS Carryings and Utilisation Analysis (Peter Brett Associates, 2015), Bressay – Lerwick Capacity Analysis Table

[39] SIITS Carryings and Utilisation Analysis (Peter Brett Associates, 2015), Bressay – Lerwick Capacity Analysis Table

- The new vessel is estimated to cost in the region of £4.5m[40].
- There would be no major harbour works associated with this option.[41]
- The total cost of this option in 2016 prices would therefore be **£4.5m**.
- It should be noted that introducing a higher classified vessel (EU B) would improve its resale value in the event that a fixed link was to be progressed at any stage in the future. This is again an issue which would be considered at the OBC stage.

- **Option C2: Replace the MV *Leirna* with one larger vessel:**
  - In each of the 'one larger vessel' options in this paper, we have typically planned on the basis of a 50% uplift in PCU capacity. However, in the context of Bressay, the MV *Leirna* has a relatively high PCU carrying relative to her length overall (LOA). Scaling up to +50% in terms of PCUs would therefore involve the use of a vessel akin to the MV *Daggri* in terms of the generic vessels under consideration. This would seem disproportionate and we have therefore considered a larger version of the current sheltered water vessel here, which would be capable of accommodating circa 28 PCUs (i.e. approximately a 50% uplift).
  - The new vessel is estimated to cost in the region of £6m.
  - Only limited harbour works would be required, including dredging & refendering at Bressay (circa £800k)[42] a new berthing dolphin & refendering at Lerwick (circa £750k)[43].
  - The total cost of this option would be around **£7.55m.**

- **Option C3: Replace the MV *Leirna* with two vessels & develop a new overnight berth at Lerwick:**
  - This option assumes 2 * *Leirna* equivalent vessels which would carry 100 passengers and 15-20 PCUs.
  - The new vessels would cost in the region of £4.5m each. The required harbour works would be equivalent to those identified in Option C1. However, an overnight berth would also need to be developed in Lerwick for the second vessel, which it is estimated would cost around £150k.[44]
  - It is assumed that the second vessel would operate on a day boat basis, increasing the number of sailings by 50% and operate a high frequency service across the day.
  - The total cost of this option in would be around **£9.15m**.

- **Option C4: Supplement options C1 or C2 with a passenger only vessel:**
  - This option includes the provision of a passenger only vessel to supplement any of the single ro-ro options set out above. It is assumed that this vessel would carry around 50-100 passengers. The timetable of this vessel would require further analysis but it is possible it would be tied up or used for charters outwith peak hours.

[40] Derived by applying RPI growth to original Leirna build cost of £2.5m in 1992

[41] See Bressay Harbour Drawing, Box 2, Like-for-Like Option and Lerwick Harbour Drawing, Box 2, Like-for-Like Option.

[42] See Bressay Harbour Drawing, Box 3, Larger Vessel Option.

[43] See Lerwick Harbour Drawing, Box 3, Larger Vessel Option.

[44] See Bressay Harbour Drawing, Box 4, Overnight Berth at Lerwick Option.

- The vessel would cost around £0.5m-£1m and would be designed to fit with existing harbour infrastructure, although some modest upgrades are likely to be required to ensure compliant access and egress from the vessel.

- **Option C5: Construct a fixed link between Bressay and Shetland mainland**

  - The issue of a fixed link between Bressay and Shetland mainland has been analysed in the most detail of any of the fixed link proposals, most recently in 2008. The current adopted position of the Council is the construction of a drill and blast tunnel beneath the Sound of Bressay on an alignment between Gremista and Heogan on Bressay. The tunnel would allow bi-directional traffic movement, with a separate cycleway / footpath.

  - A range of capital costs have been provided for a fixed link (see Table 1.1 for more information on the derivation of the below costs):

    - Unlined UK: £21.1m (£25.9m including optimism bias & contingency)

    - Unlined Norwegian: £16.8m (£20.6m including optimism bias & contingency)

    - 1/3 Lined UK: £22.5m (£27.5m including optimism bias & contingency)

    - 1/3 Lined Norwegian: £17.8m (£21.8m including optimism bias & contingency)

Bressay Chain Ferry

5.3.2 One of the options raised for consideration in this study was the provision of a chain ferry across the Sound of Bressay. The proposed alignment for the chain ferry would be between Loofa Baa and North Ness, although detailed technical feasibility work would need to be carried out if this proposal was to be progressed. This option has been analysed and is ruled out on the basis of technical and operational feasibility (as explained below). We have not therefore provided appraisal tables or an AST for this option.

5.3.3 The principal reason that this option is infeasible is that the MCA is unlikely to certify a chain ferry to operate in the Category D waters in Lerwick Harbour. This is summarised in the MCA "Code of Practice for the construction, machinery, equipment, stability and operation of Chain / wire ferries, carrying passengers and vehicles". The guidance notes that a vessel may be considered for the issue of a [Chain / Wire Ferry] certificate allowing it to operate in Category A-C waters, but not Category D waters. This, in its own right, would rule out the provision of a chain ferry.

5.3.4 Our maritime partners contacted the MCA in both Glasgow and Southampton to explore further the possibility of an exemption for operating a chain ferry in the Sound of Bressay. The MCA replied whilst there is nothing to stop such an application for an exemption being made, it would be difficult to justify on safety grounds and in any case would also have to be discussed and agreed with the Health and Safety Executive (HSE) as it would depart from the Memorandum of Understanding currently in place between HSE and MCA with respect to the Certification of Chain Ferries.

5.3.5 In addition, even if certification was achieved, a chain ferry offers little advantage over an existing Ro-Ro ferry. The MCA guidance notes that new vessels would be expected to comply with current requirements based as practicable on similar MCA passenger carrying vessels. This suggests that any chain ferry would have to be crewed on an equivalent basis to the MV *Leirna*.

5.3.6 The two chains on any ferry would also need replacing every eighteen months at around £40,000 per chain. There would also need to be at least one if not two spare chains kept on standby. The operator would also have to consider how the vessel would be replaced during

annual refit and what happens if the vessel breaks down or breaks adrift, as has happened at Tor Point. This would therefore require the maintenance of ferry infrastructure at both Bressay and Lerwick, whilst a spare vessel and crew would have to be provided to cover refit, significantly increasing the overall cost of the operation. It is therefore difficult to see any obvious advantage of operating a chain ferry, particularly with the MV *Leirna* being such a fuel efficient vessel.

Appraisal

5.3.7 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 5.2: Bressay Capital Options – Appraisal against Objectives

	Option C1 - (Do Min) – Replace MV *Leirna* on a like-for-like basis	Option C2 – Replace MV *Leirna* with one larger vessel	Option C3 – Replace MV *Leirna* with two vessels	Option C4 – Supplement Options C1-C3 with a passenger only vessel	Option C5 – Fixed link between Bressay & Shetland mainland
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓	✓✓	-	✓✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	-	✓✓	✓✓	✓	✓✓✓
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	N/A	N/A	N/A	N/A	N/A
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	✓✓✓	✓	✓✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	-	-	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-	-	✓✓✓

5.3.8 The key points from the above table are:

- The proximity of Bressay to Lerwick means that a fixed link **(Option C5)** would provide a highly positive contribution to all five relevant objectives. It would alleviate any capacity issues associated with the ferry, facilitate 24-hour access to Lerwick and further afield to Sumburgh Airport.

- It should be noted that there is some slack within the current timetable to increase the frequency of the existing vessel. This would alleviate current capacity constraints.

- The provision of a larger vessel **(Option C2)** would address the AM and PM peak capacity issues identified on the Bressay route. This would support commuting to Lerwick through removing the capacity issues associated with peak travel-to-work sailings (*Note – the frequency of the MV Leirna has recently been increased at peak times, with anecdotal evidence suggesting that this has addressed the capacity issues).*

- A two-vessel option **(Option C3)** would offer the same benefit as one larger vessel, although the scale of the impacts would be greater. This option would also significantly enhance the frequency of the service (assuming revenue funding supported this), providing what would effectively be a 'turn-up-and-go' service.

- The provision of a passenger only vessel **(Option C4)** would not provide many benefits in its own right but would supplement the benefits offered by Options C1-C3 through increasing frequency, connectivity and passenger capacity.

Appraisal against STAG Criteria

Table 5.3: Bressay Capital Options – Appraisal against STAG Criteria

	Option C1 - (Do Min) – Replace MV *Leirna* on a like-for-like basis	Option C2 – Replace MV *Leirna* with one larger vessel	Option C3 – Replace MV *Leirna* with two vessels	Option C4 – Supplement Options C1-C3 with a passenger only vessel	Option C5 – Fixed link between Bressay & Shetland mainland
Environment	✓	✓	×	×	×××
Safety	-	-	×	×	×
Economy	-	✓	✓✓	✓	✓✓✓
Integration	-	-	✓	✓	✓✓✓
Accessibility & Social Inclusion	✓	✓	✓✓✓	✓✓	✓✓✓
Established Policy Directives	✓	✓	✓✓	✓	✓✓
Technical Feasibility	*There are no technical feasibility issues associated with this option.*	*Minor harbour works would be required at both Bressay & Lerwick.*	*An additional overnight berth would be required in Lerwick.*	*This option is There are no technical feasibility issues associated with this option.*	*This option is the most technically proven of any of the fixed link proposals.*
Operational Feasibility	*There are no operational feasibility issues associated with this option.*	*There are no operational feasibility issues associated with this option.*	*Additional crew(s) would be required.*	*Additional crew(s) would be required.*	*See Section 1.4 – fixed links.*
Affordability	***£4.5m** – for new vessel.*	***£7.55m** for larger vessel and harbour works*	***£9.15m** for two vessels and overnight in Lerwick. There is also a significant increase in revenue costs (see below).*	*Supplements options 1-3 **£500k to £1m** plus minimal harbour works, additional crew and fuel*	*See Table 1.1*

	Option C1 - (Do Min) – Replace MV *Leirna* on a like-for-like basis	Option C2 – Replace MV *Leirna* with one larger vessel	Option C3 – Replace MV *Leirna* with two vessels	Option C4 – Supplement Options C1-C3 with a passenger only vessel	Option C5 – Fixed link between Bressay & Shetland mainland
Public Acceptability	*This option would be an acceptable ferry based option*	*This option would be an acceptable ferry based option*	*No obvious requirement for a 2-vessel solution was noted by the public*	*Few comments on this option but no widespread support was found*	*There is some support for a fixed link although others are opposed or think that it is an unrealistic proposition*

5.3.9 The key points from above appraisal against the STAG criteria are:

- A fixed link **(Option C5)** offers the most significant benefits in terms of the STAG criteria. In particular, Bressay is now almost wholly reliant on Lerwick for employment, education and all key services. A fixed link would therefore provide significant accessibility, economic and integration benefits for Bressay, effectively making it an extension of the Lerwick conurbation. Of particular importance is the potential role of a fixed link in reversing the recent population decline on the island. Whilst a fixed link makes the most positive contribution to the objectives and STAG criteria, it is also the most expensive in capital terms by some margin.

- Each of the Ro-Ro vessel options **(Options C1-C3)** would provide incremental benefits on the current position and on each other in terms of contribution to the economy and accessibility & social inclusion. A two-vessel service would offer particularly significant benefits in this respect but, at the same time, would be more than double the cost of the like-for-like option, which is broadly capable of meeting the current needs of the community.

- A passenger only vessel **(Option C4)** would augment the benefits offered by any of the three Ro-Ro options.

- From an environmental perspective, any one vessel solution **(Options C1 & C2)** is likely to offer a reduced level of emissions, whilst any two vessel option **(Options C3 & C4)** would lead to a marginal increase in emissions due to more sailings being operated. A fixed link **(Option C5)** has the potential for significant effects from permanent development of new infrastructure. This option would also generate increased traffic movements on Bressay.

- The two vessel solutions **(Options C3 & C4)** would generate a very minor safety disbenefit. There would be a slightly increased risk associated with additional sailing hours and, given the length of the crossing, a close quarters' incident.

5.4 Appraisal of Revenue Options

Revenue Options

5.4.1 The following revenue options were identified for Bressay:

- **Do Minimum**
  - Continue with the current level of service.

- **Option R1: Offer an 0600 departure from Bressay to allow connection with the first flights from Sumburgh**

- This service would operate on a bookings-only basis on Monday - Friday and would depart Bressay at around 0600. At present the first sailing departs Bressay at 0700.
- This would result in a maximum of an additional 260 (5 * 52) return sailings per year, assuming weekday operation only. It is assumed that the crew would be paid at the unsocial hours' overtime rate for these sailings.

- **Option R2: Offer additional peak hour weekday sailings**
  - This option would include an 0810 departure from Bressay and a 1650 & 1735 ex Lerwick.
  - It should be noted that this is already occurring on a trial basis. At other times, the vessel will go back for short-shipped traffic if time permits.
  - Additional sailings during the rest of the operating day could be factored in if ever required (additional fuel being the only notable cost).
  - As an example, it is assumed that this core option would result in an additional 780 (15 (3 per day) * 52) return sailings per year. It is assumed that there would be no additional crew cost as these sailings are within current working hours.

Appraisal

Appraisal against Objectives

5.4.2 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 5.4: Bressay Revenue Options – Appraisal against Objectives

	Option R1- Offer an 0600 departure from Bressay allow connection with the first flights from Sumburgh	Option R2 – Offer additional peak hour sailings
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	✓	✓✓
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	N/A	N/A
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓	✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓✓✓	-

5.4.3 The key benefit of Option R1 is that it would significantly enhance the strategic transport connectivity of Bressay, allowing residents to make a day return to the Scottish mainland. In addition, unlike in a number of other islands, an early morning departure from Bressay would also support commuting through allowing residents to commence work prior to 0730 (supporting e.g. shift work).

5.4.4 The operation of additional sailings at peak times would address the current peak capacity constraints on the Bressay route. This would ensure the ability to reliably commute and would enhance frequency / connectivity to the mainland.

Appraisal against STAG Criteria

Table 5.5: Bressay Revenue Options – Appraisal against STAG Criteria

	Option R1- Offer an 0600 departure from Bressay allow connection with the first flights from Sumburgh	Option R2 – Offer additional peak hour sailings
Environment	✖	✖
Safety	-	✖
Economy	✓	✓
Integration	✓✓	-
Accessibility & Social Inclusion	✓	✓✓
Established Policy Directives	✓	✓
Technical Feasibility	*There would be no technical issues associated with this option.*	*There would be no technical issues associated with this option.*
Operational Feasibility	*Additional crewing hours and fuel would be required.*	*Additional fuel would be required*
Affordability	*Low – £10k per annum relative to Option C1 - only five return sailings over the week*	*Estimated to be beneficial as revenue would exceed incremental fuel costs. Key capacity constraints would be removed.*
Public Acceptability	*There was public support for this measure*	*There was public support for this measure*

5.4.5 The key points from above appraisal against the STAG criteria are:

- The benefits of both options in terms of the STAG criteria are that they facilitate enhanced accessibility and integration, giving rise to economic benefits for Bressay.
- Both options are relatively low cost, with the additional peak sailings only giving rise to small additional fuel costs. Both options would have a negative environmental impact associated with additional sailings, but this would be extremely minor.

5.5 Annual Operating Cost Estimates

5.5.1 In 2015/16 there were approximately 15,120 single sailings between Bressay and Lerwick. The revenue costs and income associated with operating the Bressay ferry service was as follows:

Table 5.6: Bressay Revenue Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£802,699
Vessel - Fuel	£57,845
Vessel - Maintenance	£148,857
Vessel - Other Costs	£127,706
Vessel Total	**£1,137,107**
Terminal - Maintenance	£19,886
Terminal - Other Costs	£28,438
Terminal Total	**£48,324**
Route Total	**£1,185,432**
Route Income	*-£380,969*
Route Net Cost	**£804,462**

5.5.2 In addition to these costs, an internal berthing charge of £422,942 was paid in 2015-16.

5.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Bressay service costs around **£0.8m** per annum (net) to operate.

5.5.4 An estimate of the annual net revenue budget costs associated with the Capital ('C') and Revenue ('R') options outlined above is shown in the chart below. For brevity, the revenue options are shown in relation to Capital Option C1 only.

5.5.5 The figures shown are the estimated net annual revenue costs associated with each option (although again it should be noted that the options are not mutually exclusive). The figures on the horizontal axis show the overall annual net operating cost for each option.

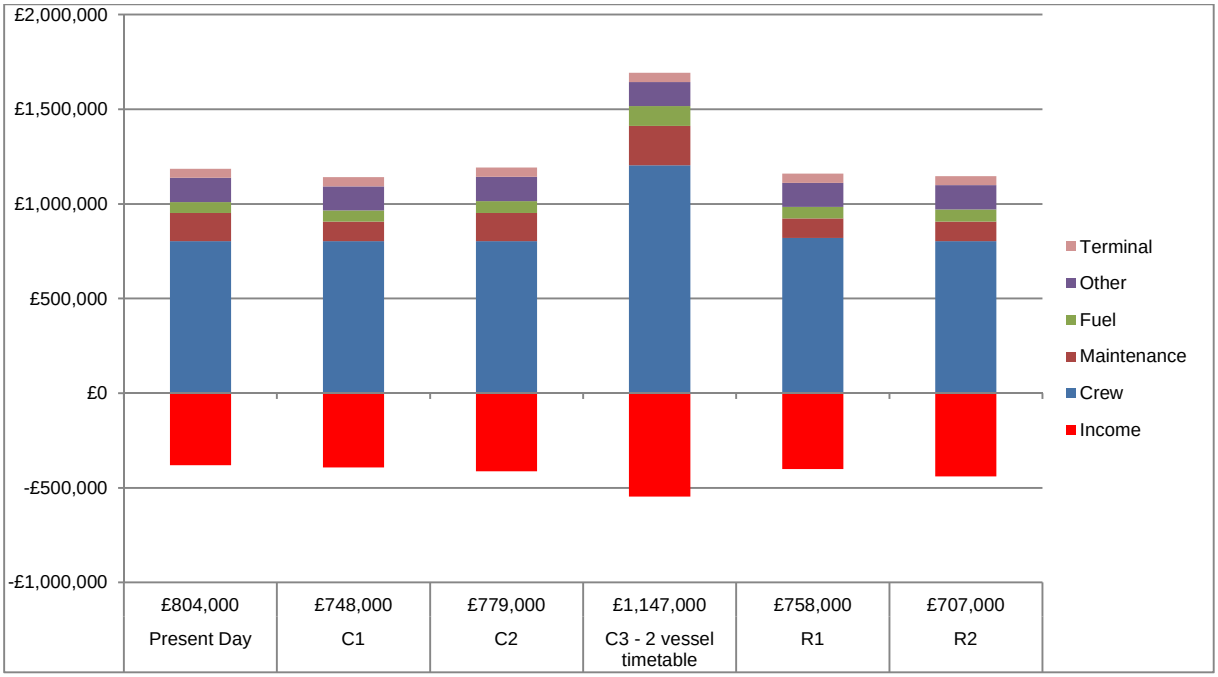


Figure 5.1: Bressay Annual Revenue Cost Estimates

5.5.6 The main points to emerge from the above are:

- C1: reduced fuel costs associated with the new vessel compared to the present day see overall costs fall.
- C2: increased fuel costs with the new vessel compared to the present day see overall costs rise, crew costs are assumed unaffected, remaining at four. Small increase in fares revenue as capacity constraints are lifted with the larger vessel.
- C3: increase in all costs, by approximately 50%. Increase in fares revenue.
- Option C4 would be a supplement to either C1 or C2 – estimated revenue costs of operating the passenger only service are not available at this stage.
- R1: additional crew and fuel costs lead to a small net increase over C1 of £10k. Small increase in fares revenue assumed.
- R2: additional fuel costs are outweighed by fares revenue leading to a reduction in net cost of £41k per annum relative to C1. Fares revenue assumed due to removal of capacity constraint and additional services.

5.6 Public Consultation – Prioritisation

5.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

5.6.2 This list comprised improvements to aspects of connectivity associated with ferry and where appropriate air services. Whist it did not include Fixed Links as an option, there was on 'Other – Please Specify' option. In addition, question 3 on the proforma asked: '*Do you have any comments on the future transport options presented?*' and this provided a further option for views on fixed links to be expressed.

5.6.3 The number of completed questionnaires from Bressay was 35.

5.6.4 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the 'Other – Please Specify' option. Note that these columns do not sum to 100% as the question allowed three responses.

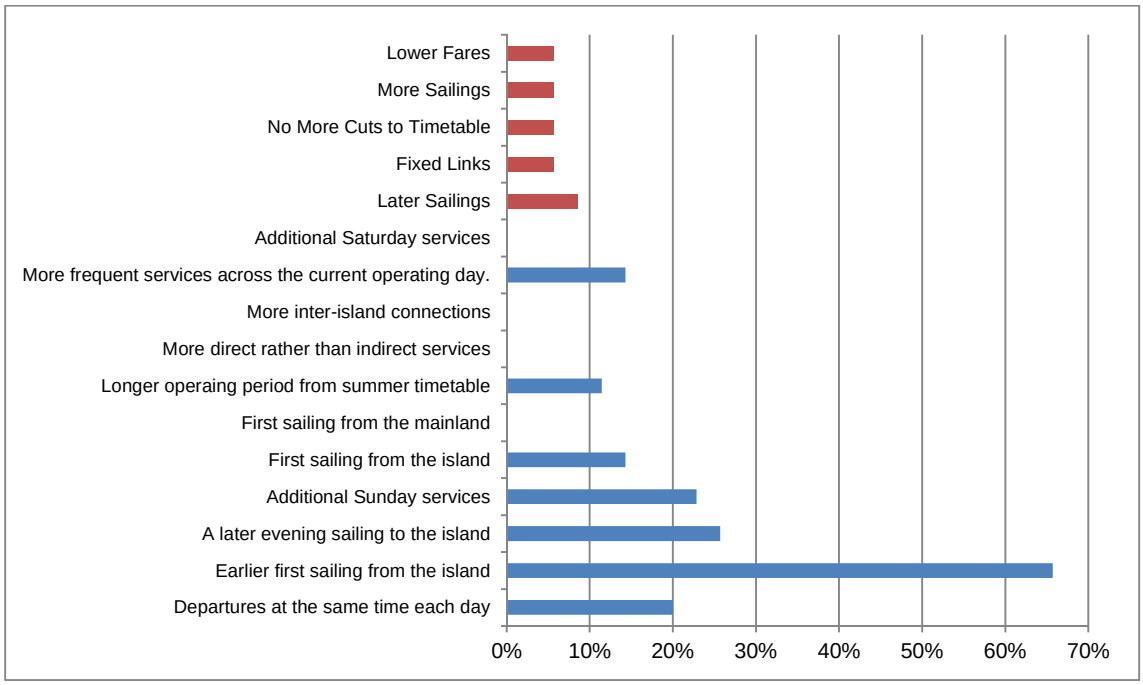


Figure 5.2: Bressay – Prioritisation of Enhancements

5.6.5 The top priority for Bressay residents was an earlier first sailing from the island, with this option being selected as a priority by 65% of respondents. This option was in part associated with allowing people to access jobs on the mainland with an 0700 start, which is currently not possible. Some 5% of respondents noted Fixed Links at this stage.

5.6.6 When asked for comments on the options, 26% of respondents noted a desire for a fixed link solution.

5.6.7 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

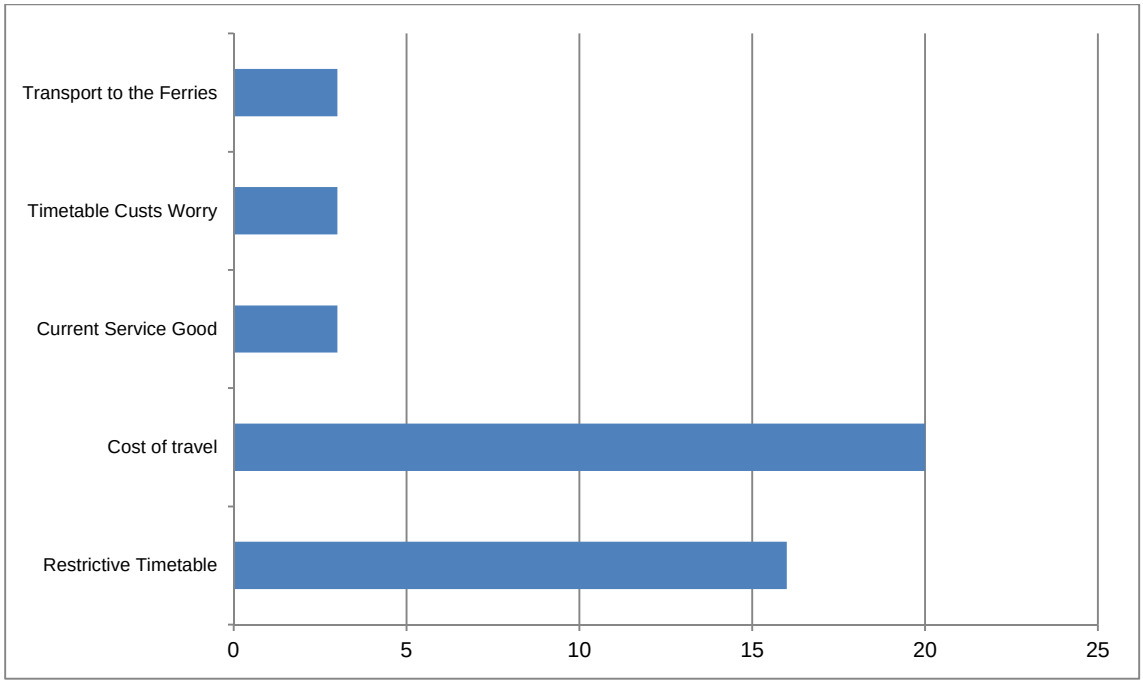


Figure 5.3: Bressay – Other Issues Raised (Frequency)

5.6.8 The other main issue raised in Bressay was fares. Bressay is the shortest crossing covered by the current flat fare policy and thus fares seem high relative to the short crossing time. Allied to this is the almost complete dependency of Bressay on Lerwick.

5.7 Rationale for Selection / Rejection

5.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 5.7: Outcome of Appraisal, Bressay

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
Option C1 - (Do Min) – Replace MV *Leirna* on a like-for-like basis	✓	Further more detailed analysis of supply and demand (present and forecast) is required to establish whether 1 * *Leirna* style vessel could meet the requirements of the route. This option could be combined with R1-R2 to extend the operating day.
Option C2 – Replace MV *Leirna* with one larger *Leirna* style vessel	✓	1 * larger *Leirna* type vessel would alleviate the peak capacity issues on the route. The costs and benefits of this compared to C1 need to be established and quantified. This option could be combined with R1-R2 to extend the operating day.
Option C3 – Replace MV *Leirna* with two vessels	✘	It is clear from the capacity analysis that the Bressay route only experiences capacity issues at peak times, and even at that only on a handful of specific sailings. These issues can be addressed through running the vessel more frequently during peak hours. Any new like-for-like vessel (potentially with mezzanine decks) or a larger vessel is likely to be able to provide the required capacity. The cost of a two vessel solution therefore appears disproportionate and a suitable crew / overnight berth would be required.
Option C4 – Supplement Options C1-C2 with a passenger only vessel	✓	This option would provide a low cost means to substantially increase connections between Bressay and Lerwick. Given that the service would operate directly into the town centre, this option is worthy of further consideration. Community feedback is required on whether this option would attract public support.
Option C5: Construct a fixed link between Bressay & Shetland mainland	✓	The research undertaken as part of this study, including the pricing of the tunnel option by a Norwegian & UK contractor, suggests that a fixed link could be competitive when compared with ongoing ferry replacement cycles.
Option R1- Offer an 0600 departure from Bressay allow connection with the first flights from Sumburgh	✓	Community feedback is required on whether this option would attract public support, but as a low cost option with potentially tangible benefits it is worthy of further consideration.
Option R2 – Offer additional peak hour sailings	✓	This option should be taken forward. It is understood that some of the additional sailings envisaged here are already running on an unofficial / trial basis. This is low cost as the only marginal cost is the fuel.

6 Fair Isle

6.1 Capital Investment Timeframe

- The current Fair Isle vessel, the MV *Good Shepherd IV* is 30 years old and in need of replacement. The vessel is Lo-Lo only, has a very low capacity, is single-screwed, slow and uncomfortable. A new vessel is required in the immediate future.
- The current shoreside infrastructure is rudimentary but potentially suitable for a new Lo-Lo of the existing dimensions, although any step up from this would require harbour works at both Fair Isle and Grutness.
- The current vessel is based in, and crewed from Fair Isle. The lack of a protected overnight berth means that the vessel is winched up a slipway for protection overnight and when not in use. The vessel is not intensively used.

6.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix E.

6.2 Identified Problems

6.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '*' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

6.2.2 The following transport problems in relation to Fair Isle were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 6.1: Fair Isle Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	×	Fair Isle residents can reach Tingwall in 25 minutes by air, with a 15 minute connection to Lerwick by bus. However, ferry journey times are long, some 300 minutes direct to Lerwick and 160 minutes to Grutness, with a one hour bus connection or 30 minute drive.[45] The long ferry journey times means that anyone who cannot travel by air (either because of physical accessibility issues, cost or weather) faces an unattractive and extended trip to the mainland. *The community consultation response noted the Lerwick connection, whilst relatively long, is also the most affordable and provides the longest duration for a day-trip to the town.*
2	First sailing / flight	*	The issue for Fair Isle is related more to time on mainland / Lerwick / island. *The community consultation response noted that the time of the first sailing / flight has an impact on onward travel.*
3	Last sailing / flight[46]	*	The issue for Fair Isle is related more to time on mainland / Lerwick / island. *The community consultation response noted that the time of the last sailing / flight has an impact on onward travel.*

[45] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Fair Isle – Lerwick – Travel Time & Cost Page.

[46] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

	Service Characteristics	Severity Rating	Why is this a problem or not?
4	Time on mainland	×××	It is not possible to make a meaningful day return either to or from Fair Isle by ferry – day access is entirely dependent on the air service. Whilst residents can get three hours in Lerwick on the days the ferry goes there, this still requires a ten hour round-trip on the boat. The air service itself is of a reasonable level offering 13-21 hours weekly on the mainland, 11-18 hours in Lerwick and 18-26 hours on the island depending on season.[47] However, this is still a relatively limited period of time ashore when comparing Fair Isle to other islands of a similar size (e.g. Fetlar, North Ronaldsay, Papa Westray etc). The limited time ashore can lead to a need for costly overnight stays when carrying out work-based or personal business which extends beyond the length of the operating day. Fair Isle has no link to the mainland on Sundays all year, or Saturdays and Sundays from October to April inclusive.
5	Time in Lerwick	×××	See point 4 above
6	Time on island	×	See point 4 above *The community consultation response noted that the time on the island varies greatly due to the timetable.*
7	Frequency / Sailings per Day / Timetable gaps	*	The community successfully work around the current frequency. The bigger question is the number of connections overall and effective time on the mainland / island. *The community consultation suggested that this should be cited as a minor negative as the actual operation is harder for the community to manage.*
8	Capacity	×××	The MV *Good Shepherd IV* is very limited in terms of vehicle and indeed passenger capacity. The vessel can only take one or two small cars and 12 passengers, whilst she cannot accommodate any heavy freight or plant.[48] The air service is also limited to 6-7 passengers but can take 8-9 passengers depending on weight. This places a significant capacity constraint on the island, particularly when one or both modes are affected by bad weather. In addition, the deadweight limitation on the vessel means that bringing any larger vehicles or plant onto the island requires the use of a different vessel. The capacity issue impacts negatively both on the key tourist trade and access to the mainland for island residents.
9	Reliability (weather / mechanical)	××	The ferry crossing to Fair Isle traverses rough and exposed seas. This, combined with the small vessel used, presents reliability challenges on the route, particularly during winter. In many cases, the ferry has to travel when there is a weather window, even if this is off-timetable. The air service is overall believed to be reliable but can be affected by the frequent fog and other weather conditions which are experienced in Fair Isle and on mainland Shetland. Reliability issues can lead to both islanders and visitors incurring costly overnight stays, whilst a sustained period of cancellations can have significant impacts on the inbound and outbound supply chain.
10	Comfort	×××	The MV *Good Shepherd IV* is a relatively uncomfortable vessel given the sea states in which she operates. Indeed, the vessel is fitted with seatbelts! The vessel is also single screwed, which means it is vulnerable in the extent of an engine, drive chain component or propeller failure. The consultation suggests that these issues combine to deter tourists travelling by ferry (putting pressure on the low-capacity air services) and limiting the willingness of islanders to use the vessel.
11	Physical access	××	As an older vessel operating out of a non Ro-Ro port, the MV *Good Shepherd IV* can present physical accessibility issues for older and disabled passengers, a key issue on Fair Isle. The Britten-Norman Islander aircraft are not well suited to those with any kind of mobility impairments either. *The community consultation response noted that either of the existing modes of transport can involve undignified access and not meet anticipated levels in terms of*

[47] SIITS Air Service Provision (Peter Brett Associates, 2015), Time Ashore – Weekly.

[48] SIITS Vessels Review (TMG, 2015), p. 9.

	Service Characteristics	Severity Rating	Why is this a problem or not?
			ease of access or comfort.
12	Integration with PT (local bus)	*	There is a bus service which meets the ferry at Grutness and a demand-responsive service to Lerwick from Tingwall Airport. *The community consultation response noted that this should be a minor negative as the bus link at Grutness is reliant on the ferry running to timetable.*
13	Integration with PT (strategic)	××	Given the limited connections from Fair Isle, onward travel will always have to be well planned. However, there are a number of problems over and above this. Firstly, a high degree of reliability is required on both the connecting and onward service as any delay or cancellation can lead to the need for a costly overnight stay or a long layover on Shetland mainland. In addition, the air service from Fair Isle travels to Tingwall and requires a double-bus connection to get to Sumburgh. *The community consultation response noted that extensive planning can be a barrier and there may be potential to explore improvements to booking processes and operational information.*
14	Crossing / flight times	×	The ferry crossing is very long as the vessel is very slow.
15	Onboard facilities	××	As a small and relatively old vessel, the MV *Good Shepherd IV* has little in the way of onboard facilities. Of particular importance is the absence of a chilled compartment, which presents a challenge when moving perishable goods given the length of the crossing (even from Grutness). This is a problem both in terms of supplying the island and for any island business (current or prospective) moving either large or chilled goods.
16	Weekday / weekend service variation[49]	×××	Fair Isle has a significant weekend connectivity gap. During the summer, there is a Saturday ferry return and two air rotations, although there are no services on a Sunday. There are no weekend services at all during the winter, which effectively cuts the island off on winter weekends.[50] This suppresses both the key tourist market and the ability of islanders to take an overnight off-island trip at the weekend.
17	Landside infrastructure issues	××	The ferry berth is constrained and exposed, with the vessel having to be hauled out of the water overnight.[51] This limits the size of vessel which can serve Fair Isle and is the cause of a number of the problems outlined above.
18	Landside human resources	×	There is an ongoing logistical challenge of providing fire cover at the airfield, which could have an impact on the long-term sustainability of the air service. This is currently managed well. The ferry crew is also island based, which could present an issue for crew resourcing in the medium to longer term.

6.3 Appraisal of Capital Options

Capital Options

6.3.1 It should be noted that we have not considered the option of a materially larger Lo-Lo vessel. Given the scale of investment required at Fair Isle to realise such an option, it would be more appropriate to progress towards a Ro-Ro solution, given that the additional incremental cost associated with this would be relatively low.

6.3.2 In addition, the scale and cost of works and resources required to bring this route into line with the other main Ro-Ro Shetland routes in terms of vessel size / capacity would be disproportionate in this context. This route therefore requires a bespoke vessel, and careful planning of air and ferry services in combination.

[49] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[50] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Ferry Service Provision and SIITS Air Service Provision (Peter Brett Associates, 2015), Air Service Provision

[51] SIITS Ports Review (TMG, 2015), p. 18.

6.3.3 The following capital options were identified for Fair Isle:

- **Option C1a: Replace the MV *Good Shepherd IV* with a like-for-like vessel**
  - This vessel would be a broadly similar replacement for the MV *Good Shepherd IV* in terms of size and capacity but offering more appropriate passenger accommodation and greater levels of comfort. The vessel would be twin-screwed and would carry 12 passengers and one PCU. It would have a workboat classification as per the current vessel.
  - This option would not require harbour works.
  - The estimated cost of replacing the MV *Good Shepherd IV* on a like-for-like basis would be **£750k**.[52]
- **Option C1b: Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel**
  - This vessel would be a replacement for the MV *Good Shepherd IV* as laid out in Option C1a above. However, this vessel would travel at 10-12 knots, significantly reducing current crossing times.
  - This option would not require harbour works assuming that the current arrangements for taking the vessel out of the water could continue.
  - The estimated cost of replacing the MV *Good Shepherd IV* on a faster Lo-Lo vessel would be **£1.25m**, scaling up the cost from above.
- **Option C2: Replace the MV *Good Shepherd IV* with a bespoke Small Ro-Ro vessel**
  - This vessel would be a catamaran of approximately 20-25 metre length and 6 metre beam. This vessel would be capable of carrying approximately 50 passengers and 5 PCUs. The vessel would operate at around 14 knots, although would have a design speed of around 18 knots. The vessel cost is estimated at £3 million.
  - A catamaran is the most appropriate choice of vessel for Fair Isle as it is shallow drafted, faster and a vessel of aluminium construction would be easier to take out of the water (although aluminium is weaker than steel so the vessel would likely have a lesser service life).
  - A new fixed Ro-Ro ramp and slipway / hoist would be required at Fair Isle, at a cost of around £1.8 million.[53] A new fixed Ro-Ro ramp and minimal dredging would be required at Grutness, at a cost of around £950k.[54]
  - The total cost of this option would be around **£5.75m**.
- **Option C3: Replace the MV *Good Shepherd IV* with a Lo-Lo freight vessel shared with Foula:**
  - This vessel would be based on the current MV *Snolda* which has a track record of accessing Foula. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots.

[52] Derived by applying RPI growth to original Good Shepherd build cost of £250k in 1986.

[53] See Fair Isle Harbour Drawing, Box 2, Ro-Ro Vessel Option.

[54] See Grutness Harbour Drawing, Box 2, Ro-Ro Option.

- The new vessel has been estimated to cost in the region of £3m. Both the *Good Shepherd IV* and the *New Advance* would no longer be required.
- It is assumed the vessel would be mainland based, either at Walls, or using an existing berth at Scalloway (the latter assumed for the purposes of costing).
- There would be no need for harbour works at Fair Isle. However, dredging would be required at Foula, where there would also be tidal restrictions.
- The overall total cost of this option would therefore be in the region of **£3m** (excluding any works required at Walls or Grutness if these sites are chosen and dredging at Foula).

- **Option C4: Replace the MV *Good Shepherd IV* with a passenger vessel and a freight vessel shared with Foula:**
  - The MV *Good Shepherd IV* would be replaced by a dedicated Fair Isle passenger catamaran and a freight vessel shared with Foula (as per option C3).
  - The passenger catamaran would be based on Fair Isle. It could be based on a vessel such as the Wildcat 53 design (e.g. the MV *Orca III* which runs to St Kilda) and would be estimated to cost £1m. The *Orca III* is 16.5m LOA and is a Category 0 (unrestricted vessel) which operates at 20 knots and can carry 12 passengers.
  - The costs of a shared freighter are set out in Option C3 above.
  - The total cost of this option would be in the region of **£4m.**

- **Option C5: Bespoke mainland-based Lo-Lo ferry service**
  - This option would see the ferry based at a new overnight berth at Grutness. This solution would mean a vessel similar to the MV *Snolda* (circa £3 million) could serve Fair Isle without any of the issues surrounding overnighting at Fair Isle. The MV *Snolda* is known to be able to berth at Fair Isle. It is assumed that the service would be provided on a Lo-Lo basis possibly with vehicles loaded and discharged via the stern ramp when the tide permits.
  - A new overnight berth would be required at Grutness, at a cost of approximately £2.4 million.[55] Local feedback has suggested that this would be a highly challenging berth to develop and, given the prevailing conditions at Grutness, tank testing would likely be required with this option.
  - The key issue here is that this implies mainland based crew and a service which maximises time on island rather that time on mainland.
  - The total cost of this option would be in the region of **£5.4m.**

- **Option C6: Construct a replacement runway on Fair Isle**
  - This option would involve the construction of a replacement runway in Fair Isle with a view to improving the crosswind reliability of the air service (by aligning the runway direction with the Tingwall runway). The district of Rippack has been identified as a potential location, although no detailed surveying has been undertaken, whilst land ownership issues have not been considered.

[55] See Grutness Harbour Drawing, Box 2, Overnight Berth Option

- It is estimated that the cost of this option would be in the region of **£400k** plus land acquisition, but this is a very high level estimate.

Appraisal

6.3.4 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 6.2: Fair Isle Capital Options – Appraisal against Objectives

	Option C1a – Replace the MV *Good Shepherd IV* with a like-for-like vessel	Option C1b – Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *Good Shepherd IV* with a Ro-Ro vessel	Option C3 – Replace the MV *Good Shepherd IV* with a freight vessel shared with Foula	Option C4 – Replace the MV *Good Shepherd IV* with a passenger vessel and freighter shared with Foula	Option C5 – Mainland based Lo-Lo ferry service	Option C6 – Construct a new runway on Fair Isle
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	-	✓✓	✓✓	✓✓	✓✓✓	✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	✓	✓	-	✓	×××	✓
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	-	-	✓	-	-
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and	-	-	-	-	-	-	-

	Option C1a – Replace the MV *Good Shepherd IV* with a like-for-like vessel	Option C1b – Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *Good Shepherd IV* with a Ro-Ro vessel	Option C3 – Replace the MV *Good Shepherd IV* with a freight vessel shared with Foula	Option C4 – Replace the MV *Good Shepherd IV* with a passenger vessel and freighter shared with Foula	Option C5 – Mainland based Lo-Lo ferry service	Option C6 – Construct a new runway on Fair Isle
Sundays.							
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-	-	-	-	✓

6.3.5 The following bullets summarise the key information from the table above:

- The conversion to Ro-Ro **(Option C2)** would transform vehicular access to the island, increasing capacity and being considerably easier to load and unload. The options which include the provision of calls by a shared freighter **(Options C3 and C4)** would provide a moderate benefit in terms of capacity, as the vessel would be capable of carrying six PCUs and a further 12 passengers **(C4)**. It is estimated that the provision of a new runway on Fair Isle **(Option C6)** would reduce cancellations by around 5%, providing a small increment in capacity in terms of the air service.

- The provision of a faster Lo-Lo or Ro-Ro vessel **(Options C1b, C2 and C4)** would not allow additional rotations within a day, but would reduce journey times, allowing a longer time on the mainland when travelling by ferry. In addition, a materially faster vessel may allow the Fair Isle service to take account of shorter weather windows. Any improvement to the air service would more reliably facilitate available time in Lerwick / on the mainland.

- **Option C4** would provide a two vessel service for Fair Isle (one dedicated passenger vessel and a shared freighter) and would thus provide more connections, reducing time between them.

- The proposed new runway **(Option C6)** could potentially improve the reliability of the air service, enhancing access to strategic transport connections. However, any impact would be minimal and having different sites would cause operational challenges.

- A mainland based ferry service **(Option C5)** would allow a material improvement in the quality of the vessel and the reliability of service for Fair Isle, addressing capacity issues. Journey times would also be reduced. However, there would be a major negative impact on time on mainland by ferry (which would reduce to zero) if the current maximum of one return sailing per day continued to operate.

Appraisal against STAG Criteria

Table 6.3: Fair Isle Capital Options – Appraisal against STAG Criteria

	Option C1a – Replace the MV *Good Shepherd IV* with a like-for-like vessel	Option C1b – Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *Good Shepherd IV* with a Ro-Ro vessel	Option C3 – Replace the MV *Good Shepherd IV* with a freight vessel shared with Foula	Option C4 – Replace the MV *Good Shepherd IV* with a passenger vessel and freighter shared with Foula	Option C5 – Mainland based ferry service	Option C6 – Construct a new runway on Fair Isle
Environment	✓	✓	✗	✗	✗	✗	✗✗
Safety	✓	✓	✓	✓	✓	✓	✓
Economy	✓	✓✓	✓✓✓	✓	✓✓	-	✓
Integration	-	✓	✓✓	✓	✓	-	✓
Accessibility & Social Inclusion	✓	✓✓	✓✓✓	✗	✓✓	✓✓	✓
Established Policy Directives	✗✗	✓	✓✓	✗	✓	✗✗	✓
Technical Feasibility	*There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like would be a technically appropriate solution.*	*There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like would be a technically appropriate solution. Achieving higher speeds with vessel design also challenging*	*A new fixed Ro-Ro ramp and slipway / hoist would be required at Fair Isle. A new fixed Ro-Ro ramp and minimal dredging would be required at Grutness,*	*The freight vessel could overnight at Scalloway, Walls or Grutness.*	*The freight vessel could overnight at Scalloway, Walls or Grutness. The passenger vessel would be based in Fair Isle.*	*A new overnight berth would be required at Grutness. Local feedback suggests developing a berth at Grutness would be highly challenging. Tank testing on the proposed overnight berth would be required.*	*No detailed surveying has been undertaken, whilst land ownership issues have not been considered.*
Operational Feasibility	*There would be no operational feasibility issues associated with this option.*	*There would be no operational feasibility issues associated with this option.*	*There would be no operational feasibility issues associated with this option*	*A crew would be required for the new vessel. The freighter could not currently enter Ham Harbour – dredging is required.*	*A crew would be required for the new vessel. The freighter could not currently enter Ham Harbour – dredging is required.*	*A mainland based crew would be required*	*The position in relation to the existing Fair Isle runway would need to be considered.*
Affordability	*Workboat with similar carrying capacity around £750k.*	*As Option C1a but faster - around £1.25m plus fuel costs*	*Vessel & harbour works assumed £5.75m plus additional operating costs*	*New Snolda type vessel estimated at £3m. Ongoing dredging required at Foula. Additional operating costs*	*New Snolda type vessel estimated at £3m. New pax vessel estimated at £1m. Ongoing dredging required at Foula. Additional operating costs*	*New Snolda type vessel estimated at £3m. Overnight berth at Grutness £2.4 million. Additional operating costs*	*Estimated at around £400k plus land acquisition*
Public Acceptability	*This option was not supported*	*A faster and higher capacity vessel would be acceptable to the public.*	*A faster and higher capacity RoRo vessel would be acceptable to the public.*	*No obvious support for this proposal*	*No obvious support for this proposal*	This option would not be acceptable to the public. An island based ferry and crew is seen by many as	Some support for this proposal was found

	Option C1a – Replace the MV *Good Shepherd IV* with a like-for-like vessel	Option C1b – Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *Good Shepherd IV* with a Ro-Ro vessel	Option C3 – Replace the MV *Good Shepherd IV* with a freight vessel shared with Foula	Option C4 – Replace the MV *Good Shepherd IV* with a passenger vessel and freighter shared with Foula	Option C5 – Mainland based ferry service	Option C6 – Construct a new runway on Fair Isle
						essential for the future of the island.	

6.3.6 The key points from above appraisal against the STAG criteria are:

- From an environmental perspective, the provision of a like-for-like Lo-Lo **(Option C1a)** would generate a minor environmental benefit from the provision of a new and more fuel efficient vessel. The same is also true of a materially faster Lo-Lo **(Option C1b)**, although the environmental benefit could be offset to some extent by the higher speeds. **Options C2 & C5** would require harbour works and thus would have a negative environmental impact, although provided the works are implemented sensitively taking account of environmental constraints, new permanent works are considered unlikely to be significant in the longer term. **Options C3 & C4** would require ongoing dredging at Foula, whilst the latter would also be a two vessel solution and would thus increase emissions. The construction of a new runway on Fair Isle **(Option C6)** would have the potential for significant environmental effects because new infrastructure is located in a sensitive area.

- All of the vessel related options **(Options C1a – C4)** would represent an enhancement to safety as they would replace the ageing and single-screwed MV *Good Shepherd IV*. The provision of a new runway **(Option C6)** would improve the reliability and potentially the safety of the air service in terms of reducing exposure to crosswinds.

- A like-for-like replacement **(Option C1a)** would offer a minor economy benefit as it would provide a more modern and fit-for-purpose Lo-Lo vessel for Fair Isle. This benefit would be further magnified by the provision of a like-for-like but materially faster Lo-Lo vessel **(Option C1b)**, which would provide additional economic benefits in terms of reduced journey times for those using the ferry. The provision of a new Ro-Ro vessel **(Option C2)** would represent a major positive in terms of the economy criterion – as well as providing travel time benefits, it would facilitate limited car-based accessibility to the island, thus providing EALI / wider benefits for residents and tourists. The shared freighter **(Option C3)** would also provide car-based access to the island but the economic benefits would be more muted with the vessel not based on the island. **Option C4** would represent a significant enhancement on Option C3 as it would provide a dedicated passenger vessel for Fair Isle as well as additional car-based access through the freighter, albeit the benefits would be less than the combined Ro-Ro option **(Option C2)**. The new runway **(Option C6)** would clearly support the economy criterion, but the overall magnitude of the improvement is likely to be relatively limited.

- In terms of integration, the provision of Ro-Ro for Fair Isle **(Option C2)** could be transformative for the economy and would support the Fair Isle Development Plan. The other ferry related options would improve transport integration, principally in terms of enhancing reliability and improving access to strategic connections (a problem cited by the community in their consultation return).

- **Options C1a, C1b, C4 and C2** provide incremental benefits on the current situation and on each other in terms of accessibility and social inclusion. The Ro-Ro option would have the biggest benefit as it would ease physical accessibility to the vessel, which is a major problem at present. **Option C3**, the shared freighter, would represent a minor

negative in terms of accessibility as the ferry would not be based on the island. **Option C6**, the new runway, would enhance accessibility and social inclusion through improving the overall reliability of the service.

- The design of the MV *Good Shepherd IV* is relatively obsolete and there are technical feasibility issues surrounding a like-for-like vessel **(Option C1a)** or materially faster equivalent **(Option C1b)**. In addition, it can be argued that Fair Isle needs an improvement on this currently limited service if the island is to progress and the Development Plan is to be realised. The shared freighter options **(Options C3 and C4)** whilst intuitively logical, would require dredging at Foula. However, **Option C3** would remove the flexibility of the service and the ability to take advantage of weather windows, a key issue given the local weather conditions.

- The issue of whether the vessel is based on the mainland **(Option C5)** or on the island (all other options) is a key one locally both in operational terms and also in terms of island employment / income. In the former case, the parallel is Papa Stour, but it is understood that an island based vessel is the strong preference in Fair Isle.

6.4 Appraisal of Revenue Options

Revenue Options

6.4.1 The following revenue options were identified for Fair Isle:

- **Do Minimum**
  - Continue with the current level of service.
- **Option R1: Increase the service frequency of the current Fair Isle ferry**
  - This option would involve increasing the service frequency to two rotations per week in winter and up to five weekly rotations in the summer, essentially almost doubling the current number of sailings (a figure of five is assumed here for costing purposes). As the current vessel crew have other commitments on the island, it is assumed that these additional sailings would be provided by a second crew.
- **Option R2: Increase the frequency of the air service to three rotations per day, seven days a week in summer and two rotations per day, seven days a week in winter**
  - This option would involve increasing the number of rotations to Fair Isle to three per day in the summer and two per day in the winter.
  - This option would provide nine extra connections per week in summer and four extra connections in winter. The existing three rotations on a Monday would be retained.
  - The Fair Isle airfield resource would need to be increased to accommodate this step change in service levels. In addition, Tingwall airfield is currently closed on a Sunday from May to September and on both Saturday and Sunday from October to April but would have to be opened and staffed appropriately to accommodate this option.
  - Additional weekend fire cover would also be required on Fair Isle.
  - No detailed cost information is available for this option.

Appraisal of Revenue Options

6.4.2 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 6.4: Fair Isle Revenue Options – Appraisal against Objectives

	Option R1 – Increase the frequency of the Fair Isle ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	✓✓	✓✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	✓✓	✓✓✓
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓✓	✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	✓	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓	✓✓

6.4.3 The provision of 1 additional sailing per week in winter and 2 per week in summer **(Option R1)** would make a highly positive contribution to the objectives. Given the currently low service frequency, this option would significantly increase the total capacity available on the route, as well as the frequency and time between connections. It would also support enhanced integration with strategic transport services.

6.4.4 The air service is the lifeline mode of travel for Fair Isle, with the majority of personal and business travel made by air. The service is well used throughout the year, with tourism peaks in the summer and around avian migration periods. At present, capacity is a key issue on Fair Isle services and the addition of nine extra connections per week in summer and four in winter **(Option R2)** would provide a significant enhancement in this respect. This option, providing an appropriate timetable, would provide Fair Isle residents with a minimum half day in Lerwick seven days a week, whilst also providing the same amount of time on island. This option would also remove weekday /weekend timetable variations and would provide a step change in local and strategic connectivity for Fair Isle.

Appraisal against STAG Criteria

Table 6.5: Fair Isle Revenue Options – Appraisal against STAG Criteria

	Option R1 – Increase the frequency of the Fair Isle ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w
Environment	✖	✖
Safety	✖	✖
Economy	✓	✓✓✓
Integration	✓	✓✓
Accessibility & Social Inclusion	✓✓	✓✓✓
Established Policy Directives	✓	✓✓
Technical Feasibility	*There are no technical feasibility issues associated with this option.*	*There are no technical feasibility issues associated with this option.*
Operational Feasibility	*The current Fair Isle crew hold more than one job and thus there could be crew availability challenges with scaling the service up.* *The MV Good Shepherd IV currently carries a crew of 3-4 (minimum 2) and thus an additional crew (four in total plus reliefs) would likely be required, a key challenge with island-based crewing.*	*There are likely to be a range of operational issues with this option in terms of flying hours, aircraft utilisation, reliability and recovery time.* *In addition, Tingwall airfield would need to be opened and crewed at the weekend, whilst additional weekend fire cover would be required on Fair Isle.* *Alternatively, the weekend service could potentially operate from Sumburgh.*
Affordability	*Annual revenue support would equate to £432k per annum, an increase of £117k per annum on current costs.*	*Air service revenue support is not disaggregated by route. This option could however be relatively expensive, as it would require additional fuel and potentially additional pilot hours. It would also require the opening and crewing of Tingwall airfield at the weekend, whilst weekend fire cover would also be required on Fair Isle.*
Public Acceptability	*There was no obvious groundswell of support for increased ferry frequency. The priority was the replacement of the vessel itself.*	*Some concerns were expressed regarding the resource implications for those who currently operate the airstrip of a full 7-day service but there is support for more flights in principle.*

6.4.5 The key point from the above appraisal against the STAG criteria is that **Option R1** would significantly enhance the accessibility and social inclusion of Fair Isle. Residents could travel more frequently to Shetland mainland, whilst tourists would also benefit from these connections, supporting different durations of stay. This would have a highly positive impact on the Fair Isle economy and would also support the Fair Isle Development Plan.

6.4.6 A significant enhancement to the air service **(Option R2)** would be transformative to the Fair Isle economy, so long as the service was reliable and provided sufficient recovery capability during periods of poor weather. The principal benefit of an enhanced air service is that it would assist in tackling the significant capacity constraints associated with the current services, supporting resident and tourism travel. There would be a series of TEE benefits associated with enhanced frequency, whilst wider / EALI benefits would emerge in terms of residents, tourists, locally traded services and manufacturing & processing (e.g. Fair Isle crafts).

6.4.7 The enhanced air service would also make a significant contribution to improving both community and comparative accessibility. Fair Isle residents would be better able to access key personal services, business opportunities and onward travel connections, whilst travel to the island would become less problematic. From an integration perspective, this option would clearly support policy integration in terms supporting the Fair Isle Development Plan, the key document setting out the planned positive outcomes for the island.

6.4.8 There are a range of operational issues surrounding the scaling up both the ferry and air service from Fair Isle. Whilst these issues could potentially be addressed, they would require a significant uplift in revenue funding and human resources. However, the Council pointed out that opening Tingwall at the weekends provides a realistic potential for increase revenue:

- The weekend is the preferred operating window for many in the general aviation community. Weekend opening has the potential to attract additional traffic / income from this group.
- Weekend air ambulance traffic may increase, taking advantage of the additional operating hours available at 'normal' operating rates.
- There is also currently no provision for weekend day trips to either Fair Isle or Foula. This would be an attractive proposition for both local residents and visitors, providing potential for increased passenger numbers.

6.5 Annual Operating Cost Estimates

6.5.1 In 2015/16 there were approximately 200 single sailings between Fair Isle and Shetland mainland. The revenue costs and income associated with operating the Fair Isle ferry service was as follows:

Table 6.6: Current Fair Isle Operating Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£176,259
Vessel - Fuel	£11,411
Vessel - Maintenance	£63,560
Vessel - Other Costs	£60,452
Vessel Total	**£311,682**
Terminal - Maintenance	£10,547
Terminal - Other Costs	£11,717
Terminal Total	**£22,264**
Route Total	**£333,946**
Route Income	*-£18,968*
Route Net Cost	**£314,978**

6.5.2 In addition to these costs, an internal berthing charge of £782 was paid in 2015-16.

6.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Fair Isle service costs around **£0.3m** per annum (net) to operate.

6.5.4 An estimate of the annual net revenue budget costs associated with the Capital ('C') and Revenue ('R') options outlined above is shown in the chart below. For brevity, the revenue options are shown in relation to Capital Option C1 only.

6.5.5 The figures shown are the estimated net annual revenue costs associated with each option (although again it should be noted that the options are not mutually exclusive). The figures on the horizontal axis show the overall annual net operating cost for each option.

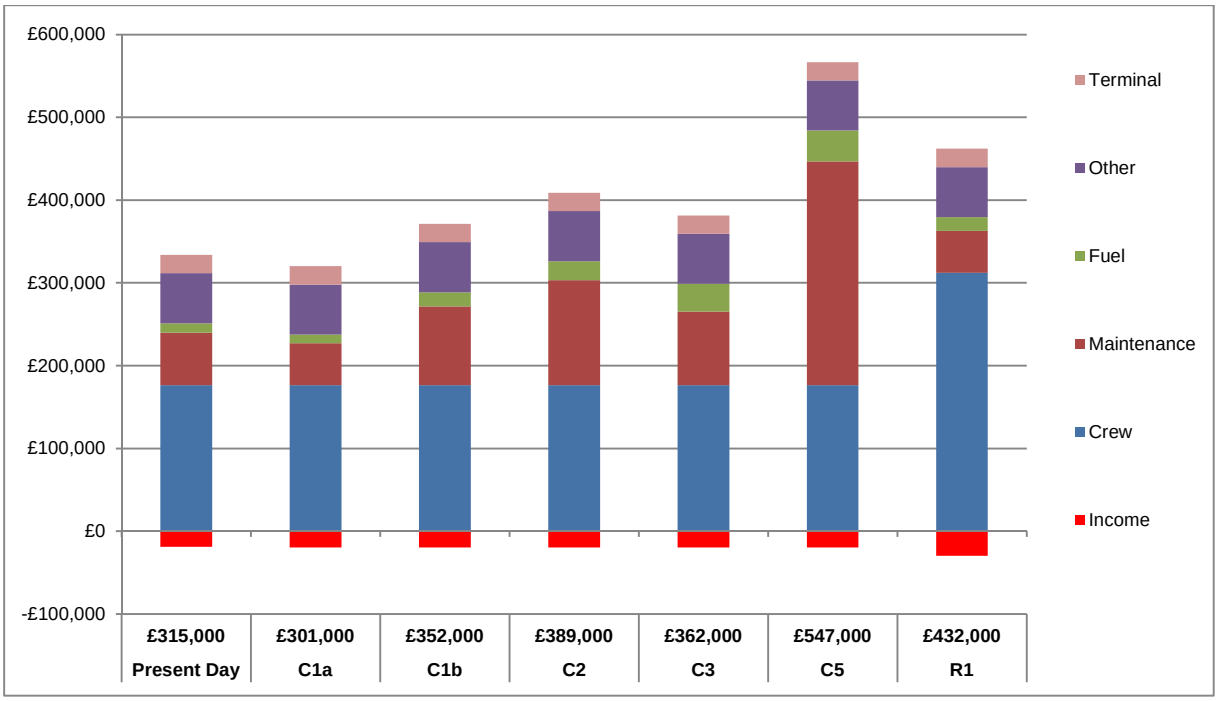


Figure 6.1: Fair Isle Annual Revenue Cost Estimates

6.5.6 The main points to emerge from the above are:

- C1a: reduced fuel costs associated with the new vessel compared to the present day see overall costs fall
- C1b: increased fuel costs with the faster vessel compared to the present day see overall costs rise, crew costs are assumed unaffected, remaining at four. Small increase in fares revenue assumed.
- C2: increase fuel and maintenance costs. Small increase in fares revenue assumed.
- C3: cost here assume the Fair Isle 'share' of this service, other costs are attributed to Foula. Small increase in fares revenue assumed.
- C4: as C3 with additional passenger only vessel revenue costs which cannot be determined at this stage. Increase in fares revenue assumed.
- C5: the higher costs here reflect the use of a *Filla* style vessel. Increase in fares revenue assumed.

- R1: crew and fuel costs are factored up by 1.75 to account for the additional sailings – this multiplier would apply to any of the other vessel options.

6.6 Public Consultation – Prioritisation

6.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

6.6.2 The number of completed questionnaires from Fair Isle was **13**.

6.6.3 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the 'Other – Please Specify' option. Note that these columns do not sum to 100% as the question allowed three responses.

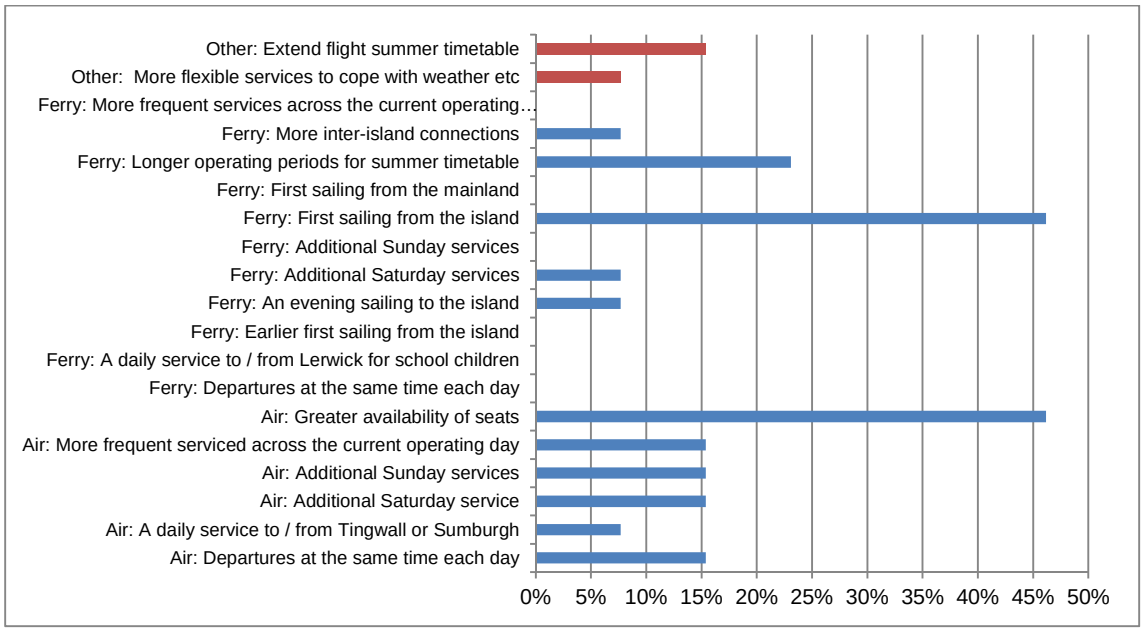


Figure 6.2: Fair Isle – Prioritisation of Enhancements

6.6.4 The top priority for Fair Isle residents was greater availability of seats on the aircraft and the (presumably retention of) the first sailing of the day to be from the island, ie reflecting an island based crew.

6.6.5 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

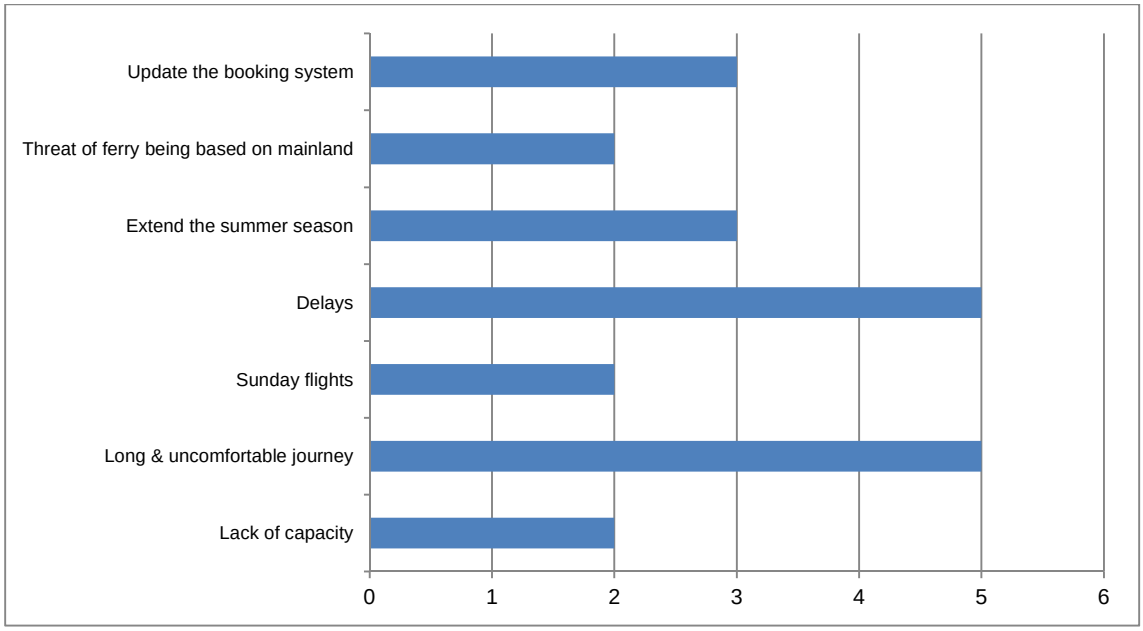


Figure 6.3: Fair Isle – Other Issues Raised (Frequency)

6.6.6 The other main issues raised in Fair Isle was the long and uncomfortable journey associated with the current ferry and issue surrounding weather related delays with both the air and ferry services.

6.7 Rationale for Selection / Rejection

6.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 6.7: Outcome of Appraisal, Fair Isle

Capital & Revenue Options	Take Forward (✓) / Reject (✗)	Ration for Selection / Rejection
Option C1a – Replace the MV *Good Shepherd IV* with a like-for-like vessel	✗	This option would not make any meaningful contribution to the objectives or STAG criteria and there is also an issue of design obsolescence with the current vessel type. All of the problems and issues associated with the current service would continue.
Option C1b – Replace the MV *Good Shepherd IV* with a like-for-like but materially faster vessel	✗	Whilst a like-for-like but materially faster vessel would support the objectives and STAG criteria, it is unlikely to be technically feasible – a faster vessel with the current hull form is not deemed to be possible.
Option C2 – Replace the MV *Good Shepherd IV* with a Ro-Ro vessel	✓	This option is retained for further consideration. A Ro-Ro services makes a significant contribution to both the objectives and STAG criteria.
Option C3 – Replace the MV *Good Shepherd IV* with a freighter shared with Foula	✗	A shared freighter would materially affect the potential to sail during weather windows affecting the viability of the island, and is therefore rejected.
Option C4 – Replace the MV *Good Shepherd IV* with a passenger vessel and freighter shared with Foula	✓	The rationale for rejecting Option C3 is also appropriate to this option. However, a dedicated passenger vessel would provide a faster bespoke option for Fair Isle, mitigating somewhat against potential supply issues with the freighter. A shared freighter would provide capacity to cater for heavier items / vehicles etc. Further analysis of sailing patterns would be required to quantify the extent of the reliance on 'weather windows'.
Option C5 – Mainland based ferry service	✓	This option would allow a larger vessel with better seakeeping to operate to Fair Isle from a mainland overnight berth and Lerwick. The impact on island based crew needs further investigation and needs to be tested for public acceptability. However, it does have be acknowledged that this option worsens the accessibility of Fair Isle residents and may be ruled out after the community consultation. It should also be noted that there is considerable technical uncertainty as to whether a suitable overnight berth could be developed at Grutness. This option would therefore be revisited at the outset of the OBC stage and may be removed from further consideration at this stage.
Option C6 – Construct a new runway on Fair Isle	✗	Whilst this option could potentially assist in reducing cancellations at Fair Isle, the impact is likely to be minimal and is set against the cost of constructing a new runway and fully licensing the airfield. In addition, this option has the potential for significant negative environmental effects because the new runway would be located in an environmentally sensitive area.
Option R1 – Increase the frequency of the Fair Isle ferry service	✓	This option has human resource implications but increased ferry-based connectivity should not be ruled out. It should be noted though that a basic requirement of the RSM is the provision of a 7-day service which Fair Isle does not currently have.
Option R2 – Increase air frequency to 2 per day, 7 days p/w	✓	A 7-day per week service may have disproportionate costs associated with the all-year weekend opening of Tingwall, although this would also give rise to a number of revenue opportunities. The principal of increasing the number of weekday flights to Fair Isle should be explored further, particularly in conjunction with any move to a shared ferry service. It should also be noted that a basic requirement of the RSM is the provision of a 7-day service which Fair Isle does not currently have, and this may require weekend operating at Tingwall.

7 Foula

7.1 Capital Investment Timeframe

- The current Foula vessel, the MV *New Advance* was built in 1996. She is a very small vessel (10m) given the length and exposure of the crossing but is at the same time the maximum size of vessel which can fit into and overnight in Ham Harbour. The vessel is currently scheduled for replacement in 2024. As there is no suitable berth in Foula, the vessel is taken out of the water overnight on davits.

- The vessel is classed as a Workboat and is based in and crewed from Foula. The service is currently provided by BK Marine under contract to Shetland Islands Council – this contract lasts until 31st March 2017.

7.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix F.

7.2 Identified Problems

7.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (✗, ✗✗ or ✗✗✗). Where there is a '✱' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

7.2.2 The following transport problems in relation to Foula were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 7.1: Foula Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	✗	Foula residents can reach Tingwall in 15-20 minutes by air, with a 15 minute connection to Lerwick by bus. However, ferry journey times are long, some 120 minutes to Walls.
4	Time on mainland	✗✗✗	It is not possible to make a meaningful day return either to or from Foula by ferry – day access is entirely dependent on the air service. The air service itself is of a reasonable level offering 8-18 hours weekly on the mainland, 7-17 hours in Lerwick and 9-20 hours on Foula.[56] However, this is still a relatively limited period of time ashore when comparing Foula to other islands of a similar size (e.g. Fetlar, North Ronaldsay, Papa Westray etc). The limited time ashore can lead to a need for costly overnight stays when carrying out work-based or personal business which extend beyond the length of the air operating day. Foula has no connections to the mainland on a Sunday in summer or at weekends all year round. *The initial community consultation response noted that access can be made to the Walls doctor by ferry, as well as to the shop, post office, garage and vet. It further explains that it is not possible to visit the doctor by plane and bus on a day trip. Residents have to hire a taxi to and from Tingwall or stay overnight, both of which are considered to be expensive.*
5	Time in Lerwick	✗✗✗	See point 4. *The community consultation response points out that the measure of time that is important for Foula residents is the amount of time which can be spent in Lerwick in a*

[56] SIITS Air Service Provision (Peter Brett Associates, 2015), Time Ashore – Weekly.

	Service Characteristics	Severity Rating	Why is this a problem or not?
			day, not the accumulative time over the week. Note - these times have been established but were aggregated for the purpose of this paper.
6	Time on island	✖✖	See point 4.
8	Capacity	✖✖✖	The MV *New Advance* is very limited in terms of vehicle and indeed passenger capacity. The vessel can only take one small car and 12 passengers, whilst she cannot accommodate any heavy freight or plant.[57] The air service is also limited to 8-9 passengers depending on weight. This places a significant capacity constraint on the island, particularly when one or both modes are affected by bad weather. In addition, the deadweight limitation on the vessel means that bringing any larger vehicles or plant onto the island requires the use of a different vessel. The capacity issue impacts negatively both on access to the mainland for island residents and on visitors to the island. *The community consultation response noted that Directflight will only book six passengers because of the weight limitation on G-SICB.* *It was also noted that the recent refurbishment of the MV New Advance allows a car / van or plant up to three tonnes, and heavier if it can fit in the hold.*
9	Reliability (weather / mechanical)	✖✖	The ferry crossing is long and exposed. This, combined with the small vessel used, presents reliability challenges on the route, particularly during winter. In many cases, the ferry has to travel when there is a weather window, even if this is off-timetable. The air service is overall believed to be reliable but can be affected by the frequent fog which affects Foula and Tingwall. Reliability issues can lead to both islanders and visitors incurring costly overnight stays, whilst a sustained period of cancellations can have significant impacts on the inbound and outbound supply chain. *The community consultation response noted that frequent fog, cross-winds and ice on the runway are also frequent problems.*
10	Comfort	✖✖	The MV *New Advance* is a relatively uncomfortable vessel given the sea states in which she operates (indeed her workboat classification hints at her size).
11	Physical access	✖✖	As a small vessel operating out of a non Ro-Ro port, the *New Advance* can present physical accessibility issues for older and disabled passengers, a key issue on Foula, which has an ageing demographic. As previously explained, the Britten-Norman Islander aircraft are not well suited to those with any kind of mobility impairments either. This is a key problem on Foula – the ageing demographic on the island means that, in the longer-term, physical accessibility could become a barrier to necessary travel. *The community consultation response noted that the new pier facilities at Walls have improved physical accessibility.*
13	Integration with PT (strategic)	✖✖	Given the limited connections from Foula, onward travel will always have to be well planned. However, there are a number of problems over and above this. Firstly, a high degree of reliability is required on both the connecting and onward service as any delay or cancellation can lead to the need for a costly overnight stay or a long layover on Shetland mainland. In addition, the air service from Foula travels to Tingwall and requires a double-bus connection to get to Sumburgh.
14	Crossing / flight times	✖	See point 1.
15	Onboard facilities	✖✖	As a small vessel (classified as a workboat), the MV *New Advance* has little in the way of onboard facilities. This lessens the attractiveness of the ferry as a travel option and puts pressure on aircraft capacity.
16	Weekday / weekend service variation[58]	✖✖✖	Foula has a significant weekend connectivity gap. Other than a summer Saturday ferry return, there are no weekend services at all, which effectively cuts the island off.[59] This suppresses the ability of islanders to take an overnight off-island trip at the weekend and discourages potential visitors to the island.

[57] SIITS Vessels Review (TMG, 2015), p. 13.

[58] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[59] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Ferry Service Provision and SIITS Air Service Provision (Peter Brett Associates, 2015), Air Service Provision

	Service Characteristics	Severity Rating	Why is this a problem or not?
17	Landside infrastructure issues	××	The ferry berth is constrained and exposed, with the vessel having to be hoisted out of the water overnight. The harbour is silted-up which prevents the larger MV *Snolda* calling as she did in the past.[60]
18	Landside human resources	××	There is an ongoing challenge of providing fire cover at the airfield, which could have an impact on the long-term sustainability of the air service. The ferry crew is also island based, which could present an issue for crew resourcing in the medium to longer term. *The community consultation response noted that the present skipper is in his 40s, the mate is in his 30s, the other crew member is in his 20s and the stand-by crew has members in their 30s and 40s including a stand-by skipper in his 30s. There is also an 18 year old attending NAFC qualifying as a deck officer. All are Foula residents.*

7.3 Appraisal of Capital Options

7.3.1 In addition, the scale and cost of works and resources required to bring this route into line with the other main Ro-Ro Shetland routes in terms of vessel size / capacity would be disproportionate in this context. This route therefore requires a bespoke vessel, and careful planning of air and ferry services in combination.

Capital Options

7.3.2 The following capital options were identified for Foula:

- **Option C1a: Replace the MV *New Advance* with a like-for-like vessel:**
  - This vessel would be a similar replacement for the MV *New Advance* in terms of dimensions and carrying characteristics. The vessel would carry 12 passengers and one PCU, and would have a workboat classification.
  - This option would not require harbour works other than remedial dredging at Foula.[61]
  - The estimated cost of replacing the MV *New Advance* on a like-for-like basis would be **£950k.**
- **Option C1b: Replace the MV *New Advance* with a similar but materially faster Lo-Lo vessel:**
  - This vessel would be a similar replacement for the MV *New Advance* in terms of carrying capacity. However, this vessel would travel faster at e.g., 10-12 knots.
  - This option would not require harbour works assuming the vessel's dimensions and characteristics are similar to the MV *New Advance* and the vessel can be lifted out of the water on the current davits.
  - The estimated cost of replacing the MV *New Advance* on a faster like-for-like vessel would be **£1.25m**.
- **Option C2: Replace the MV *New Advance* with a bespoke small Ro-Ro vessel:**
  - Similar to Fair Isle, this vessel would be a catamaran of approximately 20-25m length and 6m beam. This vessel would be capable of carrying approximately 50

[60] SIITS Ports Review (TMG, 2015), p. 34.

[61] See Foula Harbour Drawing, Box 2, Like-for-Like option

passengers and 5 PCUs. It would operate at around 14 knots, although would have a design speed of around 18 knots. The vessel cost is estimated at £3m.

- A new harbour would need to be built at Foula which would include a new breakwater, provision of a new jetty / Ro-Ro ramp and dredging. It is estimated that this would cost £14.1 million at the very minimum, although potentially much more given the remote location of Foula.[62]
- The Ro-Ro ferry could either travel to West Burrafirth or, if it continued to go to Walls, around £1 million of harbour works would be needed.[63] Walls is assumed here.
- Any new harbour development work would initially require tank testing to ensure the solution is technically appropriate. This in itself is not a small undertaking and could cost in the region of £100k.
- The total cost of this option would be around **£18.1m**.

- **Option C3: Replace the MV *New Advance* with a Lo-Lo freight vessel shared with Fair Isle:**
  - This vessel would be based on the current MV *Snolda* which has a track record of accessing Foula. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots.
  - The new vessel has been estimated to cost in the region of £3m. Both the *Good Shepherd IV* and the *New Advance* would no longer be required.
  - It is assumed the vessel would be mainland based, either at a new facility at Grutness or Walls, or using an existing berth at Scalloway (the latter assumed for the purposes of costing).
  - There would be no need for major harbour works at Foula or Fair Isle. However, dredging would be required at Foula, where there could also likely be tidal restrictions.
  - The overall total cost of this option would therefore be in the region of **£3m** (excluding any works required at Walls or Grutness if these sites are chosen, and dredging at Foula).

- **Option C4: Replace the MV *New Advance* with a passenger vessel and a freight vessel shared with Fair Isle:**
  - The MV *New Advance* would be replaced by a like-for-like vessel and a freight vessel shared with Fair Isle.
  - The costs of a like-for-like replacement for the MV *New Advance* are set out in relation to Option C1, whilst the costs of a shared freighter are set out in Option C3 above.
  - The total cost of this option would be in the region of **£3.95m**.

Appraisal of Capital Options

7.3.3 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

[62] See Foula Harbour Drawing, Box 3, Full or Partial Ro-Ro Service Option.

[63] See Walls Harbour Drawing, Box 2, Full or Partial Ro-Ro Service Option.

Appraisal against Objectives

Table 7.2: Foula Capital Options – Appraisal against Objectives

	Option C1a – Replace the MV *New Advance* with a like-for-like vessel	Option C1b – Replace the MV *New Advance* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *New Advance* with a Ro-Ro vessel	Option C3 – Replace the MV *New Advance* with a freight vessel shared with Fair Isle	Option C4 – Replace the MV *New Advance* with a passenger vessel and freighter shared with Fair Isle
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	-	✓✓	✓✓	✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	NA	NA	NA	NA	NA
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	✓	✓	-	-
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	-	-	✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	-	-	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-	-	-

7.3.4 The following bullets summarise the key information from the table above:

- The provision of a faster workboat for Foula **(Option C1b)** could improve the amount of time available on Shetland mainland / Lerwick on any given day. A faster vessel may also allow the Foula community to take better advantage of weather windows, thus improving the reliability of the service.

- The conversion of Foula to Ro-Ro **(Option C2)** would transform vehicular access to the island, increasing capacity and being considerably easier to load and unload. The options which include the provision of calls by a shared freighter **(Options C3 and C4)** would provide a moderate benefit in terms of capacity, as the vessel would be capable of carrying six PCUs and 12 passengers.

- The combination of a passenger only vessel and calls by a shared freighter **(Option C4)** would provide an increase in both capacity and frequency.

Appraisal against STAG Criteria

Table 7.3: Foula Capital Options – Appraisal against STAG Criteria

	Option C1a – Replace the MV *New Advance* with a like-for-like vessel	Option C1b – Replace the MV *New Advance* with a like-for-like but materially faster vessel	Option C2 – Replace the MV *New Advance* with a Ro-Ro vessel	Option C3 – Replace the MV *New Advance* with a freight vessel shared with Fair Isle	Option C4 – Replace the MV *New Advance* with a passenger vessel and freighter shared with Fair Isle
Environment	✓	✓	✗✗	✗	✗
Safety	-	-	✓	-	-
Economy	✓	✓✓	✓✓✓	✓	✓
Integration	-	✓	✓✓	✓	✓
Accessibility & Social Inclusion	✓	✓✓	✓✓✓	✗	✓
Established Policy Directives	✗✗	✓	✓✓	✗	✓
Technical Feasibility	*There would be no technical feasibility issues associated with this option.*	*It would be technically challenging to design a like-for-like vessel capable of going at higher speeds.*	*A new harbour would be required at Foula to accommodate Ro-Ro operations. This would include a new breakwater, a piled jetty, land reclamation and dredging.*	*The freight vessel could overnight at Scalloway, Walls or Grutness.*	*The freight vessel could overnight at Scalloway, Walls or Grutness. The passenger vessel would be based in Foula.*
Operational Feasibility	*There would be no operational feasibility issues associated with this option.*	*There would be no operational feasibility issues associated with this option.*	*The harbour at Foula would require frequent dredging.*	*A crew would be required for the new vessel. The harbour at Foula would require frequent dredging. Freighter harbour access at Foula could be tidally constrained. Weather constraints would impact on the viability of this service if timetabled*	*A crew would be required for the new vessel. The harbour at Foula would require frequent dredging. Freighter harbour access at Foula could be tidally constrained. Weather constraints would impact on the viability of the freighter service if timetabled although the pax ferry could be flexible.*
Affordability	*Like-for-like vessel around £950k.*	*Like-for-like faster vessel around £1.25m.*	*Vessel & harbour works assumed £18.1m*	*Vessel costs estimated at £3m. Dredging required at Foula.* *Costs of any upgrades to Walls and Grutness excluded.*	*Vessel costs estimated at £3.95m. Dredging required at Foula.* *Costs of any upgrades to Walls and Grutness excluded.*
Public Acceptability	*The initial community council and subsequent public consultation noted that this option would be acceptable.*	*The initial community council and subsequent public consultation noted that this option would be acceptable.*	*There appeared to be very little appetite in Fouls for a major RoRo conversion.*	*The initial community council and subsequent public consultation noted that this option would **not** be acceptable.*	*The initial community council and subsequent public consultation noted that this option would **not** be acceptable.*

7.3.5 The key points from above appraisal against the STAG criteria are:

- From an environmental perspective, the provision of a like-for-like Lo-Lo **(Option C1a)** would generate a minor environmental benefit from the provision of a new and more fuel efficient vessel. The same is also true of a materially faster Lo-Lo **(Option C1b)**, although the environmental benefit could be offset to some extent by the higher speeds. **Options C2** would require major harbour works at Ham, with significant effects during construction. There would also be seascape and visual impacts in longer term although these would decrease as the breakwater became weathered.

- **Option C2** would represent an enhancement to safety as it would replace the ageing and relatively small MV *New Advance* with a Ro-Ro vessel, reducing the risks associated with Lo-Lo options. However, the scale of the benefit would be very limited.

- A like-for-like replacement **(Option C1a)** would offer a minor economy benefit as it would provide a more modern and fit-for-purpose Lo-Lo vessel for Foula. This benefit would be further magnified by the provision of a like-for-like but materially faster Lo-Lo vessel **(Option C1b)**, which would provide additional economic benefits in terms of reduced journey times for those using the ferry. The provision of a new Ro-Ro vessel **(Option C2)** would represent a major positive in terms of the economy criterion – as well as providing travel time benefits, it would facilitate limited car-based accessibility to the island, thus providing wider / EALI benefits for residents and tourists. The shared freighter **(Option C3)** would also provide car-based access to the island but the economic benefits would be reduced with the vessel not based on the island. **Option C4** would represent a significant enhancement on Option C3 as it would provide a dedicated passenger vessel for Foula as well as additional car-based access through the freighter, albeit the benefits would be less than the combined Ro-Ro option **(Option C2)**.

- In terms of integration, the provision of Ro-Ro for Foula **(Option C2)** could be transformative for the economy and would support the economic and population development of the island. The other ferry related options would improve transport integration, principally in terms of enhancing reliability and improving access to strategic connections.

- **Options C1a, C1b, C4 and C2** provide incremental benefits on the current situation and on each other in terms of accessibility and social inclusion. The Ro-Ro option would have the biggest benefit as it would ease physical accessibility to the vessel, which is a major problem at present. **Option C3**, the shared freighter, would represent a minor negative in terms of accessibility as the ferry would not be based on the island.

- The lowest cost and most technically simple option would be to replace the current Lo-Lo on a like-for-like basis **(Options C1a)**. Our research suggests that the provision of a materially faster like-for-like vessel is technically challenging. The Ro-Ro **(Option C2)** option would require significant capital investment in Foula to be realised.

- The community consultation response indicated that only **options C1a, C1b and C2** would be publicly acceptable to Foula residents.

7.4 Appraisal of Revenue Options

Revenue Options

7.4.1 The following revenue options were identified for Foula:

- **Do Minimum**

  - Continue with the current level of service.

- **Option R1: Increase the service frequency of the current Foula ferry**
  - This option would involve increasing the service frequency to 3-4 weekly rotations year round.
- **Option R2: Increase the frequency of the air service to two rotations per day, seven days a week in summer and winter**
  - This option would involve increasing the number of rotations to Foula to two per day in the summer and winter.
  - This option would provide seven extra connections per week in summer and eight in winter.
  - The airfield is likely to have to be licensed to accommodate this step change in service levels. In addition, Tingwall airfield is currently closed on a Sunday from May to September and on both Saturday and Sunday from October to April but would have to be opened and staffed appropriately to accommodate this option.
  - Additional weekend fire cover would also be required on Foula.
  - A sub-option would involve running two rotations per day on weekdays only avoiding the need for opening Tingwall at weekends.
- **Option R3: Replace current operation with a mainland based Foula ferry service shared with Papa Stour**
  - This option would provide a combined Papa Stour / Foula service using the current and future Papa Stour vessel, potentially running on alternate days. This option may be tidally constrained at Foula. The vessel would continue to provide a Lo-Lo service to Foula and this more substantial vessel could offer improved capacity, reliability and improved passenger comfort. The MV *New Advance* would no longer be required.
  - The vessel would continue to overnight at West Burrafirth and the crew would therefore be mainland based as they are at present.
  - It is assumed that this service would provide for 2-3 crossings per week.

Appraisal of Revenue Options

Appraisal against Objectives

7.4.2 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 7.4: Foula Revenue Options – Appraisal against Objectives

	Option R1 – Increase the frequency of the Foula ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w	Option R3 – Mainland based service shared with Papa Stour
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	✓✓	✓✓✓	✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment	N/A	N/A	N/A

	Option R1 – Increase the frequency of the Foula ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w	Option R3 – Mainland based service shared with Papa Stour
centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.			
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	✓✓	✓✓✓	×××
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓✓	✓✓	-
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	✓	✓✓✓	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓	✓✓	-

7.4.3 The provision of 1-2 additional sailings per week **(Option R1)** would make a highly positive contribution to the objectives. Given the currently low service frequency, this option would increase the total capacity available on the route, as well as the frequency and time between connections. It would also support enhanced integration with strategic transport services. The air service is the lifeline mode of travel for Foula, with the majority of personal and business travel made by air. At present, capacity is an important issue on Foula services and the addition of seven or eight extra connections per week **(Option R2)** would provide a significant enhancement in this respect. This option, providing an appropriate timetable, would provide Foula residents with a minimum half day in Lerwick seven days a week, whilst also providing the same amount of time on island. This option would also remove weekday / weekend timetable variations and would provide a step change in local and strategic connectivity for Foula.

7.4.4 A mainland based service **(Option R3)** would provide an improved and higher quality vessel for the island. At present, a single rotation from Foula to Walls and back provides for approximately two hours on the mainland for island residents. Any equivalent mainland service would not allow any time on the mainland although at present the practice is to use the air service for trips to the mainland in any case. Onward links from West Burrafirth could potentially be improved if both the Papa Stour and Foula service is operating from there.

Appraisal against STAG Criteria

Table 7.5: Foula Revenue Options – Appraisal against STAG Criteria

	Option R1 – Increase the frequency of the Foula ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w	Option R3 – Mainland based service shared with Papa Stour
Environment	×	×	×
Safety	×	×	-
Economy	✓	✓✓	×

	Option R1 – Increase the frequency of the Foula ferry service	Option R2 – Increase air frequency to 2 per day, 7 days p/w	Option R3 – Mainland based service shared with Papa Stour
Integration	✓	✓✓	✗
Accessibility & Social Inclusion	✓✓	✓✓	✗✗
Established Policy Directives	✓	✓✓	✓
Technical Feasibility	*There are no technical feasibility issues associated with this option.*	*This option would likely require Foula airfield to be licensed.*	*Regular dredging required at Foula.*
Operational Feasibility	*There would be a need for additional crew hours and fuel.*	*There are likely to be a range of operational issues with this option in terms of flying hours, aircraft utilisation, reliability and recovery time. In addition, Tingwall airfield would need to be opened and crewed at the weekend, whilst additional weekend fire cover would be required on Foula.* *Alternatively, the weekend service could potentially operate from Sumburgh*	*Additional crew / crewing hours on the Papa Stour vessel. Potential tidal restrictions with access to Foula. The flexibility to make use of weather windows would also be compromised from Foula's perspective.*
Affordability	*This would be a relatively low cost option given the small vessel, low crew compliment and small increase in the number of sailings.*	*This option could be relatively expensive, as it would require the additional fuel and potentially additional pilot hours. It would also require the opening and crewing of Tingwall airfield at the weekend, whilst weekend fire cover would also be required on Foula.*	*The current Foula contract would be withdrawn with resulting cost savings and 'fixed' route costs would be shared with Papa Stour. Additional crew and fuel costs for Papa Stour vessel associated with Foula call.*
Public Acceptability	*The community does not consider an increase in the use of the current ferry service as appropriate as it would have an impact on the other jobs undertaken by island residents.*	*Some concerns were expressed regarding the resource implications for those who currently operate the airstrip of a full 7-day service but there is support for more flights in principle.*	*This option would not be acceptable to the Foula public given the implications for flexibility of service and island based employment.*

7.4.5 The key point from above appraisal against the STAG criteria is that **Option R1** would significantly enhance the accessibility and social inclusion of Foula. Residents could travel more frequently to Shetland mainland and would have better access to onward connections. However, the Foula community do not believe that this option would be appropriate for them.

7.4.6 A significant enhancement to the air service **(Option R2)** would be transformative to Foula, so long as the service was reliable and provided sufficient recovery capability during periods of poor weather. The principal benefit of an enhanced air service is that it would assist in addressing the capacity constraints associated with the current services, supporting resident travel. There would be a series of TEE benefits associated with enhanced frequency, whilst wider / EALI benefits would emerge in terms of residents and locally traded services.

7.4.7 The enhanced air service would also make a significant contribution to improving both community and comparative accessibility. Foula residents would be better able to access key personal services, business opportunities and onward travel connections, whilst travel to the island would become less problematic, supporting for example Council officials. From an

integration perspective, this option would clearly support policy integration in terms supporting the economic sustainability and development of the island.

7.4.8 There are a range of operational issues surrounding the scaling up the air service from Foula. Whilst these issues could potentially be addressed, they would require a significant uplift in revenue funding and human resources. There would however be revenue benefits associated with opening Tingwall at the weekend, as set out in the Fair Isle chapter.

7.4.9 The shared Papa Stour service **(Option R3)** would potentially reduce costs and make more efficient use of the Papa Stour vessel. Foula would also be served by a higher capacity vessel on a permanent basis, albeit the timetable would have to operate around tidal restrictions. All issues surrounding taking the vessel out of the water at Foula would be removed without the need for extensive harbour works at Foula. However, as the crew would be mainland based, there would be a loss of income / wages to the Foula community unless the crew spent time ashore. In addition, the flexibility provided by the current arrangements in terms of meeting weather windows would be compromised.

7.5 Annual Operating Cost Estimates

7.5.1 As the Foula service is currently run on a contract basis, detailed revenue budget information is not available in the same way as it is for other routes. In 2015/16 the cost to the Council for the Foula ferry service was £567,862.

7.5.2 It is therefore not possible to develop detailed operating cost projections based on the current costs associated with the route.

7.6 Public Consultation – Prioritisation

7.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

7.6.2 The number of completed questionnaires from Foula was **12**.

7.6.3 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the ‘Other – Please Specify’ option. Note that these columns do not sum to 100% as the question allowed three responses.

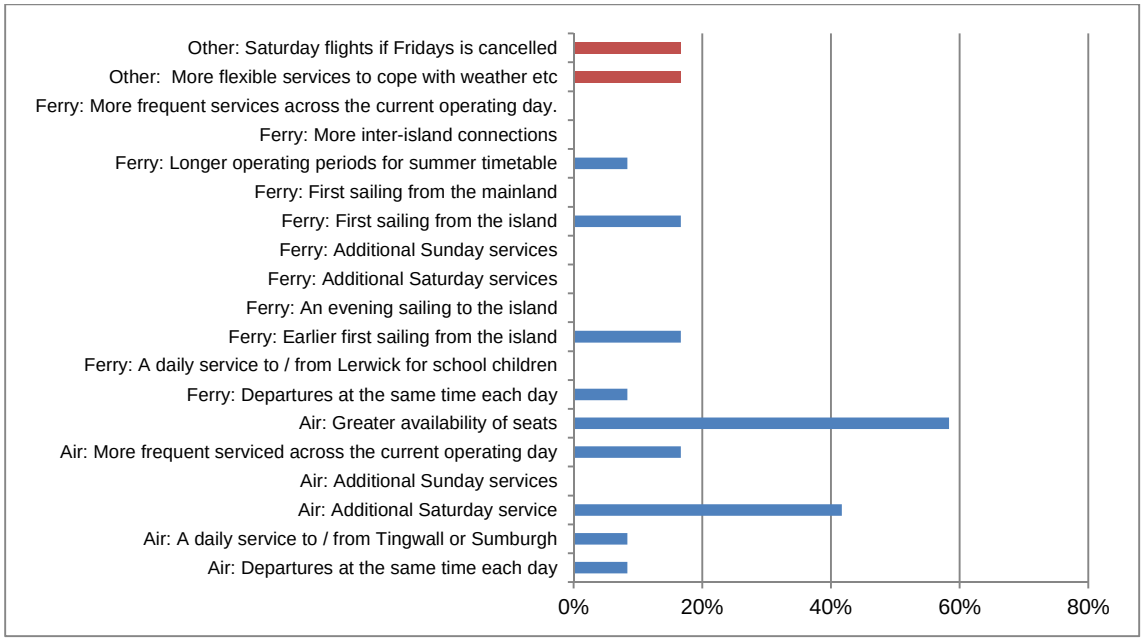


Figure 7.1: Foula – Prioritisation of Enhancements

7.6.4 The top priority for Foula residents was greater availability of seats on the aircraft and an additional Saturday sailing.

7.6.5 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

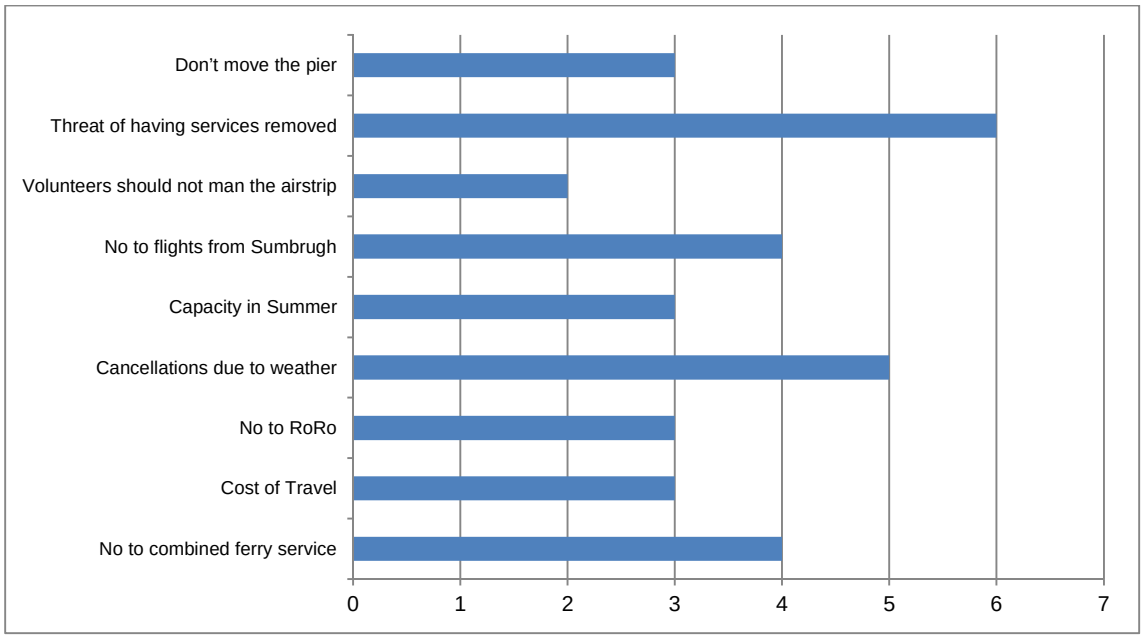


Figure 7.2: Foula – Other Issues Raised (Frequency)

7.6.6 The other main issues raised in Foula were in relation to some of the options and reflected a desire to retain the current transport links rather than make a wholesale change. The situation with staffing resources at the airstrip underlies the 'threat of having services removed' point, with some also expressing a desire to retain the current LoLo service.

7.7 Rationale for Selection / Rejection

7.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 7.6: Outcome of Appraisal, Foula

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
Option C1a – Replace the MV *New Advance* with a like-for-like vessel	✓	Given the constrained nature of the harbour and overnight berthing arrangements at Foula, this option cannot be ruled out. Initial consultation suggested that this was a viable option for Foula residents although it may not meet the long terms needs of the island.
Option C1b – Replace the MV *New Advance* with a like-for-like but materially faster vessel	✘	Whilst a like-for-like but materially faster vessel would support the objectives and STAG criteria, it is unlikely to be technically feasible – a faster vessel with the current hull form is not deemed to be possible.
Option C2 – Replace the MV *New Advance* with a Ro-Ro vessel	✘	The technical difficulties and cost of harbour works at Ham are considered to be disproportionately large to justify scaling up to a Ro-Ro solution for Foula.
Option C3 – Replace the MV *New Advance* with a freight vessel shared with Fair Isle	✘	A shared freighter would materially affect the potential to sail during weather windows affecting the viability of the island, and is therefore rejected.
Option C4 – Replace the MV *New Advance* with a passenger vessel and freighter shared with Fair Isle	✓	The rationale for rejecting Option C3 is also appropriate to this option. However, a dedicated passenger vessel would provide a faster bespoke option for Foula, mitigating somewhat against potential supply chain issues with the freighter. A shared freighter would provide capacity to cater for heavier items / vehicles etc and would improve reliability. Further analysis of sailing patterns would be required to quantify the extent of the reliance on 'weather windows'.
Option R1 – Increase the frequency of the Foula ferry service	✓	This option has human resource implications for Foula residents but increased ferry-based connectivity should not be ruled out. It should be noted though that a basic requirement of the RSM is the provision of a 7-day service which Foula does not currently have.
Option R2 – Increase air frequency to 2 per day, 7 days p/w	✓	A 7-day per week service may have disproportionate costs associated with the all-year weekend opening of Tingwall, although this would also give rise to a number of revenue opportunities. The principal of increasing the number of weekday flights to Foula should be explored further, particularly in conjunction with any move to a shared ferry service. It should also be noted that a basic requirement of the RSM is the provision of a 7-day service which Foula does not currently have, and this may require weekend operating at Tingwall.
Option R3 – Mainland based service shared with Papa Stour	✓	This option would allow a larger vessel with better seakeeping to operate to Foula from a mainland overnight berth. The impact on island based crew needs further investigation and this options needs to be tested for public acceptability. There may be a loss of flexibility in operating during weather windows.

8 Papa Stour

8.1 Capital Investment Timeframe

- The MV *Snolda* is 33 years old and is thus approaching the end of her operational life. She will require to be replaced in the early part of the strategy period, estimated at 2020 by the Council.
- The MV *Snolda* is classed as a UK Class VIIIA Cargo ship. She is limited to carrying 12 passengers all year round due to lack of sub-division below the water line.
- The linkspans at West Burrafirth and Papa Stour were recycled from Yell Sound following improvements to the Toft - Ulsta route in 2004. They are therefore relatively old and should be replaced in line with any replacement vessel and / or life expiry.

8.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix G.

8.2 Identified Problems

8.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '✱' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

8.2.2 The following transport problems in relation to Papa Stour were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 8.1: Papa Stour Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
4	Time on mainland	××	Unlike a number of the other Outer Isles, it is possible to make a meaningful return to the mainland, Lerwick and the island by ferry although this is limited to a Wednesday, Friday and Saturday. The air service provides for an effective day return on a Tuesday. However, the amount of time at each end of the crossing is limited – 16-25 hours per week on the mainland, 13-20 hours in Lerwick and 20-31 hours on the island.[64] This is a relatively limited period of time ashore when comparing Papa Stour with other islands of a similar size (e.g. Fetlar, North Ronaldsay, Papa Westray etc). The limited time ashore can lead to a need for costly overnight stays (or off-island living) when carrying out work-based or personal business which extends beyond the length of the operating day.
5	Time in Lerwick	××	See point 4.
6	Time on island	××	See point 4.
7	Frequency / Sailings per Day / Timetable gaps	✱	In summer, there are two return sailings from the mainland on a Wednesday, Friday and Saturday, with one return sailing on a Sunday. This has not come up as a problem in our research but community feedback is required. However, there is only a single sailing on a Saturday in winter which the community consider a problem.

[64] SIITS Air Service Provision (Peter Brett Associates, 2015), Time Ashore – Weekly.

	Service Characteristics	Severity Rating	Why is this a problem or not?
			Feedback from the community stressed the importance of maintaining the Saturday afternoon sailing all year round.
8	Capacity	*	Vehicle capacity is believed to be satisfactory for the size of the island, although the 12 passenger limit on the ferry is perceived to be a problem, as it can lead to passengers not securing a space on the service of their choice. *Feedback from the community suggests that capacity can be an issue in the tourist season, with the 12 passenger certification of the vessel seen to be insufficient.*
11	Physical access	×	The MV *Snolda* is an older vessel and can present physical accessibility issues for older and disabled passengers. However, access to the lounge is straight from car deck on same level but there are sills in doorways which are an issue for those with mobility problems. As previously explained, the Britten-Norman Islander aircraft are not well suited to those with any kind of mobility impairments. This is a key problem on Papa Stour – the ageing demographic on the island means that, in the longer-term, physical accessibility could become a barrier to necessary travel.
13	Integration with PT (strategic)	×	Given the limited connections from Papa Stour, onward travel will always have to be well planned. However, there are a number of problems over and above this. Firstly, a high degree of reliability is required on both the connecting and onward service as any delay or cancellation can lead to the need for a costly overnight stay or a long layover on Shetland mainland. In addition, the air service from Papa Stour travels to Tingwall and requires a double-bus connection to get to Sumburgh.
16	Weekday / weekend service variation[65]	×	Papa Stour has connections five days per week. However, the loss of the second Saturday sailing in winter is perceived to be restrictive by the community.
18	Landside human resources	×	The absence of fire cover at the airfield means the air service is limited to two rotations per week. The low frequency of the air service means that its usage is very limited, with the ferry being the more popular of the two travel options. Landside human resources would become an issue if the service frequency was increased.

8.3 Appraisal of Capital Options

Capital Options

8.3.1 The following capital options were identified for Papa Stour:

- **Option C1: Replace the MV *Snolda* on a like-for-like basis at life expiry:**
  - The new vessel would be approximately 25m long and would carry 12 passengers and 6 PCUs. The vessel would run at 9 knots, would be twin-screwed and would be a Class VIIIA cargo ship.
  - Harbour works would be limited, consisting of refendering and minimal dredging at West Burrafirth. This would cost around £250k.[66]
  - The new vessel has been estimated to cost in the region of £3m.
  - The total cost of this option would be around **£3.25m**.

[65] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[66] See Papa Stour Harbour Drawing, Box 2, Like-for-Like Option & West Burrafirth Drawing, Box 2, Like-for-Like Option.

- **Option C2: Replace MV *Snolda* with one larger vessel.**
  - The smallest of the 'generic' vessel types being considered here is the TYPE 1 35m double ended 15-20 pcu ferry. This would however represent a major scaling up from the current MV *Snolda* freight vessel which would seem excessive in the context of an island with a very low population. The vessel considered here is therefore similar in design to the current MV *Filla*. The new vessel would therefore be 35m long and would carry 30 passengers and nine PCUs. The vessel would operate at 9.5 knots and be an EU B Class vessel operating without restriction.
  - The required harbour works would consist of potentially some minimal dredging at Papa Stour and refendering, minimal dredging and the provision of a dedicated parking & waiting area at West Burrafirth.[67] This would cost around £350k.
  - The estimated cost of a new MV Filla style vessel is £4.1m.
  - The total cost of this option would be around **£4.45m**.
- **Option C3: Replace MV *Snolda* with the MV *Filla*.**
  - This option would be dependent on the provision of a new vessel for Skerries, which would precede the redeployment of the MV *Filla,* which can carry 30 passengers and nine cars. The MV *Filla* was built in 2003 and could potentially serve this low intensity route for well into the appraisal period, or indeed the full 30-year period. The MV *Filla* operates at 9.5 knots and is an EU B Class vessel.
  - On life expiry, or when the MV *Filla* is introduced, harbour works akin to those in Option C2 would be required.
  - The total cost of this option would be around **£350k** (excluding the cost of a replacement Skerries vessel).

Appraisal of Capital Options

8.3.2 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Transport Planning Objectives

Table 8.2: Papa Stour Capital Options – Appraisal against Objectives

	Option C1 – Replace Like-for-like	Option C2 – Replace with larger vessel	Option C3 – Replace with MV *Filla*
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓	✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	-	-

[67] See Papa Stour Harbour Drawing, Box 3, Larger Vessel Option & West Burrafirth Drawing, Box 2, Larger Vessel Option.

	Option C1 – Replace Like-for-like	Option C2 – Replace with larger vessel	Option C3 – Replace with MV *Filla*
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	-
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-

8.3.3 The principal driver for the replacement of the current Papa Stour assets would be the life expiry of the MV *Snolda* as the current vessel largely meets the needs of the community. Any new vessel is unlikely to fundamentally impact on connectivity, frequency, timetable variation or strategic transport connections in its own right as crossing times would not be markedly shortened. The replacement of the current vessel with the MV *Filla* or an equivalent vessel would address the occasional passenger capacity issues on Papa Stour[68] – options C2 & C3 therefore record a minor benefit against this objective.

Appraisal against STAG Criteria

Table 8.3: Papa Stour Capital Options – Appraisal against STAG Criteria

	Option C1 – Replace Like-for-like	Option C2 – Replace with larger vessel	Option C3 – Replace with MV *Filla*
Environment	✓	-	×
Safety	✓	✓	✓
Economy	-	✓	✓
Integration	-	-	-
Accessibility & Social Inclusion	-	✓	✓
Established Policy Directives	✓	✓	✓
Feasibility			
Technical Feasibility	*Requires minor harbour works at both ports*	*Requires minor harbour works at both ports*	*Requires minor harbour works at both ports*
Operational Feasibility	*Crew induction on new vessel required.*	*Higher crew training costs associated with moving to a higher certification vessel.*	*Higher crew training costs associated with moving to a higher certification vessel.*
Affordability	*Vessel and harbour works estimated to cost £3.25m*	*Vessel and harbour works estimated to cost £4.45m. There is also a significant increase in revenue costs (see below).*	*Harbour works estimated to cost £350k. There would be a cost associated with anew Skerries vessel but this is covered in the Skerries chapter. There is also a significant increase in revenue costs (see below).*
Public Acceptability	*Initial feedback suggests option*	*Initial feedback suggests option*	*Initial feedback suggests option*

[68] The MV *Snolda* is limited to carrying twelve passengers due to insufficient subdivision below the waterline.

	Option C1 – Replace Like-for-like	Option C2 – Replace with larger vessel	Option C3 – Replace with MV *Filla*
	would be acceptable. No further meaningful feedback was obtained.	*would be acceptable. No further meaningful feedback was obtained.*	*would be acceptable. No further meaningful feedback was obtained.*

8.3.4 The key points from above appraisal against the STAG criteria are:

- The current MV *Filla* uses significantly more fuel that the MV *Snolda*.
- Any new vessel would record a benefit in terms of safety as it would be twin-screwed rather than single-screwed like the MV *Snolda*.
- **Options C2 & C3** would offer increased passenger and car capacity, which could give rise to small increases in economic activity, providing additional summer tourism capacity for example.
- The higher capacity vessel identified in **Options C2 & C3** would also slightly enhance community and comparative accessibility by ensuring year round reliable access to the ferry.
- There are no technical or operational feasibility issues surrounding any of the options, although minimal harbour works will be required at both ports. **Options C2 & C3** would change the classification of the vessel operating the route from a Class VIIIA cargo vessel to Class IIA / Euro B vessel, which could have implications in terms of crew training and certification.
- In terms of affordability, procuring a 25m like-for-like replacement for the MV *Snolda* would be lower cost than purchasing a larger 35m vessel. The redeployment of the MV *Filla* from Skerries would offer a larger capacity without the build cost, but there would of course be a cost to the Skerries route, whilst the MV *Filla* may still have to be replaced at some point in the 30-year strategy period, although its intensity of use would be low. There would be an increase in all vessel related costs with a larger vessel.
- The initial consultation indicated that each of the above options would be acceptable to the residents of Papa Stour.

8.4 Appraisal of Revenue Options

Revenue Options

8.4.1 The following revenue options were identified for Papa Stour:

- **Option R1a: Increase the frequency of the ferry service to two return crossings seven days per week**
  - The current timetable would be expanded to provide a twice daily return sailing between Shetland mainland and Papa Stour (providing 7 and 8 additional sailings per week in summer and winter respectively). At present there are two return crossings two days per week and one return crossing on another two days but with a second return on a summer Saturday. This is significantly less than the RSM suggested frequency of 'Standard' (6 – 8 sailings per day) 7 days each week.
  - This timetable change implies that the number of sailings currently operating would increase by 100%. Crewing costs are assumed to double as a second crew would be required (assumed to be on the same terms and conditions).

- **Option R1b: Option R1a combined with the withdrawal of the Papa Stour air service.**
  - The costs of operating Papa Stour airfield would be removed – flight costs may also be saved depending on whether these flying hours are redeployed on other routes.
- **Option R2a: Increase the frequency of the service on the current sailing days to three return crossings per day**
  - The current timetable would be expanded to provide three return crossings on a Wednesday, Friday, Saturday and Sunday, where currently there are one or two
  - This timetable change implies that the number of sailings currently operating would increase by 5 return sailings per week in the summer and 6 in winter. It is assumed that the crew would be paid at an overtime rate for hours over 37 per week.
- **Option R2b: Option R2a combined with the withdrawal of the Papa Stour air service.**
  - The costs of operating Papa Stour airfield would be removed – flight costs may also be saved depending on whether these flying hours are redeployed on other routes.

8.4.2 Note that under the appraisal for Foula, an option to create a shared service with Papa Stour was considered. This option is not considered here as it would not have a material impact on the number of connections to Papa Stour, although sailing times may be affected and there could be knock on effects of delays. The impacts of this option on Papa Stour will be fully appraised at the next stage if taken forward in the Foula context.

Appraisal of Revenue Options

Appraisal against Transport Planning Objectives

8.4.3 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 8.4: Papa Stour Revenue Options – Appraisal against Objectives

	Option R1a 2 * return crossing 7 days p/w	Option R1b 2 * return crossing 7 days p/w & withdraw air service	Option R2a 3 * return crossing on sailing days	Option R2b 3 * return crossing on sailing days & withdraw air service
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	✓✓	✓✓	✓✓	✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit	✓✓✓	✓✓	-	×

	Option R1a 2 * return crossing 7 days p/w	Option R1b 2 * return crossing 7 days p/w & withdraw air service	Option R2a 3 * return crossing on sailing days	Option R2b 3 * return crossing on sailing days & withdraw air service
a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.				
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓	✓	✓✓	✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	✓✓✓	✓✓	✓	×
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓✓	✓✓	✓✓	××

8.4.4 An increase in the service level to two return crossings per day **(Option R1a)**, seven days per week, would make a significant contribution to the objectives. As well as increasing the overall capacity across the week, this option would ensure that Papa Stour residents could benefit from a half day in Lerwick seven days per week. It would also ensure a consistent daily timetable (including weekends) and would ensure no daily gaps in accessing onward connections.

8.4.5 The benefits of operating a seven-day a week, two services a day timetable are not particularly diminished by **Option R1b** (withdrawal of the air service) given the overall step-change in connectivity. There would be a marginal loss in terms of capacity and connectivity, particularly in terms of a 'fast' and car-free connection to Lerwick.

8.4.6 The main benefit of **Option R2a** (compared to the other options), which involves operating three return crossings on days where there is currently a service, is that it would increase the frequency of the service on these days, reducing the scheduled time between connections. There would also be benefits in terms of capacity and strategic connectivity. The number of days when substantial time in Lerwick is provided would not change.

8.4.7 The differential caused by withdrawing the air service **(Option R2b)** in tandem with Option R2a is much larger than that associated with Options R1a and R1b. Whilst frequency and, to a lesser extent, capacity and strategic connections would improve, there would be a distinct negative in terms of the loss of mainland connectivity on one day of the week (Tuesday). This option would therefore score poorly against the objectives related to mainland connectivity and timetable variation.

Appraisal against STAG Criteria

Table 8.5: Papa Stour Revenue Options – Appraisal against STAG Criteria

	Option R1a – 2 return crossing 7 days p/w	Option R1b – 2 return crossing 7 days p/w & withdraw air service	Option R2a – 3 * return crossing on sailing days	Option R2b – 3 * return crossing on sailing days & withdraw air service
Environment	✗	✗	✗	✗
Safety	✗	✓	✗	✓
Economy	✓✓✓	✓✓	✓✓	✓
Integration	✓✓	✓	✓	✗
Accessibility & Social Inclusion	✓✓✓	✓✓✓	✓✓	✓
Established Policy Directives	✓✓✓	✓✓	✓✓	✓
Technical Feasibility	*No issues*	*No issues*	*No issues*	*No issues*
Operational Feasibility	*Additional crewing numbers and hours*	*Additional crewing numbers and hours*	*Additional crewing hours*	*Additional crewing hours*
Affordability	*Annual revenue support would be in the region of £673k per annum, an increase of £245k per annum from the present day.*	*See R1a* *The cost associated with running Papa Stour Airstrip in 2015/16 was budgeted at £4,600 so the savings here would be modest. The saving in flying hours would also be very low given the current timetable and there may be no net saving if the aircraft is deployed elsewhere during the time that it is currently serving Papa Stour.*	*Annual revenue support would be in the region of £594k per annum, an increase of £166k per annum from the present day.*	*See R2a* *The cost associated with running Papa Stour Airstrip in 2015/16 was budgeted at £4,600 so the savings here would be modest. The saving in flying hours would also be very low given the current timetable and there may be no net saving if the aircraft is deployed elsewhere during the time that it is currently serving Papa Stour.*
Public Acceptability	*Initial feedback suggests this option would be acceptable*	*Withdrawal of the air service is unacceptable to community*	*Initial feedback suggests this option would be acceptable*	*Withdrawal of the air service is unacceptable to community*

8.4.8 The key points from above appraisal against the STAG criteria are:

- All of the options except the Do Minimum would have a marginal negative environmental impact as they would likely generate more car trips and increased running hours. Increasing the intensity of the ferry service would, statistically, have a negative safety impact. However, withdrawal of the air service would have a positive safety impact as it would remove flights into an unlicensed airfield with no fire cover. However, both the safety and environmental impacts would be very small and should not be used as the basis of a decision between options.

- Any improvement to the frequency of the service would give rise to economic and accessibility benefits, supporting a range of policies in relation to both island sustainability and the RSM. Clearly the options which provide the largest number of connections will

have the biggest positive impacts. It is however important to note here that the introduction of the current Ro-Ro service to Papa Stour in 2004 represented a transformational change in accessibility yet did little to check the population decline of the island and other socio-economic issues. This cautionary note has to be borne in mind when setting out the benefits of further service enhancements.

- The initial consultation suggested that any option which led to the withdrawal of the air service would be unacceptable to the Papa Stour community.

8.5 Annual Operating Cost Estimates

Current Revenue Budget

8.5.1 In 2015/16 there were approximately **700** one-way sailings between Papa Stour and West Burrafirth. The revenue costs and income associated with operating the Papa Stour ferry service were as follows:

Table 8.6: Papa Stour Revenue Budget 2015-16

Cost Element	2015-16 (£)
Vessel - Employee Costs	£227,590
Vessel - Fuel	£13,471
Vessel - Maintenance	£118,897
Vessel - Other Costs	£82,662
Vessel Total	£442,620
Terminal - Maintenance	£10,854
Terminal - Other Costs	£16,686
Terminal Total	£27,540
Route Total	£470,160
Route Income	-£42,205
Route Net Cost	£427,955

8.5.2 In addition to these costs an internal berthing charge of £6,401 was paid in 2015-16.

8.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Papa Stour service costs around **£0.4m** per annum (net) to operate

8.5.4 An estimate of the annual net revenue budget costs associated with the main permutations of vessels (Capital – 'C') and timetables (Revenue – 'R') outlined above is shown in the chart below. The figures shown on the horizontal axis are the estimated net annual revenue costs associated with each option.

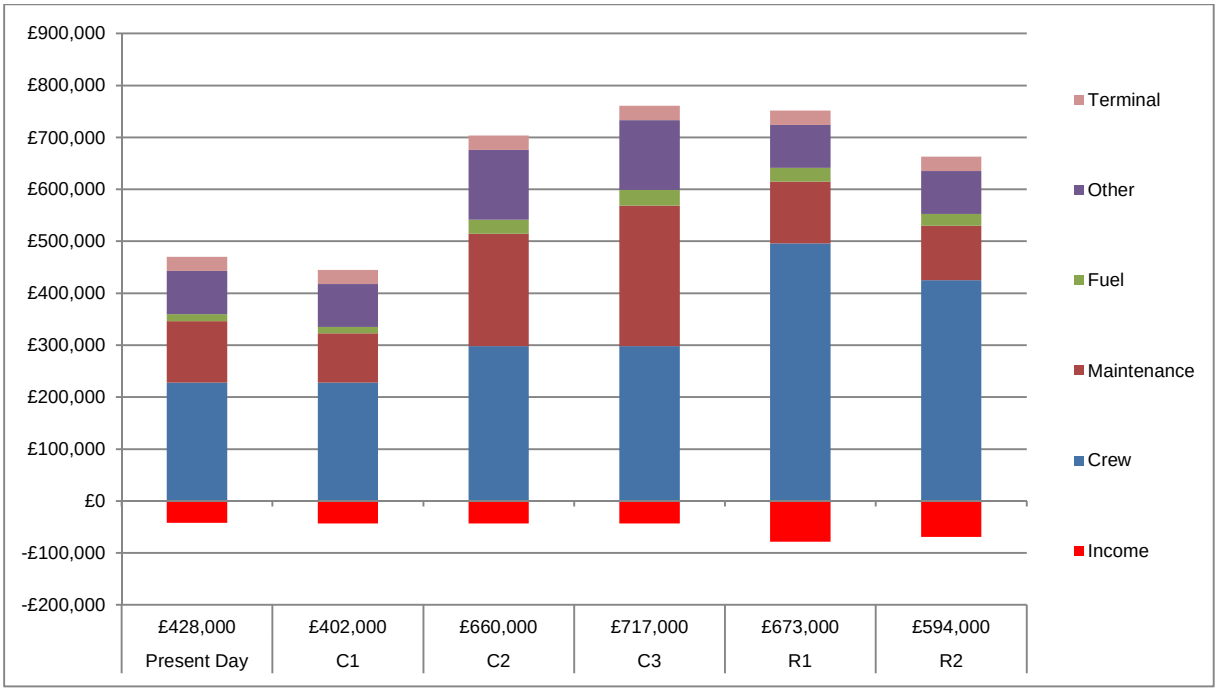


Figure 8.1: Papa Stour Annual Revenue Cost Estimates

8.5.5 The main points to emerge from the above are:

- C1: reduced fuel costs associated with the new vessel compared to the present day see overall costs fall.[69]
- C2: increased costs associated with a move to a larger vessel compared to the present day see overall costs rise, crew costs are assumed unaffected. Small increase in fares revenue assumed.
- C3: increase fuel and maintenance costs associated with running the present day *Filla* as compared to a new vessel. Small increase in fares revenue assumed.
- R1: crew and fuel costs are nearly doubled – this multiplier would apply to any of the other vessel options.
- R2: crew and fuel costs increase by a lesser amount than R1 in line with the number of sailings – this multiplier would apply to any of the other vessel options.

8.6 Public Consultation

8.6.1 The Papa Stour community did not wish to have a public exhibition held on the island, preferring instead visits to each household by Shetland Islands Council Officer Michael Craigie. The feedback obtained is included in the 'public acceptability' box related to each of the capital and revenue options.

8.7 Rationale for Selection / Rejection

8.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

[69] Note – the cost reduction offered by a new like-for-like vessel is based on the set of assumptions outlined in Chapter 1 of this report. However, these savings may not materialise if the MV *Snolda* is replaced by a like-for-like vessel as a replacement would likely be twin rather than single screwed.

Table 8.7: Outcome of Appraisal, Papa Stour

Capital & Revenue Options	Take Forward (✓) / Reject (✘)	Ration for Selection / Rejection
Option C1 – Replace Like-for-like	✓	The current vessel is generally adequate for Papa Stour. A newer vessel of similar design could presumably be certified for a slightly higher number of passengers which would address the very occasional problems in this respect. A new vessel could potentially be shared with Foula by making more intensive use of the asset.
Option C2 – Replace with larger vessel	✘	There is no requirement for a vessel with a higher carrying capacity for Papa Stour so this option should not be pursued further.
Option C3 – Replace with MV *Filla* from Skerries	✓	This option is worth retaining in the event that the Skerries vessel becomes available. The low intensity of this route would be suitable for this vessel, although she is relatively expensive to operate.
Option R1a - 2 * return crossing 7 days p/w	✓	This option should be retained in order to meet the RSM requirement of a 7-day service. It would also enable substantial time in Lerwick on a daily basis. It should be noted though that previous investment in connections to Papa Stour has not stemmed the recent trend in depopulation.
Option R1b 2 * return crossing 7 days p/w & withdraw air service	✓	There would be very little rationale for the continuation of the current minimal air service if the ferry service frequency was increased given the relatively short journey times to Lerwick.
Option R2a 3 * return crossings on current sailing days	✘	This option only provides additional frequency on existing sailing days and there is little evidence that this is a priority issue for Papa Stour.
Option R2b 3 * return crossings on current sailing days & withdraw air service	✘	Rejected as an inferior option to R2a.

9 Skerries

9.1 Capital Investment Timeframe

- The current Skerries vessel, MV *Filla*, is relatively new, having been built in 2003. The main issue associated with the current vessel is that it cannot be berthed overnight in Skerries, and thus lies at Symbister, with a Whalsay based crew (augmented by some mainland crew who travel over on the morning Whalsay ferry). Based on a 30 year lifespan, the MV *Filla* would be replaced in 2033 (although the Council estimates 2029).

- The terminal at Skerries is a natural harbour sheltered by surrounding islands with the exception of the south mouth which exposes the berth. When the MV *Snolda* operated the route, she normally operated through the south mouth, which is the quickest means of access to the island. However, the channel is relatively shallow and the larger MV *Filla* takes a longer route in, rounding the north of the isles and then approaching the harbour from the north-east. The MV *Filla* is the largest vessel capable of making this manoeuvre.

- The MV *Filla* was procured as a bespoke vessel for Skerries with the capability to take fresh water to the island as the water supply was unreliable at that time. She also has refrigerated holds to transport salmon from the no longer operational fish farm. As neither of these conditions now exists, the requirement for a vessel of this specification has disappeared.

- The Skerries terminal has an older generation 'small' linkspan and was built in 1985. It is assumed that investment in the ferry service would be accompanied by the replacement of the linkspan.

- The shoreside infrastructure at Vidlin would likely be in need of upgrade as part of any vessel replacement programme. This could potentially occur as part of any enhancement to the Whalsay service. Nonetheless, improvements at Vidlin are considered as an individual option in the context of Skerries. Provision of an overnight off-linkspan berth at Vidlin would reduce 'dead-leg' steaming and increase crewing options.

9.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix H.

9.2 Identified Problems

9.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '*' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

9.2.2 The following transport problems in relation to Skerries were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 9.1: Skerries Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	××	The suspension of air services as of 23rd November 2015 means that Skerries

	Service Characteristics	Severity Rating	Why is this a problem or not?
			residents face a relatively long and, on occasions, indirect journey to Lerwick. The ferry from Skerries to Vidlin takes 90 minutes, with the direct weekly sailing time to Lerwick being 150 minutes. On sailings to Vidlin, there is a 30-40 minute connection to Lerwick by car, whilst public transport takes 40-50 minutes (although the frequency of the bus service means the public transport option is unattractive in any case). The last sailing of the day from Skerries goes to Symbister (where the vessel overnights) except on a Sunday, which means island residents who are travelling to the mainland need to interchange onto the Symbister – Laxo ferry.[70] The long-journey time and infrequent connections creates a problem for Skerries residents in that access to mainland based employment and personal services is limited, an issue which exacerbated by the lack of on-island services. *The community consultation response noted that this was a major rather than a moderate problem.*
2	First sailing / flight	✗✗	There are only sailings to and from Skerries five days a week, whilst the first departure tends to be slightly later in the morning because the vessel overnights in Symbister. This, to some extent, limits time on the mainland and the ability to undertake personal business, particularly when return travel from Vidlin is required.[71] The combination of the comparatively long crossing time, suspension of the air service, the overnighting of the ferry in Symbister and the mainland port being Vidlin means that productive on-mainland and on-island time is limited. *The community consultation response noted that this was a major rather than a moderate problem.*
3	Last sailing / flight[72]	✗✗	The latest departure time of a sailing to Skerries is 1730. This sailing is from Vidlin, which means islanders would need to leave Lerwick no later than 1630-1645 if travelling by car. The relatively early last sailing time (and the departure point of Vidlin) is a cause of the limited mainland and on-island time (see below). *The community consultation response noted that this was a major rather than a moderate problem.*
4	Time on mainland	✗✗✗	Skerries residents get around 23 hours per week on the mainland but much reduced time in Lerwick (around 18 hours) given the need to connect to and from Vidlin on most days. Visitors get around 31 hours on the island.[73] This limits access to employment and business / personal services, an issue exacerbated by the absence of on-island services. At present Skerries residents only have usable time on the mainland on four days of the week, short of the 7-days noted in the RSM.
5	Time in Lerwick	✗✗✗	See point 4.
6	Time on island	✗✗	See point 4. *The community consultation response noted that this was a major rather than a moderate problem.*
7	Frequency / Sailings per Day / Timetable gaps	✗✗	The Skerries timetable offers relatively infrequent sailings, all of which are request only. This is very much a result of the limited demand for the service and limits the ability to travel at short notice. However, the low frequency and under-utilisation of the vessel could be considered a problem as Skerries is less well connected than e.g. Fetlar and the other Outer Isles which still have air services.[74] *The community consultation response noted that this was a major rather than a moderate problem.*
9	Reliability (weather / mechanical)	✗✗	This route is quite exposed to the weather, particularly the Skerries – Lerwick crossing. This can lead to cancellations and service disruption, a key problem with such a low frequency.

[70] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Daily Crossings and Capacity – Skerries

[71] http://www.shetland.gov.uk/ferries/documents/TimetableWinter2015-16V3.pdf

[72] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

[73] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Time Ashore – Weekly.

[74] http://www.shetland.gov.uk/ferries/documents/TimetableWinter2015-16V3.pdf

	Service Characteristics	Severity Rating	Why is this a problem or not?
			The community consultation response noted that this was a major rather than a moderate problem.
12	Integration with PT (local bus)	×××	Public transport integration at Vidlin is relatively limited, with only three buses to Lerwick per day, which are not particularly well timed with the ferry.[75] This is a factor in limiting time in Lerwick, which is key for accessing personal services.
13	Integration with PT (strategic)	××	Given the limited connections from Skerries, onward travel will always have to be well planned. A high degree of reliability is required on both the connecting and onward service as any delay or cancellation can lead to the need for a costly overnight stay or a long layover on Shetland mainland. *The community consultation response noted that this was a major rather than a moderate problem.*
14	Crossing / flight times	××	The crossing time is relatively long, 90 minutes to Vidlin and 150 minutes to Lerwick. This was previously offset by the provision of the air service but this is no longer the case.[76] The long-crossing time means that any visit to the mainland is effectively a full day affair meaning that little can be done on-island on that day. *The community consultation response noted that this was a major rather than a moderate problem.*
16	Weekday / weekend service variation[77]	×	There are only five sailing days per week, although weekend connectivity is more frequent than weekdays on which there is a sailing. *The community consultation response noted that this was a major rather than a minor problem.*
17	Landside infrastructure issues	×	Vidlin is accessed via a single track road. The marshalling area is very limited, especially when the Whalsay service is also operating from there. All vehicles have to reverse on or off the ferry, which adds to turnaround times and presents marshalling challenges at the constrained Vidlin site. This can give rise to operational and safety problems but the current situation is workable.
18	Landside human resources	×××	The lack of fire cover at Skerries airfield has led to the suspension of the air service.

9.3 Appraisal of Capital Options

9.3.1 It should be noted at the outset that it is not possible for a larger vessel than the MV *Filla* to access Skerries through either the south mouth or the north-easterly approach so no larger vessels are considered here.

Capital Options

9.3.2 The following capital options were identified for Skerries:

- **Option C1: Replace the MV *Filla* on a like-for-like basis at life expiry**
  - The MV *Filla* would be replaced in 2033 by a new vessel which would be approximately 35m long and would carry 30 passengers and 9 PCUs. The vessel would operate at 9.5 knots.
  - The new vessel would be expected to cost in the region of £4.1m.
  - As well as general replacement of life-expired assets, there would be a need for the extension of the berthing platform (an additional dolphin) at Skerries and refendering.

[75] http://www.travelinescotland.com/pdfs/timetables/SLAO019.pdf#page=1

[76] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Skerries – Lerwick – Travel Time & Cost Page.

[77] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

This would cost in the region of £650k. Refendering and the provision of a dedicated parking & waiting area would also be required at Vidlin at a cost of £150k.[78]

- The total cost of this option would be **£4.9m**.

- **Option C2: Replace the MV *Filla* immediately with a smaller vessel which could berth overnight at Skerries. The MV *Filla* would be redeployed or sold**

  - A new vessel would be approximate 25m long and would carry six PCUs. Passenger capacity would be dependent on design and would be kept as high as practicable (aiming to be over 20). The vessel would run at 9.5 knots and would be capable of operating through the south mouth, reducing the voyage distance to Vidlin and Lerwick.

  - This option would require an island based crew and could remove the current dead legging in the timetable between Whalsay and Skerries.

  - The new vessel would be expected to cost in the region of £3m.

  - This option would require the construction of an overnight berth at Skerries, allowing at least partial shelter from southerly incoming waves. An indicative design is shown in the harbour drawing but further climate assessment is needed to determine if wave conditions are suitable for overnight berthing. If necessary, a wave screen could be added to the existing structure to provide some improved protection. This option, inclusive of a wave screen and refendering, would cost around £1.3 million.[79]

  - The harbour works at Vidlin, and the berthing platform and refendering at Skerries would be as per Option C1.

  - The total cost of this option would be **£5.1m**.

- **Option C3: Develop a new overnight berth at Vidlin for the Skerries ferry**

  - This option could be combined either with Option C1 above or in partnership with options for Whalsay (see next chapter).

  - The Skerries ferry would overnight at Vidlin rather than Symbister on Whalsay. The purpose of this would be to remove the current dead legging in the timetable between Whalsay and Skerries. The crew would become mainland based but could commute from Whalsay most days.

  - The provision of a new overnight berth at Vidlin would involve construction of a 75m long jetty to provide a ferry berth and overnight berth. If additional shelter is required a breakwater could be provided but has not been costed here. This option would also require the provision of a large linkspan, land reclamation to provide approximately 0.12 ha of additional area and some minimal dredging to provide a suitable berth pocket.[80]

  - The total cost of this option would **£5.7m**. Any vessel related enhancements would be in addition to this.

[78] See Skerries Harbour Drawing, Box 2, Like-for-Like Option & Vidlin Harbour Drawing, Box 2, Like-for-Like Option.

[79] See Skerries Harbour Drawing, Box 3, Overnight berth at Skerries.

[80] See Vidlin Harbour Drawing, Box 4, Overnight berth at Vidlin Option.

9.3.3 It should be noted that the option of berthing the MV *Filla* overnight at Skerries has been considered and rejected in the past on the basis of technical feasibility. This issue was considered in some detail in 2013 during the time of the budget cuts. In order to inform the previous discussion around this option, Caledonian Maritime Assets Limited (CMAL) conducted an independent risk assessment which concluded that the vessel could not lie in Skerries safely, even if manned, in anything but ideal conditions. CMAL expressed concern about the consequences of the weather worsening whilst lying there and the Master being forced to put to sea with cold engines etc. In addition, the Council's insurers noted that they would not insure the vessel lying alongside in Skerries overnight. In the context of this study, only the berthing of a smaller vessel in Skerries is considered.

Appraisal of Capital Options

9.3.4 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 9.2: Skerries Capital Options – Appraisal against Objectives

	Option C1 – Replace the MV *Filla* on a like-for-like basis at life expiry	Option C2 – Replace with the MV *Filla* with a smaller vessel	Option C3 – Develop a new overnight berth at Vidlin
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✖	-
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	N/A	N/A	N/A
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	-	✓	✓
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	✓	✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	✓	✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-

9.3.5 The key points from the above table are summarised below:

- Capacity has not been identified as a problem on the Skerries route. However, the economic baselining report highlights the desire and need of the Skerries community to grow, and thus ferry capacity has to be able to accommodate this. A move to a smaller vessel **(Option C2)** would represent a minor negative in terms of capacity, although this would be offset to some extent by the vessel being based in the island.

- The provision of a vessel capable of overnighting in Skerries **(Option C2)** would provide potential for more time on mainland / in Lerwick as it would allow an earlier morning departure / later return to the island within current crewing hours (as well as general flexibility in operation). However, additional revenue funding would be required to cover the days where there is not currently a service. Similarly, the provision of an overnight berth at Vidlin **(Option C3)** would also support this objective through removing the morning and evening 'dead-legging' to / from Symbister.

- Similarly, overnighting the ferry in Skerries **(Option C2)** or at Vidlin **(Option C3)** could potentially allow for both a higher service frequency and a simpler point-to-point ferry service.

Appraisal against STAG Criteria

Table 9.3: Skerries Capital Options – Appraisal against STAG Criteria

	Option C1 – Replace the MV *Filla* on a like-for-like basis at life expiry	Option C2 – Replace with the MV *Filla* with a smaller vessel	Option C3 – Develop a new overnight berth at Vidlin
Environment	✓	✓	×
Safety	-	×	-
Economy	-	✓	✓
Integration	-	-	-
Accessibility & Social Inclusion	-	✓	✓
Established Policy Directives	✓	✓	✓
Technical Feasibility	*Minor harbour works required at Skerries (extension of berthing platform) & Vidlin.*	*Potential moderate harbour works required at Skerries (construction of a wave screen), minor harbour works required at Vidlin*	*Construction of a 75m long jetty to provide a ferry berth and overnight berth. If additional shelter is required a breakwater could be provided but has not been costed here. This option would also require the provision of a large linkspan, land reclamation to provide approximately 0.12 ha of additional area and some minimal dredging to provide a suitable berth pocket*
Operational Feasibility	-	*Skerries based crew would be required.* *MV Filla would need to be redeployed or sold.*	*This option could have positive benefits for the Whalsay service, providing a new ferry berth at the diversionary port of Vidlin.*
Affordability	*The total cost of this option would be £4.9m.*	*The total cost of this option would be £5.1 million.*	*The total cost of this option would be £5.7 million. This option would supplement a vessel option and would reduce costs or increase connectivity by removing dead legging.*
Public Acceptability	*This option would only be acceptable to the community if the vessel was based at Skerries, which is understood to be technically infeasible.*	*The Skerries community provided highly detailed feedback and indicated that this is one of two potential preferred options.*	*Feedback from the Skerries community found that the single benefit of this option is that the ferry would be based at one end of the route, which would save time on the*

	Option C1 – Replace the MV *Filla* on a like-for-like basis at life expiry	Option C2 – Replace with the MV *Filla* with a smaller vessel	Option C3 – Develop a new overnight berth at Vidlin
			Skerries – Vidlin journey. However, the downside is that the unproductive positioning time will actually be increased for the Skerries – Lerwick route, which will further reduce the time available in Lerwick. The issues identified with berthing the vessel away from Skerries will also remain. In addition, infrastructure improvements will be required at Vidlin; these improvements are seen to be of no value to the Vidlin community whereas similar investment in Skerries would be of high value to its community. The Community Council does not believe that this option should be taken forward.

9.3.6 The key points from above appraisal against the STAG criteria are:

- The vessel options **(Options C1 & C2)** would have minor environmental benefits from operating newer tonnage. The provision of a new overnight berth at Vidlin **(Option C3)**, which would require harbour works and land reclamation, would score a minor negative.

- From a safety perspective, the provision of a smaller vessel **(Option C2)** would score negatively given the long and exposed crossing from Skerries (particularly on days where the ferry sails to Lerwick). Conversely, a smaller ship would have the choice of using the south mouth entrance to Skerries, which is more sheltered from north-easterly winds. Whilst the vessel would be classified for the waters in which she operates, the journey would be less comfortable and reliability could be affected.

- The provision of a point-to-point service with the vessel overnighting in Skerries or Vidlin **(Options C2 & C3)** would support the economy of the island and the accessibility of the population. However, these benefits would only be realised if the services were reliable and the timetable not negatively affected in any way.

- The Skerries community has indicated that the provision of a smaller vessel would not be acceptable to them, whilst they further note that the vessel overnighting in Vidlin would only be acceptable if the timetable was maintained. These options need to be tested further in public engagement.

9.4 Appraisal of Revenue Options

Revenue Options

9.4.1 The air service to Skerries is currently suspended due to the lack of RFFS on the island. There are also currently no ferry services to Skerries on a Tuesday or Thursday.

9.4.2 The following revenue options were identified for Skerries:

- **Option R1: Do Minimum**

- Continue with the current level of timetabled service. It should be noted that the Do Minimum in this instance includes the reinstatement of the air service to a level prior to the RFFS reductions. However, this is dependent on a scenario where sufficient resources are available in the island to provide this function. The air service would operate on a Monday (1 rotation), Wednesday (1 rotation) and Thursday (2 rotations).

- **Option R2: Offer one return sailing from Skerries to either Lerwick or Vidlin on days where there is not currently a service (Tuesday and Thursday).**
  - This option would include a single return sailing from Skerries to either Lerwick or Vidlin on a Tuesday and Thursday. The connections would permit the maximum amount of time available on the mainland within the available crewing hours.
  - An average crew cost per sailing from Skerries to Vidlin has been assumed at standard overtime rates.

- **Option R3: Introduce two return sailings to / from Vidlin a day or one return sailing from Skerries to/from Lerwick a day with either Vidlin or Lerwick sailings operating seven days a week.**
  - This option would include two return sailings to / from Vidlin a day or one return sailing from Skerries to/from Lerwick a day with either Vidlin or Lerwick sailings operating seven days a week.
  - An average crew cost per sailing from Skerries to Vidlin has been assumed at standard overtime rates.

- **Option R4: Permanently discontinue the air service from Skerries.**
  - The Skerries air service is currently suspended due to lack of RFFS. This option would involve the permanent discontinuation of the service.
  - *Note – this option is only being considered in parallel with options to improve the ferry service, ensuring no worsening of the Do Minimum position.*

Appraisal against Objectives

9.4.3 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 9.4: Skerries Revenue Options – Appraisal against Objectives

	Option R1 – Do Minimum (air services as per pre-RFFS cuts)	Option R2 – Return sailing from Skerries on a Tuesday & Thursday	Option R3 – Two return Vidlin services or one return Lerwick service seven days a week	Option R4 – Permanently Discontinue the Air Service
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	✓[81]	-	-	✘
TPO2a: Where an island has a	N/A	N/A	N/A	N/A

[81] The Do Minimum would record a positive against a number of the STAG criteria as it would involve reinstatement of the air service to a level pre-RFFS cuts.

	Option R1 – Do Minimum (air services as per pre-RFFS cuts)	Option R2 – Return sailing from Skerries on a Tuesday & Thursday	Option R3 – Two return Vidlin services or one return Lerwick service seven days a week	Option R4 – Permanently Discontinue the Air Service
'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.				
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	✓	✓✓	✓✓✓	✖✖
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓✓	✓✓	✓✓✓	✖
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	✓[82]	✓✓	✓✓✓	✖
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓[83]	✓	✓✓	✖

9.4.4 The key points from the above table are:

- The Do Minimum **(Option R1)** would offer an increase in capacity as it would reinstate the air service on a Monday, Wednesday and Thursday, providing one rotation per day on Monday and Wednesday and two on Thursday from Tingwall. Whilst the service could only carry a maximum of 16 passengers in each direction over the length of the operating day, this represents around a quarter of the Skerries population. Conversely, the withdrawal of the air service **(Option R4)** would lead to a reduction in capacity.

- **Option R1** would enhance the amount of time available on Shetland mainland by filling the timetable gap on a Thursday and permitting extended time on the mainland on a Monday. The provision of a daily return **(Option R2)** would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services to / from Skerries. The provision of a twice daily return to Vidlin or a single return to Lerwick **(Option R3)** by ferry would be transformative for Skerries in terms of access to Lerwick and the mainland more generally. The withdrawal of the air service **(Option R4)** would have a negative impact unless married with one of the enhanced ferry service options.

[82] The Do Minimum records a positive against this STAG criterion because it reduces the variation between weekdays.

[83] The Do Minimum records a positive against this STAG criterion because it provides additional days on which a connection would be available, thus enhancing the overall strategic connectivity.

- The reinstatement of the pre-RFFS air service **(Option R1)** and ferry connections on a Tuesday and Thursday **(Option R2)** would give rise to a moderate benefit in terms of frequency, whilst a twice daily return to Vidlin or daily return to Lerwick **(Option R3)** would be relatively transformative in terms of frequency.

- **Options R2 and R3** fill the daily gaps in the timetable in their entirety, although the provision of a twice daily return would clearly have a larger impact in this respect. The provision of a twice daily return ferry from Skerries **(Option R3)** would also support strategic transport integration through providing additional connections for those arriving from outwith Shetland. RSM suggests a daily "Standard-Limited" frequency (of 3-5 sailings per day) when running to Vidlin or "Limited" (1-2 sailings per day) when operating to Lerwick. The permanent withdrawal of the air service would clearly have a negative impact in terms of strategic connectivity, removing the 'fast' connections to and from Tingwall which allow for a better range of choice when travelling onto / returning from further afield.

Appraisal against STAG Criteria

Table 9.5: Skerries Revenue Options – Appraisal against STAG Criteria

	Option R1 – Do Minimum (air services as per pre-RFFS cuts)	Option R2 – Return sailing from Skerries on a Tuesday & Thursday	Option R3 – Two return Vidlin services or one return Lerwick service seven days a week	Option R4 – Permanently Discontinue the Air Service
Environment	-	✗	✗	✓
Safety	✗✗	✗	✗	✓
Economy	✓	✓✓	✓✓✓	✗✗
Integration	✓	✓	✓✓	✗✗
Accessibility & Social Inclusion	✓	✓✓	✓✓✓	✗✗
Established Policy Directives	✓	✓	✓✓	✗✗
Technical Feasibility	*There would be no technical issues associated with this option.*	*There would be no technical issues associated with this option.*	*There would be no technical issues associated with this option.*	*There would be no technical issues associated with this option.*
Operational Feasibility	*The community cannot currently provide the level of resource required for RFFS, although if the ferry was based on Skerries, the island-based crew could provide cover if scheduling allows but not when both air and ferry services are operating. There may also be a need for airfield licensing if the air service was to be reinstated.*	*This option would require a full second crew.*	*This option would require a full second crew.*	*There would be no operational issues associated with this option. Flying hours freed up for elsewhere.*
Affordability	*Potential costs associated with licensing (network wide)*	*Second crew and fuel would be required.*	*Second crew and fuel would be required.*	*Minor cost savings from not maintaining Skerries airstrip. Existing cost*

	Option R1 – Do Minimum (air services as per pre-RFFS cuts)	Option R2 – Return sailing from Skerries on a Tuesday & Thursday	Option R3 – Two return Vidlin services or one return Lerwick service seven days a week	Option R4 – Permanently Discontinue the Air Service
	and RFFS equipment and training.			*savings of not flying to Skerries maintained.*
Public Acceptability	*The community consultation found that this option is not acceptable. There is a view amongst the community that the level of service has be extended beyond that offered by the Do Minimum if Skerries is to be sustainable in the long-term.*	*This option offers seven day/week sailings and therefore will overcome the problems identified with R1. The Community Council therefore noted that this option should be taken forward for further consideration.*	*This option offers seven day/week sailings and therefore will overcome the problems identified with R1. The Community Council therefore noted that this option should be taken forward for further consideration.*	*Skerries Community Council noted that no decision should be made on the future of the air service until stakeholders have had the opportunity to review in detail:* • *the need for, and the requirements of, an air service to Skerries.* • *if the service is to continue, how it can be best reinstated.* • *if the service is no longer required, how the capability to reinstate it in the future can be retained.*

9.4.5 The key points from above appraisal against the STAG criteria are:

- A step change in the number of sailings offered **(Option R2** and particularly **Option R3)** would have a minor negative environmental impact through increasing global emissions.

- The options related to increasing the air and ferry service **(Options R1-R3)** would have minor safety disbenefits as they would increase the number of flights and sailings. In particular, the reinstatement of the air service (included as part of the Do Minimum) would involve flying into a very short runway. The airfield is also currently unlicensed. In this respect, the permanent discontinuation **(Option R4)** of the air service records a minor safety benefit.

- The provision of a seven day ferry service with two return services per day to Vidlin or one return to Lerwick **(Option R3)** would have highly positive economic impacts on Skerries, a key issue considering the current economic difficulties being experienced by the community. As well as providing frequency benefits, there would be wider positive impacts for residents and the public sector (e.g. day return access for Council staff). The provision of sailings on a Tuesday and Thursday **(Option R2)** would generate similar benefits, although of a lesser magnitude given the lower service frequency. The reinstatement of the air service as part of the Do Minimum **(Option R1)** would also support the economy of Skerries through enhancing connectivity, particularly for those seeking to make short duration trips to / from the island. The scale of benefits in terms of accessibility and social inclusion is broadly similar.

- **Options R1-R3** would enhance strategic integration, particularly the high frequency service offered by **Option R3**. Improvement to transport links generally sits well within the wider policy context of supporting the economic development of island communities, a particularly key issue for Skerries at present given recent difficulties.

- In terms of operational feasibility, the reinstatement of the air service as part of the Do Minimum **(Option R1)** presents a significant challenge in terms of recruiting, training and retaining the necessary RFFS services, either locally or via mainland based staff staying on the island whilst on shift. There is also a wider network question surrounding the need for a move towards fully licensed airfields. The ferry-related options are technically feasible but there would be a requirement for a full additional crew under each option.

9.5 Annual Operating Cost Estimates

Current Revenue Budget

9.5.1 In 2015/16 there were approximately 1,400 single sailings between Skerries and Shetland mainland. The revenue costs and income associated with operating the Skerries ferry service was as follows:

Table 9.6: Skerries Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£397,399
Vessel - Fuel	£134,839
Vessel - Maintenance	£270,592
Vessel - Other Costs	£134,619
Vessel Total	**£937,449**
Terminal - Maintenance	£7,712
Terminal - Other Costs	£7,156
Terminal Total	**£14,868**
Route Total	**£952,317**
Route Income	*-£27,881*
Route Net Cost	**£924,436**

9.5.2 In addition to these costs an internal berth charge of £23,761 was paid in 2015-16.

9.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Skerries service costs around **£0.9m** per annum (net) to operate.

9.5.4 An estimate of the annual net revenue budget costs associated with the main permutations of vessels (Capital – 'C') and timetables (Revenue – 'R') outlined above is shown in the chart below. The figures shown on the horizontal axis are the estimated net annual revenue costs associated with each option. Option R1, the Do Minimum is not shown here as it would be the Present Day scenario plus the cost increment of resuming air services to Skerries.

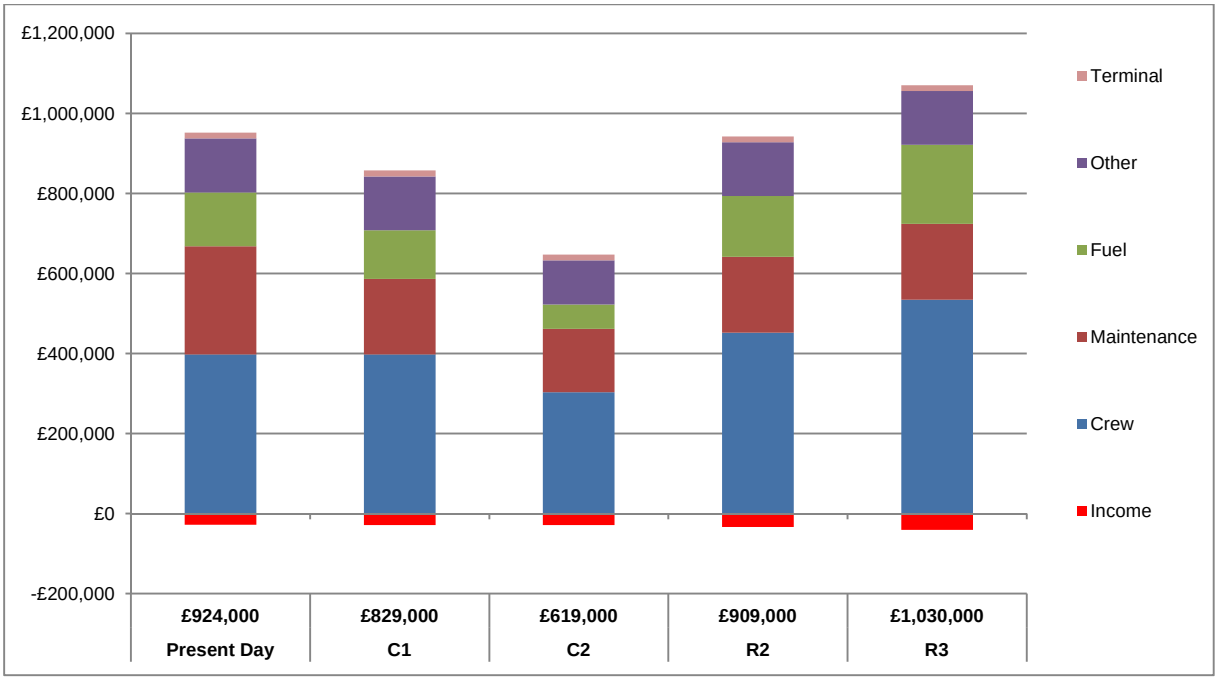


Figure 9.1: Skerries Annual Revenue Cost Estimates

9.5.5 The main points to emerge from the above are:

- No costs associated with resuming the Skerries air service are included due to the uncertainty surrounding this.
- C1: reduced fuel costs associated with the new vessel compared to the present day see overall costs fall
- C2: costs are further reduced with the smaller vessel – note that there would be additional fuel cost savings associated with the shorter passage through the South Mouth
- R2: crew and fuel costs are increased by approximately 10 / 8 reflecting the increased sailings. Fares revenue increased on a *pro rata* basis.[84]
- R3 crew and fuel costs are increased by approximately 13 / 8 reflecting the increased sailings. Fares revenue increased on a *pro rata* basis.

9.6 Public Consultation

9.6.1 Unfortunately, the Skerries public drop-in session was cancelled due to the funeral of a member of the community. A follow-up visit to Skerries was carried out by Shetland Islands Council Officer Michael Craigie and detailed feedback, including strengths, weaknesses, opportunities & threats (SWOT) analysis of the capital and revenue options, was helpfully provided by Skerries Community Council.

9.6.2 The feedback obtained is included in the 'public acceptability' box related to each of the capital and revenue options. The detailed SWOT analysis will also be helpful in further appraisal of the options at OBC stage.

[84] Note that this is difficult to predict due to uncertainty about whether extra days are to Vidlin or Lerwick and how long ship would wait at mainland port with the crew on pay.

9.7 Rationale for Selection / Rejection

9.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 9.7: Outcome of Appraisal, Skerries

Capital & Revenue Options	Take Forward (✓) / Reject (✗)	Ration for Selection / Rejection
Option C1 – Replace the MV *Filla* on a like-for-like basis at life expiry	✓	A replacement vessel of a similar size could meet the needs of Skerries. A more modern design without the requirement to carry fresh water or refrigerated fish may be more efficient.
Option C2 – Replace with the MV *Filla* with a smaller vessel	✓	This option would allow the vessel to be island based, bringing local employment opportunities and would permit a more direct sailing through the South Mouth. The potential reliability of this vessel compared to a larger vessel would need further investigation.
Option C3 – Develop a new overnight berth at Vidlin	✗	As a measure in its own right, this would not be likely to generate sufficient benefits for Skerries to justify the capital cost. Crew would also continue to be based away from Skerries. The improvements of facilities at Vidlin could be of merit from the perspective of the Whalsay route though.
Option R1 – Do Minimum (air services as per pre-RFFS cuts)	✓	All means to restore the air service should be considered. Should the air service be reinstated on a sustainable basis, the option to increase the number of flights serving Skerries beyond three days per week should be considered.
Option R2 – Return sailing from Skerries on a Tuesday & Thursday	✓	Any additional connections will be of benefit to Skerries and this option would plug gaps in the timetable.
Option R3 – Two return Vidlin services or one return Lerwick service seven days a week	✓	This option would provide the 7-day connection required by the RSM so is retained.
Option R4 – Permanently Discontinue the Air Service	✓	Although clearly negative to the island, this has to be an option in the event that the air service cannot be operated on a sustainable basis in the medium term. This measure could be combined with R2 or R3 to provide 7-day connectivity.

10 Whalsay

10.1 Capital Investment Timeframe

- A STAG appraisal of options for this route was commissioned in 2005 and reported fully in 2008. Despite the study being taken through the full STAG process, a variety of factors have delayed investment in links between the island and Shetland mainland. This need is now pressing.

- There are two ferries operating on the route to Whalsay. The more modern of the two vessels, the MV *Linga*, was introduced in 2002 and remains one of the newer vessels within the Shetland fleet. The second vessel, the MV *Hendra*, is 34 years old and in need of short-term replacement. She is both capacity constrained and has accommodation below the waterline, which is against current regulations for new builds. The vessels operate on a shift boat / day boat basis.

- The Council estimates that MV *Linga* will need to be replaced in 2034, although she would become the second Whalsay ferry from 2019, and could become a relief vessel in 2027. The MV *Hendra* is scheduled for replacement in 2022.

- The shoreside infrastructure at Laxo, Symbister and Vidlin would likely be in need of upgrade or replacement as part of any vessel replacement programme and will be a necessity if larger vessels are to be deployed on the route.

- Both of these vessels currently overnight in, and are crewed from Symbister.

10.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix I.

10.2 Identified Problems

10.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '*' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

10.2.2 The following transport problems in relation to Whalsay were therefore identified in the Pre-Appraisal Report and verified through subsequent community feedback.

Table 10.1: Whalsay Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	*	The overall journey time to Lerwick was not cited as an issue in previous consultations. *The community consultation response noted that this is a moderate problem (××). It was explained that the overall journey time to Lerwick can be a problem for commuting workers, especially if the ferry goes to Vidlin. Weekend workers face more problems as the service is restricted to one ferry and commuters travelling by bus cannot make the journey in the 80 min time frame due to the bus timetable not linking with the ferry timetable as only one ferry is running at the weekend.*
2	First sailing / flight	*	The first departure from Symbister is early in the morning at 0630. *The community consultation response noted that this is a moderate problem (××) and*

	Service Characteristics	Severity Rating	Why is this a problem or not?
			would be seeking earlier sailings.
3	Last sailing / flight[85]	✗	The consultation suggested that the timetable is not seen to be conducive to undertaking social activities in Lerwick.[86] However, even in winter, the first departure from Whalsay is 0630 and last departure from the mainland 2310 (on request), which suggests that the inability to undertake social activities on mainland is purely a function of distance.[87] *The community consultation response noted that this is a moderate problem (✗✗).*
4	Time on mainland	*	The current timetable allows for a significant amount of time on the mainland 7-days per week. *The community consultation response noted that this is a minor problem (✗). The response noted that a lack of capacity and low frequency at weekends impacts negatively on this.*
5	Time in Lerwick	*	The current timetable allows for a significant amount of time in Lerwick 7-days per week. *The community consultation response noted that this is a minor problem (✗). The response noted that a lack of capacity and low frequency at weekends impacts negatively on this.*
6	Time on island	*	The current timetable allows for a significant amount of time on the island daily. *The community consultation response noted that this is a minor problem (✗). The response noted that a lack of capacity and low frequency at weekends impacts negatively on this.*
7	Frequency / Sailings per Day / Timetable gaps	✗	The timetable for Whalsay is relatively thin in the evening compared to Yell Sound (the population of Yell being a similar size of island to Whalsay). Whalsay has three timetabled and one request sailing after 1800. This compares to five timetabled and one request sailing on Yell Sound. This is largely a product of the longer crossing-time and the reduction to a one vessel service in the evening. This is considered a problem by Whalsay residents. The limited evening connectivity is seen as being a contributing factor to younger people leaving the island, although there is no firm evidence to support this point. There is also a gap in the timetable on a Wednesday (one return sailing removed from timetable for drills and maintenance) for parents returning to Whalsay to collect their children from school.[88] *The community consultation response noted that this is a moderate problem (✗✗).*
8	Capacity	✗✗✗	The Whalsay route has issues in terms of peak vehicle capacity. The 0750 departure from Symbister is the most constrained service, with 31 of these sailings showing greater than 80% car deck utilisation in summer 2014. Further, all of these sailings are concentrated on Mondays and Tuesdays. In the winter, the 0630 (22 occasions with car deck utilisation over 80%) and 0750 (15 occasions with car deck utilisation over 80%) are the busiest sailings from Symbister. In the reverse direction, the peak sailing is 1755 ex Laxo, which has 16 sailings in summer and 47 sailings in winter (generally concentrated on a Friday) which have over 80% car deck utilisation. Finally, the gap in the Wednesday timetable is evident from the carryings data, with the 1445 service ex Laxo frequently showing high utilisation levels.[89] The shortage of capacity on key sailings means that desirable journeys, particularly for commuters, can be delayed (with the potential for a late start to the working day or missed onward connections) or cancelled altogether, particularly where the journey is short notice or discretionary.
9	Reliability (weather /	✗	The Laxo – Symbister route is very exposed to winds from the south-east. On

[85] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

[86] SIITS Consultation Review (Peter Brett Associates, 2015), p. 16.

[87] http://www.shetland.gov.uk/ferries/documents/TimetableWinter2015-16V3.pdf

[88] SIITS Consultation Review (Peter Brett Associates, 2015), p. 16.

[89] SIITS Carryings and Utilisation Analysis (Peter Brett Associates, 2015), Laxo - Symbister Capacity Analysis Table

	Service Characteristics	Severity Rating	Why is this a problem or not?
	mechanical)		occasions where the service cannot be operated, the vessels divert to Vidlin,.[90] The longer at sea and on land journey times impact negatively on the travel-to-work market, particularly in terms of journey time disbenefits. The timetable is designed to accommodate the longer Vidlin leg, meaning that one diversion does not disrupt the timetable across the day. *The community consultation response noted that this is a major problem (×××). The response explained that the vessels are ageing and that this is set against a background of maintenance budget reductions. There were also concerns raised over the reliability of the MV Linga.*
10	Comfort	×	The facilities on the MV *Linga* are appropriate for the length of crossing, less so on the MV *Hendra*. *The community consultation response noted that this is a moderate problem (××).*
11	Physical access	×	The MV *Hendra* is a relatively old vessel and physical access can be challenging for those with a mobility impairment. The passenger accommodation on this vessel is also below the waterline, which means stairs also have to be negotiated once on the vessel. Physical access can therefore be challenging for the elderly and disabled, although passengers with impaired mobility usually travel on the other vessel, MV *Linga*, when possible. The MV *Linga* has good disabled access. *The community consultation response noted that this is a major problem (×××).*
12	Integration with PT (local bus)	××	There is very limited bus integration at Laxo (and indeed Vidlin) for Whalsay residents. Opportunities to commute to Lerwick using the bus are very limited.[91] The dependence on the private car has a negative environmental impact and increases the cost of travel for islanders, leading to further comparative disadvantage.
13	Integration with PT (strategic)	××	Whalsay has a timetable which allows islanders to easily access NorthLink services from Lerwick. However, residents cannot catch the first Aberdeen, Edinburgh, Inverness or Kirkwall flights, although the first flight to Glasgow is accessible. The inability to catch the first morning flights to various locations means that Whalsay residents cannot carry out a day return visit for meetings, appointments etc, leading to potentially costly overnight stays.
14	Crossing / flight times	*	The crossing time was not cited as an issue in previous consultations. *The community consultation response noted that this is a moderate problem (××). They note that the crossing time is a problem for those with a disability as the toilets are not accessible for passengers in a wheelchair.*
15	Onboard facilities	*	The facilities on the vessel are appropriate for the length of crossing. *The community consultation response noted that this is a moderate problem (××). This is due to the lack of disabled access to the toilets.*
16	Weekday / weekend service variation[92]	×	Whalsay has a reduced service at the weekend. There are ten timetabled plus one request sailing on both a Saturday and Sunday, which compares to 16/17 timetabled sailings plus one request sailing during the week. Whilst overall weekend provision is lower, weekend provision to/from Whalsay compares very favourably to many other Scottish islands with a similar crossing time.[93] This was a problem identified through the consultation and is believed to be a cause of younger people leaving the island, although there is no firm evidence to support this point. *The community consultation response noted that this is a major problem (×××). It was noted that reduced weekend sailing frequencies as a result of the 2013 budget cuts have caused problems for those who have to work weekends, people attending social, sporting or cultural events, families wanting to have weekend excursions when they are neither working nor studying and anyone wanting to travel from Whalsay to Yell, Unst, Fetlar.*

[90] SIITS Vessels Review (TMG, 2015), p. 17.

[91] http://www.travelinescotland.com/timetableplanner/displayTimetableDetails.do?rid=1447671063183&hss=5cCWG282621564

[92] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[93] SIITS Ferry Service Provision (Peter Brett Associates, 2015), Daily Crossings and Capacity –Whalsay.

	Service Characteristics	Severity Rating	Why is this a problem or not?
17	Landside infrastructure issues	✗✗	Vidlin, the diversionary port for Whalsay, is accessed via a single track road. The marshalling area is very limited. This can give rise to operational and safety problems but the current situation is workable. *The community consultation response noted that this is a moderate problem (✗✗). The response reiterated the issues at Vidlin and noted that current fares are leading to an increasing number of people parking their cars at the ferry terminal rather than taking a car onboard.*
18	Landside human resources	✓	There are not currently any problems with landside human resources.

10.3 Appraisal of Capital Options

Capital Options

10.3.1 The following capital options were identified for Whalsay:

- **Option C1 (Do Minimum): Replace the MV *Hendra* and MV *Linga* on a like-for-like basis:**
  - The new vessels would be 35m TYPE 1 and would cost in the region of £5.5m each and would provide similar capacity to the current vessels.
  - Harbour works would be required at Laxo, including the replacement of the berthing structure and linkspan. This would cost around £4.5 million.[94]
  - Minor harbour works would also be required at Vidlin, including the provision of a dedicated parking & waiting area. This would cost around £150k.[95]
  - No harbour works would be immediately required at Symbister.[96]
  - The total capital cost of this option in 2016 prices would therefore be around **£15.65m**.
- **Option C2: Replace the MV *Hendra* and MV *Linga* with two larger vessels**
  - The MV *Hendra* and MV *Linga* would be replaced by two 45m TYPE 2 vessels, which would cost in the region of £7 million each.
  - There would be a need for major harbour works at Laxo and Vidlin. To scale up to a TYPE 2 vessel, Laxo would require a new piled jetty, breakwater extension, a replacement linkspan and dredging. This would cost around £5.4 million.[97]
  - The required works at Vidlin for a TYPE 2 vessel would include the replacement of the berthing structure & linkspan and the provision of a dedicated parking & waiting area. This would cost around £3.8 million.[98]
  - No harbour works would be immediately required at Symbister.[99] However, the TYPE 2 vessels would be at the upper range of what the current Symbister Harbour could currently accommodate in terms of overall dimensions.

[94] See Laxo Harbour Drawing, Box 2, Like-for-Like Option.

[95] See Vidlin Harbour Drawing, Box 2, Like-for-Like Option.

[96] See Symbister Harbour Drawing, Box 2, Like-for-Like Option.

[97] See Laxo Harbour Drawing, Box 3, Larger Vessel Option.

[98] See Vidlin Harbour Drawing, Box 3, Larger Option.

- The total capital cost of this option would therefore be around **£23.2m**.

- **Option C3: Replace the MV *Hendra* and MV *Linga* with three like-for-like vessels**

  - The working assumption with this option is that the MV *Hendra* and MV *Linga* would be replaced with 3 * 35m TYPE 1 vessels. However, various vessel size mixes could apply and the final decision should be informed by analysis of demand in the Outline and Final Business Case (FBC), which would be used to determine this.

  - The new vessels would cost in the region of £5.5m each.

  - The harbour works at Laxo and Vidlin would be equivalent to those required under Option C1 (£4.65m). There would not be a physical need for harbour works at Symbister with this option. However, it is unlikely that the three Whalsay ferries and the Skerries ferry MV *Filla* could be accommodated within the current harbour given existing congestion. There are a variety of potential solutions to this, ranging from reorganising the existing harbour (e.g. relocating the marina elsewhere) to basing one of the ferries elsewhere (e.g. developing an overnight berth at Vidlin). The additional costs associated with this are not factored into this option.

  - The total capital cost of this option would therefore be around **£21.2m**.

- **Option C4: Construct new North Voe Harbour on Whalsay which would accommodate the ferry service**

  - The current Symbister harbour would be converted to leisure and commercial uses.

  - This option would be required if a decision was taken to build or cascade any vessels to Whalsay larger than a TYPE 2. It could also be a solution to the marine congestion in Symbister Harbour associated with a three vessel solution (Option C3).

  - A new ferry terminal at North Voe would be a significant undertaking and would require a new breakwater, a new piled jetty, land reclamation, a new linkspan and shoreside facilities. It is estimated that this would cost around **£15.5m**.[100]

- **Option C5: Construct a fixed link (tunnel or a bridge) between Whalsay and Shetland Mainland**

  - There is at present uncertainty over the precise design and alignment of a fixed link to Whalsay. The most recent tunnel feasibility work was carried out in 2010 and established the potential for a tunnel as the preferred option.

  - A number of fixed link proposals have been examined in varying levels of detail over the years; but none of the studies commissioned to date has benefitted from supporting ground / seismic investigation, which in itself is a substantial undertaking. This necessarily limits the engineering accuracy of design assumptions and consequently the robustness of any cost assessments. The many assumptions that have been made will have to be tested before construction risks can be properly understood and an attempt at their quantification made. All costs suggested to date will have to include for full unmitigated optimism bias.

  - This option would permit the redeployment of the MV *Linga* (and potentially the shoreside infrastructure to another route). The MV *Hendra* is life-expired.

[99] See Symbister Harbour Drawing, Box 3, Larger Vessel Option.

[100] See Symbister Harbour Drawing, Box 4, New Harbour at Whalsay (North Voe) Option.

- A range of capital costs have been provided for a fixed link (see Table 1.1 for more information on the derivation of the below costs):
  - Unlined UK: £108.1m (£201.0m including optimism bias & contingency)
  - Unlined Norwegian: £86.3m (£160.4m including optimism bias & contingency)
  - 1/3 Lined UK: £115.1m (£214.1m including optimism bias & contingency)
  - 1/3 Lined Norwegian: £91.0m (£169.3m including optimism bias & contingency)

Appraisal of Capital Options

10.3.2 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 10.2: Whalsay Capital Options – Appraisal against Objectives

	Option C1 – Replace *Hendra & Linga* like-for-like TYPE 1 vessels	Option C2 – Replace *Hendra & Linga* with 2 * TYPE 2 vessels	Option C3 – Replace *Hendra & Linga* with 3 * TYPE 1 vessels	Option C4 – Construct new North Voe Harbour	Option C5 – Fixed Link (tunnel) between Whalsay & Shetland Mainland
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓	✓✓✓	-	✓✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	-	✓	✓	-	✓✓✓
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	N/A	N/A	N/A	N/A	N/A
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	✓✓✓	-	✓✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓	-	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-	-	✓✓✓

10.3.3 The evidence collected as part of the baselining analysis clearly demonstrates that the Whalsay service has capacity issues at peak times, despite a fairly frequent two vessel service. Outwith peak hours, capacity issues tend to emerge when the service is operated by a single vessel, at the weekend or during weekly maintenance for example. As a result, the options which offer an increase in capacity over and above the **Do Minimum (Option C1)** score well against the capacity criterion. **Option C5**, a fixed link, would remove all capacity constraints on the route. Similarly, a three vessel service **(Option C3)** could, if combined with increased revenue funding, offer an almost turn-up-and-go frequency, which would also alleviate the capacity problems on the route. **Option C2**, the introduction of two larger capacity vessels, would also go some way towards relieving the capacity issues experienced by Whalsay, although there may still be some issues around peak time, and if the weekend service continues to be operated by one vessel.

10.3.4 In terms of TPO2a, Whalsay already has a commutable service to Shetland mainland and there are significant flows to both Lerwick and Sullom Voe. However, the ability to commute can be negatively impacted by capacity constraints on the ferry and thus **Options C2** (two larger vessels) and **C3** (three-vessel solution) would address this impediment to commuting. A fixed link **(Option C5)** would of course fundamentally transform access from Whalsay, fully supporting all aspects of commuting including shift work and night working.

10.3.5 In terms of frequency (TPO3), a two vessel solution would not offer any improvement on the current service unless the vessels were materially faster. A three vessel solution **(Option 3)** could however provide a major positive impact in terms of frequency, offering an almost turn-up-and-go service when all three vessels are deployed and the ability to cover gaps in the timetable e.g. for maintenance. This option, if aligned with additional revenue funding, could also support TPO4 by removing the variation between the weekday and weekend timetables. **Option C5 (**a fixed link) would again remove all frequency considerations by allowing unrestricted travel between Whalsay and Shetland mainland.

10.3.6 The only capital option which would have a material impact on strategic connectivity would be the provision of a fixed link **(Option C5)**. A fixed link would allow access to Shetland mainland for onward connections at any time of the day or night.

Appraisal against STAG Criteria

Table 10.3: Whalsay Capital Options – Appraisal against STAG Criteria

	Option C1 – Replace *Hendra & Linga* like-for-like, 2 * TYPE 1	Option C2 – Replace *Hendra & Linga* with 2 * TYPE 2 vessels	Option C3 – Replace *Hendra & Linga* with 3 * TYPE 1 vessels	Option C4 – Construct new North Voe Harbour	Option C5 – Fixed Link (tunnel) between Whalsay & Shetland Mainland
Environment	✓	✓	✖	✖✖	✖✖✖
Safety	✓	✓	✖	✓✓	✖
Economy	-	✓	✓✓	-	✓✓✓
Integration	✓	✓	✓	✓	✓✓
Accessibility & Social Inclusion	✓	✓	✓✓	-	✓✓✓
Established Policy Directives	✓	✓	✓✓	✓	✓✓
Technical Feasibility	*There would be moderate harbour works required at*	*There would be moderate harbour works required at*	*There would be moderate harbour works required at*	*There would be no technical feasibility issues*	*A number of fixed link suggestions have been*

	Option C1 – Replace *Hendra & Linga* like-for-like, 2 * TYPE 1	Option C2 – Replace *Hendra & Linga* with 2 * TYPE 2 vessels	Option C3 – Replace *Hendra & Linga* with 3 * TYPE 1 vessels	Option C4 – Construct new North Voe Harbour	Option C5 – Fixed Link (tunnel) between Whalsay & Shetland Mainland
	Laxo and minor harbour works required at Vidlin. No harbour works would immediately be required at Symbister.	*Laxo and Vidlin – No harbour works would immediately be required at Symbister.*	*Laxo and Vidlin – No harbour works would immediately be required at Symbister. However, there may be a need for additional investment to address marine congestion in Symbister Harbour.*	*associated with this option outwith those associated with the construction of the harbour.*	*examined in varying levels of detail over the years; but none of the studies commissioned to date has had the benefit of any supporting ground / seismic investigation. This necessarily limits the engineering accuracy of design assumptions and consequently the robustness of any cost assessments. Proposals remain conceptual in nature.*
Operational Feasibility	*Crew induction training would be required.* *The MV Linga could be redeployed.*	*Higher crew training costs associated with moving to a higher certification vessel.* *Crew induction training would be required* *The MV Linga could be redeployed.*	*Additional crew and fuel would be required to support a three vessel operation.* *Crew induction training would be required* *The MV Linga could be redeployed.*	*There would be an operational benefit as the ferries would have a dedicated harbour and would not need to work around other traffic.*	*See Section 1.4 – fixed links.*
Affordability	*The total capital cost of this option would be around £15.65m.*	*The total capital cost of this option would be around £23.2m.*	*The total capital cost of this option would be around £21.2m. There is also a significant increase in revenue costs (see below).*	*The total capital cost of this option would be around £15.5m. The costs of the required vessel solution would need to be added to this cost.*	*See Table 1.1*
Public Acceptability	*This option would not be acceptable to the public as it does not address the capacity issue*	*Of those who commented on the ferry options, this option was supported*	*Of those who commented on the ferry options there was no obvious public clamour for a three vessel solution.*	*There was some support for this option expressed through the public consultation*	*A fixed link options is favoured by many on the island.*

10.3.7 The key points from above appraisal against the STAG criteria are:

- The three vessel replacement options **(Options C1-C3)** record a minor environmental benefit associated with new and more efficient tonnage, although the three vessel option **(Option C3)** would result in an increase in emissions from increased running hours. The construction of a new harbour at North Voe **(Option C4)** would potentially have a

moderate negative environmental effect as there would be significant impacts during construction. There would also be seascape and visual impacts in longer term, although these would decrease as the breakwater became weathered. The fixed link **(Option C5)** would have potential for significant negative effects from permanent development of new infrastructure, whilst the option would also generate increased vehicle kilometres, although this may to some extent be offset by reduced ferry emissions.

- All three vessel replacement options would have a minor positive safety impact stemming from the replacement of the current MV *Hendra*, which has accommodation below the water line. However, a three vessel solution **(Option C3)** would record a minor safety disbenefit due to the higher risks of a close quarters incident and increased congestion in the already busy Symbister Harbour. The construction of a new harbour at North Voe **(Option C4)** could also have a moderate positive safety impact by ensuring a dedicated harbour for ferries and significantly reducing the risks of marine accidents in the congested Symbister Harbour. A fixed link **(Option 5)** would have minor safety disbenefits through increased vehicle kilometres and hence accidents.

- From an 'Economy' perspective, the provision of two new larger vessels **(Option C2)** would have marginal positive impacts as it would reduce the capacity constraint affecting Whalsay. A three vessel solution **(Option C3)**, if aligned with enhanced frequency, would offer TEE benefits (associated with reduced wait times) and moderate wider / EALI benefits through significantly improving access to the Whalsay economy. A fixed link **(Option C5)** would have major economic impacts on Whalsay, in effect making the island an extension of Shetland mainland (assuming no tolls are in place).

- From an integration perspective, a three vessel solution **(Option C3)** would contribute positively to transport and policy integration, whilst a fixed link **(Option C5)** could have a transformative effect on Whalsay as an island, supporting transport integration, policy and, importantly, land-use integration through making the stock of unused houses on the island more attractive (with potential in-migration supporting the island more generally.

- All of the new vessel options would give rise to accessibility and social inclusion benefits. The key benefit would be an improvement in physical accessibility to the vessels. At present, the MV *Hendra* has passenger accommodation below the waterline and is very inaccessible for those with a physical disability (disabled passengers can remain in their car for the crossing but there remains a social exclusion impact from being unable to access the passenger areas or toilets). A fixed link **(Option C5)** would also tackle this issue and would further address any social inclusion issues associated with e.g. the recently reduced weekend service, being unable to access social activities in Lerwick in the evening etc.

- The three ferry options are technically and operationally feasible. All of these options would require harbour works, with the three vessel solution **(Option C3)** potentially requiring further investment to address the marine congestion issues in Symbister Harbour.

- There remain technical feasibility / risk / cost issues surrounding a fixed link **(Option C5)**, which requires further detailed development work.

10.4 Appraisal of Revenue Options

Revenue Options

10.4.1 The following revenue options were identified for Whalsay:

- **Option R1: Offer an on-request early departure from Whalsay, which would allow connection with the first flights from Sumburgh**

- This service would operate Monday - Friday and would depart Symbister around 0500.
- This would result in a maximum of 260 (5*52) additional sailings per annum, assumed to be charged at unsocial overtime rates.

- **Option R2: Offer additional request sailings on Friday and Saturday nights (through 0200)**
  - This would result in a maximum of 104 (2*52) additional sailings per annum, assumed to be charged at unsocial overtime rates.

- **Option R3: Operate standard weekday timetable seven days a week**
  - The current standard weekday timetable (operated Tuesday, Thursday and Friday) would be operated at the weekends (Monday and Wednesday would remain the scheduled maintenance days). This broadly represents a return to the per 2013 cuts timetable.
  - This would result in 728 additional return sailings per annum, assumed to be charged at standard overtime rates with unsocial allowance.

- **Option R4a: Run both vessels for the full operating day seven days a week**
  - The current day vessel would operate on the same basis as the shift vessel, providing a two vessel service for the full operating day, seven days a week
  - This would result in 2,184 additional return sailings per annum, assumed to be charged at standard overtime rates with unsocial allowance when appropriate.

- **Option R4b: Run both vessels for the full operating day Monday to Friday**
  - The current day vessel would operate on the same basis as the shift vessel, providing a two vessel service for the full operating day, five days a week.
  - This would result in 1,040 additional return sailings per annum, assumed to be charged at standard overtime rates with unsocial allowance when appropriate.
  - The route would operate with a single vessel at the weekend.

Appraisal of Revenue Options

Appraisal against Objectives

10.4.2 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 10.4: Whalsay Revenue Options – Appraisal against Objectives

	Option R1 – Offer an on request early departure from Whalsay for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7-days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
TPO1: The capacity of the	-	-	✓✓	✓✓	✓

	Option R1 – Offer an on request early departure from Whalsay for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7-days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.					
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	-	-	✓	✓	-
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	NA	NA	NA	NA	NA
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓	✓	✓✓	✓✓✓	✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓	✓✓✓	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓✓✓	-	✓	✓	✓

10.4.3 The proposal for an early morning departure from Whalsay to connect with the first flights **(Option R1)** would have a major impact in terms of strategic connectivity. If this service were to be realised, Whalsay residents would be able to make a day return to the Scottish mainland by air. At the other end of the day, the extension of the Friday and Saturday timetable to 0200 **(Option R2)** would offer a benefit in terms of service frequency, although the off-peak nature of these sailings means there would be little contribution to the other objectives.

10.4.4 **Options R3, R4a and R4b** all relate to improvements to the service frequency. The benefit of **Option R3** is an enhanced weekend service, effectively offering the weekday timetable on a

Saturday and Sunday (restoring the timetable to the pre-2013 budget cuts). The option would also enhance the overall service frequency from Whalsay.

10.4.5 **Options R4a and R4b** would result in a significant timetable improvement for Whalsay. This option would involve converting the 'day boat' into a shift boat and running both vessels for an operating day in the region of eighteen hours[101] **(Option R4a**, 7 days a week and **Option R4b**, Monday – Friday). Both options would increase the frequency of the service and overall level of connectivity. **Option 4b** would additionally equalise the weekday and weekend timetables, addressing the lower level of service for Whalsay at weekends.

Appraisal against STAG Criteria

Table 10.5: Revenue Options – Appraisal against STAG Criteria

	Option R1 – Offer an on request early departure from Whalsay for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7-days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
Environment	✖	✖	✖✖	✖✖	✖✖
Safety	✖	✖	✖	✖	✖
Economy	✓	✓	✓	✓✓✓	✓✓
Integration	✓✓	-	✓	✓✓	✓✓
Accessibility & Social Inclusion	✓	✓✓	✓✓	✓✓✓	✓✓
Established Policy Directives	✓	✓	✓	✓	✓
Technical Feasibility	-	-	-	-	-
Operational Feasibility	*No operational issues but crew overtime & fuel required*	*No operational issues but crew overtime & fuel required*	*No operational issues but additional crew & additional fuel would be required*	*No operational issues but a full additional crew & additional fuel would be required*	*No operational issues but additional crew & additional fuel would be required*
Affordability	*This option would increase operating costs to £2.35m per annum, an increase of £105k per annum on the current situation.*	*This option would increase operating costs to £2.31m per annum, an increase of £66k per annum on the current situation*	*This option would increase operating costs to £2.46m per annum, an increase of £214k per annum on the current situation*	*This option would increase operating costs to £2.86m per annum, an increase of £613k per annum on the current situation.*	*This option would increase operating costs to £2.54m per annum, an increase of £299k per annum on the current situation.*
Public Acceptability	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*

10.4.6 The key points from above appraisal against the STAG criteria are:

[101] It is unlikely that both vessels will exactly run an 18 hour operating day as the last ship to finish at night has to be the first ship to sail in the morning, whilst there is also a need to provide stand-by hours for emergency call-out.

- **Option R1** would have a notably positive impact on transport integration, allowing Whalsay residents to catch the early morning flights from Shetland. The enhanced connectivity would improve community and comparative accessibility, which in turn would promote minor economic benefits.

- The on-request late night sailings on a Friday and Saturday **(Option R2)** would significantly enhance community accessibility, allowing Whalsay residents to partake in evening social activities in Lerwick. This would support island life and potentially help promote population retention.

- The operation of the standard weekday timetable seven-days per week **(Option R3)** would provide moderate benefits in terms of weekend connectivity. The operation of both vessels for the full operating day **(Options R4a and R4b)** would significantly enhance accessibility and social inclusion, giving rise to TEE benefits (through enhanced frequency) and wider / EALI benefits for e.g. residents, tourism, locally traded services etc. Clearly, the magnitude of the benefits would be significantly greater with the realisation of this option over seven as opposed to five days.

- In terms of affordability, **Options R1 and R2** would be relatively low cost (although with proportionately lower benefits**). Options R3, R4a and R4b** would all involve significant additional crewing increments, with **Option R4a** being the most crew intensive.

10.5 Annual Operating Cost Estimates

Current Revenue Budget

10.5.1 In 2015/16 there were approximately 11,000 single sailings between Whalsay and Shetland mainland. The revenue costs and income associated with operating the Whalsay ferry service was as follows:

Table 10.6: Whalsay Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£1,535,050
Vessel – Fuel	£331,764
Vessel – Maintenance	£478,808
Vessel - Other Costs	£269,079
Vessel Total	£2,614,701
Terminal – Maintenance	£61,561
Terminal - Other Costs	£39,818
Terminal Total	£101,379
Route Total	£2,716,080
Route Income	*-£471,388*
Route Net Cost	**£2,244,692**

10.5.2 In addition to these costs an internal berthing charge of £400,566 was paid during 2015-16.

10.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Whalsay service costs around **£2.2m** per annum (net) to operate.

10.5.4 An estimate of the annual net revenue budget costs associated with the main permutations of vessels (Capital – 'C') and timetables (Revenue – 'R') outlined above is shown in the chart below. The figures shown on the horizontal axis are the estimated net annual revenue costs associated with each option.

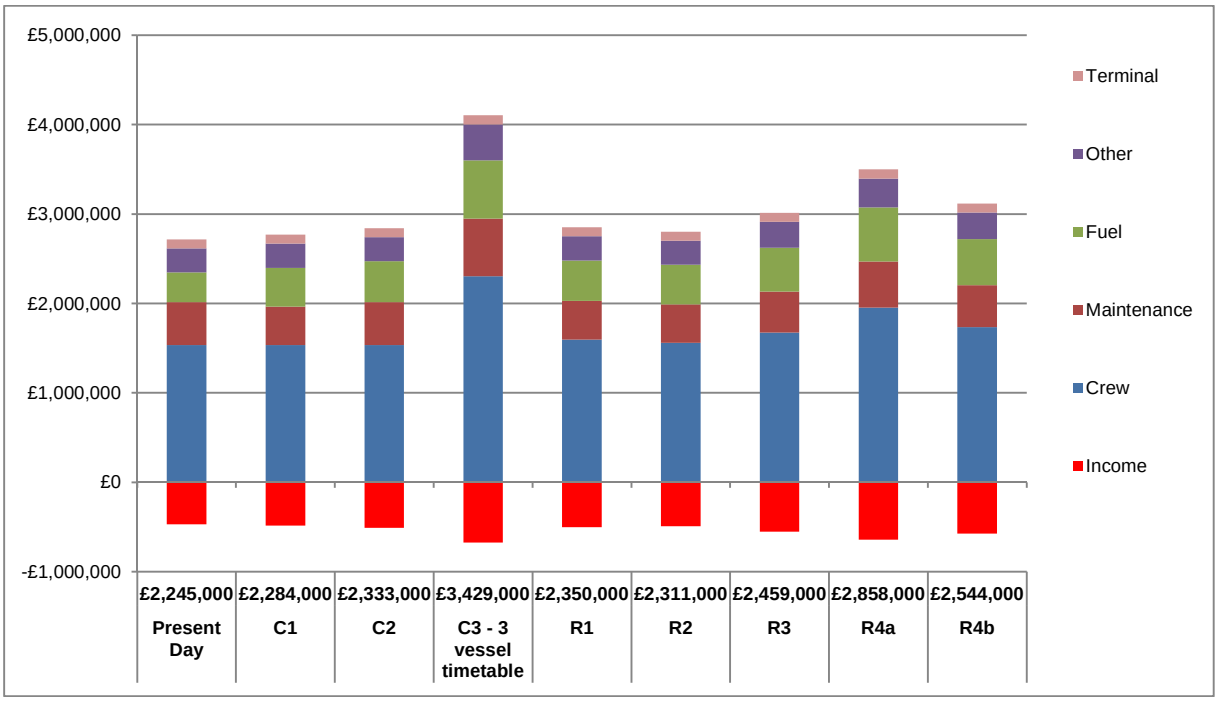


Figure 10.1: Whalsay Annual Revenue Cost Estimates

10.5.5 The main points to emerge from the above are:

- C1 and C2 see modest increases in cost relative to the present day.
- A 3-vessel solution in C3 sees a major increase in net annual operating costs, up by around 50% compared to C2.
- Of the revenue options, Option R4a sees the biggest increase as this represents the maximum deployment of the two vessels.

10.6 Public Consultation – Prioritisation

10.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

10.6.2 This list comprised improvements to aspects of connectivity associated with ferry and where appropriate air services. Whist it did not include Fixed Links as an option, there was on 'Other – Please Specify' option. In addition, question 3 on the proforma asked: '*Do you have any comments on the future transport options presented?*' and this provided a further option for views on fixed links to be expressed.

10.6.3 The number of completed questionnaires from Whalsay was **228**.

10.6.4 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the 'Other – Please Specify' option. Note that these columns do not sum to 100% as the question allowed three responses.

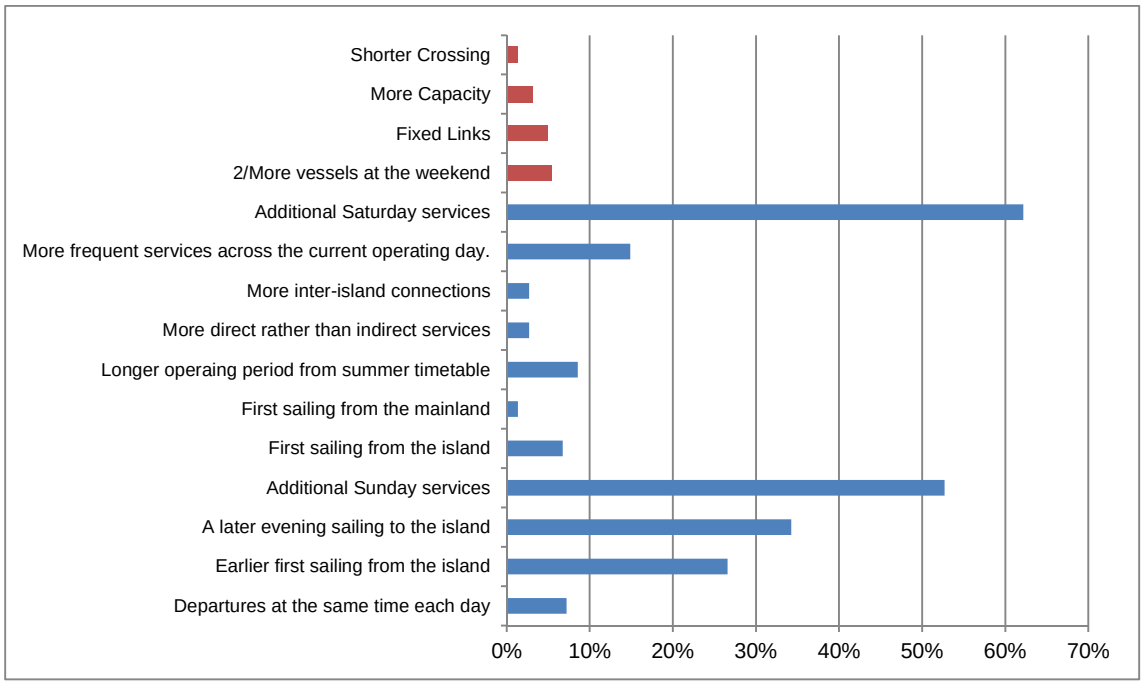


Figure 10.2: Whalsay – Prioritisation of Enhancements

10.6.5 The top priority for Whalsay residents was additional Saturday and Sunday sailings. This reflects the single vessel operation which is in place at weekends. Some 5% of respondents noted Fixed Links at this stage.

10.6.6 When asked for comments on the options, 33% of respondents noted a desire for a fixed link solution. Others expressed a desire to continue with ferry services.

10.6.7 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

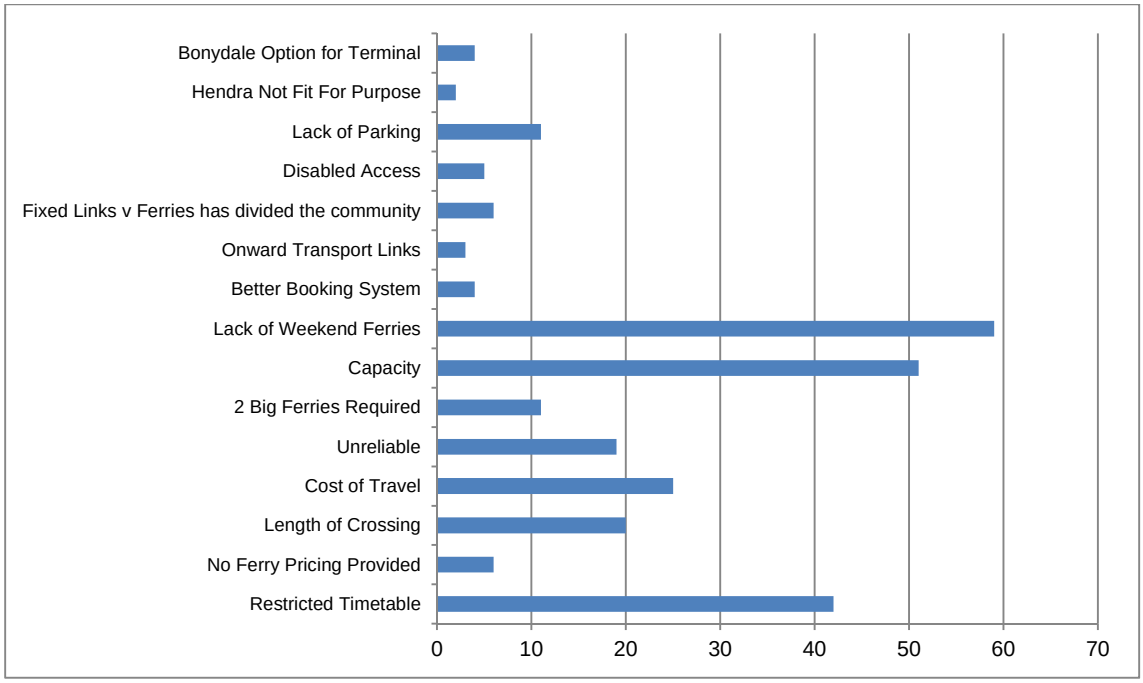


Figure 10.3: Whalsay – Other Issues Raised (Frequency)

10.6.8 The related other main issues raised in Whalsay was 'lack of weekend ferries' / 'restricted timetable'. Lack of vehicle carrying capacity is the other main issue for Whalsay residents.

10.7 Rationale for Selection / Rejection

10.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 10.7: Outcome of Appraisal, Whalsay

Capital & Revenue Options	Take Forward (✓) / Reject (✗)	Ration for Selection / Rejection
Option C1 – Replace *Hendra* & *Linga* with like-for-like TYPE 1 vessels	✗	The capacity issues identified on the route would not be resolved with two vessels of similar carrying capacity. The vessels are fully utilised during the peak periods therefore there is no possibility of providing additional services when most required.
Option C2 – Replace *Hendra* & *Linga* with 2 * TYPE 2 vessels	✓	Two larger vessels would provide significant additional capacity and this option should be considered further. An alternative would be 1 * TYPE 1 vessels and 1 * TYPE 2 vessel or larger vessels. This would depend on detailed analysis of demand and the harbour implications would also have to be considered.
Option C3 – Replace *Hendra* & *Linga* with 3 * TYPE 1 vessels	✓	Three vessels would provide a step change in frequency and flexibility, albeit the capacity of any one sailing would be similar to the present day. These three vessels could be a mix of TYPE 1 and TYPE 2 vessels if required. The exact specification would require detailed analysis of present and future demand. There may be a need for further investment to relieve congestion in Symbister Harbour if a three vessel solution is adopted.
Option C4 – Construct new North Voe Harbour	✓	This option provides a means of addressing congestion and marine safety issues associated with Symbister Harbour. The construction of North Voe would also be required if any vessels larger than the TYPE 2 are to be deployed on the Whalsay route.
Option C5 – Fixed Link (tunnel) between Whalsay & Shetland Mainland	✗	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Option R1 – Offer an on request early departure from Whalsay for connections to Sumburgh	✓	This is a relatively low cost option which could meet a specific requirement for early connections to Sumburgh from the island. The crewing issues surrounding this should be considered further.
Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	✓	This is a relatively low cost option which could meet a specific requirement for late connections to the mainland from the island. The crewing issues surrounding this should be considered further.
Option R3 – Operate standard weekday timetable 7-days a week	✓	This option would largely reverse the 2013 service revisions by re-instating the 7-day operation of the two vessels. This option should be considered further in relation to the costs and benefits of this option. Historic carryings data could be used to determine the impact of the service changes and hence the likely increase if these changes were reversed.
Option R4a – Run both vessels for the full operating day, 7-days a week	✗	This option represents the maximum level of service with 2-vessel, with both ferries running a 16-18 hour operating day 7-days per week. This level of service would seem excessive during off peak periods, particularly if there are larger capacity vessels deployed on the route.
Option R4b – Run both vessels on a shift vessel basis Monday - Friday	✓	This option would provide a 16-18-hour 2-vessel service on weekdays providing increased capacity and frequency during the evening. The potential demand for this should be explored further.

11 Yell

11.1 Capital Investment Timeframe

- There was considerable investment in the Yell Sound route in 2004, with two new vessels (the MV *Daggri* and MV *Dagalien*) being accompanied by a series of harbour improvement works to accommodate them.
- Assuming a 30 year lifespan, the assets on Yell Sound would not need to be replaced through until 2034[102], unless the vessels are cascaded elsewhere.

11.1.1 The ASTs, harbour investment drawings and environmental constraints maps for this route are contained in Appendix J.

11.2 Identified Problems

11.2.1 A range of 18 potential transport problems was considered for each island. The table below show the subset of problems which were identified together with a rating of the severity of the problem (×, ×× or ×××). Where there is a '*' shown in the rating column, this means that the study had not initially identified this issue as a problem, but feedback from the community suggested that this issue was a problem. The text in red notes specific community feedback in relation to this issue, or where they have proposed a different severity rating for this problem.

Table 11.1: Yell Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	*	The overall journey time to Lerwick was not cited as an issue in previous consultations. *The community consultation response noted that connectivity on weekdays and weekends is deemed a problem – × for weekday and ×× for weekends.*
2	First sailing / flight	*	The first departure from Ulsta is early in the morning at 0615. *The community consultation response noted that the timing of the first sailing is deemed a problem – rated a ×.*
3	Last sailing / flight[103]	×	The consultation suggested that the timetable is not seen to be conducive to undertaking social activities in Lerwick.[104] However, even in winter, the first departure from Yell is 0615 and last departure from the mainland 2255 (on request), which suggests that the inability to undertake social activities on mainland is purely a function of distance.[105] *The community consultation response noted that this is a moderate problem - ××*
7	Frequency / Sailings per Day / Timetable gaps	*	On a typical weekday (Tuesday – Friday), there are 24 timetabled and one request sailing across Yell Sound. The Monday frequency is slightly lower but still offers 20 timetabled sailings plus one request sailing. The reduced service on Mondays is considered a problem for fish lorries.

[102] Note the Council assumes 2031 replacement for the MV *Daggri* and 2022 for the MV *Dagalien*.

[103] The combination of 2) First Sailing / Flight and 3) Last Sailing Flight represent the RSM measure of (Length of Operating Day).

[104] SIITS Consultation Review (Peter Brett Associates, 2015), p. 14.

[105] http://www.shetland.gov.uk/ferries/documents/TimetableWinter2015-16V3.pdf

	Service Characteristics	Severity Rating	Why is this a problem or not?
			The community consultation response noted that this is ✕ for personal travel and ✕✕✕ for aquaculture related traffic.
8	Capacity	*	Vehicle capacity has not been identified as an issue. *The community consultation response noted that this is ✕✕ for ferries after meal breaks and also explained that the reduction of ferries on a Saturday and Sunday is a problem, especially when there are functions on the island. However, analysis of operator data suggests that this is not the case.*
9	Reliability (weather / mechanical)	*	There are not believed to be any major reliability issues on this route. *The community consultation response noted that this is a major problem (✕✕✕), noted that the 0745 from Ulsta and 0815 from Toft are frequently regularly cancelled due to a lack of staff. However, analysis of operator data suggests that this is not the case.*
16	Weekday / weekend service variation[106]	✕	Yell has a reduced service at the weekend. There are 15 (Saturday) and 14 (Sunday) timetabled sailings plus one request sailing on both a Saturday and Sunday. This compares to 24 timetabled sailings plus one request sailing during the week (except Monday). Whilst overall weekend provision is lower, it compares very favourably to many other Scottish islands. The consultation suggested this presents something of a problem for Yell residents, although it is clear from the timetable and data that Sunday travel is possible, albeit it is slightly less frequent. *The community consultation response noted that this is a moderate problem (✕✕)*
17	Landside infrastructure issues	*	The facilities are generally adequate for the route but there are times when weather disruption could be lessened with a breakwater at Toft. During times of disruption, marshalling areas are seen to be inadequate. *The community consultation response noted that Yell Community Council would be concerned with the cost of adding a breakwater. They also note that parking facilities at Ulsta and Toft are inadequate. They deem this a minor problem (✕).*

11.3 Appraisal of Capital Options

Capital Options

11.3.1 The following capital options were identified for Yell:

- **Option C1 (Do Minimum): Replace the MV *Dagalien* and MV *Daggri* on a like-for-like basis:**
  - The new vessels would be TYPE 3 and would cost in the region of £10.7m each in 2016 prices.
  - The only harbour works associated with this option would be an extension of the existing parking & waiting area at Toft at a cost of £100k.[107]
  - The total capital cost of this option would therefore be around **£21.5m**.

[106] The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

[107] See Toft Harbour Drawing, Box 2, Like-for-Like Option and Ulsta Harbour Drawing, Box 2, Like-for-Like Option.

- **Option C2: Replace the MV *Dagalien* and MV *Daggri* with two larger vessels**

  - The working assumption with this option is that the MV *Dagalien* and MV *Daggri* would be replaced by two TYPE 4 vessels. However, differing vessel combinations could be considered and analysis of demand in the Final Business Case (FBC) would be used to determine this.

  - The new vessels would cost in the region of £14.75m each.

  - Harbour works would be limited to extension of the existing parking & waiting area and refendering at Toft (£250k) and provision of a dedicated parking & waiting area at Ulsta (£100k).[108]

  - There remains an element of doubt as to whether a 75m vessel could access the lay-by berth at Ulsta. Ulsta Harbour Drawing (Box 3 – Larger Vessel) includes a manoeuvre path which Beckett Rankine believes is feasible and safe under reasonably calm conditions, although some dredging would be needed (costing around £300k). This manoeuvre does require the vessel to lean against the existing row of piles, so these would need to be checked and possibly new fenders will be required. If this manoeuvre path is not feasible, a breakwater would be required at Toft so that the second vessel could lie there. The costs of the breakwater are outlined under Option C3 below. This would be established at OBC stage.

  - The total capital cost of this option would therefore be around **£30.15m**.

- **Option C3: Replace the MV *Dagalien* and MV *Daggri* with three vessels of varying size**

  - The working assumption with this option is that the MV *Dagalien* and MV *Daggri* would be replaced by three 65m TYPE 3 vessels. However, various vessel mixes could apply and the final decision should be informed by analysis of demand in the Final Business Case (FBC), which would be used to determine this.

  - The new vessels would cost in the region of £10.7m each.

  - One of the three vessels would need to lie overnight at Toft. This would require the construction of a 210m detached breakwater to provide shelter from northerly or easterly waves allowing vessels to safely overnight. It is estimated that this would cost £6.6 million[109] and would be supplemented by a small investment in improved parking / waiting facilities (around £100k).

  - The total capital cost of this option in 2016 prices would therefore be around **£38.8m**.

- **Option C4: Construct a fixed link (tunnel or a bridge) between Yell and Shetland Mainland**

  - There is at present uncertainty over the precise design and alignment of a fixed link to Yell. The most recent tunnel feasibility work was carried out in 2008 established the potential for a 3.5km dual lane tunnel, although very limited ground investigation has been undertaken. Options for a bridge were considered in 1999 at a conceptual level only. Our assumption is therefore that a fixed link would take the form of a tunnel.

  - This option would permit the redeployment of the MV *Dagalien* and MV *Daggri* (and potentially the shoreside infrastructure to another route.

[108] See Toft Harbour Drawing, Box 3, Larger Vessel Option and Ulsta Harbour Drawing, Box 3, Larger Vessel Option.

[109] See Toft Harbour Drawing, Box 4, Breakwater at Toft Option.

- A range of capital costs have been provided for a fixed link (see Table 1.1 for more information on the derivation of the below costs):
  - Unlined UK: £95.6m (£177.9m including optimism bias & contingency)
  - Unlined Norwegian: £76.3m (£141.9m including optimism bias & contingency)
  - 1/3 Lined UK: £101.8m (£189.4m including optimism bias & contingency)
  - 1/3 Lined Norwegian: £80.5m (£149.8m including optimism bias & contingency

Appraisal of Capital Options

11.3.2 The following sections contain the appraisal of each capital option against the study objectives and the STAG criteria.

Appraisal against Objectives

Table 11.2: Yell Capital Options – Appraisal against Objectives

	Option C1 – Replace *Dagalien & Daggri* like-for-like, 2 * TYPE 3	Option C2 – Replace *Dagalien & Daggri* with 2 * TYPE 4 vessels	Option C3 – Replace *Dagalien & Daggri* with 3 * TYPE 3 vessels	Option C4 – Fixed Link (tunnel) between Yell & Shetland Mainland
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	✓✓	✓✓	✓✓✓
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	-	-	-	✓✓
TPO2b: Where an island does not have a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.	N/A	N/A	N/A	N/A
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	-	-	✓✓	✓✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓	✓✓✓
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	-	-	-	✓✓✓

11.3.3 The Pre-Appraisal Report noted that there are no immediate problems on the Yell Sound route which would trigger significant investment before the life expiry of the current assets. **Option C1** (like-for-like replacement of the current vessels) does not therefore make a contribution to the objectives over and above that offered by the current assets.

11.3.4 **Option C2**, the introduction of two larger vessels would significantly increase capacity across the Yell Sound – each individual sailing could accommodate around 19 additional PCUs over and above the current vessels. This would alleviate the capacity peaks identified on this crossing. This option would have neutral impact in terms of the other four objectives.

11.3.5 The addition of a third vessel onto the Yell Sound **(Option C3)** would make a significant contribution to the objectives. From a capacity perspective, when all three vessels are operating, the vessels would offer a capacity of 93 PCUs per hour in each direction compared to the current 62. Perhaps more importantly, a three vessel solution, if allied with additional revenue funding, would offer an almost turn-up-and-go frequency on Yell Sound, significantly reducing the scheduled time between connections. Finally, a third vessel would make a contribution to minimising timetable variation, providing flexibility and standing in during e.g. scheduled maintenance, drydock periods etc. However, an appropriate layby berth would be required to support this, adding to the cost and complexity of this option.

11.3.6 The provision of a fixed link for Yell **(Option C4)** would make a considerable contribution to the objectives. A fixed link would remove all capacity, timetable and frequency constraints and would negate any weather related reliability issues.

Appraisal against STAG Criteria

Table 11.3: Yell Capital Options – Appraisal against STAG Criteria

	Option C1 – Replace *Dagalien & Daggri* like-for-like, 2 * TYPE 3	Option C2 – Replace *Dagalien & Daggri* with 2 * TYPE 4 vessels	Option C3 – Replace *Dagalien & Daggri* with 3 * TYPE 3 vessels	Option C4 – Fixed Link (tunnel) between Yell & Shetland Mainland
Environment	✓	✓[110]	×	××
Safety	-	-	×	×
Economy	-	✓	✓✓	✓✓✓
Integration	-	-	✓	✓✓
Accessibility & Social Inclusion	-	✓	✓✓	✓✓✓
Established Policy Directives	✓	✓	✓✓	✓✓
Technical Feasibility	-	*A new breakwater **may** be required at Toft to accommodate overnight berthing.*	*A new breakwater would be required at Toft to accommodate overnight berthing. An additional layby berth would be required for the third vessel.*	*Very limited ground investigation and high levels of technical uncertainty*
Operational Feasibility	-	-	*Additional crew and fuel would be required*	*See Section 1.4 – fixed links.*
Affordability	*The total cost of this option would be £21.5m. No expenditure required until 2030+ though.*	*The total cost of this option would be £30.15m. No expenditure required until 2030+ though. If a breakwater was required at Toft, this would cost an*	*The total cost of this option would be £38.8m. No expenditure required until 2030+ though. There is also a significant increase in revenue costs (see below).*	*See Table 1.1*

[110] This option would return is a minor negative if a breakwater is required for overnight berthing at Ulsta.

	Option C1 – Replace *Dagalien & Daggri* like-for-like, 2 * TYPE 3	Option C2 – Replace *Dagalien & Daggri* with 2 * TYPE 4 vessels	Option C3 – Replace *Dagalien & Daggri* with 3 * TYPE 3 vessels	Option C4 – Fixed Link (tunnel) between Yell & Shetland Mainland
		additional £6.6m		
Public Acceptability	*Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options*	*Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options*	*Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options*	*A fixed link options is favoured by many on the island.*

11.3.7 The key points from above appraisal against the STAG criteria are:

- The two vessel solutions **(Options C1 and C2)** would offer minor environmental benefits from the operation of newer and more efficient vessels. Migrating to a three vessel solution **(Option C3)** would have a minor negative impact caused by an increase in emissions and the need for a new breakwater at Toft. A fixed link **(Option C4)** would likely record moderate negative environmental impacts, although it is assumed that design and build would be carried out in an environmentally sensitive manner.

- The fixed link option **(Option C4)** offers the single largest contribution to the STAG criteria (as well as the objectives). Whilst this is the case, there is considerable technical uncertainty surrounding a fixed link and the likelihood / timeline for securing central government funding. The initial capital cost estimates for a fixed link are also significantly in excess of the ferry related options.

- The three ferry option **(Option C3)** would offer additional benefits in terms of economy and accessibility over and above the like-for-like **(Option C1)** and two larger vessels **(Option C2)** options. However, it is questionable whether the evidenced transport problems and forecast demand for the service would merit a third vessel, particularly given the cost differential with the Do Minimum.

- The Yell Community Council has indicated that, in their opinion, a fixed link is the only acceptable option for the future of the community.

11.4 Appraisal of Revenue Options

Revenue Options

11.4.1 The following revenue options were identified for Yell:

- **Option R1: Offer an on-request early departure from Yell, which would allow connection with the first flights from Sumburgh**
  - This service would operate Monday - Friday and would depart Ulsta around 0500.
  - This would result in a maximum of 260 (5*52) additional return sailings per annum, assumed to be charged at unsocial overtime rates.

- **Option R2: Offer additional request sailings on Friday and Saturday evenings (through 0200)**
  - This would result in a maximum of 104 (2*52) additional return sailings per annum, assumed to be charged at unsocial overtime rates.

- **Option R3: Operate standard weekday timetable seven days a week**
  - The current standard weekday timetable (operated Tuesday–Friday) would be operated at the weekends (Monday would remain the scheduled maintenance day). This broadly represents a return to the per 2013 cuts timetable.
  - This would result in 988 additional return sailings per annum, assumed to be charged at unsocial overtime rates.
- **Option R4a: Run both vessels for the full operating day seven days a week**
  - The current day vessel would operate on the same basis as the shift vessel, providing a two vessel service for the full operating day, seven days a week.
  - This would result in 3,536 additional return sailings per annum, assumed to be charged at overtime rates plus unsocial after 2230 and at weekends.
- **Option R4b: Run both vessels for the full operating day Monday to Friday**
  - The current day vessel would operate on the same basis as the shift vessel, providing a two vessel service for the full operating day, five days a week.
  - This would result in 1,820 additional return sailings per annum, assumed to be charged at standard overtime rates plus unsocial after 2230.
  - The route would operate with a single vessel at the weekend.

Appraisal of Revenue Options

Appraisal against Objectives

11.4.2 The following sections contain the appraisal of each revenue option against the study objectives and the STAG criteria.

Table 11.4: Yell Revenue Options – Appraisal against Objectives

	Option R1 – Offer an on request early departure from Yell for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7-days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	-	-	✓	✓	-
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting.	-	-	-	-	-
TPO2b: Where an island does not have a	NA	NA	NA	NA	NA

	Option R1 – Offer an on request early departure from Yell for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7-days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit a half day (e.g. 4 hours) in Lerwick, 7 days a week, all year round.					
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	✓	✓	✓✓	✓✓✓	✓✓
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	-	-	✓✓✓	✓✓✓	-
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	✓✓✓	-	✓	✓	✓

11.4.3 The proposal for an early morning departure from Yell to connect with the first flights **(Option R1)** would have a major impact in terms of strategic connectivity. If this service were to be realised, Yell residents would be able to make a day return to the Scottish mainland by air. At the other end of the day, the extension of the Friday and Saturday timetable to 0200 **(Option R2)** would offer a benefit in terms of service frequency, although the off-peak nature of these sailings means there would be little contribution to the other objectives.

11.4.4 **Options R3, R4a and R4b** all relate to improvements to the service frequency. The benefit of **Option R3** is an enhanced weekend service, effectively offering the weekday timetable on a Saturday and Sunday (restoring the timetable to the pre-2013 budget cuts). The option would also enhance the overall service frequency from Yell.

11.4.5 **Options R4a and R4b** would result in a significant timetable improvement for Yell. This option would involve converting the 'day boat' into a 'shift boat' and running both vessels for the entire eighteen hour operating day (Option R4a, 7 days a week and Option R4b, Monday – Friday). Both options would increase the frequency of the service and overall level of connectivity. **Option R4b** would additionally equalise the weekday and weekend timetables, addressing the lower level of service for Yell at weekends.

Appraisal against STAG Criteria

Table 11.5: Yell Revenue Options – Appraisal against STAG Criteria

	Option R1 – Offer an on request early departure from Yell for connections to Sumburgh	Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	Option R3 – Operate standard weekday timetable 7-days a week	Option R4a – Run both vessels for the full operating day, 7 days a week	Option R4b – Run both vessels on a shift vessel basis Monday - Friday
Environment	✖	✖	✖	✖	✖
Safety	-	✖	✖	✖	✖
Economy	✓	✓	✓	✓✓✓	✓✓
Integration	✓✓	-	✓	✓✓	✓✓
Accessibility & Social Inclusion	✓	✓✓	✓✓	✓✓✓	✓✓
Established Policy Directives	✓	✓	✓	✓	✓
Technical Feasibility	-	-	-	-	-
Operational Feasibility	*No operational issues but crew overtime & fuel required*	*No operational issues but crew overtime & fuel required*	*No operational issues but additional crew & additional fuel would be required*	*No operational issues but a full additional crew & additional fuel would be required*	*No operational issues but additional crew & additional fuel would be required*
Affordability	*Minor reduction from the present day based on capital Option C1*	*Minor reduction from the present day based on capital Option C1*	*Minor reduction from the present day based on capital Option C1*	*£385k increase on current costs of £2.3m*	*£116k increase on current costs of £2.3m*
Public Acceptability	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*	*No opposition to any of the revenue options was expressed during the public consultation*

11.4.6 The key points from above appraisal against the STAG criteria are:

- **Option R1** would have a notably positive impact on transport integration, allowing Yell residents to catch the morning flights from Shetland. The enhanced connectivity would improve community and comparative accessibility, which in turn would promote minor economic (TEE and wider / EALI) benefits.

- The on-request late night sailings on a Friday and Saturday **(Option R2)** would significantly enhance community accessibility, allowing Yell residents to partake in evening social activities in Lerwick. This would support island life and potentially help promote population retention.

- The operation of the standard weekday timetable seven-days per week **(Option R3)** would provide moderate benefits in terms of weekend connectivity. The operation of both vessels for the full operating day **(Options R4a and R4b)** would significantly enhance accessibility and social inclusion, giving rise to TEE benefits (through enhanced

frequency) and a wider range of EALI benefits for e.g. residents, tourism, locally traded services etc. Clearly, the magnitude of the benefits would be significantly greater with the realisation of this option over seven as opposed to five days.

- In terms of affordability, Options R1 and R2 would be relatively low cost (although with proportionately lower benefits). Options R3, R4a and R4b would all involve significant additional crewing increments, with Option R4a being the most crew intensive.

11.5 Annual Operating Cost Estimates

Current Revenue Budget

11.5.1 In 2015/16 there were approximately 15,300 single sailings between Yell and Shetland mainland. The revenue costs and income associated with operating the Yell Sound ferry service was as follows:

Table 11.6: Yell Sound Costs

Cost Element	2015-16 (£)
Vessel - Employee Costs	£1,769,494
Vessel - Fuel	£502,347
Vessel - Maintenance	£629,767
Vessel - Other Costs	£316,108
Vessel Total	**£3,217,716**
Terminal - Maintenance	£8,621
Terminal - Other Costs	£34,865
Terminal Total	**£43,486**
Route Total	**£3,261,202**
Route Income	*-£992,466*
Route Net Cost	**£2,268,736**

11.5.2 In addition to these costs an internal berthing charge of £1,937,791 was paid on this route. This is by some distance the largest berthing charge paid on the network reflecting the large vessels (gross tonnage) and the frequent service.

11.5.3 The total net revenue cost of any service option is a combination of characteristics of the asset(s) used, the timetable operated and the fares income generated. The current Yell service costs around **£2.3m** per annum (net) to operate.

11.5.4 An estimate of the annual net revenue budget costs associated with the main permutations of vessels (Capital - 'C') and timetables (Revenue -'R') outlined above is shown in the chart below. The figures shown on the horizontal axis are the estimated net annual revenue costs associated with each option.

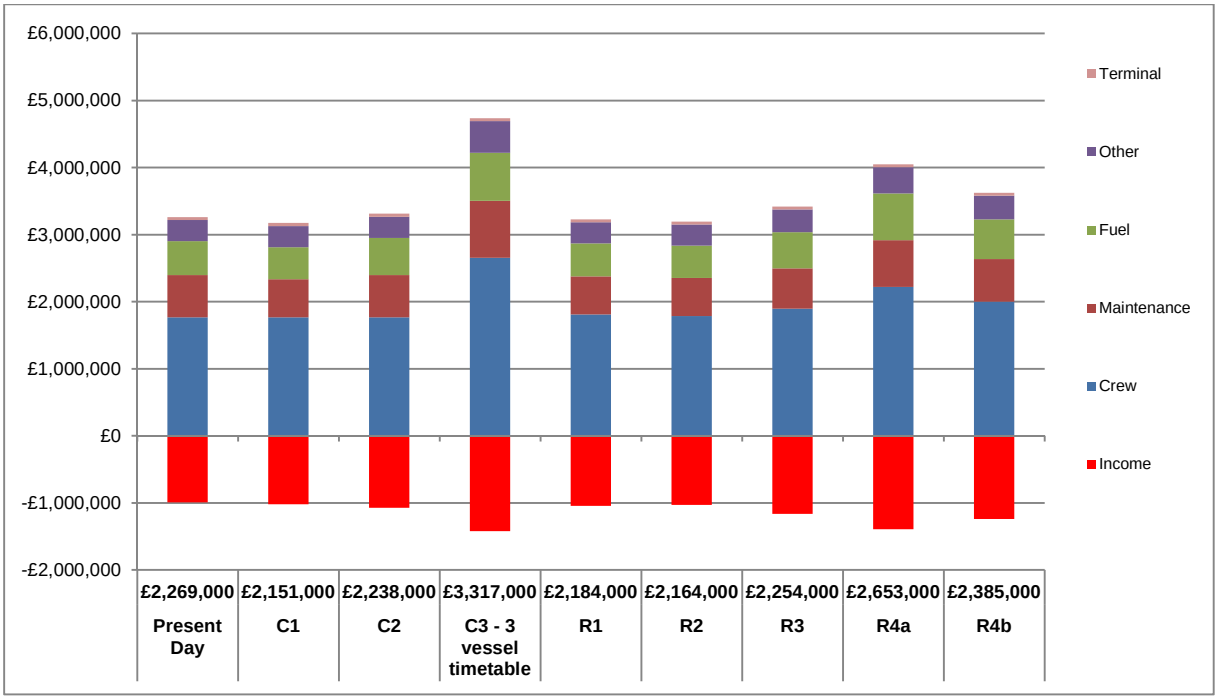


Figure 11.1 Yell Annual Revenue Cost Estimates

11.5.5 The main points to emerge from the above are:

- C1: new vessels of a similar size bring reduced costs due to improved efficiency
- C2: larger vessels see increased fuel costs but no major change from the present day
- C3: large increase associated with a third vessel
- Of the revenue options, Option R4a sees the biggest increase as this represents the maximum deployment of the two vessels

11.6 Public Consultation – Prioritisation

11.6.1 Chapter 1 described the Public Engagement undertaken in August / September 2016. A key part of this was the identification of priorities for enhancements to services in the event of additional resources being available. The public were provided with a list of potential enhancements and invited to tick the three that they would prioritise.

11.6.2 This list comprised improvements to aspects of connectivity associated with ferry and where appropriate air services. Whist it did not include Fixed Links as an option, there was on 'Other – Please Specify' option. In addition, question 3 on the proforma asked: '*Do you have any comments on the future transport options presented?*' and this provided a further option for views on fixed links to be expressed.

11.6.3 The number of completed questionnaires from Yell was **135**.

11.6.4 The figures below show the percentage of respondents who ticked each option. The blue bars relate to the options provided in the survey with the red bars showing options provided by respondents under the 'Other – Please Specify' option. Note that these columns do not sum to 100% as the question allowed three responses.

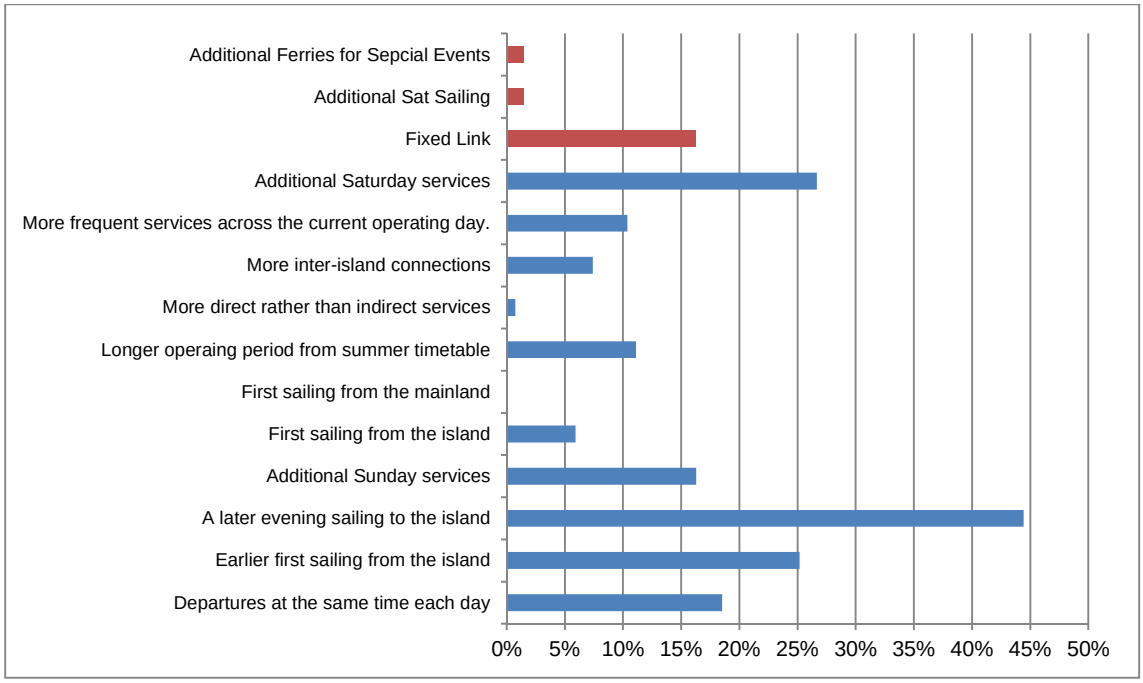


Figure 11.2: Yell – Prioritisation of Enhancements

11.6.5 The top priority for Yell residents was a later evening sailing to the island, followed by additional Saturday service and an earlier first sailing. Around 15% of respondents replied 'Other – Fixed Link'.

11.6.6 When asked for comments on the options, 57% of respondents noted a desire for a fixed link solution. Others expressed a desire to continue with ferry services.

11.6.7 The chart below provides an indication of the frequency by which other issues were raised across all questions in the survey (excluding fixed links which has been noted above).

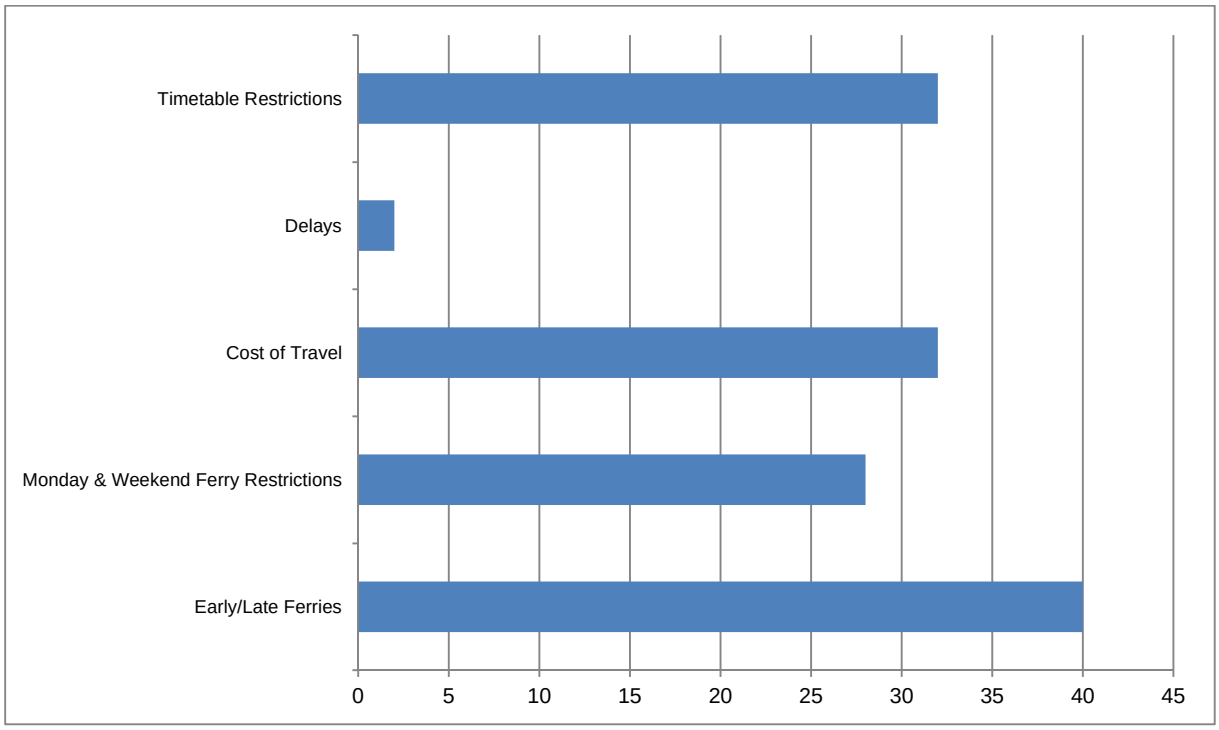


Figure 11.3: Yell – Other Issues Raised (Frequency)

11.6.8 In line with the above, the related main issue raised in Yell was the need for earlier and later ferries, and restrictions caused by single vessel operation at the weekend and the Monday maintenance period and the cost of travel.

11.7 Rationale for Selection / Rejection

11.7.1 The table below summarises the options together with our initial recommendation as to whether the option should be taken forward for more detailed appraisal.

Table 11.7: Outcome of Appraisal, Yell

Capital & Revenue Options	Take Forward (✓) / Reject (✗)	Ration for Selection / Rejection
Option C1 – Replace *Dagalien* & *Daggri* with like-for-like TYPE 3 vessels	✓	The current vessels meet the needs of the route in terms of capacity and frequency. Like-for-like remains appropriate.
Option C2 – Replace *Dagalien* & *Daggri* with 2 * TYPE 4 vessels	✓	This option provides scope for the growth of Yell, Unst and Fetlar and alleviates any existing capacity issues. Detailed cost and demand analysis required when comparing this option with Option C1.
Option C3 – Replace *Dagalien* & *Daggri* with 3 * TYPE 3 vessels	✗	A three vessel solution would be disproportionate for the length of the crossing, particularly given the need for significant infrastructure works at Toft.
Option C4 – Fixed Link (tunnel) between Yell & Shetland Mainland	✗	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Option R1 – Offer an on request early departure from Yell for connections to Sumburgh	✓	This is a relatively low cost option which could meet a specific requirement for early connections to Sumburgh from the island. The crewing issues surrounding this should be considered further.
Option R2 – Offer additional request sailings on Friday and Saturday evenings (through to 0200)	✓	This is a relatively low cost option which could meet a specific requirement for late connections to the mainland from the island. The crewing issues surrounding this should be considered further.
Option R3 – Operate standard weekday timetable 7-days a week	✓	This option would largely reverse the 2013 service revisions by re-instating the 7-day operation of the two vessels. This option should be considered further in relation to the costs and benefits of this option. Historic carryings data could be used to determine the impact of the service changes and hence the likely increase if these changes were reversed.
Option R4a – Run both vessels for the full operating day, 7-days a week	✗	This option represents the maximum level of service with 2-vessels, with both ferries running a 16-18 hour operating day 7-days per week. This level of service would seem excessive during off peak periods, particularly if there are larger capacity vessels deployed on the route.
Option R4b – Run both vessels on a shift vessel basis Monday - Friday	✓	This option would provide a 16-18-hour 2-vessel service on weekdays providing increased capacity and frequency during the evening. The potential demand for this should be explored further.

12 Financial Summary

12.1 Introduction

12.1.1 This Chapter brings together the key financial information associated with the remaining options, ie the options which it is proposed are taken into consideration at Outline Business Case stage. The options which are not recommended to be taken forward are not included in the following tables. At OBC stage, the costs and benefits associated with each option would be developed in more detail and quantified, and a preferred option would be identified.

12.1.2 It should therefore be recognised that these are initial high level cost estimates commensurate with the SBC stage of the process. They should be regarded as indicative of the broad orders of magnitude of the options relative to one another with a view to determining which options are taken forward to the next stage.

12.1.3 Outturn costs would be dependent on exact vessel specifications, procurement and financing strategies, implications on crewing and crew terms and conditions, fuel prices, and more detailed evaluation of the scope of harbour and ship to shore infrastructure works required to accommodate the preferred vessel design.

12.1.4 Note that any OBC would also have to take cognisance of any changes to fares policy which may emerge in the short or medium term.

12.1.5 In the tables which follow, figures in *italics* are derived on a *pro-rata* basis from other options from which values have been calculated.

12.2 Bluemull Sound

Summary of Cost Estimates

Table 12.1: Summary of Ferry Options Costs – Bluemull Sound

	Capital			Annual Revenue Costs			
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R2 early / late**	**R3 7-day**	**Implied timetable**
Present Day				£2,189k			
C1* 2 * 'Type 1'	£11.0m	£6.9m	**£17.9m**	£2,462k	£2,496k	£2,721k	
C2* 2 * 'Type 2' Vessels	£14.m	£9.15m	**£23.2m**	£2,473k	*£2,518k*	*£2,739k*	
C3* 3 * 'Type 2a' Vessels	£16.5m	£6.9m	**£23.4m**				£3,544k

12.2.1 For the Bluemull Sound routes, the capital spend is estimated at between £18m and £23m. Annual revenue costs are estimated to range between £2.5m and £3.6m.

Priorities

12.2.2 The two Bluemull Sound vessels are 25+ years old and do not meet modern design requirements. There are also capacity issues on the route. It is therefore recommended that

an OBC for Bluemull is undertaken in the **short-medium** term to determine the future capital and revenue preferred options for the route.

Key Issues for OBC / Selection of Preferred Option

- Further detailed analysis of origin-destination based carryings data to inform the balance of services and connections between Unst and Fetlar, and Yell
- Detailed analysis of whether a three vessel solution is required or whether a two vessel solution can meet the needs of both islands in terms of connectivity, capacity and timetable.
- Allied to this would be detailed vessel specification work to ensure that the new vessels meet the needs of the route. This would also consider the potential for redeployment in the event of any fixed link being implemented.
- Resource implications of resuming a 2-vessel operation at the weekend
- Detailed analysis of cost and operational issues of running air services to Unst, together with market research to establish potential demand
- Analysis of sensitivity to potential changes to fares policy

12.3 Bressay

Summary of Cost Estimates

Table 12.2: Summary of Ferry Options Costs – Bressay

	Capital			Annual Revenue Costs		
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R1 early sailing**	**R2 additional peak hour**
Present Day				£804k		
C1 1 * LFL 'MV *Leirna*' Vessel	£4.5m	£0	**£4.5m**	£748k	£758k	£707k
C2 1 * Larger 'MV *Leirna*' Vessel	£6.0m	£1.6m	**£7.6m**	£779k	*£789k*	*£736k*
C4 Supplementary Passenger vessel	£750k	*	**£750k**	*		

* would depend on timetable operated

12.3.1 For the Bressay route, the capital spend is estimated at between £4.5m and £8.3m. Annual revenue costs are estimated to range between £750k and £800k plus any additional net running costs associated with a passenger vessel.

Priorities

12.3.2 The MV *Leirna* was built in 1992 and will thus be in need of replacement in the **medium term** (the next decade).

12.3.3 Most of the issues surrounding this service could be resolved in the short term with increased revenue resource and this should be the priority here. A key issue for Bressay is fares and if action were to be taken on fares, any substantive response in terms of demand may bring forward the requirement for additional capacity on the route.

Key Issues for OBC / Selection of Preferred Option

- Further detailed analysis of carryings data to inform the detailed vessel specification at life expiry of the MV *Leirna*.
- Determine crewing resource issues surrounding earlier start to operating day
- What role could a passenger only vessel fulfil?
- Analysis of sensitivity to potential changes to fares policy

12.4 Fair Isle

Summary of Cost Estimates

Table 12.3: Summary of Ferry Options Costs – Fair Isle

	Capital			Annual Revenue Costs	
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R1 increased ferry frequency**
Present Day				£315k	
C2 1 * bespoke RoRo vessel	£3.0k	£2.75m	**£5.75m**	£389k	£432k
C4 1 * Fair Isle based passenger vessel and shared freighter	£4.0m	-	**£4.0m**	£362k plus passenger vessels costs (not known at this stage)	*
C5 Mainland based larger LoLo	£3.0m	£2.4m	**£5.4m**	£547k	*

* would depend on timetable operated

12.4.1 For the Fair Isle route, the capital spend is estimated at between £4.0m and £5.8m. Annual revenue costs are estimated to range between £390k and £550k.

Priorities

12.4.2 The MV *Good Shephard IV* is the vessel in most immediate need of replacement in the fleet. It is suggested that a common OBC could be undertaken for Fair Isle, Foula, Papa Stour and Skerries given that they are linked by the air network and potential shared vessel options. This should be undertaken in the **short term**.

12.4.3 Following the OBC work, we would envisage that Fair Isle would then progress swiftly to the Final Business Case.

12.4.4 In the short term, revenue based measures could be implemented via the air service contract to increase flight numbers.

Key Issues for OBC / Selection of Preferred Option

- Of the three shortlisted options, C2 appeared to be preferred. The OBC should seek to confirm this or otherwise by working up the detail of how the three options would be implemented in practice as well as the costs associated with each.
- Determine the detailed vessel specification and operational arrangements in close cooperation with local community to ensure buy in to the emerging vessel specification. This would include a review of options for overnight berthing of the vessel in Fair Isle.
- Determine the feasibility of running addition timetabled flights to Fair Isle and how this can be implemented from (i) an island based resource perspective (airfield staffing), and (ii) through the current contract and the resources available to the air service operator.
- Analysis of sensitivity to potential changes to fares policy

12.5 Foula

Summary of Cost Estimates

Table 12.4: Summary of Ferry Options Costs – Foula

	Capital			Annual Revenue Costs	
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R1 increased ferry frequency**
Present Day				NA	
C1 1 * Like for Like LoLo vessel	£1.0k	£0.0*	**£1.0m**	NA	NA
C4 1 * Foula-based passenger vessel and shared freighter	£4.0m	£0.0*	**£4.0m**	NA	NA

* excluding ongoing dredging costs

12.5.1 For the Foula route, the capital spend is estimated at between £1.0m and £4.0m. Annual revenue costs cannot be estimated due to the nature of the Foula contract.

12.5.2 A further option R3 comprised sharing the Papa Stour vessel.

Priorities

12.5.3 The short term priority for Foula is to find a resolution to the issue surrounding the operational arrangements for the airstrip and the futureproofing of services.

12.5.4 It is suggested that a common OBC could be undertaken for Fair Isle, Foula, Papa Stour and Skerries given that they are linked by the air network and potential shared vessel options. This should be undertaken in the **short term**.

12.5.5 In the short term, revenue based measures could be implemented via the air service contract to increase flight numbers

Key Issues for OBC / Selection of Preferred Option

- Public consultation in Foula suggested that the current population was largely content with the existing ferry service arrangements. As the island appears to be on a sustainable footing in terms of population and demography, the OBC should seek to confirm this with the local population.
- Determine the feasibility of running addition timetabled flights to Foula and how this can be implemented from (i) an island based resource perspective, and (ii) through the current contract and the resources available to the air service operator.
- Analysis of sensitivity to potential changes to fares policy

12.6 Papa Stour

Summary of Cost Estimates

Table 12.5: Summary of Ferry Options Costs – Papa Stour

	Capital			Annual Revenue Costs		
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R1a 2 crossings per day 7 days**	**R1a 2 crossings per day 7 days – no air service**
Present Day				£428k		
C1 1 * Like for Like vessel	£3.0k	£0.25	**£3.25m**	£402k	£673k	£673k**
C3 MV *Filla*	£0.0m*	£0.35*	**£0.4m**	£717k	*£1,200k*	£1,200k**

* excludes cost of replacement Skerries vessel
** assuming the air resource is redeployed

12.6.1 For the Papa Stour route, the capital spend is estimated at between £0.4m and £3.25m. Annual revenue costs associated with these options range from £400K to £1,200k.

Priorities

12.6.2 Although the MV *Snolda* is aging she is a very lightly used vessel which meets the current needs of the island. The short term priority for Papa Stour is to consider the continuation of air services to the island.

12.6.3 Given the very low population levels in Papa Stour, a wider community planning based approach will be necessary to consider the future development of the island.

12.6.4 It is suggested that a common OBC could be undertaken for Fair Isle, Foula, Papa Stour and Skerries given that they are linked by the air network and potential shared vessel options. This should be undertaken in the **short term**.

Key Issues for OBC / Selection of Preferred Option

- Wider questions about sustainability of the island
- Future of air service – currently limited due to lack of fire cover

- Suitability of MV *Filla* as an alternative for route given its high running costs
- Suitability of other SIC vessels which may become available as other assets are replaced
- Analysis of sensitivity to potential changes to fares policy

12.7 Out Skerries

Summary of Cost Estimates

Table 12.6: Summary of Ferry Options Costs – Skerries

	Capital			Annual Revenue Costs		
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**Option R2 – Return sailing from Skerries on a Tuesday & Thursday**	**Option R3 – Two return Vidlin services or one return Lerwick service seven days a week**
Present Day				£924k		
C1 1 * Like for Like vessel	£4.1m	£800k	**£4.9m**	£829k	£909k	£1,030k
C2 1 * Smaller RoRo vessel	£3.0	£2.1m	**£5.1m**	£619k	*£679k*	*£769k*

12.7.1 For the Out Skerries route, the capital spend is estimated at between £4.9m and £5.1m. Annual revenue costs associated with these options range from £825k to £1,030k.

Priorities

12.7.2 The short term priority for Out Skerries is to consider the continuation of air services to the island.

12.7.3 It is suggested that a common OBC could be undertaken for Fair Isle, Foula, Papa Stour and Skerries given that they are linked by the air network and potential shared vessel options. This should be undertaken in the short term.

Key Issues for OBC / Selection of Preferred Option

- Future of air service – currently limited due to lack of fire cover
- Potential to move to island based crewing
- Size of vessel and arrangements for overnighting in Out Skerries
- Future role for MV *Filla* if taken off the Skerries route
- Analysis of sensitivity to potential changes to fares policy

12.8 Whalsay

Summary of Cost Estimates

Table 12.7: Summary of Ferry Options Costs – Whalsay

	Capital			Annual Revenue Costs					
Option	**Vessel**	**Harbour**	**Total**	**Current time-table**	**R1**	**R2**	**R3**	**R4b**	**Implied time-table**
Present Day				£2,245k					
C2 2 * Larger 'Type 2' vessels	£14.0m	£9.2m	**£23.2m**	*£2,333k*	*£2,400k*	*£2,361k*	*£2,512k*	*£2,919k*	
C3 3 * LfL 'Type 1' Vessels	£16.5m	£4.65	**£21.2m**						£3,429k
C4 North Voe harbour		£15.5m	**£15.5m**						

12.8.1 For the Whalsay route, the capital spend is estimated at between £21m and £38m. Annual revenue costs are estimated to range between £2.3m and £3.4m.

Priorities

12.8.2 Capacity issues and the age of the MV *Hendra* in particular make this a priority for OBC in the **short term**. There has been limited investment in this route in recent years.

Key Issues for OBC / Selection of Preferred Option

- Detailed analysis of carryings data and unmet demand to determine optimum vessel size and characteristics. This could usefully be informed via an onboard survey.
- Potential benefits of North Voe harbour
- Detailed analysis of whether a three vessel solution is required or whether a two vessel solution can meet the needs of Whalsay in terms of connectivity, capacity and timetable. Allied to this would be detailed vessel specification work to ensure that the new vessels meet the needs of the route. This would also consider the potential for redeployment in the event of any fixed link being implemented.
- Resource implications of resuming a 2-vessel operation at the weekend and the other detailed revenue options
- Analysis of sensitivity to potential changes to fares policy

12.9 Yell

Summary of Cost Estimates

Table 12.8: Summary of Ferry Options Costs – Yell

	Capital			Annual Revenue Costs				
Option	**Vessel**	**Harbour**	**Total**	**Current timetable**	**R1**	**R2**	**R3**	**R4b**
Present Day				£2,269k				
C1 2 * LfL 'Type 3'	£21.4m	£100k*	**£21.5k**	£2,151k	£2,184k	£2,164k	£2,254k	£2,385k
C2 2 * Larger 'Type 4' Vessels	£29.5m	£650k*	**£30.15k**	£2,238k	*£2,272k*	*£2,252k*	*£2,345k*	*£2,481k*

12.9.1 For the Yell route, the capital spend is estimated at between £21.5m and £30m. Annual revenue costs are estimated to range between £2.2m and £2.5m.

Priorities

12.9.2 The immediate problems associated with the Yell Sound routes could be addressed via additional revenue resource to essentially reverse the service cuts made in 2013. An OBC for Yell is therefore not required until the **medium term**.

Key Issues for OBC / Selection of Preferred Option

- Detailed analysis of carryings data and unmet demand to determine optimum vessel size and characteristics
- Allied to this would be detailed vessel specification work to ensure that the new vessels meet the needs of the route. This would also consider the potential for redeployment in the event of any fixed link being implemented.
- Resource implications of resuming a 2-vessel operation at the weekend and the other detailed revenue options
- Analysis of sensitivity to potential changes to fares policy

List of Abbreviations

The following abbreviations are used within this report and the accompanying Appraisal Summary Tables:

AGL – Aircraft Ground Lighting

AIRAC – Aeronautical Information Regulation and Control

AvGas – Aviation Gasoline

BN – Britten Norman

CAA – Civil Aviation Authority

CHFS – Clyde & Hebridean Ferry Services

DIPTAC – Disabled Persons Transport Advisory Committee

EALI – Economic Activity and Location Impacts

EASA – European Aviation Safety Agency

FBC – Final Business Case

FTE – Full-Time Equivalent

GDL – Garden and Designed Landscape

GIS – Geographic Information Systems

GCR – Geological Conservation Review

GNSS – Global Navigation Satellite System

HES – Historic Environment Scotland

HIAL – Highlands & Islands Airports Limited

HRA – Habitats Risk Assessment

IFR – Instrument Flight Rules

IMDG – International Dangerous Goods Code

ITT – Invitation to Tender

LDP – Local Development Plan

Lo-Lo – Lift-on, lift-off

LfL – Like-for-like

LNG – Liquefied Natural Gas

LOA – Length Overall

MCA – Maritime & Coastguard Agency

MGN – Maritime Guidance Note

MPA – Marine Protected Area

MSN – Merchant Shipping Notice

NATS AIS – National Air Traffic Aeronautical Information Service

NNR – National Nature Reserve

NSA – National Scenic Area

OBC – Outline Business Case

OJEU – Official Journal of the European Union

PAPI – Precision Approach Path Indicator

PCU – Passenger Car equivalent Unit

PSO – Public Service Obligation

RFFS – Rescue & Fire Fighting Services

RET – Road Equivalent Tariff

Ro-Pax – Passenger carrying Ro-Ro vessel

Ro-Ro – Roll-on, roll-off

RSM – Routes & Services Methodology

SAC – Special Area of Conservation

SBC – Strategic Business Case

SEPA – Scottish Environment Protection Agency

SET – Single-Engine Turbine

SIC – Shetland Islands Council

SIITS – Shetland Inter-Island Transport Study

SM – Scheduled Monument

SNH – Scottish Natural Heritage

SPA – Special Protection Area

SSSI – Site of Special Scientific Interest

STAG – Scottish Transport Appraisal Guidance

STOL – Short take-off / landing

SWATH – Small water plane area twin hull

TEE – Transport Economic Efficiency

TPO – Transport Planning Objective

VFR – Visual Flight Rules

WHS – World Heritage Site

ZetTrans – Shetland Regional Transport Partnership

Appendix A Mainland Airfield – the Comparative Merits of Tingwall and Sumburgh

A.1 Background

A.1.1 The Shetland inter-island air service currently operates from the hub airfield of Tingwall, with the exception of one summer Saturday flight which operates to and from Sumburgh. Tingwall has, over many years, proven to be a highly effective airfield, offering relatively quick access to Lerwick and a largely dedicated inter-island air service hub (i.e. no competing traffic).

A.1.2 However, Tingwall Airport imminently requires some significant investment in both the runway and other fixed assets. Initially a new taller Airport Watch Tower is required to satisfy mandated air traffic control requirements and provide better visibility for the controller. The runway has also been assessed as needing resurfacing. Other issues such as an upgrade of the passenger and office facilities and an upgrade of airfield lighting are also likely to be required in the medium-term.

A.1.3 Given the above and the facilities available at Sumburgh, it is therefore appropriate in the context of this study to re-assess the comparative merits of Tingwall and Sumburgh as the base for the inter-island air service.

A.2 Tingwall – Pros and Cons

A.2.1 Tingwall Airport currently provides the base and hub of the current inter-island Public Service Obligation (PSO) air service. The airfield is home to the air operator's Shetland staff with customer facing, pilots and engineering staff being based there. The Tingwall hangar houses the two BN2 Islander aircraft and other third party aircraft, and the apron is easily accessible for passengers and staff from the airport buildings.

A.2.2 Shetland Islands Council (SIC) manages the airport and provides flight information and Rescue & Fire Fighting Services (RFFS). The Council also manages both the maintenance and licensing of the airfield.

A.2.3 The current tendered air service offers a timetable that serves Fair Isle, Foula, Out Skerries (currently suspended) and Papa Stour, and a dial-a-ride delivers bus services links between the airfield and nearby Lerwick (the principal destination for those arriving from the isles).

A.2.4 It should be noted that SIITS is considering options for a new air service from Unst (Fetlar has been ruled out) and options in relation to the withdrawal of the Papa Stour and Skerries services (in tandem with enhanced ferry services). Enhanced service frequencies for Fair Isle and Foula are also under consideration. These options may also have a bearing on the relative role of Tingwall or using an alternative home (Sumburgh Airport) for the PSO network in the life of the islands.

A.2.5 Tingwall Airport also fulfils other functions such as receiving aero medical and coastguard aircraft, whilst also acting as host to commercial and private aircraft.

A.2.6 The SIC Transport Planning Service and wider Council considered the issue (in 2012) of the most appropriate air service in quite some depth prior to the last PSO tender specifications being agreed, and the arguments and issues used at that time can usefully be rehearsed and reviewed here. However, a more thorough examination of the relative costs of each base is appropriate especially as significant capital costs are now required at Tingwall to keep the airfield operational.

A.2.7 The 2012 review of the base for inter-island air services was considered from four perspectives:

- The timescale that would be required to move the base for inter-island air services.
- The adequacy of the services that can be provided to the islands served in terms of meeting economic, social and health needs.
- The overall cost to the Council.
- Comparison of operational costs between Tingwall and Sumburgh.
    - Impacts on the cost of the inter-island air services contract.
    - Cost of providing public transport connections to / from either location.
    - Other risks / constraints

Timescale

A.2.8 It was concluded that it would take 16 to 18 months before operations could be delivered from Sumburgh Airport. It was also considered likely to take a number of months to resolve the detail of the commercial and legal issues to be agreed between Highlands and Islands Airports Limited (HIAL) and Shetland Islands Council. There would be a further period for preparation of the facilities at Sumburgh. (To put this in context, it took 10 months to refurbish the hangar at Tingwall.) This could only commence once a legal agreement had been reached between Shetland Islands Council and HIAL.

Adequacy of Service to the Islands

A.2.9 Consultation with the island communities of Fair Isle, Foula, Papa Stour and Out Skerries concluded that the predominant view of the communities is that Tingwall should remain the base for inter-island air services. This view was robustly confirmed as part of the SIITS public engagement programme in the respective islands.

A.2.10 The 2012 review also consulted residents and community groups, with Fair Isle and Foula residents in particular providing a great deal of feedback on this matter. The consultation involved a wide range of questions, but the consolidated summary of results was resoundingly negative to the prospect of closing Tingwall, as is illustrated in Figure1 below.

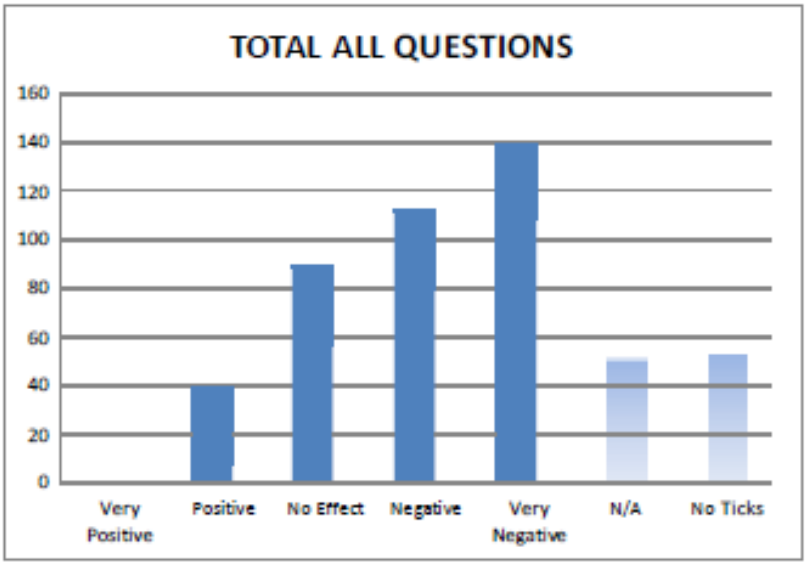


Figure 1: Consolidated Results of 2012 Review

A.2.11 The most significant issue arising from the consultation for all the islands is that operating out of Sumburgh Airport would place significant constraints on the ability of the island

communities to access essential services and conduct every day activities. Even if it proves cheaper to provide operations out of Sumburgh, if the services are judged to be inadequate then a move to Sumburgh would not be supported by islanders.

A.2.12 The main constraint is the additional travelling time from Sumburgh to Lerwick compared with Tingwall. If relying on public transport this could, in some cases, lead to less than an hour of useful time in Lerwick, which is clearly insufficient in the context of the overall cost and length of the journey.

A.2.13 Furthermore, it would constrain the ability of services and contractors to access the various islands resulting in increased costs to communities or even a reduction in services and trades being provided to the islands concerned. Many of the services accessing the islands are Council provided services and therefore efficiency of provision would decrease and cost would increase.

A.2.14 Another point to consider is the relationship between the air service and the ferry service to Foula. It is common that when air services or ferry services are disrupted then suppliers will put freight and supplies to either the ferry or the plane depending on requirements. Many of the suppliers (e.g. shops and veterinary practices) are based in Lerwick and the west of Shetland and therefore are unlikely to be able to provide the same flexibility at Sumburgh as they can provide to Tingwall / Walls. This is not an issue in relation to Fair Isle.

A.2.15 On the basis of these issues, it was concluded that the base for inter-island air services should remain at Tingwall, recognising that it best meets the economic, social and health needs of the islands served.

Overall Cost to the Council

A.2.16 The overall cost to the Council of providing the inter-island air service was considered in 2012 under four headings.

- the cost of airport operations (be it Tingwall or Sumburgh);
- impacts on the cost of the Inter-Island Air Services contract;
- ongoing maintenance costs at Tingwall and/ or decommissioning; and
- public transport costs.

A.2.17 In an attempt to make a like-for-like comparison of the costs of providing inter-island air services from Sumburgh, the following estimates were produced.

	Financial Year 2013/14				Financial Year 2014/15				Financial Year 2015/16			
	Tingwall		Sumburgh		Tingwall		Sumburgh		Tingwall		Sumburgh	
	Revenue Costs	Capital Costs	Revenue costs	Capital Costs	Revenue Costs	Capital Costs	Revenue costs	Capital Costs	Revenue Costs	Capital Costs	Revenue costs	Capital Costs
Revenue cost Tingwall	180838				163738				163378			
Capital Costs		40000		100000		15000				15000		
Landing Charges	0		19000		0		19000		0		19000	
Additional Fuel Costs	0		11440		0		11440		0		11440	
Rates and Utilities	Inclusive		25000		Inclusive		25000		Inclusive		25000	
Hangar Leasing Costs	N/A		40000		N/A		63750		N/A		85000	
Energy Costs	Inclusive		6500		Inclusive		6500		Inclusive		6500	
Maintenance	Inclusive		8500		Inclusive		8500		Inclusive		8500	
Public Transport	8000		80000		8000		80000		8000		80000	
Totals	188838	40000	190440	100000	171738	15000	214190	0	171378	15000	235440	0
Grand Total	£228,838		£290,440		£186,738		£214,190		£186,378		£235,440	

Figure 2: Like-for-Like Costs – Tingwall v Sumburgh

A.2.18 The anticipated financial benefit to SIC did not materialise at all in using Sumburgh and closing Tingwall. In fact Sumburgh proved more expensive to SIC than Tingwall in each of the three years forecast.

A.2.19 Several reservations can be raised about these comparative financial figures.

- The current capital costs of necessary upgrades to Tingwall were not included in this period of comparison (runway upgrade and watchtower installation are now pressing, although they appear not to have been included in the calculations in 2012).
- Negotiations with HIAL and the Sumburgh fuel supplier were not undertaken in any depth, and price concessions may have been forthcoming if there was a real prospect of a move.
- The additional fuel costs were compared on a per litre basis and this runs counter to the fact that Tingwall is almost double the airborne distance from Fair Isle – the most frequently serviced route – than Sumburgh. Foula – the second most frequent route – is almost equidistant from Tingwall and Sumburgh. Air distances and fuel consumption to Papa Stour and Skerries would of course increase. These costs could have been examined in more detail, and it is likely that the difference would not have been so much in Tingwall's favour.
- The calculations were based upon SIC budgets, and not total public funds (HIAL's subsidy for Sumburgh for instance is delivered via Transport Scotland).

A.2.20 This review revisits some of these cost issues, especially in light of the prospect of significant capital outlay for Tingwall.

Other Risks and Constraints

A.2.21 Over the previous two years (as of 2012) the Council had invested over £600,000 in improving facilities at Tingwall Airport, which was aimed at bringing the airport up to modern standards of airport operations, meeting health & safety standards, reducing operational costs at the airport and reducing the costs of the next air services contract through improved facilities for maintenance, fuel supply, and operational conditions at the airport. If the Council now chose to move operations from Tingwall to Sumburgh, this investment would in effect be non-recoverable.

A.2.22 The loss of strategic control by SIC was cited in 2012 as a real concern as although HIAL is government owned, its agenda and priorities could stray from SIC's more particular agenda and priorities (given the need to trade-off the needs of different users). Increased cost and a reduced ability to speedily address any operational concerns seemed to generate particular nervousness.

A.2.23 Several key stakeholder respondents also raised concerns about losing the current service responsiveness, as the BN2 Islander and its passengers would have to join queues of other traffic and priorities at Sumburgh both on the airfield and in the terminal, for instance when fog cleared. A security free gate (like at Kirkwall) would however no doubt be possible.

A.2.24 There are other users of Tingwall Airport who would also be inconvenienced by its closure.

A.2.25 These include:

- Scottish Ambulance Service – contractor Gamma Aviation using King Air BE200 and Eurocopter EC145s.
- HMCG – contractor Bristows using S92s.

- General Lighthouse Authority (formerly NLHB) – contractor PDG using Eurocopter EC135s.
- Hydro – contractor PDG using various aircraft such as Squirrel and EC135s.
- Private – various General Aviation visitors.

A.2.26 It should be noted that these other users such as SAS and NHS Shetland should be consulted about any move that might envisage closing Tingwall. This additional traffic represents about 18% of all landings at Tingwall across the year, with air ambulance representing about 4 visits each month.

Table 1: Landings at Tingwall

Landings at Tingwall	2014/15	2015/16
Inter-Island Air Service	649	751
Air Ambulance	40	56
Other Landings	105	98
Total	**794**	**905**

A.2.27 It was also noted that the additional distances to Sumburgh vis a vis Tingwall might place extra time and pressure on the emergency health services as a result of any closure. This is an important issue given the demographics of the islands in question.

Connecting Traffic

A.2.28 No figures for connecting traffic from the Scottish mainland with the outer islands are available because the change in air transport suppliers and the itinerary interchanges make it very difficult to track.

A.2.29 However, it was notable that no stakeholders raised this as a burning concern in this study. With weather related delays running at up to 34%, on some estimates, few onward connecting passengers would rely on their inter-island flight to catch an expensive onward connection to the mainland.

A.2.30 Furthermore, consultations at Kirkwall where the Orkney inter island flights and onward travel flights are co-located, and the numbers using the inter-island service are much greater, the numbers catching immediate onward flights were estimated by booking staff to be only half a dozen each week.

A.2.31 Initially at least, it can be assumed that the interlining effect of co-located air services would be minimal.

Diversion Airfields

A.2.32 The loss of Tingwall as a diversionary airfield would reduce the options for BN2 Islander pilots in the face of bad weather. The only other licensed airstrips on Shetland are Sumburgh, Scatsta or Fair Isle. Scatsta is some 55 miles from Sumburgh. Usually when Sumburgh is closed, Fair Isle is also closed, especially with fog. Apart from that, diversions would be looking at North Ronaldsay or even Kirkwall.

A.2.33 This loss of one diversionary airfield option in the Shetland system could in certain circumstances add an extra level of caution to flight planning and might result in additional cancellations. Procedures would be adjusted to take this reduction in airfields into account.

Capital Costs

A.2.34 The following figures are estimates from SIC Infrastructure Services and have been tabulated as follows.

Table 2: Required Capital Expenditure at Tingwall

Item	Capital Cost	Notes
Runway	£300,000	Required immediately
Watch Tower	£150,000	Required immediately
Terminal Adjustments / Improvements	£100,000	Upgrade of passenger facilities & offices at some point
Tingwall runway lighting renewal	£511,000	Less expensive options may well be available
Total	**£1,061,000**	

A.2.35 The very expensive runway lighting upgrade is possibly a significant overestimate as there may be cheaper fixes (light protectors) or battery operated LEDs (which have been referred to elsewhere in the main report).

Operational Costs

A.2.36 Mention has already been made of upcoming capital costs at Tingwall. An appreciation of running costs is also required to help complete the picture. Examining the operational costs Tingwall, we have come up with the following estimates.

A.2.37 SIC staff costs are broken down between full-time staff at Tingwall (3 full time) part--time staff (4) borrowed from other departments and management time. A total figure of £203,000 for 2015/16 was produced. It is assumed that Council transport staff managing the inter-island PSO are excluded from this, as their contribution to managing the PSO contract will be required under both scenarios.

Table 3: Tingwall Staff Costs

Item	Cost
Employee Costs	£163,919
Recharges to other departments (assumed would still be charged after any move of the mainland airfield)	£39,935
Total Staff Costs	**£203,854**

A.2.38 Depreciation was estimated at £21,087 for 2015/16 and this should properly be added to the annual operational cost. Income from third party users of £66,806 was recorded for that year.

A.2.39 A table was produced to capture all the costs to SIC for each of last three years, and this includes a comprehensive range of other costs such as fuel purchases, travel costs, subscriptions, licences, insurances, rates etc as well as income.

Table 4: Tingwall – Costs for Three Financial Years

	2013/14		2014/15		2015/16	
	Revenue	***Capital***	***Revenue***	***Capital***	***Revenue***	***Capital***
Operating Costs	£477,388		£363,014		£418,687	
Support Ledger Costs	£4,517		£63,682		£39,935	
Depreciation	£14,621		£18,587		£21,087	
Income	-£69,227		-£45,478		-£66,806	
Capital Costs		£28,044		£0		£0
Total	**£427,299**	**£28,044**	**£399,805**	**£0**	**£412,902**	**£0**

A.2.40 A final high level tally is shown in the table below:

Table 5: Total Tingwall Costs 2015/16

Item	Cost
Operating Costs	£412,902
Land Transport Costs	£9,100
Fuel cost (already included in subsidy)	£0
Total	**£422,002**

A.2.41 There are other issues that are harder to quantify. Directflight make some money selling fuel to third party visitors and in a Tingwall closure option they would lose this income, and this may be reflected in their future subsidy requests. Directflight currently employ one engineer in Shetland with the ambition to recruit more. Directflight also currently employ two office staff who accomplish handling and the call centre with help from the engineer and even pilots. It should be noted that all these staff reside close to Tingwall and thus are distant from Sumburgh, and any move would cause disruption to many of these staff. Indeed, some staff may choose to not make the move with the longer commute costs and times. As another example, the CAA require every airport to have an annual survey by a suitably qualified contractor. The current contractor (SLC) surveys all Shetland's airports at the same time to reduce costs. If Tingwall no longer needs a survey, the costs to the remaining airports will increase.

Summary

A.2.42 The table below provides a qualitative summary of the benefits of using Tingwall as the base for the inter-island air service. The scale runs from ✓✓✓, which represents a major positive to ✗✗✗, which represents a major negative.

Table 6: Tingwall – Qualitative Appraisal

Item	Qualitative Scoring	Notes
Social / Consumer		
Convenience to Lerwick	✓✓✓	Improves attractiveness of service
Length of Day Visit	✓✓✓	Improves utility of service
Onward Connectivity	✓✓	Closer to island bus, road and ferry nexus
Onward Air Connectivity	✗	Far from Sumburgh
Key employment location	✓	More dispersed than all centred on Sumburgh
Aeromedical role	✓	Vital-ness to be assessed
Operational		
Agile and responsive	✓✓✓	Simple service that could complicate at Sumburgh
Strategic Control	✓✓	SIC has direct control
Capital Costs		
Significant near term	✗✗✗	Just to keep airfield open rather than improve
Substantial medium term	✗✗	Pax. experience and office Improvements
Running Costs		
Standalone operation	Neutral	Little opportunity for economies of scale or for multi-tasking
More expensive	✗	To SIC than Sumburgh / HIAL option
Cost Risk	✗	Future technology and other upgrades (eg GNSS) fall to SIC
Regulatory / Technology Risk	✗	Further changes create new obligations for SIC
Possible Ameliorations	✗	*Few opportunities to defray the negatives except perhaps runway lighting*

A.3 Sumburgh – Pros and Cons

A.3.1 According to AA Route Planner, the distance is 25.4 miles and takes 37 minutes between Sumburgh and Lerwick, whilst the road journey is 6.7 miles and takes 13 minutes between Lerwick and Tingwall. A time penalty of 24 minutes is therefore imposed on the Sumburgh traveller accessing Lerwick, amounting to nearly a one hour shorter effective day in Lerwick.

A.3.2 It should also be remembered that Tingwall lies some 13 minutes travel time from Lerwick town centre. Curtailing the day by a further one hour will reduce the effectiveness of the visit quite significantly, and on some days in winter almost make a day return unviable.

Table 7: Air Time on Island / Mainland by Season

	Time on Island			Time on Mainland		
	Summer	***Early & Late Winter***	***Deep Winter***	***Summer***	***Early & Late Winter***	***Deep Winter***
Fair Isle						
Monday	07:10	06:20	05:25	06:25	04:45	04:15
Tuesday	Only one rotation					
Wednesday	05:10	04:55	04:25	04:00	03:45	03:15
Thursday	04:45	03:40	03:10	03:35	02:30	02:00
Friday	05:00	04:50	04:30	05:00	03:40	03:20
Foula						
Monday	Only one rotation					
Tuesday	06:40	05:10	04:55	05:50	04:20	04:05
Wednesday	07:30	2 back-to-back flights		06:40	2 back-to-back flights	
Thursday	06:15	04:50	04:30	05:25	04:00	03:40
Friday	Only one rotation					
Skerries						
Monday	1 rotate	None	None	1 rotate	None	None
Wednesday	1 rotate	None	None	1 rotate	None	None
Thursday	06:25	06:05	05:35	06:10	05:05	04:35
Papa Stour						
Tuesday	06:35	05:10	04:55	05:55	04:30	04:15

A.3.3 A calculation was made for this study by SIC using the current cost of the dial-a-ride service and a similar service between Sumburgh and Lerwick and the comparative figures were £9,100 and £80,000 imposing an additional £70,900 land transport bill on the service (a budget which would also constantly be under pressure in the current funding environment).

A.3.4 However, the Scottish Government already supports one public funded airport at Sumburgh and Scotland PLC (as distinct from SIC) could ostensibly save money by concentrating the island's civilian air activities at this one base. Sumburgh has a range of sunk costs in terms of runways, facilities, staff and hangars, and once again could avoid the future upgrade and maintenance costs involved with the continued use of Tingwall.

A.3.5 There are no onward connections from Tingwall as all external Flybe / Loganair and Eastern Airways scheduled flights operate from Sumburgh. The split airport arrangements presently preclude arrangements being put in place to facilitate connections from the outer isles to external air services, e.g. for NHS patients travelling to Aberdeen.

A.3.6 The lack of connections could therefore be constraining the economic development of the outer isles compared with say, the Orkney Islands which have an integrated network through use of a single hub airport. This has an impact for both incoming tourism and for quality of island life for residents by limiting their access to Scottish mainland amenities and services, mail and newspaper deliveries.

A.3.7 It is possible that the difficulties in achieving connecting flights may also detract from the tourism potential for incoming visitors to points such as Fair Isle – in the absence of easy connections, customers may choose to go elsewhere to points which are more easily and readily accessible.

A.3.8 The current structure of the schedule makes it difficult, if not often impossible, for the outer islands to receive same-day Royal Mail and newspaper deliveries. These organisations could potentially adapt their sorting practices in Aberdeen to better connect with onward flights from Sumburgh to the outer isles. However, this benefit might only be deliverable if services to the island destinations were daily, as it would be difficult for organisations such as the Royal Mail, John Menzies and the *Press & Journal* (who sometimes act independently of Menzies combined newspaper delivery) to change their procedures dependent upon the day of the week. Of course newspapers now play a much weaker role in daily life than heretofore.

A.3.9 A speedy road link with Lerwick would be particularly important to minimise the drawbacks of Sumburgh's relative remoteness from the town and a cost estimate has been based upon providing a dial-a-ride service on the basis of each arrival and departure being individually accommodated.

A.3.10 If Papa Stour and Skerries were dropped from the air schedule this would affect the balance of attractions between the two hub options. If Unst was re-introduced into the air system this would also affect calculations. In general terms, a Sumburgh base would be wholly negative for Papa Stour and Skerries as they would have longer flight times and mainland journey times, and with the short ferry time from Papa Stour to mainland, it would make the benefit of an air service almost negligible. Unst is more complicated as the relatively good ferry and road link makes an air service harder to justify to Tingwall, but a link to Sumburgh may well provide attractive options for onward connections (assuming despatch reliability rates are improved).

Capital Costs

A.3.11 If a move was undertaken, it seems almost inevitable that a new hangar would need to be constructed to house the aircraft as all existing hangarage at Sumburgh is currently fully occupied. The cost of this is unclear but no matter how modest a hangar was built, it is likely to cost over £500,000 and if connection to services, car parking and access are included in the estimate it could exceed £1m.

A.3.12 For comparison, a new maintenance hangar for the Public Service Obligation inter-island air services operated by Loganair was commissioned at Kirkwall Airport in October 2006. The hangar was developed in partnership by Orkney Islands Council and HIAL. The facility provided a new operating base for Loganair's Islander aircraft which serve the Outer North Isles. The building, which replaced an out-of-date hangar at the airport, was constructed with £750,000 of OIC funding and a £300,000 capital contribution from HIAL. The airport also provided the land for the project via a lease to the Council. However, this hangar was built to permit JAR 145 approved engineering (higher level of heating and insulation requirements) and to accommodate larger aircraft such as the Saab 340, so it is likely that a less expensive hangar could be constructed.

A.3.13 Other high level figures were also obtained for illustrative purposes for a recent Search & Rescue hangar for Bristow at Norwich Airport (details below). This example is bigger and of a higher specification than the Shetland PSO would require, and hence is a top-end example of what is available at a relatively economic price compared to a rigid build (Rubb Building Systems supply permanent tension membrane fabric buildings).

- Steel frame, fabric covered hangar.
- 35m x 40m with 6m door height.
- 1304m^2.

- Approximate cost £485K
- Concrete foundation and pad £145K

A.3.14 It is appreciated that build costs would be significantly more on Shetland than for mainland examples. It should also be noted that this type of membrane hangar succumbed to wind damage at Anglesey Airport recently, and a rugged construction will be required to withstand the much harsher Shetland weather. Rubb Building Systems may well not be suitable.

A.3.15 HIAL highlighted the Bond Nissan Hut type hangar built recently at Inverness Airport for the Air Ambulance helicopter (Bond) as another potentially cost effective approach. Bond hangar in Inverness which is of a Nissan hut design and would be less expensive than the £600k assumed in this report, and might approximate to something suitable for BN2 Islanders and little else. This Helimed hangar was supplied by Miracle Span Ltd (http://miraclespan.co.uk/). The footprint is 16m x 16m and the cost in 2011, excluding concrete base, electrical, heating, lighting, fit out etc. was in the region of £40,000 to install.

A.3.16 HIAL assured the study in general terms that utility services (water, sewage, power) would be near to any likely hangar site, so connecting these services should not be excessive. Staff access road and parking provision were not examined in this study, and hence the estimates used are approximate.

A.3.17 If a new hangar was constructed, it would be prudent to future proof it and perhaps provide it with the means of undertaking other aero engineering work in a way similar to the way the Kirkwall hangar was conceived, as it now serves not only BN2 Islanders but also Saabs. There may also be business opportunities for aircraft overnight parking or general aviation

aircraft *ad hoc* parking that could be addressed. However, such enhancements should perhaps be priced as separate to, and above, the core needs of the PSO air service. A separate business case, unlikely to coincide with the time pressures of the PSO decision making, would likely need to be developed. For the purposes of this study, we have selected a mid-range capital figure of £600,000 to cover a basic BN2 hangar with little other capability.

A.3.18 Although different funding models could be adopted, it was assumed for this exercise that SIC or Shetland Land and Property (SLAP) would fund the establishment of the hangar and that HIAL would charge a ground rent for the hangar site. HIAL might be persuaded to invest in the hangar but they would require a longer term commitment from SIC to do so, and the annual rent would reflect covering this capital cost in a timely manner. Financially and strategically, the two approaches could be compared, but it is very likely that a buildings rent paid to HIAL would be much more onerous for SIC than a ground rent paid to HIAL.

A.3.19 With regard to AvGas it is likely that the increased usage of fuel would require an investment in a fuel farm (as opposed to bowser supply). Sumburgh currently supplies very small quantities of AVGAS, it is delivered in 45 gallon drums with all the problems (manual handling, etc) that brings. If the BN2 Islanders were to be fuelled at Sumburgh, they would need to install a fuel farm similar to that built at Tingwall c 2008. This would cost about £100,000. The supplier has indicated that for refuelling after every flight, they would need another full-time tanker driver. This has been estimated (as a similar facility to Tingwall) to represent an approximate £100,000 investment. It is unclear how the fuel provider would deal with this – through higher fuel charges or a request for public support to upgrade their facility.

Operational Costs

A.3.20 Estimating the operating costs of the PSO service running from Sumburgh were a result of conversations with HIAL Head Office and Sumburgh Airport management.

A.3.21 It has been assumed that a two track security system can be put in place similar to Kirkwall, where inter-island passengers avoid the rigours of off-island travel / security.

A.3.22 A side door to the apron was identified in the main terminal and a portion of the Apron adjacent to that door would become the ‘home’ of the PSO. A simple escorted walk out to the aircraft, similar to present arrangements, was envisaged with no security check required.

A.3.23 One attraction of the Sumburgh solution is that SIC would pay for both operational services, and future capital (other than the hangar) obligations in their airport charges. SIC would no longer have to concern themselves about future runway or terminal upgrades or migration costs to new technologies. This would all be covered by their user charges. Hence the lumpiness of SIC’s aviation budget would subside, after the financing of any new hangar was addressed. SIC could then leave all compliance and infrastructure renewal and upgrade issues to HIAL.

A.3.24 The new hangar would have a range of operational charges connected with rates, insurance, refuse, power etc. For the purposes of the comparison these were assumed to be the same as the current comparable costs at Tingwall. Collectively these come to an estimated £155,322 per year.

A.3.25 In discussion with HIAL regarding the best use of check-in desks and handling staff, they immediately saw the potential for staff synergies and recommended using an existing handling agent rather than setting up a parallel organisation with their own separately hired check-in counter. Similarly, with regard to the call centre, HIAL speculated that the manned Visit Shetland desk at the airport could be combined cost effectively with the flight booking function. Finally, it was assumed that a small air service operator’s office and separate pilot planning room (similar to the present arrangement) would be provided, although there are many combinations and permutations on how this could be achieved. However, it should be stressed that any ‘shared’ or sub-contracted options would only be attractive if they offered an improvement in service levels or a reduction in cost, and the current staff roles and complement could be transferred to Sumburgh unchanged, if that was what was specified or

desired. It would be up to the operator, no doubt in consultation with SIC, to identify if any of these approaches offered any benefit. In general, it does seem that opportunities for multi-tasking in call centre, aero engineering, and ground handling exist at Sumburgh, whilst they do not, to the same extent, at Tingwall.

A.3.26 With regard to protecting SIC's strategic control and interests at Sumburgh, a discussion was had about constructing a Memorandum of Understanding and/or service level agreement that could address various issues of concern, including future proofing the service, giving it appropriate priority within airport planning and operational practices and generally ensuring that the service levels did not degrade over time. HIAL was also keen to simplify administration for both parties by charging agreed fixed costs for the service, rather than track every take-off and landing as a chargeable event.

A.3.27 The following high level costing structure was constructed using current HIAL 2016/17 pricing. HIAL offered SIC a 1/3 discount over their standard charges in the exploratory discussions that were had. In annualised summary:

Table 8: Sumburgh Related Costs

Item	Cost
Landing charges	£9,011
Pax Charge	£44,986
Aircraft apron parking	£648
Offices rent	£20,000
Hangar Ground Rent	£20,000
Hangar Ops Costs annual estimates from current costs	£155,322
Est. Add. Pax Handling costs	£9,400
Land Transport Costs	£80,000
Est. Additional Fuel Cost	£35,348
Other SIC Dept. Recharges	£39,935
Total	**£414,650**

A.3.28 Fuel has been dealt with by an estimate for Tingwall, as we do not know what Directflight pay for it. 90,000 litres of AvGas was assumed as required by the service[1] at a discounted price of £1.16 / litre plus 5% duty = £109,620 (ballpark quote by Air BP (via their subsidiary North Air)). Directflight has been presumed to pay only £74,272 (amount declared to SIC in report covering April 15 to March 16) per annum (previous year totalled £69,668 which gives some idea of annual variation possible). The higher fuel cost at Sumburgh would partly be compensated by the likely lower fuel usage, but we have assumed that any increase in total fuel charges would be transferred to the subsidy request that SIC would endure. The differential fuel figure (£35,348) estimated is likely on the high side as we have assumed the same fuel consumption from both airports.

Strategic Control

A.3.29 Direct control over the operation and destiny of the inter-island air service is valued highly by SIC and there was concern that the service falling under the pricing, operational and strategic control of HIAL might degrade the service's flexibility and responsiveness. In discussions with HIAL on the matter, it was suggested that perhaps a suitable Memorandum of Understanding,

[1] From figures supplied by SIC

Service Level Agreement and/or communication and monitoring regime could be put in place to protect SIC's obligations and interests in this regard. An example of service impact could be the future implementation of car parking charges at Sumburgh, which would be unwelcome to islanders.

A.3.30 Furthermore, HIAL saw merit in various parties sitting together for a workshop, perhaps with the other BN2 Islander sponsoring councils and even operators and see if new collaborative solutions to address the various challenges were possible. Co-ordinated PSO tendering, closer collaboration in airfield management and staff training, reliability improvements through GNSS approved approaches, more multi-tasked staff, better access to specialist expertise, next generation aircraft acquisition were all aired as issues worth considering.

Sumburgh Summary Chart

A.3.31 The table below provides a qualitative summary of the benefits of using Sumburgh as the base for the inter-island air service. The scale runs from ✓✓✓, which represents a major positive to ×××, which represents a major negative.

Table 9: Sumburgh – Qualitative Appraisal

Item	Qualitative Scoring	Notes
Social / Consumer		
Convenience to Lerwick	××	Reduces attractiveness of service
Length of Day Visit	×××	Reduces utility of service
Onward Connectivity	×	Further from bus, road and ferry nexus
Onward Air Connectivity	✓✓	Inhibited by BN2 reliability
Key employment location	✓	More dispersed than all centred on Sumburgh
Terminal Facilities	✓	Café, WiFi, seating etc.
Car Parking	×	Further from check-in
Aeromedical role	××	More remote to hospital / main centre of population
Papa Stour and Out Skerries	×××	Almost wholly negative prospect
Fair Isle	Neutral	Pros and Cons – more balanced estimation Tourism helped, total travel time extended but not as much as others
Foula	××	Negative as same air time but increased land time
Unst	Neutral	Mildly positive if onward travel facilitated, but hardly justifiable for Lerwick journeys
Operational		
Agile and responsive	Neutral	Sumburgh likely to be less responsive
Strategic Control	Neutral	SIC has to protect 'its' operation at Sumburgh
Capital Costs		
Significant near term	×××	New hangar

Item	Qualitative Scoring	Notes
Protection Long term	✓✓✓	Under this (and possibly other scenarios) risk passed to HIAL / TS
AVGAS Fuel Farm	××	Unsure how this expense would be covered/funded
Running Costs		
SIC Costs	Neutral	Little savings if any
Combined Aviation Hub	✓	Opportunities for economies of scale or for multi-tasking
Cost Risk	✓	Protected from future technology and other upgrades (eg GNSS) fall to SIC
Regulatory / Technology Risk	✓✓	Protected
Possible Ameliorations	Neutral	MOU / SLA with HIAL Ring fenced operation in Sumburgh Responsive taxi type service minimising total travel time penalty

A.4 Key Issues

A.4.1 A key issue is whether SIC / ZetTrans will do 'whatever it takes' to retain air services to both Skerries and Papa Stour or whether alternative compensatory responses are possible and acceptable, such as enhanced ferry provision. If it is considered that air services are vital to the future social and economic life of these communities, then these destinations should be retained in the system, but this will require additional resource to recruit, retain and train staff and to license and possibly upgrade those airfields.

A.4.2 Key to any transport decisions are wider strategic decisions about equity of access for inhabitants, countering depopulation, supporting economic regeneration and facilitating inbound tourism, visiting friends and family, provision of social services (such as health and education) and quality of life and social inclusion considerations. It is likely that the case for protecting minimum quality standards should inform transport decision making, rather than transport being viewed from the perspective of only responding to current demonstrable demand. Air services are particularly potent in delivering across many of these headline policy goals outlined above. Protecting a minimum standard of provision rather than hard-nosed cost-benefit, or value for money, calculations is sometimes appropriate, and the Council needs to make this judgement call.

A.4.3 If destinations such as Skerries and Papa Stour drop out of the PSO system, then the negative implications in moving the air service hub to Sumburgh are somewhat reduced, but still may very well be considered insurmountable. Fair Isle and Foula would benefit from increased frequency to mainland with the loss of the other destinations, and other ameliorations (such as good land transport) may lead to the conclusion that the negative aspects of Tingwall's closure are reduced to an acceptable level by the positives these islands would enjoy as a result of a more concentrated air system. Unst's possible introduction into the PSO system raises ambiguous implications – reducing utility in connecting with Lerwick whilst increasing onward connectivity possibilities

A.4.4 Another key issue is the contraction of the effective day at either end of the route, because of the longer terrestrial access times to Lerwick. This factor was very prominent in the user surveys undertaken in the 2012 review, and could perhaps on its own lead to the rejection of Sumburgh as a realistic hub. The most significant issue arising from the consultation for all

the islands is that operating out of Sumburgh Airport would place significant constraints on the ability of the island communities to access essential services and conduct every day activities.

A.4.5 The loss by SIC of strategic control and potential loss of responsiveness of the service in the face of delays and cancellations could be ameliorated by discussions and flexible arrangements with HIAL. However, it is possible that the welcome flexibility enjoyed at Tingwall could potentially degrade somewhat at Sumburgh.

A.4.6 The increased distance between ferry and air service options in the face of cancellations would also be increased by the use of Sumburgh *vis a vis* Tingwall. This would also apply to inconvenienced freight.

A.4.7 This document has explored the use of Sumburgh and has identified ways in which the service could be made to work there. The Orkney PSO system co-locating in a HIAL airport provides something of a template.

A.4.8 The minor cost savings and protection from future regulatory, technology and capital outlay will be potentially attractive to SIC, but these positives must be balanced against the social costs for the utility and attractiveness of the service. Some ameliorations are possible and a judgement needs to be taken on their likelihood of delivery.

A.4.9 The positive social benefits such as improved onward connectivity and facilitated inbound tourism are likely to be meagre and uncertain, and though potentially significant in the longer term are unlikely to be significant drivers in current decision making.

A.4.10 Airfreight implications are mixed. Mainland deliveries might be enhanced using Sumburgh, but inter-island deliveries are likely to be less responsive and reduced in their utility by using Sumburgh.

A.4.11 More comprehensive engineering support should be easier to deliver at Sumburgh rather than Tingwall. This is because there is a cluster of qualified engineers and engineering support equipment and facilities already at Sumburgh. The potential for existing engineers to have the BN2 Islander added to their licence or for them to undertake basic walk arounds and overnight checks adds a possible new source of engineering support to the operator. It should also be easier to recruit engineers seeking a career in aviation where a progression through different aircraft types and support organisations can be identified. This however does also present the possible downside of BN2 engineers being poached by other organisations.

A.4.12 The loss of Tingwall as a diversionary airfield would reduce the options for BN2 Islander pilots in the face of bad weather. Procedures would have to be adjusted to take this reduction in airfields into account. However, this is not judged to be a show stopper, *vis a vis* the viability or operational integrity of the inter-island air service.

A.5 Conclusions

A.5.1 There is a simple maxim in the aviation sector: runways are easy to close (e.g. Plymouth, Manston, Filton) but incredibly difficult to re-open or get built from scratch - witness Broadford on Skye and Heathrow's third runway. For a nation like Scotland on the periphery of Europe, where aviation will always be an essential lifeline service - socially and economically - closing airports (and implicitly therefore runways) should always be a last resort.

A.5.2 From a financial point of view, it appears that annualised operational savings are minimal in transferring the hub to Sumburgh – they are too close or insignificant to be the deciding factor. Additionally, much of the operational cost in running Tingwall is actually SIC staff costs, and this staff budget allocation is not something that can be turned on and off easily, and hence potential savings may well be partly illusory and likely not a short-term benefit. This is summarised in the tables below:

Table 10: Comparison of Operational Costs

Operational Cost	Sumburgh Costs	Operational Cost	Tingwall Costs
Landing charges	£9,011	Operating Costs	£412,902
Pax Charge	£44,986	Land Transport Costs	£9,100
Aircraft apron parking	£648	Fuel Cost (already in subsidy)	
Offices	£20,000		
Hangar Ground Rent	£20,000		
Hangar Ops Costs annual	£155,322		
Add. Pax Handling costs	£9,400		
Land Transport Costs	£80,000		
Est. Additional Fuel Cost	£35,348		
Other SIC Dept. Recharges	£39,935		
Total	**£414,650**	**Totals**	**£422,002**

Table 11: Comparison of Capital Costs

Capital Cost	Sumburgh Costs	Capital Cost	Tingwall Costs
New Hangar (wide range)	£600,000	Runway	£300,000
Connecting utilities	further work required	Watch Tower	£150,000
Car parking and road access	further work rqd.	Terminal Adjustments / improvements	£100,000
JAR 145 standard interior	further work rqd.		
Upper end estimate	**£1,200,000**	**Sub Totals**	**£550,000**
Possible Avgas Fuel Farm estimate	£100,000	Tingwall runway lighting renewal (high estimate)	£511,000

A.5.3 From a socio economic point of view, Tingwall still is the more attractive hub option. Various ameliorations could be put in place to increase the utility of Sumburgh as a hub. A reduction or change in the destinations included in the inter-island air service would also have a bearing on the comparative attractiveness of each hubbing option.

Appendix B Fixed Links Paper

AUGUST 2016
SHETLAND ISLAND COUNCIL

Shetland Inter-Island Transport Study - Fixed Link Working Paper – Supplement – "Bottom-Up" Cost-Estimates

ENGINEERING DELIVERABILITY AND COST RISK REVIEW
MAINLAND TO BRESSAY / WHALSAY / YELL & YELL TO UNST (BLUEMULL SOUND)

DONALDSON ASSOCIATES
a COWI company

DONALDSON ASSOCIATES
a COWI company

ADDRESS Donaldson Associates Limited
The Pentagon Centre
Washington Street
Glasgow
G3 8AZ

TEL 0141 2482410
www donaldsonassociates.com

AUGUST 2016
SHETLAND ISLAND COUNCIL

Shetland Inter-Island Transport Study - Fixed Link Working Paper – Supplement – "Bottom-Up" Cost-Estimates

ENGINEERING DELIVERABILITY AND COST RISK REVIEW
MAINLAND TO BRESSAY / WHALSAY / YELL & YELL TO UNST (BLUEMULL SOUND)

PROJECT NO.	JS969
DOCUMENT NO.	002
VERSION	DRAFT
DATE OF ISSUE	2016-08-15
PREPARED	SLCP
CHECKED	SLCP
APPROVED	AS

CONTENTS

1	Introduction	4
1.1	Context	4
1.2	Brief	5
1.3	Method	5
2	Construction Cost Estimates of 2016	7
2.1	Introduction	7
2.2	UK and Norwegian Construction Costs for Bressay	7
2.3	UK and Norwegian Costs - Discussion	10
2.4	Client Side Scheme Costs	11
2.5	Bressay Scheme Cost	11
2.6	Operation and Maintenance	13
2.7	Pro-rata costs for other Fixed Links	13
3	Planning Cost Estimates	15
3.1	Reasons for and use of "Optimism Bias"	15
3.2	"Planning Estimates" based on 2016 Cost-Estimates	17
4	Summary and Conclusions	19
4.1	Conclusions	19

DRAFT

1 Introduction

1.1 Context

In December 2014, Shetland Islands Council, HITRANS, Transport Scotland, Orkney Islands Council and ZetTrans agreed a Joint Statement establishing Partnership commitments to jointly address ferry replacement issues in Shetland and Orkney. It was recognised that there was a need for evidence gathering to support future funding and investment decisions. It was further recognised that the evidence gathering should follow Transport Scotland's established Routes and Services Methodology and STAG Appraisal approaches to ensure consistency and legitimacy alongside other transport projects and services in Scotland.

A Shetland Inter-Island Transport Study (SIITS) was commissioned to meet these requirements and to build on two recent studies undertaken by Peter Brett Associates:

- Shetland Island Routes and Services Methodology (RSM) Study, 2015
- Shetland Islands Transport Scoping Study, 2015

SIITS is delivered in two phases.

As part of Phase 1, Donaldson Associates Limited were commissioned to review all the previous fixed links studies between Bressay-Mainland, Unst-Yell, Yell-Mainland, and Whalsay-Mainland; from a cost, risk and engineering feasibility perspective; focusing solely on the deliverability, costs and cost uncertainty and risks to SIC of considering these options further.

The layout of the current position of the four prospective crossings was to be established, and identification made of any remaining gaps in knowledge, which may be preventing a definitive decision being taken.

The initial review therefore had the objective of producing an up-to-date and consistent picture of the factual position for the fixed links and considered:

DRAFT

- the technical arguments – is there a consensus that can be reached on the deliverability of each scheme?

- risks & uncertainty – set out the key uncertainties with respect to the information currently available, and also identify any key gaps in understanding which may prevent a meaningful decision being taken with respect to whether fixed link options are taken forward.

- costs / cost ranges – previous cost estimates are dated and are to be updated using appropriate indices.

This work was undertaken in October and November of 2015, and was summarised in the Donaldson Associates Limited report "Shetland Inter-Island Transport Study - Fixed Link Working Paper" (Ref: JS969-SIITS-Fixed-Link-Review-2015-11-20 B01).

The methodology employed within the study adjusted historical cost estimates to 2015 prices using principles recommended by the UK Government and national indices published by Royal Institute of Chartered Surveyors.

DRAFT

1.2 Brief

In March 2016, SIC commissioned Donaldsons Associates Limited to produce a supplemental report to the 2015 report, in which there that would be:

- a new set of 2016 prices provided by tunnelling contractors

- a non-technical description of how and why cost estimates were factored for planning purposes

1.3 Method

A number of UK tunnelling contractors and one Norwegian tunnelling contractor were asked whether they would provide independent 2016 cost estimates for the Shetland Fixed Links.

After some protracted negotiation, one UK contractor and one Norwegian contractor agreed to provide "bottom-up" cost estimates for the Bressay Fixed Link based on the design produced by Donaldsons Associates Limited in 2008.

All contractors declined to offer costs estimates for the other fixed links, on which there is limited geological and other technical engineering information.

The newly derived 2016 cost estimates for the Bressay link were compared with the historical cost estimate of 2008 and the factored "index-linked" cost estimate of November 2015.

The typical cost per meter for providing a fitted-out running tunnel based on the Bressay design was then applied on a pro-rata basis to the nominal lengths of the other fixed-links (Unst-Yell, Yell-Mainland, Whalsay-Mainland).

The 2008, 2015 and 216 cost estimates and their corresponding "planning prices" are provided and tabulated for the sake of comparison.

A non-technical summary of the planning factoring process has been provided.

DRAFT

2 Construction Cost Estimates of 2016

2.1 Introduction

Two tunnel contractors agreed to provide "bottom-up" costs estimates for the cost they believed they would submit at tender to construct the Bressay fixed-link based on an engineer's design produced by Donaldson Associates Limited in 2008.

The unofficial term "bottom-up estimate" is taken here to signify an estimate that is derived by a process of thinking through all the specific issues of the project, including project risks in the ground and how they can be mitigated though good construction practice, and includes time and motion estimation upon which manpower and equipment costs can be derived. One contractor stated that the estimate their firm submitted could be considered a bona-fide estimate of their tender price for delivering such a scheme.

The construction costs provided by the contractors are not the whole scheme capital costs of the project; as they lack the cost of items such as further ground investigation, detailed design, land acquisition and the like, which are paid for in advance of and outside of the construction contract. These client-side costs are discussed in more detail in section 2.4 below.

2.2 UK and Norwegian Construction Costs for Bressay

The prices provided by the UK and the Norwegian contractor where presented in different ways from one another and from the estimates set out in 2008/2015. In order to arrive at a presentation of costs that allowed for comparison one with another, both sets of 2016 prices where therefore reconfigured into a format that matched the 2008/2016 construction cost-estimates. For the avoidance of doubt, this process did not include any readjustment in rates. The results are presented in Table 2.1 below.

These costs are for a design at Bressay that is compliant with existing UK standards, and moreover includes provision of a cycle way. However, given the

unique situation of the Shetland Islands, a case might conceivably be made for a less costly scheme using lesser vehicle clearances as used in Norway (which are sub-standard according to UK rules). Removal of the cycle way would further reduce the cross-section of the tunnel and the volume of rock removed. This would lead to further cost reduction. Costing of such alternative design options has not been attempted in this study.

DRAFT

Item	Quantity	Unit	Rate GBP £ @ 2008	Cost Estimate GBP £ @ 2008	Index	Index @ Nov-15 Rel. to Aug 2008	Rate GBP £ @ Nov-2015	Cost Estimate GBP £ @ Nov-2015	Rate GBP £ @ 2016	Cost Estimate GBP £ @ 2016	Rate GBP £ @ 2016	Cost Estimate GBP £ @ 2016
Construction Costs	**Original**		**UK Contractor 2008**		**Indexed Linked Estimates**				**UK Contractor 2016**		**NOR Contractor 2016**	
Excavation and support of driven tunnel *	1,200	m	12,257	14,708,400	ROADCON Tender Price Index of Road Construction	1.3603	16,673.20	20,007,836.52	£12,257	£14,708,400	£9,107	£10,928,400
Road construction within tunnelled section	1,200	m	250	300,000	ROADCON Tender Price Index of Road Construction	1.3603	340.08	408,090.00	£250	£300,000	£708	£849,600
Drainage, concrete and associated pipes	1,200	m	500	600,000	ROADCON Tender Price Index of Road Construction	1.3603	680.15	816,180.00	£1,450	£1,740,000	£587	£704,400
M&E Equipment	1,200	m	3,000	3,600,000	ROADCON Tender Price Index of Road Construction	1.3603	4,080.90	4,897,080.00	£3,630	£4,356,000	3,630	4,356,000
Tunnel Sub-Total (without any secondary Lining)			**16,007**	**19,208,400**	-		**21,774.32**	**26,129,186.52**	**£17,587**	**£21,104,400**	**£14,032**	**£16,838,400**
Contingency for secondary lining (inc membrane) **	350	m	3,416	1,195,600	ROADCON Tender Price Index of Road Construction	1.3603	4,646.78	1,626,374.68	£3,416	£1,195,600	£2,327	£814,450
Tunnel Sub-Total (with 350m of secondary Lining)			**19,423**	**20,404,000**	-		**26,421.11**	**27,755,561.20**	**£21,003**	**£22,300,000**	**£16,359**	**£17,652,850**
Road construction outside tunnel (portal and tie-in roads)	575	m	3,000	1,725,000	ROADCON Tender Price Index of Road Construction	1.3603	4,080.90	2,346,517.50	£3,500	£2,012,500	£4,236	£2,435,700
Bressay Cutting (in Rock)	25,000	m^3	42	1,050,000	ROADCON Tender Price Index of Road Construction	1.3603	57.13	1,428,315.00	£42	£1,050,000	£35	£875,000
Lerwick Cutting (in Rock)	15,000	m^3	42	630,000	ROADCON Tender Price Index of Road Construction	1.3603	57.13	856,989.00	£42	£630,000	£35	£525,000
Labour Camp										£605,000		£605,000
Total (without any secondary Lining)				**22,613,400.00**	-			**30,761,008.02**		**£25,401,900**		**£21,279,100**
Contingency for secondary lining (inc membrane) **	350	m	3,416	1,195,600	ROADCON Tender Price Index of Road Construction	1.3603	4,646.78	1,626,374.68	£3,416	£1,195,600	£2,327	£814,450
Total (without 350m secondary Lining)				**23,809,000**	-			**32,387,383**		**£26,597,500**		**£22,093,550**

TABLE 2.1 – BRESSAY FIXED-LINK – CONSTRUCTION COST-ESTIMATES OF 2008, NOV 2015, AND UK AND NORWEGIAN OF 2016 (EXCLUDES LAND ACQUISITION / FURTHER GI / DESIGN FEES)

DRAFT

2.3 UK and Norwegian Costs - Discussion

In March and April of 2010 a series of meeting were held in Lerwick and Glasgow that culminated in a workshop at which, inter alia, it was sought to understand why there was an apparent difference between UK and Norwegian bored tunnel construction costs. The findings following those meeting were summarised in the workshop report as follows:

- There tend to be fewer but highly skilled experienced personnel on Norwegian tunnelling projects who work very efficiently
- 'Active design' at the face during construction means decisions are taken in 'real time' enabling quick and efficient progress
- Competition is high
- Low profit margin – two to three percent
- High productivity
- Dedicated and modern equipment
- Rarely line tunnels with secondary lining and it is more common to line with spray concrete (shotcrete) - over rock bolts with waterproof membrane which provides a water seal
- Quite minimum design - no provision for pedestrians or cyclists therefore smaller tunnel cross section leading to lower volume to be excavated
- The contractual system in Norway helps – risk sharing keeps costs down
- It was noted that Norwegian costs would most likely rise if they were working outside the Norwegian market
- Norwegian contractors are giving up on working outside of Norway, e.g. when working in Sweden the Norwegian contractors find that they face much slower progress because of issues with contracts, regulations, culture, etc and the costs become higher with reduced profits
- The Government 'self insures' in Norway and has a dedicated budget for this
- Insurers share the risk in Norway (up to 30%)
- Tunnel insurance tends to be higher in UK
- The Contractor provides insurance for machinery, labour, and tunnel collapse (under certain circumstances only)
- Taxes are applied to waste (excavated rock) in the UK if taken 'off-site', sold as aggregate or put in landfill whereas waste can be disposed of in land around the tunnel in Norway with no disposal cost without planning permission or Environmental Impact Assessment (EIA), if placed to a thickness of less than 0.5m thick

Other considerations:

DRAFT

› Norwegian tunnels are paid for with tolls (usually paid off in 12 to 15 years). Tolls are comparable with ferry costs or even higher in some cases

2.4 Client Side Scheme Costs

Client side costs for the Bressay bored tunnel scheme were identified in Annex G of the 2008 STAG 2 report.

A client side cost for risk management was subsequently identified and was priced at £2,125,000. This included sizeable payments in duty for landfill or aggregate tax and duty to Crown Estates of £800,000 and £900,000 respectively. This cost is uplifted suing the retail Price Index to £2,533,000.

The totals for client side scheme costs are set out in Table 2.2 below.

Item	Unit	Cost Estimate GBP £ @ 2008	Index	Index @ Nov-15 Rel. to Aug 2008	Cost Estimate GBP £ @ Nov-2015
Client Side CAPEX Costs					
Investigations and Survey ***	Sum	£ 950,000	ALLCOS Resource Cost Index of All Construction: All New Work	1.1167	£ 1,060,865
Professional Fees****	Sum	£ 1,100,000	Retail Price Index	1.192	£ 1,311,200
Land Acquisition	Sum	£ 20,000	Retail Price Index	1.192	£ 23,840
Accommodation Works	Sum	£ 180,000	ALLCOS Resource Cost Index of All Construction: All New Work	1.1167	£ 201,006
Hoegan Road Improvements	Sum	£ 200,000	ROCOS Resource Cost Index of Road Construction: Combined	1.1422	£ 228,440
Client Side CAPEX Total		**£ 2,450,000**			**£ 2,825,351**
Cost of Risk Management		**£ 2,125,000**	**Retail Price Index**	**1.192**	**£ 2,533,000**

TABLE 2.2 – BRESSAY FIXED-LINK – CLIENT SIDE COSTS

2.5 Bressay Scheme Cost

The spread of scheme costs for the Bressay fixed-link is set out in Table 2.3 below.

DRAFT

Item	Cost Estimate GBP £ @ 2008	Cost Estimate GBP £ @ Nov-2015	Cost Estimate GBP £ @ 2016	Cost Estimate GBP £ @ 2016	Cost Estimate GBP £ @ 2008	Cost Estimate GBP £ @ Nov-2015	Cost Estimate GBP £ @ 2016	Cost Estimate GBP £ @ 2016
		Indexed Linked Estimates	UK Contractor 2016	NOR Contractor 2016		Indexed Linked Estimates	UK Contractor 2016	NOR Contractor 2016
	Total (without any secondary Lining)				Total (with 350m of secondary Lining)			
Construction Costs (Tunnel, Portals and connecting Raods)	£ 22,613,400	£ 30,761,008	£ 25,401,900	£ 21,279,100	£ 23,809,000	£ 32,387,383	£ 26,597,500	£ 22,093,550
Client Side Costs	£ 2,450,000	£ 2,825,351	£ 2,825,351	£ 2,825,351	£ 2,450,000	£ 2,825,351	£ 2,825,351	£ 2,825,351
Capital Cost	£ 25,063,400	£ 33,586,359	£ 28,227,251	£ 24,104,451	£ 26,259,000	£ 35,212,734	£ 29,422,851	£ 24,918,901
Contingency (10%)	£ 2,506,340	£ 3,358,636	£ 2,822,725	£ 2,410,445	£ 2,625,900	£ 3,521,273	£ 2,942,285	£ 2,491,890
Optimism Bias (12.6%)	£ 3,157,988	£ 4,231,881	£ 3,556,634	£ 3,037,161	£ 3,308,634	£ 4,436,804	£ 3,707,279	£ 3,139,782
Risk Management Costs	£ 2,125,000	£ 2,533,000	£ 2,533,000	£ 2,533,000	£ 2,125,000	£ 2,533,000	£ 2,533,000	£ 2,533,000
Budget Cost	£ 32,852,728	£ 43,709,876	£ 37,139,610	£ 32,085,057	£ 34,318,534	£ 45,703,812	£ 38,605,415	£ 33,083,573

TABLE 2.3 – SHETLAND FIXED-LINKS – FITTED-OUT RUNNING TUNNEL PRO-RATA CONSTRUCTION COST-ESTIMATES OF 2008, NOV 2015, AND UK AND NORWEGIAN OF 2016 (EXCLUDES ANYTHING THAT IS NOT IN THE TUNNEL SUCH AS PORTALS / CONNECTING ROAD LINKS / LAND ACQUISITION / FURTHER GI / DESIGN FEES)

DRAFT

2.6 Operation and Maintenance

In Chapter 15.7 "Transport Economic Efficiency" of the 2008 STAG Stage 2 report for Bressay, the cost of the operation and maintenance of the bored tunnel was discussed (along with the other options).

The cost provided in that study was an average of £195,000 per year over sixty years at 2008 prices.

The main operating costs of the tunnel will be that of wages and electricity.

The increase in cost of labour in the UK between 2008 and 2016 is approximately 14% - as derived from Statistical bulletin: Index of Labour Costs per Hour (ILCH): Quarter 1 (Jan to Mar) 2016 (experimental) Changes in the costs of employing labour, analysed by sector and industry as published by the government at http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/indexoflabourcostsperhourilch/quarter1jantomar2016experimental.

Over the same period, the increase in the industrial price of electricity is approximately 18% - as derived from "Fuel price indices for the industrial sector in current and real terms: excluding/including CCL (QEP 3.3.1 and 3.3.2)" as published by the government at https://www.gov.uk/government/statistical-data-sets/industrial-energy-price-indices.

For planning purposes a simplistic increase of 16% is adopted. A simplistic approach is justified given that major changes in energy generation and supply are likely over the coming decades as renewable energy becomes more dominant; and consequently there are major uncertainties in the changes to prices over the forthcoming planning period of sixty years.

Using an uplifted average of 16% gives a figure of £226,200 per year for sixty years at 2016 prices.

2.7 Pro-rata costs for other Fixed Links

To obtain a minimum benchmark construction cost for the Unst, Yell and Whalsay fixed-link tunnels, the rates for providing a fitted-out running-tunnel for Bressay have been used. These pro-rated tunnel costs are set out in Table 2.4 below.

DRAFT

Fixed Link Details									Unlined				1/3 length Lined			
From/To	Date	Type	Ref	Title	Depicts	Max Gradient [%]	Submarine Rock cover [m]	Tunnel Length [m]	UK 2008	UK 2015 Indexed	UK 2016 Bottom Up	NOR 2016 Bottom Up	UK 2008	UK 2015 Indexed	UK 2016 Bottom Up	NOR 2016 Bottom Up
Mainland / Bressay	Mar-08	Drawing	JS533/101 Rev 0	Lerwick - Bressay Stage 2 fixed link horizontal and vertical tunnel alignment	Plan & Long Section	8	25	1200	£ 19,208,400	£ 26,129,187	£ 21,104,400	£ 16,838,400	£ 20,574,800	£ 27,987,900	£ 22,470,800	£ 17,769,200
Yell / Unst	Jan-08	Figure	Figure 2	Yell to Unst Crossing	Plan & Long Section	7	50	4050	£ 64,828,350	£ 88,186,005	£ 71,227,350	£ 56,829,600	£ 69,439,950	£ 94,459,164	£ 75,838,950	£ 59,971,050
Mainland / Yell	Jan-08	Figure	Figure 1	Mainland to Yell Crossing	Plan & Long Section	7	50	5438	£ 87,046,066	£ 118,408,764	£ 95,638,106	£ 76,306,016	£ 93,238,135	£ 126,831,835	£ 101,830,175	£ 80,524,091
Mainland / Whalsay	Mar-10	Drawing	JS533-510 Rev 0	Shetland - Whalsay Fixed Tunnel Link Tunnel Option 1A - Overview Drawing	Plan	7	40	6147	£ 98,395,029	£ 133,846,758	£ 108,107,289	£ 86,254,704	£ 105,394,413	£ 143,368,020	£ 115,106,673	£ 91,022,727
			JS533-51i Rev 0	Shetland - Whalsay Fixed Tunnel Link Tunnel Option 1A - Proposed Long Section	Long Section											
Unlined rate* per meter to provide tunnel =									£ 16,007	£ 21,774	£ 17,587	£ 14,032	x	x	x	x
Lined rate* per meter to provide tunnel =									>	>	>	>	£ 19,423	£ 26,421	£ 21,003	£ 16,359

***(excluding portals and connecting roads)**

TABLE 2.4 – SHETLAND FIXED-LINKS – FITTED-OUT RUNNING TUNNEL PRO-RATA CONSTRUCTION COST-ESTIMATES OF 2008, NOV 2015, AND UK AND NORWEGIAN OF 2016 (EXCLUDES ANYTHING THAT IS NOT IN THE TUNNEL SUCH AS PORTALS / CONNECTING ROAD LINKS / LAND ACQUISITION / FURTHER GI / DESIGN FEES)

DRAFT

3 Planning Cost Estimates

DRAFT

3.1 Reasons for and use of "Optimism Bias"

Government at all levels is required to seek to maximise the return to the taxpayer when buying roads, bridges, tunnels, hospitals, schools & etc. on behalf of the public.

When deciding whether to spend money on a particular project, the benefit of the project to the community has to be assessed before a decision can be taken on whether to invest the taxpayer's money.

This is a complicated process, and involves predicting how things will change after the project is complete, and whether the likely anticipated changes are significant enough to justify the cost of funding the project.

Other consideration include whether the cost of providing the project produces the greatest benefit for the greatest number of citizens and also whether the project is aligned with government policy objectives.

A critical part of the cost-benefit assessment is assessing the likely cost to buy or procure the project (including the ongoing costs of its operation and maintenance); as it is against this figure that the benefits can be compared. When considering civil engineering projects we can call this engineer's cost-estimate a "construction cost estimate".

Historically, the prediction of the costs to buy and procure projects displayed a pattern of inaccuracies; where almost every estimate significantly underestimated the costs.

In order to offset this systematic underestimation of costs, the government required that the planning process use a technique called "Optimism Bias" which requires that construction cost-estimates be increased to offset the tendency for cost estimators to underestimate the costs of providing a project.

The "Optimism Bias" is a percentage by which the construction cost-estimate is increased to produce a larger "planning cost-estimate".

It was observed that the amount of project specific information available significantly influenced the accuracy of construction cost-estimates. If specific information was lacking, cost estimators were overly optimistic in their costing. In other words, the cost estimators where not properly pricing the risk of the uncertainties in the project.

Some things that the Government buys have more uncertainty associated with their delivery and purchase than other things; and as was explained in section 6.4 of Donaldsons Associates report of November 2015 (of which this current report is a supplement), inter-island fixed links (bridges or tunnels), as contemplated here in the Shetlands, are regarded as having considerable technical uncertainties; and so are consequently classified as high risk "non-standard civil engineering" projects under HM Treasury guidance (ref: Mott MacDonald 2002).

Such non-standard projects carry more uncertainty in their delivery than most projects and consequently more risk to the taxpayer, and so have large "optimism bias" numbers.

Currently there is not much project specific information for the Ust-Yell, Yel-Mainland, and Whalsay-Mainland fixed links, and so consequently large "optimism bias" numbers are used by planners to convert the engineers cost-estimates into "planning estimates".

Referring once again to section 6.4 of the Donaldson Associates report of November 2015, it was reported that as regards fulfilment of the necessary risk mitigation / management standards required by HM Treasury, it is evident that:

- none of the crossings have achieved the lower bounds of 3% (duration) and 6% (CAPEX) permitting a works contract to be drawn up and awarded;
- the Bressay to Mainland tunnel option will qualify as a "project" under HM Treasury procedures, as there is a clearly defined design option which has been subjected to robust risk management protocols that have resulted in derivation of project specific mitigation factors; and these factors bring the project optimism bias levels to within credible values for sensible project progression towards confirmatory ground investigation and detailed design; in anticipation of subsequent progression to award of a works contract;
- the remaining crossings currently lack any clear selection of a preferred design option; so that there is effectively no "project" on which to commence a meaningful project risk management process. The current status of risk management of each fixed link is as follows:

DRAFT

Fixed Link	Adjusted CAPEX Optimism Bias
Bressay to Mainland: Bored Tunnel	12.8%
Unst to Yell: Any Option	66%
Yell to Mainland: Any Option	66%
Whalsay to Mainland: Any Option	66%

TABLE 3.1 – ALLOCATION OF MITIGATED OPTIMISM BIAS BY PROJECT

3.2 "Planning Estimates" based on 2016 Cost-Estimates

The construction cost-estimates are converted into "planning estimates" by increasing the construction cost-estimate by the "optimism bias" percentage set out in Table 3.1 above.

The fitted-out running tunnel construction cost-estimates set out in Table 2.4 above in this report are therefore increased by the percentages set out in Table 3.1 to produce "planning estimates" which are in turn presented in Table 3.2 below.

The whole scheme planning cost for the Bressay fixed-link with and without permanent linings are set out in Table 2.3 above.

DRAFT

HM Treasury Adjustment 2016

Contingency	10%	Bressay
Optimism Bias	12.6%	
Contingency	20%	Yell, Unst, Whalsay
Optimism Bias	66%	

Fixed Link Details										**Unlined**				**1/3 length Lined**			
From	**To**	**Date**	**Type**	**Ref**	**Title**	**Depicts**	**Max Gradient [%]**	**Submarine Rock cover [m]**	**Tunnel Length [m]**	**UK 2008**	**UK 2015 Indexed**	**UK 2016 Bottom Up**	**NOR 2016 Bottom Up**	**UK 2008**	**UK 2015 Indexed**	**UK 2016 Bottom Up**	**NOR 2016 Bottom Up**
Mainland	Bressay	Mar-08	Drawing	JS533/101 Rev 0	Lerwick - Bressay Stage 2 fixed link horizontal and vertical tunnel alignment	Plan & Long Section	8	25	1200	£ 23,549,498	£ 32,034,383	£ 25,873,994	£ 20,643,878	£ 25,224,705	£ 34,313,166	£ 27,549,201	£ 21,785,039
Yell	Unst	Jan-08	Figure	Figure 2	Yell to Unst Crossing	Plan & Long Section	7	50	4050	£ 120,580,731	£ 164,025,968	£ 132,482,871	£ 105,703,056	£ 129,158,307	£ 175,694,045	£ 141,060,447	£ 111,546,153
Mainland	Yell	Jan-08	Figure	Figure 1	Mainland to Yell Crossing	Plan & Long Section	7	50	5438	£ 161,905,683	£ 220,240,300	£ 177,886,877	£ 141,929,190	£ 173,422,932	£ 235,907,214	£ 189,404,126	£ 149,774,810
Mainland	Whalsay	Mar-10	Drawing	JS533-510 Rev 0	Shetland - Whalsay Fixed Tunnel Link Tunnel Option 1A - Overview Drawing	Plan	7	40	6147	£ 183,014,754	£ 248,954,970	£ 201,079,558	£ 160,433,749	£ 196,033,608	£ 266,664,517	£ 214,098,412	£ 169,302,272
				JS533-51i Rev 0	Shetland - Whalsay Fixed Tunnel Link Tunnel Option 1A - Proposed Long Section	Long Section											

TABLE 3.2 – SHETLAND FIXED-LINKS – FITTED-OUT RUNNING TUNNEL PRO-RATA CONSTRUCTION COST-ESTIMATES OF 2008, NOV 2015, AND UK AND NORWEGIAN OF 2016 (EXCLUDES ANYTHING THAT IS NOT IN THE TUNNEL INCLUDING PORTALS, ROAD LINKS, LAND ACQUISITION / FURTHER GI / DESIGN FEES)

4 Summary and Conclusions

4.1 Conclusions

DRAFT

The results of this 2016 project specific bottom-up construction cost-estimate exercise has indicated that the indices published by RICS, as used in the November 2015 cost updating process, were overly pessimistic and led to an overestimate in construction cost.

The difference between the UK and Norwegian construction cost-estimates can be attributed to a number of reasons, which include things as diverse as recent exchange rate discounts following Brexit, to greater efficiencies in tunnelling in Norway construction realised by the availability of small highly multi-skilled workforce.

Appendix C Bluemull Sound (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO1 (Do Minimum): Replace the MV Bigga and MV Geira on a like-for-like basis.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">The current Bluemull Sound vessels, the MV Bigga and MV Geira, would be replaced by two like-for-like vessels.

The new vessels would be TYPE 1

The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£17.90 million.</td></tr>
<tr><td>Current revenue support
£2.19 million (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£2.47 million (rounded) per annum.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
<tr><td>Geographic Context:</td><td colspan="3">The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell.

Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland.

Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes.</td></tr>
</table>

	The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted from significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.

travel between the island(s) and Shetland Mainland	
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Not Applicable*** This objective is not considered relevant for Fetlar & Unst.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. Further more detailed analysis of supply and demand is required to establish whether 2 * 35m TYPE 1 vessels could meet the requirements of the route.
Implementability Appraisal	

Technical:	The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans. There are no other technical feasibility issues associated with this option.	
Operational:	Crew induction training would be required on the new vessels.	
Financial:	The capital cost would be £17.90 million, with annual revenue support estimated at £2.47m, an increase of approximately £280k per annum on the current day figure.	
Public:	There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the ageing MV *Bigga* and MV *Geira* with more modern vessels gives rise to a potential reduction in emissions. There would be no other environmental constraints associated with this option. **Environmental Constraints** The environmental constraints at the Bluemull Sound ports are provided below for information Gutcher Constraints • Residential properties within 50m of ferry terminal • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 1km and Bastavoe Shellfish Water Protected Area within 4km • Geological SSSI to north and south of ferry terminal • listed building within 100m • Coastal flooding risk • Good air quality Belmont Constraints • Residential properties within 200m of the ferry terminal • Core paths CPPUO03 Belmont to Lund starts at the harbour • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 0.5km and Bastavoe Shellfish

		Water Protected Area within 6km • Coastal flooding risk • Good air quality Hamars Ness Constraints • Not applicable as no significant works proposed
Safety:	✓	Both the MV *Bigga* and MV *Geira* have passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a minor safety benefit associated with replacing the current vessels with modern tonnage.
Economy:	Neutral	This option would have no impact in terms of economy, except in terms of the potential perception benefits from having new modern vessels.
Integration:	✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access and meets wider and more general policy commitments to supporting inter-island transport links.
Accessibility and Social Inclusion:	✓✓	The accommodation is below the waterline on both of the existing vessels, which makes physical access challenging for those with mobility issues – this option would assist in tackling the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO2 – Replace MV Bigga and MV Geira with two larger vessels</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">The current Bluemull vessels, the MV Bigga and MV Geira, would be replaced by two larger vessels.

The new vessels would be TYPE 2

In order to accommodate larger vessels,
A new piled jetty and large linkspan would be required at Gutcher.
A new piled jetty, large linkspan and dredging would be required at Belmont.
A new parking and waiting area would be required at Hamars Ness.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£23.15 million.</td></tr>
<tr><td>Current revenue support
£2.19 million (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£2.48 million (rounded) per annum.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
</table>

Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in

	agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.
Planning Objectives	
Objective:	Performance against planning objective:
TPO 1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of two larger vessels would increase capacity on the Bluemull Sound route – each individual sailing could accommodate 8-12 additional PCUs over and above the current vessels. This would assist in alleviating the capacity peaks identified on this route (e.g. the 0630 ex Belmont and 1740 ex Gutcher).
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Not Applicable*** This objective is not considered relevant for Bluemull Sound.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should	***Performance against Transport Planning Objective: Neutral***

be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	This option would have no impact on strategic connectivity.	
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. 2 * larger vessels would alleviate capacity issues on the route. The costs and benefits of this compared to Option C1 (the Do Minimum) would need to be established and quantified.	
Implementability Appraisal		
Technical:	• In order to accommodate larger vessels, a new piled jetty and large linkspan would be required at Gutcher. • A new piled jetty, large linkspan and dredging would be required at Belmont. • A new parking and waiting area would be required at Hamars Ness.	
Operational:	• Higher crew training costs associated with moving to a higher certification vessel. • Crew induction training would be required.	
Financial:	The capital cost would be £23.15 million, with annual revenue support estimated at £2.48m, an increase of approximately £290k per annum on the current day figure.	
Public:	There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. Some support for this option from Fetlar residents.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	• Potential for emissions reduction from vessels compared to current vessels. • Construction works to berths and increased dredging has potential for short term environmental effects (noise, visual, water quality). • No other effects predicted but effects of maintenance works unknown as not specified. **Environmental Constraints** The environmental constraints at the Bluemull Sound ports are provided below for information Gutcher Constraints • Residential properties within 50m of ferry terminal • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 1km and Bastavoe Shellfish Water

		Protected Area within 4km • Geological SSSI to north and south of ferry terminal • listed building within 100m • Coastal flooding risk • Good air quality Belmont Constraints • Residential properties within 200m of the ferry terminal • Core paths CPPUO03 Belmont to Lund starts at the harbour • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 0.5km and Bastavoe Shellfish Water Protected Area within 6km • Coastal flooding risk • Good air quality Hamars Ness Constraints • Not applicable as no significant works proposed
Safety:	✓	Both the MV *Bigga* and MV *Geira* have passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a moderate safety benefit associated with replacing the current vessels with modern tonnage.
Economy:	✓	The provision of two larger vessels would assist in alleviating the capacity issues identified on the Bluemull Sound route. This would give rise to minor TEE benefits, where residents can now travel on a ferry they could not previously travel on. The majority of these benefits would accrue to the residents of Unst given the larger population and the fact that the higher utilisation sailings tend to be ex Belmont. The additional capacity would also give rise to minor EALI benefits for residents, locally traded services and tourism (a product Unst is trying to develop), particularly on Unst given the larger scale of the economy. Moreover, two larger and modern vessels would improve the perception of both islands as a place to live work and do business. There may also be a benefit for the manufacturing and processing sector in Unst. The community feedback explained that Cooke Aquaculture, one of the larger private sector employers on Unst, exports their salmon by boat direct from the Uyeasound Pier, which it was noted that they were

		ultimately they were forced into because of the ferry service capacity problems and unreliability (although this may be an issue of perception impacting on reality).
Integration:	✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access and meets wider and more general policy commitments to supporting inter-island transport links. Addressing the capacity issues would also make a positive contribution to the Unst and Fetlar Development Plans.
Accessibility and Social Inclusion:	✓✓	The provision of two larger ferries would improve community accessibility through reducing the capacity issues identified on the Bluemull Sound. The accommodation is below the waterline on both of the existing vessels, which makes physical access challenging for those with mobility issues – this option would assist in tackling the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Replace the MV *Bigga* and MV *Geira* with three new vessels.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The current Bluemull Sound vessels, the MV *Bigga* and MV *Geira*, would be replaced by three larger vessels. The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans. A decision would also need to be taken on the overnight arrangements and on berthing arrangements during breaks for the third vessel, and this could add to the cost of this option. A low cost option could involve the use of the facility at Cullivoe although this would lead to operational inefficiencies. *Note - The working assumption with this option is that the MV Bigga and MV Geira would be replaced by three like-for-like vessels (TYPE 1). However, there are various vessel combinations available and analysis of demand in the Outline and Final Business Cases would be used to determine this.*	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £23.40 million. *Current revenue support* £2.19 million (rounded) per annum. *Annual revenue support* £3.56 million (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.

Background Information	
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is

	seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** A three vessel solution would offer an almost turn-up-and-go frequency on the Bluemull Sound route (particularly for Unst which currently has the more frequent connections, a situation which would be assumed to continue given the population differential between Unst and Fetlar), significantly reducing the scheduled time between connections. This would generate major positive benefits for both islands (particularly Unst) in that the increased frequency would mitigate the capacity issues currently experienced and would likely future proof the route against growth. A third vessel would also make a contribution to minimising timetable variation, providing flexibility and standing in during e.g. meal breaks (if a sufficient layby berth were available), scheduled maintenance, drydock periods etc. The issue of timetable irregularity, low frequency and service gaps was raised as a specific concern by the Fetlar community, and one which they see as having a highly negative impact on the ongoing sustainability of the community.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for the Bluemull Sound.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is delivered by the current service.
TPO3: The scheduled time between	***Performance against Transport Planning Objective: Moderate Positive***

connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	The provision of a three vessel solution on the Bluemull Sound route would offer an almost 'turn-up-and-go' timetable, particularly for Unst. On a typical weekday (Tuesday – Friday), the two vessel service offers 26 (+1 request) direct sailings between Belmont and Gutcher and 6 (+2) direct sailings between Hamars Ness. These are supplemented by a number of indirect sailings between the islands. Given the current service frequency, an additional vessel could add a significant number of additional sailings (in excess of 20 single sailings) if operated on a 'day boat' basis.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** A three vessel solution would provide sufficient flexibility to allow for the maintenance of a two vessel service during scheduled maintenance meal breaks (if a suitable standby berth were available), ensuring consistency across the working week.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity, although the service frequency would be higher for residents travelling to / from Sumburgh and Lerwick.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. A 3-vessel solution would alleviate capacity issues on the route and provide a step change in the service. The costs and benefits of this compared to Option C1 (the Do Minimum) and C2 (2* larger vessels) need to be established and quantified. An overnight berthing solution for the third vessel would need to be confirmed.
Implementability Appraisal	
Technical:	• The berthing structures at Gutcher and Belmont would be replaced and the linkspans upgraded to large linkspans. • An additional overnight berth for the third vessel may be required
Operational:	• Requirement for additional crew & crew induction training. • Issue around where third vessel overnights.
Financial:	The capital cost would be £23.40 million, with annual revenue support estimated at £3.56m, an increase of approximately £1.37m per annum on the current day figure.
Public:	There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. Some support for this option from Fetlar residents.

STAG Criteria		
Criterion	**Assessment**	**Supporting Information**

	Summary	
Environment:	✓	• Potential for emissions reduction from new vessels compared to current vessels. This however, could be offset by the operation of a third vessel. • Construction works to berths and increased dredging has potential for short term environmental effects (noise, visual, water quality). • No other effects predicted but effects of maintenance works unknown as not specified. **Environmental Constraints** The environmental constraints at the Bluemull Sound ports are provided below for information Gutcher Constraints • Residential properties within 50m of ferry terminal • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 1km and Bastavoe Shellfish Water Protected Area within 4km • Geological SSSI to north and south of ferry terminal • listed building within 100m • Coastal flooding risk • Good air quality Belmont Constraints • Residential properties within 200m of the ferry terminal • Core paths CPPUO03 Belmont to Lund starts at the harbour • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 0.5km and Bastavoe Shellfish Water Protected Area within 6km • Coastal flooding risk • Good air quality Hamars Ness Constraints • Not applicable as no significant works proposed
Safety:	Neutral	The MV *Bigga* and MV *Geira* both have passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a moderate safety benefit associated with this option.

		However, it should be noted that a three vessel solution could potentially have a marginally negative impact on safety. In previous examples where the service frequency has been increased, there has been an uplift in car carryings. Whilst increased car journeys are likely to increase with this option, any impact is likely to be marginal. Moving to a three vessel solution would statistically increase the possibility of marine accidents (due to more ferry journeys being undertaken). There would also be an increased risk of a close quarter incident with three vessels operating a relatively short route. However these risks are deemed to be relatively minor overall.
Economy:	✓✓	A three vessel solution would contribute positively to the STAG economy criterion. The frequency increase would offer minor TEE benefits, particularly in Fetlar where the service frequency is more limited. Even if there was not an uplift carryings, there would be an 'option value' associated with having a service available. Perhaps more significantly, a three vessel service would offer moderate EALI benefits, particularly if the third vessel was used to fill existing gaps in the timetable. Benefits would accrue in terms of residents, tourism and locally traded services. Given the prominence of the aquaculture sector on Unst, a higher frequency service would support the manufacturing & processing sector, and could encourage inward investment into the island (e.g. tourism and food and drink opportunities at Saxa Vord).. Finally, more modern vessels would improve the perception of both Fetlar and Unst as a place to live work and do business.
Integration:	✓✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access and meets wider and more general policy commitments to supporting inter-island transport links. Addressing the capacity issues would also make a positive contribution to the Unst and Fetlar Development Plans.
Accessibility and Social Inclusion:	✓✓	The provision of three larger ferries would improve community accessibility through reducing the capacity issues identified on the Bluemull Sound route, which are seen to be the key constraint to economic growth. The frequency issues could also be addressed if additional revenue funding was provided to increase the service level. This option would also support enhanced disabled access to the Bluemull Sound services , helping to tackle the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO4 – Develop a new harbour at Mid Yell for the Fetlar service.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would involve the development of a new harbour at Mid Yell with the majority of Fetlar services running direct from the island to Mid Yell. This option would only be taken forward with one of the vessel options C1-C3. Unst services would continue to operate to Gutcher and, on occasions, Hamars Ness. The Yell landfall would therefore be split between Gutcher and Mid-Yell.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £6.8 million *Current revenue support* Not applicable *Annual revenue support* Not applicable
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and		

	from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness,which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should	***Performance against Transport Planning Objective: Minor Negative***

not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	This option would have a minor negative impact on capacity as it would remove capacity from the busier Gutcher – Belmont leg of the route. The current timetable on Gutcher – Belmont could therefore only be maintained with a three vessel solution (Option C3).
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Unst & Fetlar.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on this objective.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Negative*** The diversion of Fetlar services to Mid Yell would reduce service frequency (and the number of connections over the day) unless combined with a three vessel solution.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Moderate Negative*** The splitting of the current triangular route would reduce the service frequency and likely make the timetable more irregular.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option has been excluded from further consideration for a number of reasons including: the splitting of the Yell landfall; the reduction of capacity on the Belmont – Gutcher route (unless a three vessel solution is taken forward); and the scale of the costs given the very limited benefits.
Implementability Appraisal	

Technical:	Requirement for construction of an entirely new harbour – potential delays surrounding consents and planning permission.	
Operational:	If packaged with a less than three vessel ferry option, this option would reduce services on the main Gutcher – Belmont crossing.	
Financial:	A new harbour at Mid-Yell would cost around £6.8m excluding contingency and optimism bias.	
Public:	There was very little engagement from the Unst public with respect to replacement ferry options. The majority of comments on the options were concerned with fixed links. No obvious support for this proposal.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	××	Overall, this option would record a negative moderate impact as the works would have the potential for significant effects involving the construction of a new Ro-Ro berth in an as yet undeveloped area. The long-term impact may be slightly less negative providing the works are implemented sensitively. The following impacts have been identified in terms of environmental sub-criteria • Noise & vibration: short-term impacts at closest properties and on wildlife during construction. • Local air quality: No significant long-term effects predicted but potential for dust during construction. • Water quality, drainage & flood defence: Some short-term impacts on marine water quality including shellfish water during construction and from dredging activity, but unlikely to be significant in the longer-term. • Geological features: Some loss of marine sediment where dredging is required. • Biodiversity & habitats: Short-term impacts on otter and / or marine mammals etc. • Landscape: New works of major scale with potential for significant effects, including the need for a new access road. • Visual amenity: Short-term impacts during construction. • Cultural heritage: Some impacts on setting of nearby designated buildings and monuments.
Safety:	-	This option would have no impact in terms of the STAG safety criterion.
Economy:	-	This option would have no impact in terms of the STAG economy criterion.
Integration:	✓	The provision of a new harbour at Mid Yell would record a positive in terms of transport integration for Fetlar residents, who would have foot passenger access to services in the village. There would however, be a reduction in integration with services in Unst.
Accessibility and Social Inclusion:	-	This option would have no impact in terms of the STAG accessibility & social inclusion criterion. The benefits associated with Fetlar residents having improved access to Mid Yell are offset by a reduction

		in connections to Unst and the reduced service frequency on the busier Gutcher – Belmont route.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO5a – Commence an air service from Unst to Tingwall	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would involve the provision of capital funding to restore the air strip at Baltasound to a serviceable standard and ongoing revenue funding to support the operation of an air service with appropriate ground support. The reopened airfield would be fully licensed.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £100k. *Current revenue support* £0 *Annual revenue support* Dependent on the number of rotations over the week.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of		

	Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service from Baltasound to Tingwall would offer an extremely minor increase in capacity. The Britten-Norman Islander, the current and preferred aircraft, is restricted to a maximum of eight passengers,

Mainland	so even with a relatively frequent service (which is unlikely), the capacity increase would be limited.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** The provision of a morning air service to Tingwall and an evening return would make Unst commutable, albeit only for a very small number of people given the capacity constraints associated with the aircraft.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** Whilst the current ferry service already delivers this objective, the commencement of an air service would reduce the journey time.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service between Baltasound and Tingwall would add one or more daily return connections into the timetable. However, any impact is likely to be very minor.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service between Baltasound and Tingwall would add one or more daily return connections into the timetable. This could assist in reducing variations in the timetable but any impact would be very minor.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	The potential for this option to transform journey times and exploit opportunities presented by available flying hours and a high quality airfield merit further investigation. Community feedback is required on whether this option would attract public support.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.

Operational:	Operational issues include the availability of flying hours / aircraft and the provision of Flight Information and Rescue & Fire Fighting Services at Baltasound. Baltasound Airfield would also need to be fully licensed, potentially at significant cost.
Financial:	• Estimated capital cost of restoring Baltasound to an operational standard would be around £100k. • Airfield licensing and operational costs would be in addition to this
Public:	Some support was expressed for this proposal through the public engagement.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	The provision of an air service from Baltasound would lead to a very marginal increase in emissions, as it would involve the development and operation of an entirely new service.
Safety:	✗	There would be a very minor safety disbenefit associated with this option due to the increase in total flying hours.
Economy:	✓✓	The introduction of an air service from Baltasound would provide significant TEE benefits for those using it. An air service would dramatically reduce the journey times to Lerwick and potentially Sumburgh, but it is important to stress that this benefit would only accrue to a very small number of people given the limited capacity of the aircraft.
Integration:	✓✓	The provision of an air service would provide an additional transport connection for the island and would therefore represent an enhancement in integration. A fast connection to Unst could also support tourism and business travel, whilst a restored Baltasound Airport could be an effective base for small businesses. This would support the Unst Development Plan.
Accessibility and Social Inclusion:	✓✓	The introduction of an air service from Baltasound would significantly improve accessibility to / from the island, but this benefit would only accrue to a very small number of people given the limited capacity of the aircraft.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO5b – Commence an air service from Fetlar to Tingwall	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would involve the provision of capital funding to restore the air strip at Fetlar to a serviceable standard and ongoing revenue funding to support the operation of an air service with appropriate ground support. The reopened airfield would be fully licensed.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £200k. *Current revenue support* £0 *Annual revenue support* Dependent on the number of rotations over the week.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is		

	in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service from Fetlar to Tingwall would offer a minor increase in relative capacity, given the carrying capabilities of the ferry. The Britten-Norman Islander, the current and preferred aircraft, is restricted to a maximum of eight passengers, so even with a relatively frequent service (which is unlikely), the capacity increase

	would be limited. Nonetheless, one aircraft could carry 10% of the Fetlar population, so this would represent an increase in relative capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** The provision of a morning air service to Tingwall and an evening return would make Fetlar commutable. This could assist in addressing some of the issues of employment shortage on the island. However, the cost of travel to Lerwick would likely be a deterrent unless a relatively well-paid job could be secured.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** Whilst the current ferry service already delivers this objective, the commencement of an air service would reduce the journey time.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service between Fetlar and Tingwall would add one or more daily return connections into the timetable. However, any impact is likely to be very minor (although relatively greater than the equivalent air service for Unst given that Fetlar's ferry service is less frequent).
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Positive*** The provision of an air service between Fetlar and Tingwall would add one or more daily return connection into the timetable. This could assist in reducing variations in the timetable but any impact would be very minor (although relatively greater than the equivalent air service for Unst given that Fetlar's ferry service is less frequent).
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	The small population of the island would make this difficult to justify and it would be challenging to maintain a fully licensed airfield, whilst there would be cost and environmental impacts associated with constructing a new access to the airfield. Fetlar residents could benefit from any new Unst air services.
Implementability Appraisal	

Technical:	There are no technical feasibility issues associated with this option.
Operational:	Operation issues include the availability of flying hours / aircraft and the provision of Flight Information and Rescue & Fire Fighting Services at Fetlar, which would be particularly challenging to maintain given the low population of the island. Fetlar Airfield would also need to be fully licensed, potentially at significant cost.
Financial:	• Estimated capital cost of restoring Fetlar to an operational standard would be around £200k. • Airfield licensing and operational costs would be in addition to this
Public:	No comments were received from either Fetlar or Unst Community Councils surrounding the public acceptability of this option.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	The provision of an air service from Fetlar would lead to a very marginal increase in emissions, as it would involve the development and operation of an entirely new service.
Safety:	✗	There would be a very minor safety disbenefit associated with this option due to the increase in total flying hours.
Economy:	✓✓	The introduction of an air service from Fetlar would provide significant TEE benefits for those using it. An air service would dramatically reduce the journey times to Lerwick and potentially Sumburgh.
Integration:	✓✓	The provision of an air service would provide an additional transport connection for the island and would therefore represent an enhancement in integration. This would support the Fetlar Development Plan.
Accessibility and Social Inclusion:	✓✓	The introduction of an air service from Fetar would significantly improve accessibility to / from the island.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO6 – Construct a fixed link between Unst and Yell.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This option would involve the construction of a dual lane, single bore tunnel with a footway between Hill of Troilva and Holga Ness.

One vessel would require to be retained for Fetlar, which could operate to Gutcher, Belmont or a new harbour at Mid Yell. It is assumed that the current length of operating day would be retained, which would require a three crew operation. If the length of the operating day was to be reduced to 14 hours (as RSM suggests), this option would require a two crew operation.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant:

A range of capital costs have been provided for a fixed link, as set out in the main report:
Unlined UK: £71.2m (£132.5m including optimism bias & contingency)
Unlined Norwegian: £56.8m (£105.7m including optimism bias & contingency)
1/3 Lined UK: £75.9m (£141.0m including optimism bias & contingency)
1/3 Lined Norwegian: £60.0m (£111.6m including optimism bias & contingency)</td></tr>
<tr><td>Current revenue support: £0</td></tr>
<tr><td>Annual revenue support:

It is likely that a fixed link of this nature would require revenue support for ongoing maintenance. However, as this option is rejected from further consideration, an estimation of these costs and a determination of who would meet the costs has not been undertaken</td></tr>
<tr><td>Funding Sought From:</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.</td></tr>
</table>

(if applicable)			Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell . Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.		
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.		
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and		

	food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link between Unst & Yell would remove all capacity related constraints associated with the current ferry service. The evidence suggests that the current capacity constraints on the Gutcher – Belmont route are constraining the economic development of Unst. The remaining single vessel would comfortably meet the capacity needs of the Fetlar community.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** A fixed link between Yell & Unst, coupled with a high service frequency on Yell Sound could potentially open up commuting opportunities for Unst residents. Journey times would continue to be relatively long for trips to Lerwick, but would nonetheless be significantly reduced, whilst Sullom Voe would be much more accessible. A fixed link between Unst & Yell would also open up commuting opportunities between the two islands. The provision of a dedicated vessel for Fetlar would also support potential commuting opportunities, particularly to Yell. However, the continued need for a double ferry connection would limit opportunities for commuting to the mainland.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** The current ferry service delivers this objective.
TPO3: The scheduled time between connections should be minimised to	***Performance against Transport Planning Objective: Major Positive***

increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	The provision of a fixed link would remove any frequency related considerations associated with the ferry between Unst and Yell, although onward connections from Yell to the mainland would still be dependent on capital and revenue options in relation to Yell Sound. The provision of a dedicated ferry for Fetlar would result in a significant increase in frequency for that island. A dedicated service between Hamars Ness and Belmont / Gutcher could be provided.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any timetable related variations associated with the current Unst – Yell service. A dedicated ferry service for Fetlar would allow for a consistent daily timetable provided sufficient revenue funding is available for the same crewing level at weekends.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** A fixed link would make a marginal improvement to strategic connectivity for Unst, although this would still be constrained by connections across Yell Sound.
Rationale for Selection or Rejection of Proposal:	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Implementability Appraisal	
Technical:	Numerous fixed link suggestions have been examined in varying levels of detail over the years, but none of the studies commissioned to date has had the benefit of any supporting ground / seismic investigation. This necessarily limits the engineering accuracy of design assumptions and consequently the robustness of any cost assessments. The many assumptions that have been made will have to be tested before construction risks can be properly understood and an attempt at their quantification made. All costs suggested to date will have to include for full unmitigated optimism bias.
Operational:	A proposal of this nature could not be funded independently by Shetland Islands Council and a bid for funding

	support would therefore have to be made to Transport Scotland. A scheme of this nature would be considered a nationally significant infrastructure project, similar in scale to e.g. the Airdrie – Bathgate Rail Link (£300 million) and Borders Rail (£353 million). To this end, the project would need to go through several steps to secure funding and it should be noted that it is not included as one of Transport Scotland's 29 strategic transport priorities through to 2032 (identified by the Strategic Transport Projects Review). The project is also not cited in the Infrastructure Investment Plan 2011. The lead time for a fixed link of this nature would also be considerable, with an elapsed time of several years from initial planning through to scheme opening. The combination of a lack of funding certainty, the absence of a supporting policy commitment and the long lead-times for such a scheme give rise to significant operational risks associated with an Unst – Yell fixed link. A basic ferry infrastructure would also need to be maintained to ensure continuity during times of tunnel closure / maintenance or where there is a catastrophic failure of the asset (akin to that experienced on the Forth Road Bridge in December 2015). The current ferry infrastructure on the Bluemull Sound route is approaching the end of its operational life – cascade opportunities would therefore be limited.
Financial:	A range of capital costs have been provided for a fixed link, as set out in the main report: • Unlined UK: £71.2m (£132.5m including optimism bias & contingency) • Unlined Norwegian: £56.8m (£105.7m including optimism bias & contingency) • 1/3 Lined UK: £75.9m (£141.0m including optimism bias & contingency) • 1/3 Lined Norwegian: £60.0m (£111.6m including optimism bias & contingency) Ongoing maintenance costs would be in addition to the up-front capital costs.
Public:	A fixed link was identified as the preferred option of the Unst community, with potential spin-off benefits for Fetlar also envisaged. Strong support for this option through public engagement.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**

Environment:	✗✗✗	The provision of a fixed link is likely to have a minor negative impact through increasing vehicle kilometres, whilst there will also be potentially major environmental impacts associated with construction (further work on the alignment and design would be required to more accurately assess these impacts). **Environmental Constraints** The environmental constraints at the Bluemull Sound ports are provided below for information Gutcher Constraints • Residential properties within 50m of ferry terminal • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 1km and Bastavoe Shellfish Water Protected Area within 4km • Geological SSSI to north and south of ferry terminal • listed building within 100m • Coastal flooding risk • Good air quality Belmont Constraints • Residential properties within 200m of the ferry terminal • Core paths CPPUO03 Belmont to Lund starts at the harbour • Fetlar to Haroldswick MPA located in waters just offshore from the ferry terminal (and within 50m of the outer edge of the harbour) • Southwick Cullivoe Shellfish Water Protected Area within 0.5km and Bastavoe Shellfish Water Protected Area within 6km • Coastal flooding risk • Good air quality Hamars Ness Constraints • Not applicable as no significant works proposed
Safety:	✗	The provision of a fixed link would lead to an increase in car trips to and from Unst, which would lead to a marginally higher accident rate. There would also be potential fire risks with a tunnel but it is assumed that the design and safety standards would minimise this risk.
Economy:	✓✓✓	The provision of a fixed link would be of a significant benefit to Unst, with indirect benefits to Fetlar

		from having access to a dedicated ferry. Firstly, there would be substantial TEE benefits, associated with the removal of capacity constraints on the Gutcher – Belmont route and journey time savings associated with not having to wait for or travel on a ferry. In addition, Yell would be accessible 24 hours per day and there would be no frequency related issues. The EALI benefits to Unst would also be considerable. The island would be much more closely integrated with the larger neighbouring island of Yell and to some extent Shetland mainland. This could create additional job opportunities for Unst and would encourage both inward investment and in-migration / population retention. A fixed link would also lead to cost reductions / productivity enhancements for Unst businesses, particularly the strategically important aquaculture sector. Other sectors which would benefit include tourism and locally traded services.
Integration:	✓✓✓	A fixed link would marginally enhance transport integration with the Shetland and indeed Scottish mainland (there would remain a dependence on the Yell Sound ferries for onward connections). A fixed link could also promote land-use development in Unst (in the 'Area of Best Fit' in Baltasound), supporting the economic development of the island. A fixed link would also support a range of policies including the respective Unst & Fetlar Development Plans.
Accessibility and Social Inclusion:	✓✓✓	The provision of a fixed link would fundamentally transform the community accessibility of Unst, effectively making the island an extension of Yell, and also improving access to the Scottish mainland. Fetlar residents would also record an accessibility benefit through improved access to ferry services.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO1 – Offer an on-request early departure from both Fetlar & Unst, which would allow connection with the first flights Sumburgh.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This service would operate Monday - Friday and would be operated by one vessel. The service would depart Fetlar at 0345 and Unst at 0415. The service would have to be operated by the Gutcher-based vessel MV Bigga as it would otherwise block the linkspan. The ship would be manned from 0245 for half an hour turn to, sail from Gutcher at 0315, arrive back at Gutcher at 0430 and secure by 0500.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0</td></tr>
<tr><td>Current revenue support
£2.19 million (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£2.57 million (rounded) per annum.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
<tr><td>Geographic Context:</td><td colspan="3">The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell.

Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland.</td></tr>
</table>

	Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.
Planning Objectives	

Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide a sailing a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option is not considered relevant for Fetlar and Unst.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have not impact in terms of this objective.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** An early morning on-request service would extend the length of the operating day by adding an additional morning connection into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation. .
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** This option of an early morning request sailing from Fetlar and Unst would contribute significantly to this objective. An early departure from Belmont and Hamars Ness would allow Fetlar / Unst residents to catch the first morning flights to Aberdeen, Edinburgh and Inverness. This in turn would allow residents to make a day return trip to the Scottish mainland, removing the need for an off-island overnight stay. The impact would be

	bigger for Unst than Fetlar given the relative size of the population of each island.	
Rationale for Selection or Rejection of Proposal:	This option is rejected from further consideration. Whilst this option would improve strategic connectivity, the service would leave Fetlar and Unst in the middle of the night and is therefore likely to be very lightly used. Departures at 0345 (Fetlar) and 0415 (Unst) are unlikely to facilitate a particularly practical day trip to the Scottish mainland.	
Implementability Appraisal		
Technical:	There are no technical feasibility issues associated with this option.	
Operational:	• No operational issues but crew overtime & fuel required • Yell Sound sailing would also have to come forward.	
Financial:	£380k increment to annual operating costs of £2.19m based on Option CO1.	
Public:	There was no specific feedback on this option through the initial public consultation, but it is likely that this option would be publicly acceptable.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	There would be a small negative safety impact associated with this option. Whilst this option would not necessarily generate additional road kilometres, it may displace trips to the early hours of the morning, which could be an issue in winter if people are travelling in the dark and / or before the roads are treated.
Economy:	✓	The principal economic benefit of this option is that it would allow Fetlar and Unst residents to make a day return trip the Scottish mainland. This would potentially give rise to small TEE and EALI benefits for the islands (particularly Unst), although there would be a small loss for Shetland mainland hoteliers. There would be a direct financial benefit for the NHS. Island patients would be able to make a day return to Aberdeen for hospital appointments, thus eliminating the overnight accommodation costs which the NHS currently has to fund (although the departure time makes it questionable whether such an approach would be considered appropriate).
Integration:	✓✓	This option would significantly enhance transport integration (see TPO5).

Accessibility and Social Inclusion:	✓	There would be a minor positive in terms of community accessibility, with Fetlar and Unst residents able to both access the Scottish mainland relatively early in the morning and make a day return trip.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO2: Offer additional request sailings on Friday and Saturday evenings (to 0200)	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would result in a maximum of 52 * 2 = 104 additional return sailings per annum, an increase of 1% over the current timetable. It is assumed that crew would be paid at the unsocial hours overtime rate. An equivalent sailing across Yell Sound would be required and has been included in the costs.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0 *Current revenue support* £2.19 million (rounded) per annum. *Annual revenue support* £2.51 million (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of		

	Baltasound. Fetlar ferry terminal, Hamars Ness, which has recently benefitted significant investment in a breakwater, is in the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide a sailing at a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in

Mainland	terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered applicable to Bluemull Sound.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would not contribute to this objective, although it would extend the time available on Shetland mainland (and indeed Yell) for engaging in social activities).
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** Late evening request sailings on a Friday and Saturday would extend the length of the operating day by adding additional evening connections into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration as it is a relatively low cost option, offering an improvement in accessibility.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	• No operational issues but crew overtime & fuel required • Yell Sound sailing would also have to come forward.

Financial:	£320k increment to annual operating costs of £2.19m based on Option CO1.	
Public:	There was no specific feedback on this option through the initial public consultation, but it is likely that this option would be publicly acceptable.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	There would be a very minor safety disbenefit associated with this option as it would likely encourage a very small number of additional road kilometres.
Economy:	✓	There would be minor benefits for residents. The late evening on request sailings on a Friday and Saturday would allow Fetlar and Unst residents to partake in evening social activities in Lerwick (and Yell), potentially making the islands a more attractive place to live. There would also be associated 'options values' with having these services available.
Integration:	-	This option would have no impact in terms of integration.
Accessibility and Social Inclusion:	✓✓	This option would contribute towards improved community accessibility, allowing Fetlar and Unst residents to participate in evening social activities in Lerwick, and indeed Yell. It would also improve the comparative accessibility of the islands, bringing them closer into line with communities on Shetland Mainland.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO3 – Operate standard weekday timetable seven days per week.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The current standard weekday timetable (operated Tuesday - Friday) would be operated at the weekends (Monday would remain the scheduled maintenance day).	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0 *Current revenue support* £2.19 million (rounded) per annum. *Annual revenue support* £2.73 million (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The islands of Fetlar and Unst are the most northerly inhabited islands within the archipelago. The island of Unst is separated from Yell by the Bluemull Sound, and Fetlar lies to the south of Unst and east of Yell. Unst is by far the larger of the two islands in terms of population, but both islands have close connections with neighbouring Yell and Shetland mainland. Transport connectivity is wholly delivered by a two-vessel triangular ferry service, which links Fetlar and Unst to each other and to neighbouring Yell. The ferry from Unst – Yell takes 10 minutes; from Fetlar – Yell takes 25 minutes; and from Unst – Fetlar 25 minutes. The ferry terminal on Unst is located at Belmont in the south-west of the island, some way south of the main settlement of Baltasound. Fetlar ferry terminal, Hamars Ness, hich has recently benefitted significant investment in a breakwater, is in		

	the north-west of the island. The Yell landfall is at Gutcher, which is in the north-east of the island and around 25 minutes' drive to Ulsta, where the ferry can be caught to Shetland mainland. The MV *Bigga* currently lies overnight at Gutcher, with her first service of the day being to Belmont. The MV *Geira* lies overnight at Hamars Ness, with her first service of the day being to Gutcher.
Social Context:	Population in **Unst** declined following the closure of RAF Saxa Vord in 2006 but is now relatively stable at the 600-650 mark. The availability of housing on Unst is reasonably good (although there are some local issues) but there are concerns that housing is of the 'wrong type' for retaining and attracting families. Healthcare in Unst is seen to be of a high standard, although there is a community concern about the lack of some resident specialist services. The school roll in Unst declined sharply with the closure of RAF Saxa Vord, but has recovered slightly since 2006. **Fetlar** has experienced a significant recent decline in population (81 residents in 2013, down to 59 in August 2015) and the community is now very fragile. Limited on-island economic opportunities, a lack of appropriate housing and the closure of the island shop are amongst a number of factors cited as an issue. The lack of appropriate housing is deemed to be a problem on Fetlar. The island continues to have an on-island primary school and nursery, which is critical, but the roll in each is very low.
Economic Context:	The economic activity rate in **Unst** also declined with the closure of RAF Saxa Vord and the out-migration of a number of young and economically active families from the island. Whilst the standard of living remains good, the community highlighted the significant economic challenges faced by the island in the longer term. Unst has had its economic challenges in recent years but has now stabilised to some extent, albeit with a much smaller population. It was noted by HIE that there are some promising signs of growth in the local economy, with tourism and food & drink being key growth industries, although the community note that this is small scale in nature. **Fetlar** currently has a shortage of viable economic development opportunities, an issue the Fetlar Development Plan is seeking to address. The island has limited economic opportunities, with the bulk of employment concentrated in agriculture, small scale tourism and the public sector – travel to neighbouring islands and mainland is therefore essential. Overall, the Fetlar community explained that the reinstatement of fares on the Bluemull Sound coupled with the reduction in service provision as part of the 2013 budget cuts is seriously undermining the sustainability of the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** This option would significantly enhance the available capacity on the Bluemull Sound route at the weekend. The carryings analysis identified capacity issues on the 1550 ex Gutcher (summer and winter) on a Saturday and the 1205 (winter) and 1630 (summer) ex Belmont on a Sunday which this option would alleviate.

TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Bluemull Sound
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** The level of service set out by this objective is already achieved on a Sunday, although there is significant dead time between connections.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The option of running the weekday timetable seven days a week would make a moderate contribution to this objective by increasing the weekend service frequency to a level commensurate with weekdays.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** This option would equalise the level of connectivity across every day of the week, providing consistency on Bluemull Sound services.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** This option would enhance the weekend service frequency, facilitating generally better connectivity with strategic transport connections.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. However, this option would see a major ramp up in weekend services and the potential implications for the timetable and crewing resources should be examined in more detail.
Implementability Appraisal	
Technical:	There is no technical feasibility issues associated with this option.

Operational:	There would be no operational issues associated with this option, although additional crew and fuel would be required (see below).	
Financial:	£537k increment to annual operating costs of £2.19m based on Option CO1.	
Public:	There was very little engagement from the Unst public with respect to ferry revenue options. Some support for this option from Fetlar residents.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	The increase in service frequency at weekends is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor.
Economy:	✓	There would be relatively minor benefits associated with this option. Whilst the length of the operating day would remain the same, the increased number of connections could have benefits for residents, tourists and locally traded services. Tourism in particular is a key growth area for Unst and facilitating weekend connectivity would add value. A 7 day a week, (approximately) 17 hours operating day would also reduce the economic disadvantage of living on an island and could promote population retention and growth.
Integration:	✓	The increased frequency at the weekend would support improved transport connectivity through offering improved connections throughout the day.
Accessibility and Social Inclusion:	✓✓	The operation of the weekday timetable at the weekend would significantly enhance community accessibility, providing numerous additional connections to both Yell and Shetland mainland on a Saturday and Sunday. It would also improve the comparative accessibility of the islands, bringing them closer into line with communities on Shetland Mainland.

Environmental Constraint Map(s)

Ness of Cullivoe Geological SSSI

South Wick Cullivoe SWPA

Belmont Ferry Terminal

Belmont House GDL

Hoga Ness SM

Gutcher Ferry Terminal

Gutcher Geological SSSI

Fetlar to Haroldswick MPA

Basta Voe SWPA

Yell RSPB Reserve

Fetlar SPA

Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Bluemull Sound Options C1, C2, C3 & C6

1:30,986 @ A3

N

0 0.25 0.5 1 km

DRAFT

Shetland Inter-Island Transport Study

Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 3: Environmental Constraints Plan

Gutcher and Belmont Ferry Terminals

South Wick Cullivoe SWPA

Belmont House GDL

Gutcher Ferry Terminal

Fetlar to Haroldswick MPA

Hamars Ness Ferry Terminal

Yell RSPB Reserve

Fetlar SPA

Basta Voe SWPA

Brough House GDL

Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Bluemull Sounds Option C4

N

1:40,000 @ A3

0 0.25 0.5 1 km

DRAFT

Shetland Inter-Island Transport Study

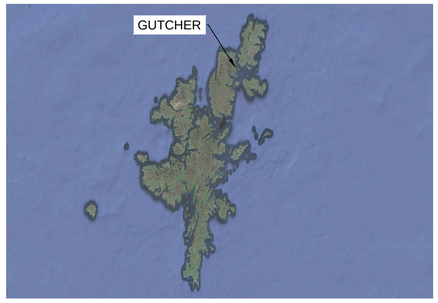
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

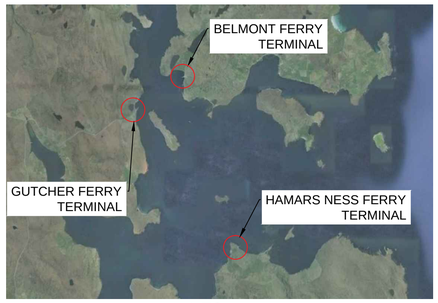
Figure 4: Environmental Constraints Plan

Gutcher and Hamars Ness Ferry Terminals

Harbour Drawing(s)



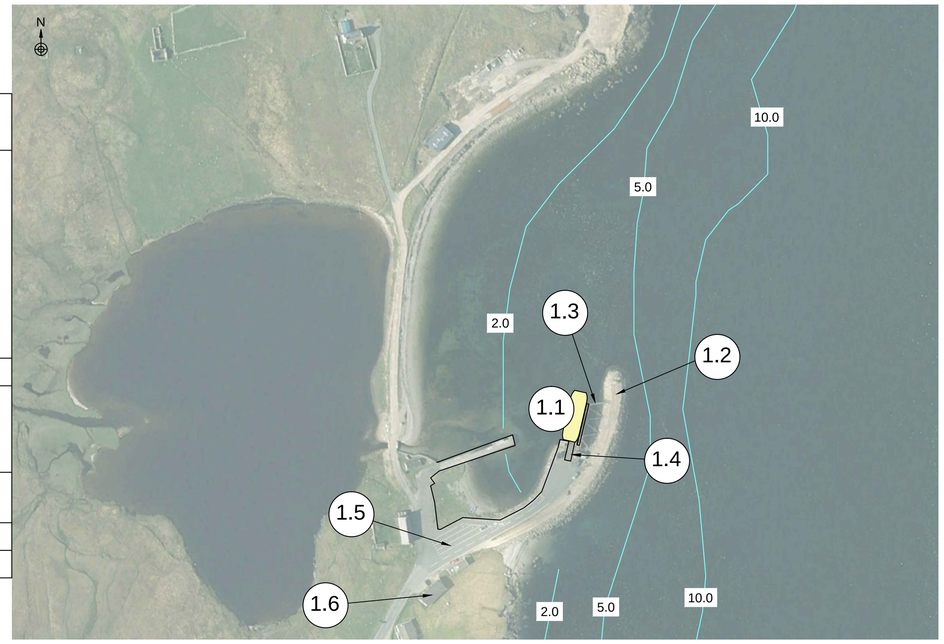
NTS



NTS

1) CURRENT CONDITION

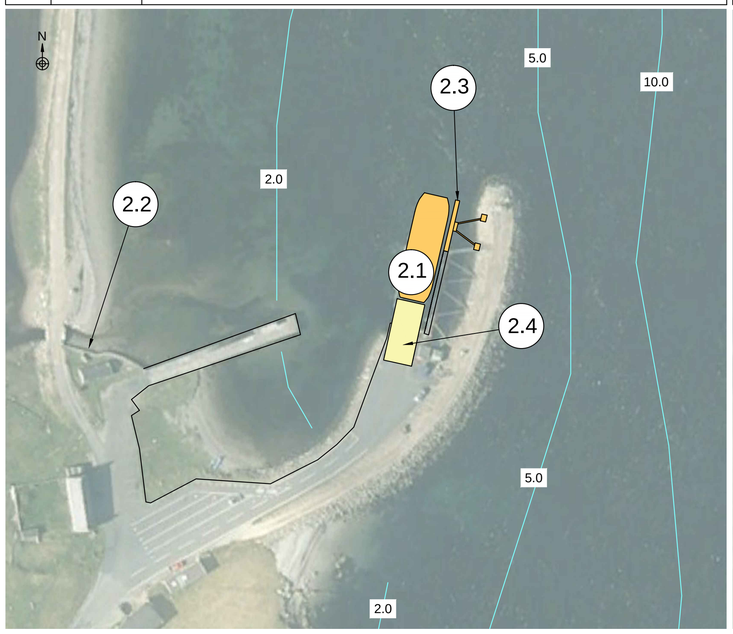
1.1	Current Main Vessel	Size: MV BIGGA • Loa = 33 m • Beam = 10.1 m • Draught = 2.61 m Capacity: • 96 passengers • 14 PCU MV GEIRA • Loa = 30m • Beam = 9m • Draught = 2.61m • 96 passengers •10 PCU
1.2	Breakwater	Rubble mound 150m long
1.3	RoRo Ferry Berth	• 40m long berth composed by 3 timber dolphins supported against the breakwater with timber struts. • Vertical rubber D type fenders
1.4	Linkspan	Small 4.5 m wide x 13.915 m long
1.5	Parking/waiting area	90 lane meters approx.
1.6	Facilities	Toilets & waiting room



Scale approx. 1:2000

2) LIKE FOR LIKE OPTION
Terminal upgrades

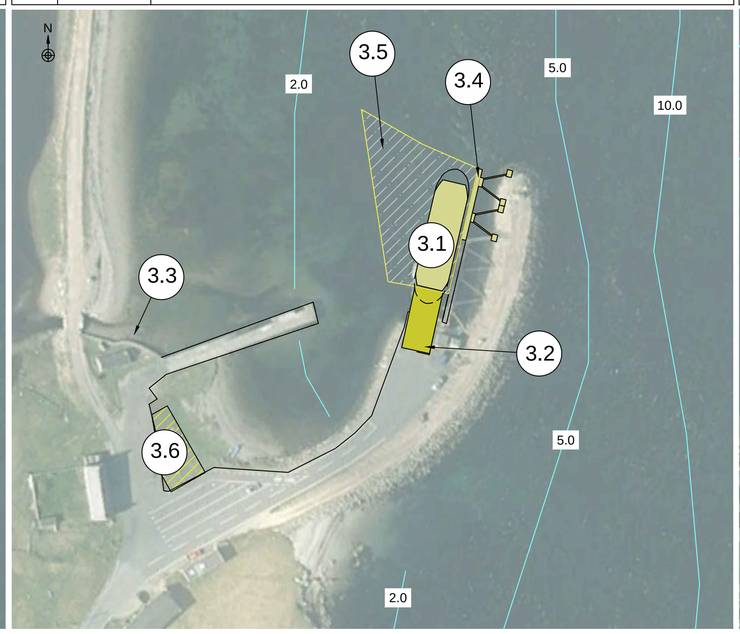
2.1	Vessel	**TYPE 1**
2.2	Inlet	Lagoon's inlet closeness to existing berth affects berthing operations during ebb tide and causes siltation. Recommended to relocate.
2.3	RoRo Ferry Berth	• Extension of RoRo berth circa 15m (see note 7.) • Well sheltered. Safely overnight berthing.
2.4	Linkspan	Upgrade to Large Linkspan (9.3m wide x 20.47m long) see note 9.



Scale approx. 1:1000

3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**TYPE 2**
3.2	Linkspan	Upgrade to Large Linkspan (9.3m wide X 20.47m long)
3.3	Inlet	See 2.2.
3.4	RoRo Ferry Berth	• Extension of RoRo berth circa 25m (see note 7). • Installation new bollards and fenders along the structure (see note 8).
3.5	Dredging	Some minimum dredging could be required.
3.6	Parking	Recommended to increase parking/waiting area.



Scale approx. 1:1000

4) NEW HARBOUR AT MID-YELL
Indicative layout

4.1	Mid - Yell option 1	• Approx. 160m rubble mound breakwater to provide a sheltered 50m long RoRo berth equipped with a large linkspan (9.4m wide X 20.47m long). • Berth protected from southeasterly swell and possible northerly sea. • Land reclamation required to provided access and parking/waiting area. • No or minimum dredging required. • Access road needs to be provided.
4.2	Mid - Yell option 2	• Use/replacement of the existing Mid - Yell pier (see note 7.) • Berth well sheltered. • Provision of parking waiting area (possible land reclamation) • Use of existing road access. • Dredging required to provided vessel access.

Scale approx. 1:2000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3292 EASTERN APPROACHES TO YELL SOUND, COLGRAVE SOUND AND BLUEMULL SOUND.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO REPLACE / UPGRADE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Bluemull Sound	2.6	1.9	1.0	0.5

0 10 20 30 40 50
1:1000 m
0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	14/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

BLUEMULL - GUTCHER OPTIONEERING

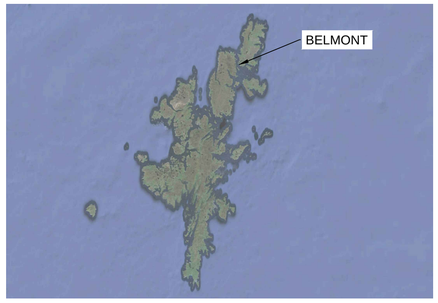
BECKETT RANKINE
Marine Consulting Engineers
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

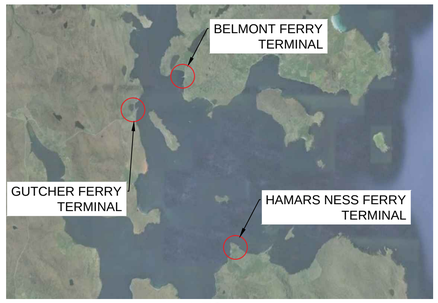
Drawn:	Checked:	Date:
DP	GR	17/03/16

Drawing Number:	Revision:
1537-01-301	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Bmtt Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-301 REV.B



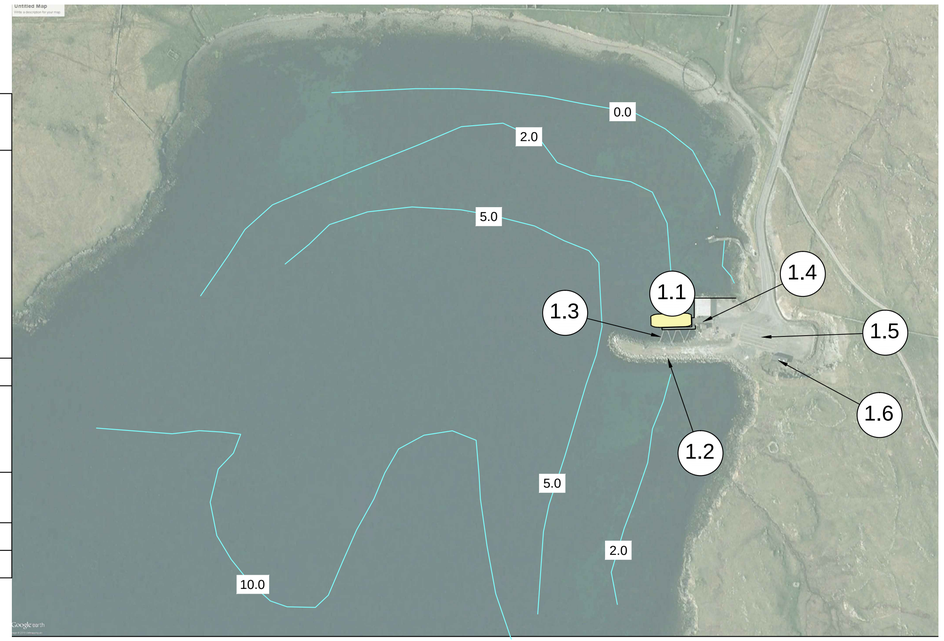
NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV BIGGA • Loa = 33 m • Beam = 10.1 m • Draught = 2.61 m MV GEIRA • Loa = 30m • Beam = 9m • Draught = 2.61m Capacity: • 96 passengers • 14 PCU • 96 passengers •10 PCU
1.2	Breakwater	Rubble mound 100m long
1.3	RoRo Ferry Berth	• 60m long berth composed by 3 timber dolphins supported against the breakwater with timber struts. • Vertical rubber D type fenders.
1.4	Linkspan	Small 4.5m wide x 13.915 m long
1.5	Parking/waiting area	150 lane meters approx.
1.6	Facilities	Toilets & waiting room



Scale approx. 1:2500

2) LIKE FOR LIKE OPTION
Terminal upgrades

2.1	Vessel	**TYPE 1**
2.2	RoRo Ferry Berth	• Vessel slightly overhangs from berth. • Sheltered from southerly waves. • If used for overnight berthing it is recommended to extend the berth circa 15m. See notes 7 & 8.
2.3	Linkspan	Upgrade to Large Linkspan (9.3m wide x 20.47m long) see note 9.

Scale approx. 1:1000

3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**TYPE 2**
3.2	Dredging	Dredge pocket and maneuvering area to be dredged to approx. -3.5mCD.
3.3	RoRo Ferry Berth	• Extension of RoRo berth circa 30m (see note 7). • Installation new bollards and fenders along the structure (see note 8).
3.4	Linkspan	Upgrade to Large Linkspan (9.3m wide x 20.47m long) see note 9.
3.5	Waiting area	Additional waiting area for busy periods.

Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3292 EASTERN APPROACHES TO YELL SOUND, COLGRAVE SOUND AND BLUEMULL SOUND.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Bluemull Sound	2.6	1.9	1.0	0.5

0 10 20 30 40 50
1:1000 m

0 25 50 75 100 125
1:2500 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	14/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

BLUEMULL - BELMONT OPTIONEERING

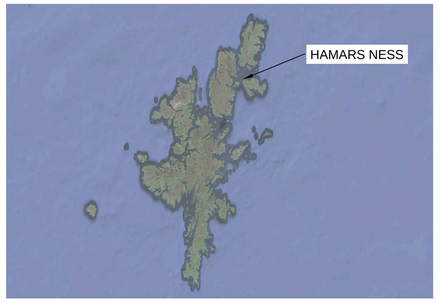
BECKETT RANKINE
Marine Consulting Engineers
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

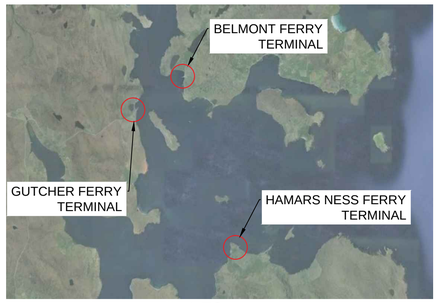
Drawn:	Checked:	Date:
DP	GR	16/03/16

Drawing Number:	Revision:
1537-01-302	B

T:\2015\1537 - Shetland Inter-island Transport Study - Beett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-302 REV B



NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV BIGGA • Loa = 33 m • Beam = 10.1 m • Draught = 2.61 m MV GEIRA • Loa = 30m • Beam = 9m • Draught = 2.61m Capacity: • 96 passengers • 14 PCU • 96 passengers •10 PCU
1.2	Breakwater	Rubble mound 200m long
1.3	RoRo Ferry Berth	• 50m long piled jetty. • Vertical rubber D type fenders
1.4	Linkspan	Large 9.3m wide x 20.47 m long
1.5	Overnight lay-by berth	Approx. 60m berth length for overnight / lay-by.
1.6	Parking/waiting area	50 lane meters approx.
1.7	Passenger facilities	Toilets & waiting room
1.8	Additional infrastructure	Slipway and suspended concrete pier

Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM BING MAPS AND GOOGLE EARTH.

6. BED LEVELS FROM FETLAR BREAKWATER AND SMALL CRAFT FACILITY - GENERAL ARRANGEMENT DRAWING PROVIDED BY THE CLIENT.

7. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

SHETLAND TIDAL LEVELS

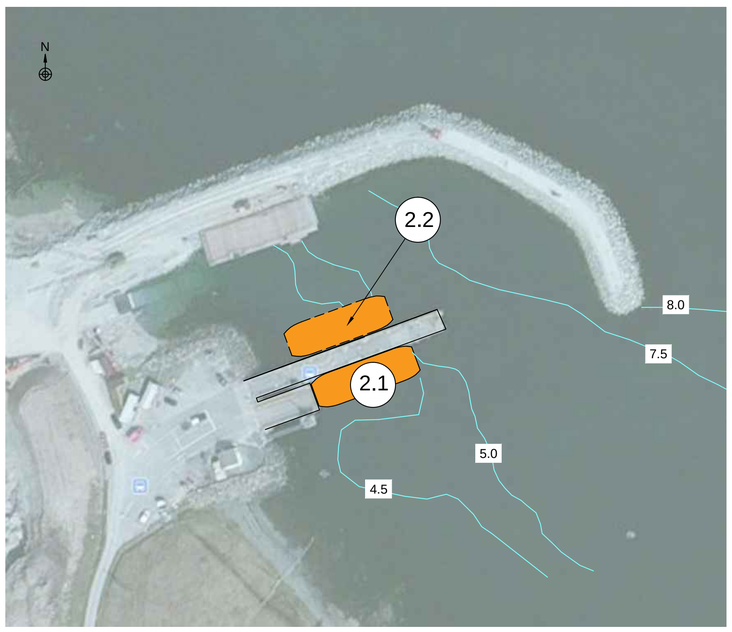
LOCATION	MHWS	MHWN	MLWN	MLWS
Bluemull Sound	2.6	1.9	1.0	0.5

0 10 20 30 40 50
1:1000 m

ORIGINAL DIMENSION 90mm

2) LIKE FOR LIKE OPTION
No Terminal upgrades

2.1	Vessel	**TYPE 1**
2.2	Overnight lay-by berth	Safely overnight berthing



Scale approx. 1:1000

3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**TYPE 2**
3.2	Overnight lay-by berth	• Review adequacy of current bollards and fenders (see note 7).
3.3	Waiting area	• Additional waiting area may be required during busy periods.

Scale approx. 1:1000

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	14/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

BLUEMULL
HAMARS NESS
OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	16/03/16

Drawing Number:	Revision:
1537-01-303	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Bvet Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-303 REV B

Appendix D Bressay (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1 (Do Minimum): Replace the MV *Leirna* on a like-for-like basis.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	Any 'like-for-like' vessel would need to be slightly larger in anticipation of the continuing trend of vehicles becoming larger. It is estimated that a like-for-like vessel would be around 35m long and would carry around 130 passengers and 20 PCUs. The vessel would run at 10 knots and would hold an equivalent to the current MCA Class IV certificate. Fitting the vessel with an azimuth propulsion system would allow an element of interchangeability and consistency with other vessels in the fleet. It is assumed that the berthing structure and linkspan (small) at Bressay will be replaced.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £4.50 million. *Current revenue support* £804k (rounded) per annum. *Annual revenue support* £760k (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound.		

	Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive /	***Performance against Transport Planning Objective: Neutral***

public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	This option would have no impact on this objective.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. Further more detailed analysis of supply and demand (present and forecast) is required to establish whether 1 * *Leirna* style vessel could meet the requirements of the route. This option could be combined with revenue options to extend the operating day.
Implementability Appraisal	
Technical:	The berthing structure at Bressay would need to be replaced.
Operational:	There are no operational feasibility issues associated with this option.
Financial:	The capital cost would be £4.5 million, with annual revenue support estimated at £760K, a reduction of £44k per annum on the current day figure.
Public:	This option was identified as an acceptable ferry based option.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Leirna* with a more modern vessel gives rise to a potential reduction in emissions. There would be no other environmental issues associated with this option. **Environmental Constraints** The environmental constraints for the Bressay route are provided below for information Bressay Ferry Terminal • Residential properties within 150m to the north of the harbour (Maryfield House Hotel (not currently trading) within 180m) and in close proximity to fixed link (if previous line is used at Hogan) • Easter Rova Head Geological SSSI approximately 4km north • Gardie House Garden and Designed Landscape within 100m (to north) of harbour • Listed buildings within 100m of harbour • Coastal flooding risk • Generally good air quality Lerwick Port (Bressay Service Ferry Terminal) • Residential properties within 50m of the harbour • Core path CPPL04 Coastal Walk • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 100m • Ferry terminal located in Lerwick Conservation Area
Safety:	Neutral	This option would have no impact on safety.
Economy:	Neutral	This option would have no impact in terms of economy, except in terms of the potential perception benefits from having a new modern vessel.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	The replacement of the MV *Leirna* with a new vessel would deliver a minor benefit in terms of accessibility & social inclusion as a new vessel would meet current disabled access requirements.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO2: Replace the MV *Leirna* with one larger vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	In each of the 'one larger vessel' options in this study, we have typically planned on the basis of a 50% uplift in PCU capacity. However, in the context of Bressay, the MV *Leirna* has a relatively high PCU carrying relative to her LOA. Scaling up to +50% in terms of PCUs would therefore involve the use of a vessel akin to the MV *Daggri* in terms of the generic vessels under consideration. This would seem disproportionate and we have therefore considered a larger version of the current sheltered water vessel here, which would be capable of accommodating circa 28 PCUs (i.e. approximately a 50% uplift). In order to accommodate a larger vessel, significant harbour work would be required at Bressay including a new piled jetty, replacement of the linkspan and dredging. A new berthing dolphin and linkspan would be required in	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £7.55 million. *Current revenue support* £804k (rounded) per annum. *Annual revenue support* £791k (rounded) per annum.

	Lerwick.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.		
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.		
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.		
Planning Objectives			

Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of a vessel with a higher PCU carrying capacity onto the Lerwick – Bressay route would make a moderate positive contribution in terms of this objective. Car deck capacity on certain AM peak departures from Bressay and PM peak departures from Lerwick max out, meaning some vehicles cannot get onto the ferry. This can lead to late arrival into work and education or missed interchange with an onward connection. In terms of the evidence to support this problem, carryings data show that the 0830 departure from Bressay frequently has a vehicle deck utilisation in-excess of 80% (above which a sailing is defined as high utilisation), particularly in the summer months. Some seventy-four 0830 departures sailed over the 80% threshold in summer 2013/14, suggesting capacity on this service, which is key to accessing employment and education, is a problem. This service is less highly utilised in the winter, with >80% sailings typically on a Monday and Tuesday. The 1715 service from Lerwick is relatively highly utilised during the winter (31 sailings >80% utilised).[1]
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Moderate Positive*** This provision of a single larger ferry on the route would support this objective through addressing the capacity issues on the ferry, ensuring reliable access to the peak services for commuters.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.

[1] SIITS Carryings and Utilisation Analysis (Peter Brett Associates, 2015), Bressay – Lerwick Capacity Analysis Table

connections across the operating day.		
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.		***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.		***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:		This option will be retained for further consideration. 1 * larger *Leirna* type vessel would alleviate the peak vehicle capacity issues on the route. The costs and benefits of this compared to a like-for-like replacement (Option CO1) need to be established and quantified.
Implementability Appraisal		
Technical:		Significant harbour work would be required at Bressay including a new piled jetty, replacement of the linkspan and dredging. A new berthing dolphin and linkspan would be required in Lerwick.
Operational:		There are no operational feasibility issues associated with this option.
Financial:		The capital cost would be £7.55 million, with annual revenue support estimated at £791k, a reduction of £13k per annum on the current day figure.
Public:		This option was identified as an acceptable ferry based option.
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Leirna* with a more modern vessel gives rise to a potential reduction in emissions (although emissions would be slightly higher than the Do Minimum, which would be a smaller hull form). There would be no other environmental issues associated with this option. The following impacts have been identified in terms of environmental sub-criteria • Noise & vibration: Short-term impacts of harbour works at closest properties during construction (particularly in Lerwick) but unlikely to be significant in context of existing harbour operations. • Local air quality: Provision for more vehicles has potential to generate increased road traffic at port areas but unlikely to impact significantly on local air quality.

		• Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities but unlikely to be significant in context of existing harbour operations. • Biodiversity & habitats: Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbours. • Landscape: Small permanent effect from new car park provision. • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbours. • Cultural heritage: Bressay works unlikely to be of a scale to impact on the setting of Gardie House. Works in Lerwick in Conservation Area but within context of working harbour. Impacts on setting of listed buildings and scheduled monuments in Lerwick unlikely to be significant in context of existing harbour **Environmental Constraints** The environmental constraints for the Bressay route are provided below for information Bressay Ferry Terminal • Residential properties within 150m to the north of the harbour (Maryfield House Hotel within 180m) and in close proximity to fixed link (if previous line is used at Hogan) • Easter Rova Head Geological SSSI approximately 4km north • Gardie House Garden and Designed Landscape within 100m (to north) of harbour • Listed buildings within 100m of harbour • Coastal flooding risk • Generally good air quality Lerwick Port (Bressay Service Ferry Terminal) • Residential properties within 50m of the harbour • Core path CPPL04 Coastal Walk • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 100m • Ferry terminal located in Lerwick Conservation Area
Safety:	Neutral	This option would have no impact on safety.
Economy:	✓	This option would record a minor benefit in terms of the Economy criterion. The alleviation of capacity issues and ensured reliability for commuters would record minor TEE benefits for users.

Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	The replacement of the MV *Leirna* with a new vessel would deliver a minor benefit in terms of accessibility & social inclusion as a new vessel would meet current disabled access requirements. The larger vessel would in all likelihood address existing vehicle capacity issues which can act as a barrier to accessibility.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Replace the MV *Leirna* with two vessels and develop an overnight berth at Lerwick	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option assumes 2 * MV *Leirna* equivalent vessels which would carry 100 passengers and 15-20 PCUs. The berthing structure at Bressay would be replaced. Minor harbour works would be required to berth the vessel overnight at Lerwick. It is assumed that the second vessel would operate on a day boat basis, increasing the number of sailings by 50% and operate a high frequency service across the day.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £9.15 million. *Current revenue support* £804k (rounded) per annum. *Annual revenue support* £1.19m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches.		

	In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of a two vessel service onto the Lerwick – Bressay route would make a moderate positive contribution in terms of this objective. Car deck capacity on certain AM peak departures from Bressay and PM peak departures from Lerwick max out, meaning some vehicles cannot get onto the ferry. This can lead to late arrival into work and education or missed interchange with an onward connection. In terms of the evidence to support this problem, carryings data show

	that the 0830 departure from Bressay frequently has a vehicle deck utilisation in-excess of 80% (above which a sailing is defined as high utilisation), particularly in the summer months. Some seventy-four 0830 departures sailed over the 80% threshold in summer 2013/14, suggesting capacity on this service, which is key to accessing employment and education, is a problem. This service is less highly utilised in the winter, with >80% sailings typically on a Monday and Tuesday. The 1715 service from Lerwick is relatively highly utilised during the winter (31 sailings >80% utilised). Whilst a two vessel solution would offer more capacity in total than one larger vessel, initial review of the carryings data suggests one large vessel would adequately meet the current carryings needs of the route.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Moderate Positive*** This provision of two ferries on this route would support this objective through addressing the capacity issues on the ferry, ensuring reliable access to the peak services for commuters. It would also double the frequency of the service through much of the operating day, including in the key AM and PM peak periods.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** This option would increase the number of connections on the route by 50%, with flexibility to offer a 100% increase in connections. This could consist of: • An additional ten return sailings Monday – Thursday and on a Saturday. • An additional eleven return sailings on a Friday. • An additional eight return sailings on a Sunday
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This Lerwick – Bressay route operates a standard and relatively consistent timetable. Any existing differentials could be addressed by a one vessel solution, so the impact of a two-vessel solution in this context is neutral.
TPO5: Where practicable, islanders should	***Performance against Transport Planning Objective: Neutral***

be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	This option would have no impact on strategic connectivity.	
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. It is clear from the capacity analysis that the Bressay route only experiences capacity issues at peak times, and even at that only on a handful of specific sailings. These issues can be addressed through running the vessel more frequently during peak hours. Any new like-for-like vessel (potentially with mezzanine decks) or a larger vessel is likely to be able to provide the required capacity. The cost of a two vessel solution therefore appears disproportionate and a suitable crew / overnight berth would be required.	
Implementability Appraisal		
Technical:	• The berthing structure at Bressay would be replaced. • Minor harbour works would be required to berth the vessel overnight at Lerwick.	
Operational:	Additional crew would be required to operate the second vessel (the 'day boat').	
Financial:	The capital cost would be £7.55 million, with annual revenue support estimated at £1.19m, an increase of £386k per annum on the current day figure.	
Public:	No obvious requirement for a 2-vessel solution was noted by the public.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *Leirna* with more modern vessels gives rise to a potential reduction in emissions. However, migrating from a one to a two vessel solution would record a minor negative as there would be a 50% increase in sailing hours. The following impacts have been identified in terms of environmental sub-criteria • Noise & vibration: Short-term impacts of harbour works at closest properties during construction (particularly in Lerwick) but unlikely to be significant in context of existing harbour operations. • Local air quality: Provision for more vehicles has potential to generate increased road traffic at port areas but unlikely to impact significantly on local air quality. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities but unlikely to be significant in context of existing harbour operations. • Biodiversity & habitats: Short term impacts on otter and/or marine mammals etc but unlikely

		to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbours. • Landscape: Small permanent effect from new car park provision. • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbours. • Cultural heritage: Bressay works unlikely to be of a scale to impact on the setting of Gardie House. **Environmental Constraints** The environmental constraints for the Bressay route are provided below for information Bressay Ferry Terminal • Residential properties within 150m to the north of the harbour (Maryfield House Hotel within 180m) and in close proximity to fixed link (if previous line is used at Hogan) • Easter Rova Head Geological SSSI approximately 4km north • Gardie House Garden and Designed Landscape within 100m (to north) of harbour • Listed buildings within 100m of harbour • Coastal flooding risk • Generally good air quality Lerwick Port (Bressay Service Ferry Terminal) • Residential properties within 50m of the harbour • Core path CPPL04 Coastal Walk • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 100m • Ferry terminal located in Lerwick Conservation Area
Safety:	✗	This additional vessel running hours would have a minor negative impact in terms of safety.
Economy:	✓✓	This option would record a moderate benefit in terms of the Economy criterion. The alleviation of capacity issues and a 50% increase in frequency would ensure reliability for commuters would record minor TEE benefits for users.
Integration:	✓	This option would provide Bressay with a significant increase in frequency, supporting enhanced integration with public transport options in Lerwick, whilst also supporting various policies aimed at fostering the economic sustainability of island.
Accessibility and Social Inclusion:	✓✓✓	The replacement of the MV *Leirna* with two vessels would deliver a major positive benefit in terms of accessibility & social inclusion as a new vessel would meet current disabled access requirements. The additional vessel would in all likelihood address existing capacity issues which can act as a

		barrier to accessibility. In absolute terms, accessibility would be enhanced through a minimum 50% increase in the number of connections by day.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO4: Supplement options C1 (like-for-like vessel) or C2 (larger vessel) with a passenger only vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option includes the provision of a passenger only vessel to supplement any of the single ro-ro options (C1 or C2). It is assumed that this vessel would carry around 50-100 passengers and would travel at 8 knots. The timetable of this vessel would require further analysis but it is possible it would be tied up or used for charters outwith peak hours.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £500k-£1m. *Current revenue support* £804k (rounded) per annum. *Annual revenue support* Likely to require a marginal increase in revenue funding.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.		

Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** Passenger capacity has not been evidenced as a problem on this route. A passenger only vessel would not therefore contribute to this objective.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** A passenger only vessel would provide additional connections at peak times which could support commuters. Any impact is however likely to be relatively minor.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Bressay.

employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** This option would increase the number of connections, with flexibility to offer a 100% increase in connections. However, these sailings would be passenger only.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This Lerwick – Bressay route operates a standard and relatively consistent timetable. Any existing differentials could be addressed by a one vessel solution, so the impact of a two-vessel solution in this context is neutral.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity unless the passenger vessel started sufficient early in the morning, with a corresponding public transport connection to Sumburgh in Lerwick.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. This option would provide a low cost means to substantially increase connections between Bressay and Lerwick. Given that the service would operate directly into the town centre, this option is worthy of further consideration. Community feedback is required on whether this option would attract public support.
Implementability Appraisal	
Technical:	Minor harbour works would be required at Bressay to facilitate a foot passenger service.
Operational:	Additional crew would be required to operate the passenger vessel.
Financial:	The capital cost would be £0.5-£1 million, with a marginal increase in annual revenue support.
Public:	A few comments were on this option at the public engagement but no widespread support was found.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	Supplementing the replacement of the MV *Leirna* with a passenger only vessel would give rise to a minor increase in emissions through an increase in the number of sailings operated.

		Harbour works are likely to be minimal, which would mean that any environmental impact would likewise be minimal. **Environmental Constraints** The environmental constraints for the Bressay route are provided below for information Bressay Ferry Terminal • Residential properties within 150m to the north of the harbour (Maryfield House Hotel within 180m) and in close proximity to fixed link (if previous line is used at Hogan) • Easter Rova Head Geological SSSI approximately 4km north • Gardie House Garden and Designed Landscape within 100m (to north) of harbour • Listed buildings within 100m of harbour • Coastal flooding risk • Generally good air quality Lerwick Port (Bressay Service Ferry Terminal) • Residential properties within 50m of the harbour • Core path CPPL04 Coastal Walk • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 100m • Ferry terminal located in Lerwick Conservation Area
Safety:	✗	This option would have a minor negative impact on safety due to increased vessel running hours.
Economy:	✓	This option would record a moderate benefit in terms of the Economy criterion. The 50% increase in frequency would provide benefits associated with additional connections over the day. Any such impact is however likely to be very limited given the already high service frequency on the Lerwick – Bressay route.
Integration:	✓	This option would provide Bressay with a significant increase in frequency, supporting enhanced integration with public transport options in Lerwick, whilst also supporting various policies aimed at fostering the economic sustainability of island.
Accessibility and Social Inclusion:	✓✓	Supplementing the replacement of the MV *Leirna* with a passenger only vessel would deliver a moderate benefit in terms of accessibility & social inclusion through increasing the number of connections across the day, seven days a week.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO5 – Construct a fixed link between Bressay and Shetland Mainland.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="4">Proposal Description:</td><td rowspan="4">The issue of a fixed link between Bressay and Shetland mainland has been analysed in the most detail of any of the Shetland fixed link proposals. The current adopted position of the Council is the construction of a drill and blast tunnel beneath the Sound of Bressay on an alignment between Gremista and Heogan on Bressay. The tunnel would allow bi-directional traffic movement.</td><td rowspan="4">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant:

A range of capital costs have been provided for a fixed link, as set out in the main report:
Unlined UK: £21.1m (£25.9m including optimism bias & contingency)
Unlined Norwegian: £16.8m (£20.6m including optimism bias & contingency)
1/3 Lined UK: £22.5m (£27.5m including optimism bias & contingency)
1/3 Lined Norwegian: £17.8m (£21.8m including optimism bias & contingency)</td></tr>
<tr><td>Current revenue support: £0</td></tr>
<tr><td>Annual revenue support:

It is likely that a fixed link of this nature would require revenue support for ongoing maintenance. However, as this option is rejected from further consideration, an estimation of these costs and a determination of who would meet the costs has not been undertaken</td></tr>
</table>

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.		
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.		
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.		
Planning Objectives			
Objective:	Performance against planning objective:		

TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link between Bressay & Shetland mainland would remove all capacity related constraints associated with the current ferry service. The evidence suggests that the current peak hour capacity constraints on the Lerwick - Bressay route are constraining the key Bressay commuter market. A fixed link would clearly alleviate this problem.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Major Positive*** The current Lerwick - Bressay service supports significant commuting to Lerwick and further afield. However, the provision of a fixed link would significantly reduce commuter journey times, allow for 24 hour travel-to-work and offer a high-degree of reliability.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant to Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any frequency related considerations associated with the ferry.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any timetable related variations associated with the current Lerwick – Bressay ferry service.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would allow twenty-four hour access to Lerwick and Sumburgh Airport.

Rationale for Selection or Rejection of Proposal:	The research undertaken as part of this study, including the pricing of the tunnel option by a Norwegian & UK contractor, suggests that a fixed link could be competitive when compared with ongoing ferry replacement cycles.
Implementability Appraisal	
Technical:	This option is technically feasible. The ground conditions for the proposed alignment are understood following some circumstantial and some limited dedicated ground investigation. It is anticipated that contingency finance (currently allowed at 10% CAPEX) and optimism bias multipliers (currently allowed at 12.6% for CAPEX) would be reduced further if more dedicated ground investigation were undertaken.
Operational:	A basic ferry infrastructure would need to be maintained to ensure continuity during times of tunnel closure / maintenance or where there is a catastrophic failure of the asset (akin to that experienced on the Forth Road Bridge in December 2015). The current ferry on the Lerwick – Bressay route could not be cascaded elsewhere on the network, although there may be limited opportunities to cascade the shoreside infrastructure.
Financial:	A range of capital costs have been provided for a fixed link, as set out in the main report: • Unlined UK: £21.1m (£25.9m including optimism bias & contingency) • Unlined Norwegian: £16.8m (£20.6m including optimism bias & contingency) • 1/3 Lined UK: £22.5m (£27.5m including optimism bias & contingency) • 1/3 Lined Norwegian: £17.8m (£21.8m including optimism bias & contingency) Ongoing maintenance costs would be in addition to the up-front capital costs.
Public:	The public consultation found that there is some support for a fixed link although others are opposed or think that it is an unrealistic proposition.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**

Environment:	×××	The provision of a fixed link is likely to have a minor negative impact through increasing vehicle kilometres, whilst there will also be potentially moderate environmental impacts associated with construction (further work on the alignment and design would be required to more accurately assess these impacts). The following impacts have been identified in terms of environmental sub-criteria • Noise & vibration: Short term impacts at closest properties during construction of tunnel and new road links. Traffic on new sections of road may have noise impacts on nearby sensitive receptors. • Local air quality: Traffic on new sections of road has potential to generate increased emissions but unlikely to impact significantly on local air quality. • Water quality, drainage & flood defence: Significant impacts on water resources not predicted provided works were sensitively planned • Geological features: Impact from tunnel from removal of geological deposits. Surplus spoil could potentially be used in new road works. • Biodiversity & habitats: Disturbance of protected species during construction. New roads have potential for local impacts on biodiversity including peatland habitats. • Landscape: Potential for adverse permanent effects from new tunnel portals if not sensitively designed and landscape impacts of new road. • Visual amenity: Short term impacts during construction. Impacts from increased traffic on approach road and other roads in Bressay on closest receptors. • Agriculture & soils: Some permanent loss of peat soils for new road. • Cultural heritage: Bressay works unlikely to be of a scale to impact on the setting of listed buildings in proximity to the works.
Safety:	×	The provision of a fixed link would lead to an increase in car trips to and from Bressay, which would lead to a marginally higher accident rate. There would also be potential fire risks with a tunnel but it is assumed that the design and safety standards would minimise this risk.
Economy:	✓✓✓	The provision of a fixed link would be of a significant benefit to Bressay. Firstly, there would be TEE benefits, associated with the removal of capacity constraints and journey time savings associated with not having to wait for or travel on a ferry. In addition, Shetland mainland would be accessible 24 hours per day and there would be no frequency related issues associated with waiting for a ferry. This is particularly critical for Bressay, which is so tightly integrated with the Lerwick economy. The EALI benefits to Bressay would also be considerable. First and foremost, Bressay would effectively become an ‘extension’ of Shetland mainland (in effect part of ‘greater Lerwick’), more fully

		integrating the islands. A fixed link would also lead to cost reductions / productivity enhancements for the small stock of Bressay businesses, particularly the fishmeal plant. Other sectors which would benefit include tourism and locally traded services.
Integration:	✓✓✓	A fixed link would significantly enhance transport integration with the Shetland and indeed Scottish mainland.
Accessibility and Social Inclusion:	✓✓✓	The provision of a fixed link would fundamentally transform the community accessibility of Bressay, effectively making the island an extension of Shetland mainland / greater Lerwick.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO1 – Offer an on-request 0600 departure from Bressay to allow connection with the first flights from Sumburgh.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This service would operate on a bookings only basis on Monday - Friday and would depart Bressay at around 0600. At present the first sailing departs Bressay at 0700. This would result in a maximum of an additional 260 (5 * 52) return sailings per year, assuming weekday operation only. It is assumed that the crew would be paid at the unsocial hours overtime rate for these sailings.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00. *Current revenue support* £804k (rounded) per annum. *Annual revenue support* £772k (rounded) per annum – note this figure is less than the current annual total as it is based a new like-for-like vessel.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services.		

	Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide a sailing a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the	***Performance against Transport Planning Objective: Minor Positive*** This commencement of the operating day one hour earlier would support a 0630 work start time in Lerwick, opening up additional opportunities in terms of shift work. It would also enhance access to other non-standard

connections provided should reliably facilitate commuting	working hours employment throughout the Shetland Islands.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** An early morning on-request service would extend the length of the operating day by adding an additional morning connection into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against*. *Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** This option of an early morning request sailing from Bressay would contribute significantly to this objective. An early departure would allow Bressay residents to catch the first morning flights from Sumburgh. This in turn would allow residents to make a day return trip to the Scottish mainland, removing the need for an off-island overnight stay.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. Community feedback is required on whether this option would attract public support, but as a low cost option with potentially tangible benefits, it is worthy of further consideration.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	Additional crewing hours and fuel would be required.
Financial:	Low – £12k per annum based on Option CO1 - only five return sailings over the week.
Public:	There is public support for this measure.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	Neutral	There would be a small negative safety impact associated with this option. Whilst this option would not necessarily generate additional road kilometres, it may displace trips to the early hours of the morning, which could be an issue in winter if people are travelling in the dark and / or before the roads are treated.
Economy:	✓	The principal economic benefit of this option is that it would allow Bressay residents to make a day return trip the Scottish mainland. This would potentially give rise to small TEE and EALI benefits for the islands, although there would be a small loss for Shetland mainland (likely Lerwick) hoteliers. There would be a direct financial benefit for the NHS. Island patients would be able to make a day return to Aberdeen for hospital appointments, thus eliminating the overnight accommodation costs which the NHS currently has to fund.
Integration:	✓✓	This option would significantly enhance transport integration (see TPO5).
Accessibility and Social Inclusion:	✓	There would be a minor positive in terms of community accessibility, with Bressay residents able to both access the Scottish mainland relatively early in the morning and make a day return trip.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO2 – Offer additional peak hour weekday sailings.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This option would include an 0810 departure ex Bressay and a 1650 & 1735 ex Lerwick.

It should be noted that this is already occurring on a trial basis. At other times, the vessel will go back for short-shipped traffic if time permits.

Additional sailings during the rest of the operating day could be factored in if ever required (additional fuel being the only notable cost).

As an example, it is assumed that this core option would result in an additional 780 (15 (3 per day) * 52) return sailings per year. It is assumed that there would be no additional crew cost as these sailings are within current working hours.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00.</td></tr>
<tr><td>Current revenue support
£804k (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£745k (rounded) per annum – note this figure is less than the current annual total as it is based a new like-for-like vessel.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
</table>

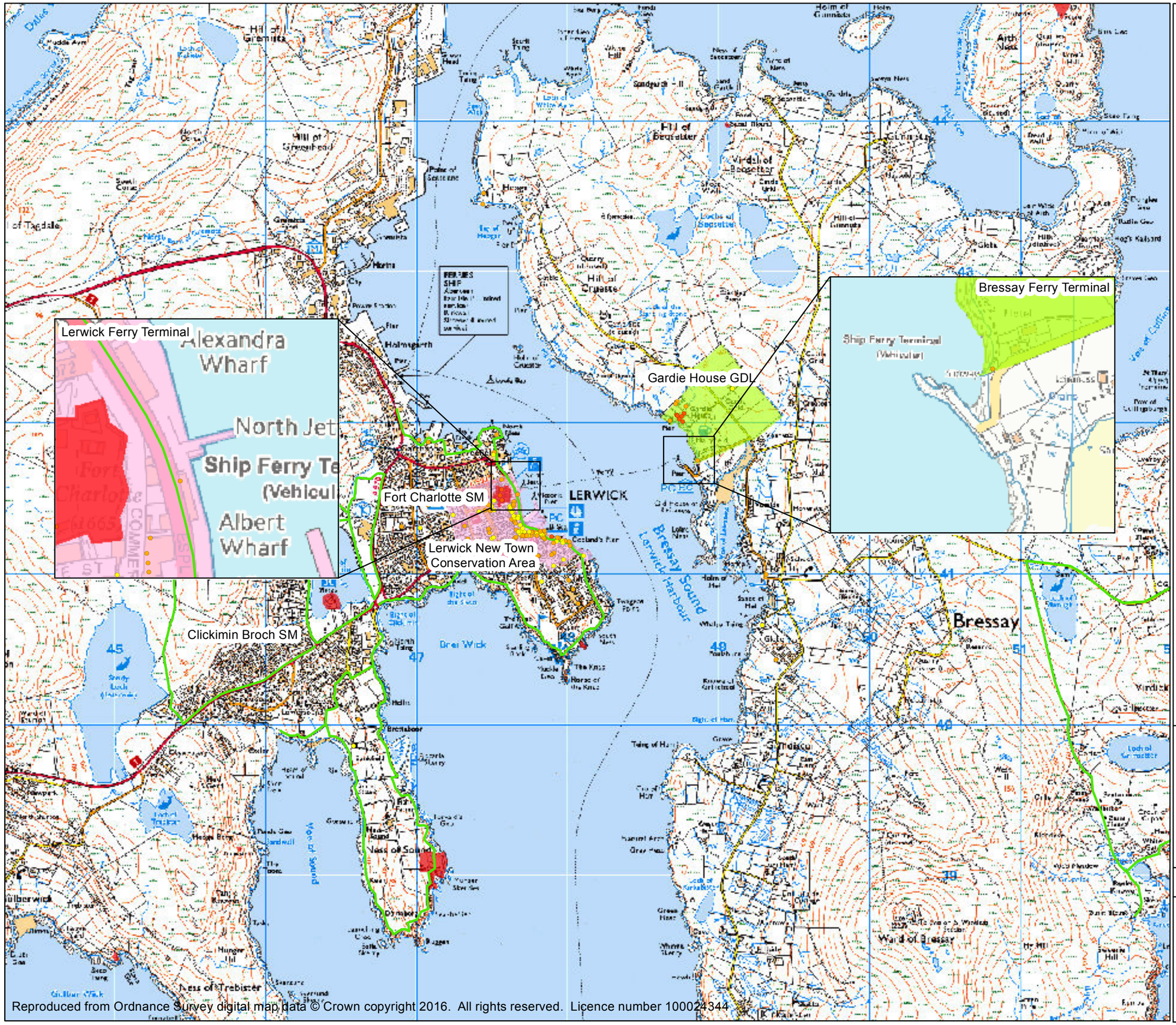
Background Information	
Geographic Context:	The island of Bressay is 7 miles long by 3 miles wide and is separated from Lerwick by the sheltered Bressay Sound. Rough grazing covers most of the island, and the coast is formed of steep cliffs and beaches. In many respects, Bressay benefits significantly from its proximity to Lerwick and the access to services that this provides. However, geographic proximity and good transport links can be something of a double edged sword for the island, with a constant challenge to prevent economic leakage and maintain local services. Transport connectivity is wholly delivered by the frequent ferry service, which links Bressay with Lerwick, the journey time being seven minutes. The MV *Leirna* currently lies overnight at Bressay.
Social Context:	Despite strong population growth towards the end of the 20th century, Bressay has experienced a recent decline in population, something which the recent closure of the school may accelerate. During our consultation with HIE, they expressed a concern that the island is becoming increasingly fragile. The lack of readily available social housing on Bressay and the relatively static property market suggests that housing could be a constraint to growth on the island and could have been a factor in the decline of its population. Bressay is the only one of the nine islands in this study where on-island nursery and primary school provision is not available. Whilst the rationale underpinning the closure of the school was perhaps sound, there is a potentially longer-term impact in terms of the attractiveness of the island for in-migrants. Medical provision for Bressay is provided by Lerwick Health Centre.
Economic Context:	There is limited on-island activity on Bressay, with the majority of residents being geared towards the Lerwick jobs market. The fishmeal factory is likely to be the largest single private sector employer. There has been an overall downturn in services in the island in recent years. Bressay has a very high economic activity rate (akin to that of Shetland as a whole), although the majority of full-time employees are likely to commute to Lerwick.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of additional sailings at peak times onto the Lerwick – Bressay route would make a moderate positive contribution in terms of this objective.

Mainland	Car deck capacity on certain AM peak departures from Bressay and PM peak departures from Lerwick max out, meaning some vehicles cannot get onto the ferry. This can lead to late arrival into work and education or missed interchange with an onward connection. In terms of the evidence to support this problem, carryings data show that the 0830 departure from Bressay frequently has a vehicle deck utilisation in-excess of 80% (above which a sailing is defined as high utilisation), particularly in the summer months. Some seventy-four 0830 departures sailed over the 80% threshold in summer 2013/14, suggesting capacity on this service, which is key to accessing employment and education, is a problem. This service is less highly utilised in the winter, with >80% sailings typically on a Monday and Tuesday. The 1715 service from Lerwick is relatively highly utilised during the winter (31 sailings >80% utilised). This option could therefore go a long way towards addressing the current capacity constraints on this route.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of additional sailings at peak times onto the Lerwick – Bressay route would support this objective through addressing the capacity issues on the ferry, ensuring reliable access to the peak services for commuters.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Bressay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** This option would increase the frequency of the ferry service at the busiest points of the day.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against***. ***Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.

an overnight stay on Shetland mainland.		
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. It is understood that some of the additional sailings envisaged here are already running on an unofficial / trial basis. This is low cost as the only marginal cost is the fuel.	
Implementability Appraisal		
Technical:	There are no technical feasibility issues associated with this option.	
Operational:	Additional crewing hours and fuel would be required.	
Financial:	Estimated to be beneficial as revenue would exceed incremental operating costs.	
Public:	There is public support for this measure.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	There may be a small negative safety impact associated with this option as it could release car deck capacity on the ferry and lead to an increase in vehicle kilometres.
Economy:	✓	This option would record a minor benefit in terms of the Economy criterion. The alleviation of capacity issues and ensured reliability for commuters would record minor TEE benefits for users.
Integration:	-	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓✓	This option would provide a moderate benefit in terms of accessibility through the alleviation of the current capacity constraints on the ferry.

Environmental Constraint Map(s)



Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)

Listed Buildings:

- Category A
- Category B
- Category C

- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Bressay Options C1, C2, C3 & C5

1:24,000 @ A3

0 0.25 0.5 km

N

Shetland Inter-Island Transport Study

Environmental Appraisal

DRAFT

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 1: Environmental Constraints Plan

Lerwick and Bressay Ferry Terminals

Harbour Drawing(s)

NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	MV LEIRNA Size: • Loa = 32.45 m • Beam = 10.7 m • Draught = 1.99 m Capacity: • 124 passengers • 19 PCU
1.2	Breakwater	Rubble mound 200m long
1.3	RoRo Ferry Berth	• 5 timber dolphins supported against the breakwater with timber struts. • Vertical rubber D type fenders
1.4	Linkspan	Small 4.5m wide x 13.915 m long
1.5	Parking/waiting area	120 lane meters
1.6	Facilities	Toilets & waiting room

Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3271 LERWICK HARBOUR AND APPROACHES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO REPLACE / UPGRADE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Lerwick	2.1	1.7	0.9	0.5

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

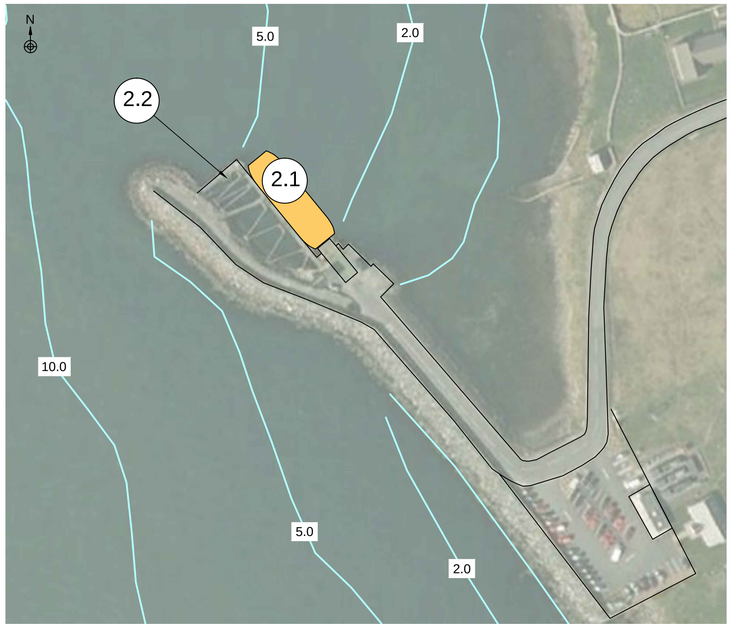
ORIGINAL DIMENSION 90mm

Reference Drawings:

2) LIKE FOR LIKE OPTION

No Terminal upgrades

2.1	Vessel	**35m Specific Vessel**
2.2	RoRo Ferry Berth	Further assessment to establish strengthen works if required (see note 7).

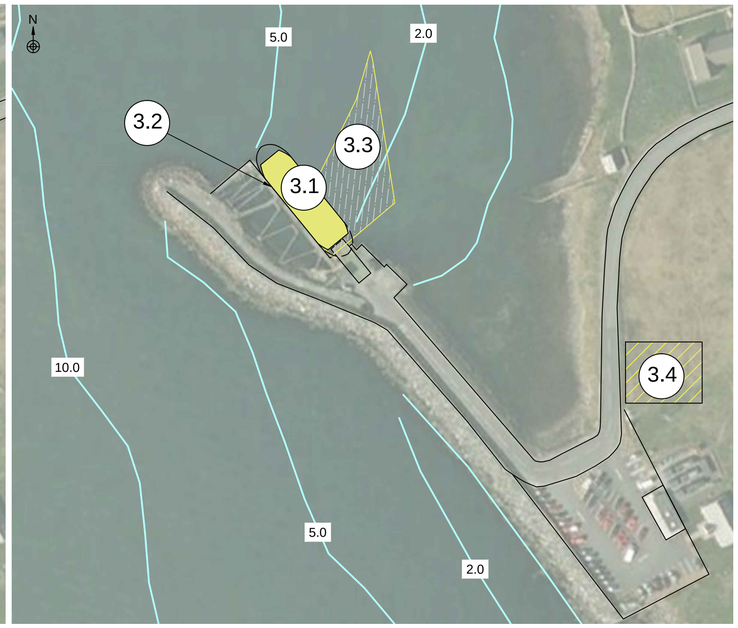


Scale approx. 1:1000

3) LARGER VESSEL

Terminal upgrades

3.1	Vessel	**Larger Specific Vessel**
3.2	RoRo Ferry Berth	• Vessel slightly overhangs from berth. If strengthen works are required, extension of the berth could be undertaken (see notes 7 & 9). • Installation of new fenders and bollards along the structure (see note 8).
3.3	Dredging	Dredge pocket and maneuvering area to be dredged to approx. -3.5mCD.
3.4	Parking	Additional parking area for increased demand.

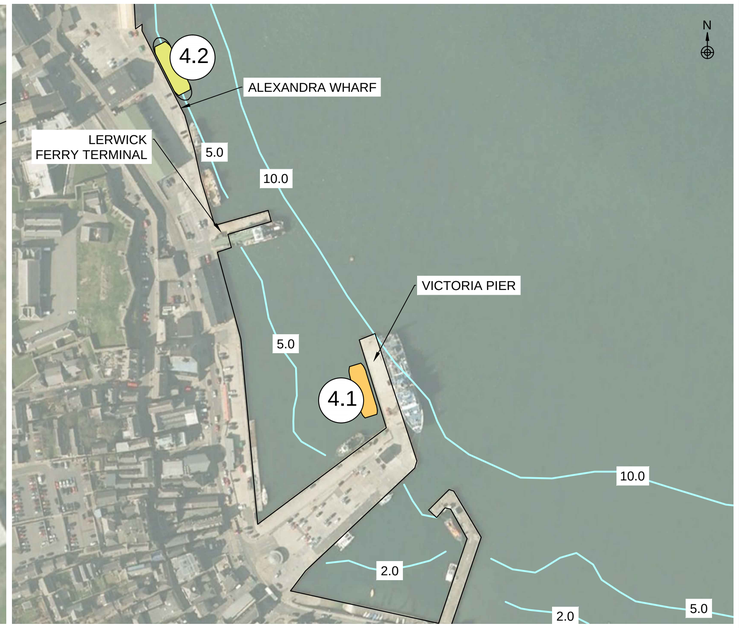


Scale approx. 1:1000

4) OVERNIGHT BERTH AT LERWICK

Possible locations

4.1	Victoria Pier West	• 61m long pier with a minimum water depth of 6m CD. • Adequate for Like for Like and Larger Specific Vessel. • Near the existing Bressay Ferry Terminal. • Well sheltered, adequate for storm conditions. • Bollards and fenders should be reviewed to establish adequacy. • To consult availability with Port Authority.
4.2	Alexandra Wharf	• 65m long quay with adequate water depth for both vessel options. • Near the existing Bressay Ferry Terminal. • Partially sheltered. Probably not adequate during storm conditions. • Bollards and fenders should be reviewed to establish adequacy. • To consult availability with Port Authority.



Scale approx. 1:2000

Rev	Date	Details
C	18/07/16	SIC comments
B	14/06/16	PBA comments
A	21/03/16	Additional information and formatting

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

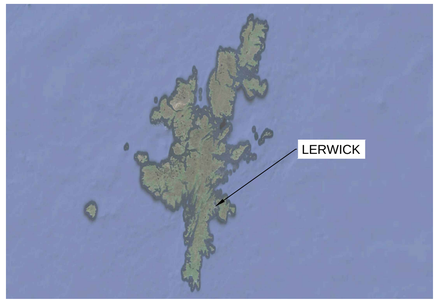
BRESSAY OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:		Scale at A1 Original:
FOR DISCUSSION		AS SHOWN
Drawn: DP	Checked: GR	Date: 07/03/16
Drawing Number: 1537-01-101		Revision: C

T:\2015\1537 - Shetland Inter-Island Transport Study - Brett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-101 REV C



NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	MV LEIRNA Size: • Loa = 32.45 m • Beam = 10.7 m • Draught = 1.99 m Capacity: • 124 passengers • 19 PCU
1.2	RoRo Ferry Berth	• 39 m concrete piled jetty. It extends 30 m from the end of the linkspan • Panelled fender
1.3	Linkspan	Small 4.5m wide x 13.915 m long
1.4	Parking/waiting area	80 lane meters
1.5	Facilities	Waiting room

Scale approx. 1:1000

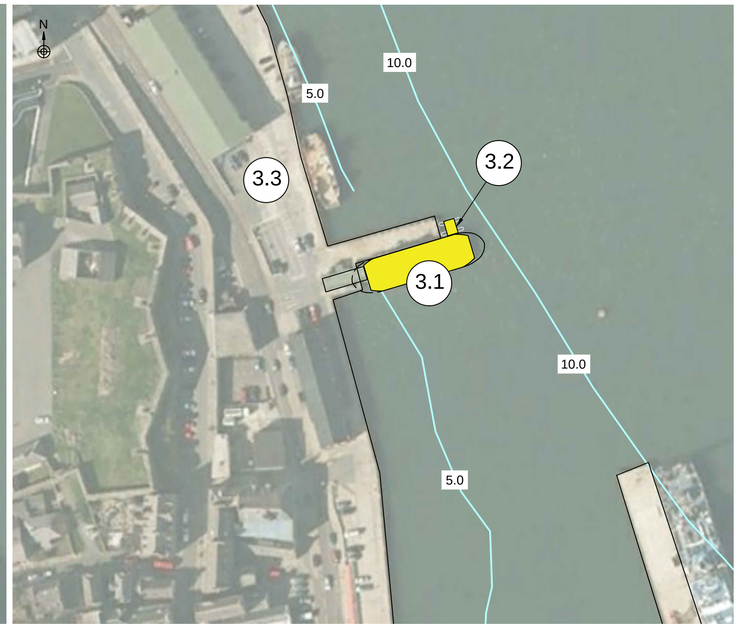
2) LIKE FOR LIKE OPTION
No Terminal upgrades

2.1	Vessel	**35m Specific Vessel**
2.2	RoRo Ferry Berth	Vessel slightly overhangs from berth. If strengthen works are required, extension of the berth could be undertaken (see notes 7 & 9).

Scale approx. 1:1000

3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**Larger Specific Vessel**
3.2	RoRo Ferry Berth	• Recommended extension of RoRo berth circa 10m. A dolphin could be provided (see note 7 & 9). • Installation of new fenders and bollards (see note 8).
3.3	Parking	To discuss with Port Authority for additional parking area for increased demand.



Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3271 LERWICK HARBOUR AND APPROACHES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO REPLACE / UPGRADE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Lerwick	2.1	1.7	0.9	0.5

0 10 20 30 40 50
1:1000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	14/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

LERWICK OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	24/03/16

Drawing Number:	Revision:
1537-01-102	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Brett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-102 REV B

Appendix E Fair Isle (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option Co1a: (Do Minimum): Replace the MV *Good Shepherd IV* with a like-for-like vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This vessel would be a broadly similar replacement for the MV *Good Shepherd IV* in terms of size and capacity but offering more appropriate passenger accommodation and greater levels of comfort. The vessel would be twin-screwed and would carry 12 passengers and one PCU. It would have a workboat classification as per the current vessel. This option would not require harbour works.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £750k. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* £300k (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		

Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Neutral*** As the proposed vessel would be a like-for-like replacement, this option would have no impact on capacity.

travel between the island(s) and Shetland Mainland	
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on time ashore.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. This option would not make any meaningful contribution to the objectives or STAG criteria and there is also an issue of design obsolescence with the current vessel type. All of the problems and issues associated with the current service would continue.
Implementability Appraisal	
Technical:	There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like would be a technically appropriate solution.

Operational:	There would be no operational feasibility issues associated with this option.	
Financial:	The capital cost would be £750k, with annual revenue support estimated at £300k, a reduction of £15k per annum on the current day figure.	
Public:	This option was not supported at the public engagement meetings.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Good Shepherd* with a more modern vessel would give rise to a potential reduction in emissions. There would be no other environmental issues associated with this option. **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage) • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with a more modern vessel would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed.
Economy:	✓	This option would deliver a minor positive impact in terms of the economy criterion. The improved

		perception of the vessel and the crossing to Fair Isle (particularly for tourists) could encourage increased sea-based travel, but any such impact would be very minor.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	This option would offer a minor positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a Lo-Lo vessel operating within the existing infrastructure). However, any such impact is likely to be very minor.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1b: Replace the MV *Good Shepherd IV* with a like-for-like vessel but materially faster vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This vessel would be a like-for-like replacement for the MV *Good Shepherd IV*. However, this vessel would travel at 10-12 knots, significantly reducing current crossing times. This option would not require harbour works assuming that the current arrangements for taking the vessel out of the water could continue.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £1.25M. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* £351k (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		

Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Neutral*** As the proposed vessel would be a like-for-like replacement, this option would have no impact on capacity.

travel between the island(s) and Shetland Mainland	
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The provision of a materially faster Lo-Lo vessel would make a minor contribution to this objective. Working on the basis of the same departure time from and arrival time to Fair Isle, a materially faster vessel would marginally extend time on mainland. In addition, a faster vessel may provide limited opportunities for taking greater advantage of weather windows.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. It is considered that this option is technically infeasible as it would not be possible to design a vessel which achieves higher speeds with the same hull form. This option also makes very little contribution to the objectives and STAG criteria.
Implementability Appraisal	

Technical:	It is considered that this option is technically infeasible as it would not be possible to design a vessel which achieves higher speeds with the same hull form. There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like would be a technically appropriate solution.	
Operational:	There would be no operational feasibility issues associated with this option.	
Financial:	The capital cost would be £1.25m, with annual revenue support estimated at £351k, an increase of £36k per annum on the current day figure.	
Public:	A faster and higher capacity vessel would be acceptable to the public.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Good Shepherd* with a more modern vessel would give rise to a potential reduction in emissions, although this could to some extent be offset by the increase in operating speed. There would be no other environmental issues associated with this option. **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage)

		• Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with a more modern vessel would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed.
Economy:	✓✓	This option would deliver a minor positive impact in terms of the economy criterion. The reduction in journey times associated with a faster vessel would provide TEE benefits, whilst there may also be marginal enhancements to reliability if a faster vessel can take better advantage of weather windows. The improved perception of the vessel and the crossing to Fair Isle (particularly for tourists), coupled with reduced journey times, could also encourage increased sea-based travel, but any such impact would be very minor.
Integration:	✓	This option would support the Fair Isle Development Plan through reducing journey times to the island and potentially providing a marginal improvement to reliability.
Accessibility and Social Inclusion:	✓✓	This option would offer a moderate positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a Lo-Lo vessel operating within the existing infrastructure). However, any such impact is likely to be very minor.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO2: Replace the MV *Good Shepherd IV* with a bespoke Small Ro-Ro vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The Ro-Ro vessel would be a catamaran of approximately 20-25 metre length and 6 metre beam. This vessel would be capable of carrying approximately 50 passengers and 5 PCUs. The vessel would operate at around 14 knots, although would have a design speed of around 18 knots. A catamaran is the most appropriate choice of vessel for Fair Isle as it is shallow drafted, faster and a vessel of aluminium construction would be easier to take out of the water (although aluminium is weaker than steel so the vessel would likely have a lesser service life). A new fixed Ro-Ro ramp and slipway / hoist would be required at Fair Isle. A new fixed Ro-Ro ramp and minimal dredging would be required at Grutness.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £5.75m. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* £388k (rounded) per annum.

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		
Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.		
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the		

	years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a Ro-Ro vessel for Fair Isle would make a moderate positive contribution to this objective. The current MV *Good Shepherd IV* can carry 1-2 small cars, which have to be craned on. The proposed Ro-Ro vessel therefore offers a significant uplift in capacity, with the considerable added benefit that vehicles could drive on and off the ferry.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The provision of a significantly faster vessel would make a minor contribution to this objective. Working on the basis of the same arrival / departure times to and from Fair Isle, a materially faster vessel (average speed 14 knots) would marginally extend time on mainland. In addition, a 14 knot vessel may provide opportunities for taking greater advantage of weather windows.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.

TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. The provision of a small Ro-Ro vessel contributes to a number of objectives and the STAG criteria and merits further analysis.
Implementability Appraisal	
Technical:	A new fixed Ro-Ro ramp and slipway / hoist would be required at Fair Isle. A new fixed Ro-Ro ramp and minimal dredging would be required at Grutness,
Operational:	There would be no operational feasibility issues associated with this option.
Financial:	The capital cost would be £5.75m, with annual revenue support estimated at £388k, an increase of £73k per annum on the current day figure.
Public:	A faster and higher capacity RoRo vessel would be acceptable to the public.

STAG Criteria

Criterion	Assessment Summary	Supporting Information
Environment:	✓	The replacement of the MV *Good Shepherd* with a more modern vessel would give rise to a potential reduction in emissions, although this could to some extent be offset by the increase in operating speed. Nonetheless, medium-speed catamarans tend to be more fuel efficient vessels than monohulls and it is therefore likely that there will be an overall reduction in emissions. The following impacts in relation the harbour works at Fair Isle and Grutness have been identified in terms of the environmental sub-criteria: • Noise & vibration: Short term impacts at closest properties and on wildlife during construction but unlikely to be significant in context of existing harbour operations • Local air quality: No significant effects predicted • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities (if required at Grutness) but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required (at Grutness). • Biodiversity & habitats: Potential for disturbance of qualifying features of SPA during

		construction which could trigger HRA, consultation required. Short-term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbour • Landscape: New works of small scale and if implemented sensitively unlikely to be significant effects on NSA Visual amenity: • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbour if implemented sensitively **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage) • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with a more modern vessel would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed. The vessel would also be Ro-Ro, which would remove the risks / challenges associated with Lo-Lo operations.
Economy:	✓✓✓	This option would deliver a major positive impact in terms of the economy criterion. The significant reduction in journey times associated with a 14 knot vessel would provide TEE benefits, whilst there would also be enhancements to reliability if a faster vessel can take better advantage of weather

		windows. The improved perception of the vessel (particularly the ability to drive on and drive off) and the crossing to Fair Isle (particularly for tourists), coupled with reduced journey times, could also encourage increased sea-based travel to Fair Isle. The provision of Ro-Ro could be of significant benefit to Fair Isle overall. Evidence from a range of islands which have converted from Lo-Lo to Ro-Ro (for example in the Orkney Islands in the 1980s or the Small Isles in the early 2000s) suggests that such a transition contributes positively to economic development. Car based access to / from Fair Isle would be beneficial, particularly for tourists, although it is important to note that the road infrastructure on the island is relatively poorly developed.
Integration:	✓✓	This option would support the Fair Isle Development Plan through significantly enhancing accessibility to the island & mainland, reducing journey times and potentially improving reliability.
Accessibility and Social Inclusion:	✓✓✓	This option would offer a major positive in terms of accessibility. As well as the enhanced access to the island & mainland (see above), accessibility to the ferry itself would be substantially improved. This would be the case for both vehicles (which could be driven rather than craned on) and passengers.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Replace the MV *Good Shepherd IV* with a Lo-Lo freight vessel shared with Foula.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This vessel would be based on the current MV *Snolda* which has a track record of accessing Fair Isle and Foula. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots. Both the *Good Shepherd IV* and the MV *New Advance* would no longer be required. It is assumed the vessel would be mainland based, either at a new facility at Grutness (although there are significant technical challenges here) or Walls, or using an existing berth at Scalloway. There would be no need for harbour works at Fair Isle AS Lo-Lo operations would continue. However, dredging would be required at Foula, where there would be tidal restrictions.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £3m excluding any works required at Walls or Grutness and dredging at Foula. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* Costs would be determined based on vessel overnight berth and timetable.

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		
Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.		
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the		

	years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a shared freighter with Foula would make a moderate positive contribution to this objective. The current MV *Good Shepherd IV* can carry 1-2 small cars, which have to be craned on. The proposed shared freighter therefore offers a significant uplift in capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on time on the mainland. However, it is worth noting that a key benefit of an island-based vessel & crew is that it allows the service to take advantage of weather windows. This flexibility would be reduced if the only service was offered by a shared freight vessel.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should	***Performance against Transport Planning Objective: Neutral***

be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. A shared freighter would materially affect the potential to sail during weather windows affecting the viability of the island, and is therefore rejected.
Implementability Appraisal	
Technical:	The freight vessel could overnight at Scalloway, Walls or potentially Grutness. Dredging would be required at Foula but no harbour works would be required at Fair Isle.
Operational:	A mainland based crew would be required for the new vessel. There would be uncertainty over the future of the current Fair Isle and Foula based crews. The freighter could not currently enter Ham Harbour – dredging would therefore be required.
Financial:	Capital cost of £3m excluding any works required at Walls or Grutness and dredging at Foula. Revenue costs would be determined based on vessel overnight berth and timetable.
Public:	No obvious support for this proposal was identified through the public engagement.

STAG Criteria

Criterion	Assessment Summary	Supporting Information
Environment:	x	The replacement of the MV *Good Shepherd* with a freight vessel would have a minor negative environmental impact, principally associated with the required dredging work at Foula. The reduction of the Fair Isle and Foula services to a single vessel could potentially lead to a reduction in emissions but it is anticipated that any such reduction would be offset by the new freighter, which would be operating a similar number of operating hours as the existing two vessels combined. The following impacts in relation the harbour works at Grutness have been identified in terms of the environmental sub-criteria (impacts in relation to Foula are considered in the Appraisal Summary Table for that island): • Noise & vibration: Short term impacts at closest properties and on wildlife during construction but unlikely to be significant in context of existing harbour operations. • Local air quality: No significant effects predicted.

		• Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities (if required at Grutness) but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required (at Grutness). • Biodiversity & habitats: Potential for disturbance of qualifying features of SPA during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbour. • Landscape: New works of small scale and if implemented sensitively unlikely to be significant effects on NSA. • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbour if implemented sensitively. **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage) • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with a more modern vessel would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed.

Economy:	✓	This option would deliver a minor positive impact in terms of the economy criterion. The increased capacity of the vessel would alleviate a current constraint on Fair Isle. However, this benefit would, to some extent, be offset by the loss of important island-based ferry jobs. There would also be a loss in service flexibility if the vessel was not based on the island.
Integration:	✓	This option would support the Fair Isle Development Plan through enhancing the capacity of the service to Fair Isle. However, this benefit would again be offset by the loss of island jobs and reduced service flexibility.
Accessibility and Social Inclusion:	✗	This option would give rise to a minor negative in terms of accessibility. Whilst physical accessibility to the new freight vessel is likely to represent an enhancement on the MV *Good Shepherd IV*, the loss of flexibility to take advantage of weather windows (due to the vessel not being based on the island) would negatively impact on the community.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO4: Replace the MV *Good Shepherd IV* with a passenger vessel and a freight vessel shared with Foula.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The MV *Good Shepherd IV* would be replaced by a dedicated Fair Isle passenger catamaran and a freight vessel shared with Foula (as per option C3). The passenger catamaran would be based on Fair Isle. It could be based on a vessel such as the Wildcat 53 design (e.g. the MV *Orca* III which runs to St Kilda), which is 16.5m LOA and is a Category 0 (unrestricted vessel) which operates at 20 knots and can carry 12 passengers. The freight vessel would be based on the current MV *Snolda* which has a track record of accessing Fair Isle and Foula. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £4m. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* Revenue support would be a combination of options.

	Both the *Good Shepherd IV* and the MV *New Advance* would no longer be required. It is assumed the vessel would be mainland based, either at a new facility at Grutness (although there would be significant technical challenges here) or Walls, or using an existing berth at Scalloway. There would be no need for harbour works at Fair Isle as Lo-Lo operations would continue. However, dredging would be required at Foula, where there would be tidal restrictions.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		
Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities.		

	The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** A passenger only vessel based on Fair Isle would continue to offer the current levels of passenger capacity and could also likely take very small pieces of freight (i.e. parcels and packages). The provision of a shared freighter with Foula would make a moderate positive contribution to this objective. The current MV *Good Shepherd IV* can carry 1-2 small cars, which have to be craned on. The proposed shared freighter therefore offers a significant uplift in capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.

employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The provision of a materially faster passenger vessel would make a contribution to this objective. Working on the basis of the same arrival / departure times to and from Fair Isle, a materially faster vessel would extend time on mainland. In addition, a faster vessel would provide opportunities for taking greater advantage of weather windows. The shared freight vessel would have no impact on time on mainland.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** This option would effectively represent a two vessel solution for Fair Isle. It is assumed that the passenger only vessel would operate at least the current timetable, although the higher speed of this vessel may provide flexibility for additional connections over the week. Calls by the freight vessel would be additional to the current timetable and would thus represent an increase in frequency.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. The rationale for rejecting Option C3 (a shared freight vessel only) is also appropriate to this option. However, a dedicated passenger vessel would provide a faster bespoke option for Fair Isle, mitigating somewhat against potential supply issues with the freighter. A shared freighter would provide capacity to cater for heavier items / vehicles etc. Further analysis of sailing patterns would be required to quantify the extent of the reliance on 'weather windows'.
Implementability Appraisal	

Technical:	The freight vessel could overnight at Scalloway, Walls or potentially Grutness. Dredging would be required at Foula but no harbour works would be required at Fair Isle as Lo-Lo options would continue. The passenger vessel would be based on Fair Isle.	
Operational:	A mainland based crew would be required for the new freight vessel. The freighter could not currently enter Ham Harbour – dredging would therefore be required.	
Financial:	Capital cost of £4m. Revenue costs dependent on vessel options chosen.	
Public:	No obvious support for this proposal was identified through the public engagement.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *Good Shepherd* with a freight vessel would have a minor negative environmental impact, principally associated with the required dredging work at Foula. In addition, by adding an additional vessel to those already calling at Fair Isle & Foula (and enhancing the timetable), it is likely that total emissions would increase. The following impacts in relation the harbour works at Grutness have been identified in terms of the environmental sub-criteria (impacts in relation to Foula are considered in the Appraisal Summary Table for that island): • Noise & vibration: Short term impacts at closest properties and on wildlife during construction but unlikely to be significant in context of existing harbour operations. • Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities (if required at Grutness) but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required (at Grutness). • Biodiversity & habitats: Potential for disturbance of qualifying features of SPA during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbour. • Landscape: New works of small scale and if implemented sensitively unlikely to be significant effects on NSA. • Visual amenity: Short term impacts during construction. Permanent works unlikely to be

		significant in the context of working harbour if implemented sensitively. **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage) • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with more modern vessels would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed. There would however be a marginal increase in total sailing hours with this option, which would have a negative safety impact. However, the scale of this impact is likely to be extremely small.
Economy:	✓✓	This option would deliver a moderate positive impact in terms of the economy criterion. The reduction in journey times associated with a faster passenger vessel would provide TEE benefits, whilst there may also be enhancements to reliability if a faster vessel can take better advantage of weather windows. There would also be one or more additional connections over the course of the week. The improved perception of the vessels and the crossing to Fair Isle (particularly for tourists), coupled

		with reduced journey times, could also encourage increased sea-based travel, but any such impact would be very minor. The increased capacity of the freight aspect of the service would also alleviate a current constraint on Fair Isle.
Integration:	✓	This option would support the Fair Isle Development Plan through reducing journey times to the island and potentially providing a marginal improvement to reliability. There would also be an increase in capacity (passengers and freight).
Accessibility and Social Inclusion:	✓	This option would offer a moderate positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a passenger vessel operating within the existing infrastructure). The increased carrying capacity of the freighter compared to the current vessel would also enhance freight based accessibility to the island. However, as the vessel would not be based in the island, there would be a loss of flexibility to take advantage of weather windows.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option C5: Replace the MV *Good Shepherd IV* with a bespoke mainland-based Lo-Lo ferry service.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would see the ferry based at a new overnight berth at Grutness. This solution would mean a vessel similar to the MV *Filla* could serve Fair Isle without any of the issues surrounding overnighting at Fair Isle. The MV *Filla* is known to be able to dock at Fair Isle. It is assumed that the service would be provided on a Lo-Lo basis possibly with vehicles loaded and discharged via the stern ramp when tide permits. A new overnight berth would be required at Grutness. The key issue here is that this implies mainland based crew and a service which maximises time on island rather that time on mainland.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £5.4m. *Current revenue support* £315k (rounded) per annum. *Annual revenue support* £547k (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.

Background Information	
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.
Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The provision of a Grutness-based freighter would make a major positive contribution to this objective. The current MV *Good Shepherd IV* can carry 1-2 small cars. The proposed shared freighter therefore offers a significant uplift in capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Major Negative*** Assuming the current maximum of one return trip per day on this route, this option would have a major negative impact on time on mainland. As the vessel would commence operation at Grutness, there would be no opportunity for a day return by ferry.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.

Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. This option would allow a larger vessel with better seakeeping to operate to Fair Isle from a mainland overnight berth and Lerwick, although positioning runs would be required from Grutness. However, it does have to be acknowledged that this option worsens the accessibility of Fair Isle residents and may be ruled out after the community engagement. It should also be noted that there is significant technical uncertainty associated with developing an overnight berth at Grutness. This would be revisited at OBC stage and this option may be ruled out at that point.	
Implementability Appraisal		
Technical:	A new overnight berth would be required at Grutness. Some minor works / dredging may be required at Fair Isle to reliability receive a Filla style vessel.	
Operational:	A mainland based crew would be required for the new vessel. There would be uncertainty over the future of the current Fair Isle based crews.	
Financial:	The capital cost would be £5.4m, with annual revenue support estimated at £547k, an increase of £232k per annum on the current day figure.	
Public:	This option would not be acceptable to the public. An island based ferry and crew is seen by many as essential for the future of the island.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *Good Shepherd* with a mainland-based freight vessel would have a minor negative environmental impact, principally associated with the required harbour work at Grutness. The following impacts in relation the harbour works at Grutness have been identified in terms of the environmental sub-criteria (impacts in relation to Foula are considered in the Appraisal Summary Table for that island): • Noise & vibration: Short term impacts at closest properties and on wildlife during construction but unlikely to be significant in context of existing harbour operations. • Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities (if required at Grutness) but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required (at Grutness).

		• Biodiversity & habitats: Potential for disturbance of qualifying features of SPA during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing harbour. • Landscape: New works of small scale and if implemented sensitively unlikely to be significant effects on NSA. • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbour if implemented sensitively. **Environmental Constraints** The environmental constraints for the Fair Isle route are provided below for information Fair Isle Constraints • Residential properties within 200m to the west of the harbour and Bird Observatory within 400m of harbour • Core path CPPD06 Fair Isle Circular adjacent to harbour • Sloagar GCR site located within 200m east of harbour • Fair Isle is entirely within a National Scenic Area (NSA) • Harbour located within Fair Isle Special Protection Area (SPA) and Special Area of Conservation (SAC) • One listed building within 250m of harbour • Coastal flooding risk • Generally good air quality Grutness Constraints • Residential properties within 200m of the harbour • Core paths CPPD01 & 02 within 100m of harbour • Sumburgh Head Special Protection Area (SPA) boundary adjacent to harbour • Sumburgh Head SSSI within 50m to the east (seabird assemblage) • Easter Rova Head Geological SSSI approximately 4km north • Listed buildings within 400m of harbour
Safety:	✓	This replacement of the MV *Good Shepherd IV* with a more modern vessel would give rise to a minor safety benefit as it is assumed that any new tonnage would be twin-screwed.
Economy:	✓	This option would deliver a minor positive impact in terms of the economy criterion. The increased capacity of the vessel would alleviate a current constraint on Fair Isle. However, this benefit would, to some extent, be offset by the loss of important island-based ferry jobs

		and the ability to make a day return trip to Shetland mainland by ferry. There would also be a loss in service flexibility if the vessel was not based on the island.
Integration:	✓	This option would support the Fair Isle Development Plan through enhancing the capacity of the service to Fair Isle. However, this benefit would again be offset by the loss of island jobs and reduced service flexibility.
Accessibility and Social Inclusion:	××	This option would give rise to a major negative in terms of accessibility. Whilst physical accessibility to the new freight vessel is likely to represent an enhancement on the MV *Good Shepherd IV*, the loss of flexibility to take advantage of weather windows (due to the vessel not being based on the island) would negatively impact on the community. More importantly, the loss of the ability to make a day return trip to the mainland by ferry would represent an accessibility loss for Fair Isle and would increase social exclusion. There would however be a benefit in terms of enhanced accessibility to Fair Isle, albeit for a very small number of hours if making a day return trip.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO6: Construct a new runway on Fair Isle.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would involve the construction of a replacement runway in Fair Isle with a view to improving the crosswind reliability of the air service (by aligning the runway direction with the Tingwall runway). The district of Rippack has been identified as a potential location, although no detailed surveying has been undertaken, whilst land ownership issues have not been considered.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* Estimated at £400k plus land acquisition, although this is a very high level cost estimate at this stage. *Current revenue support* Not applicable *Annual revenue support* Not applicable
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		

Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Minor Positive*** It is estimated that the provision of a new runway on Fair Isle would reduce cancellations by around 5%,

travel between the island(s) and Shetland Mainland	providing a small increment in capacity in terms of the air service.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The improvement in reliability offered by this option would enhance time on mainland, at least to the extent that it would permit more of the currently timetabled connections to operate.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the air service (although it would allow more of the timetabled connections to operate).
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** The proposed new runway could potentially improve the reliability of the air service, potentially enhancing access to strategic transport connections. However, any impact would be minimal.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. Whilst this option could potentially assist in reducing cancellations at Fair Isle, the impact is likely to be minimal and is set against the cost of constructing a new runway and fully licensing the airfield. In addition, this option has the potential for significant negative environmental effects because the new runway would be located in an environmentally sensitive area.
Implementability Appraisal	
Technical:	No detailed surveying has been undertaken, whilst land ownership issues have not been considered.

Operational:	The position in relation to the existing Fair Isle runway would need to be considered.	
Financial:	Estimated at £400k plus land acquisition, although this is a very high level cost estimate at this stage.	
Public:	There was a degree of support for this option expressed through the public consultation.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗✗	The construction of a new runway on Fair Isle would have the potential for significant environmental effects because the new infrastructure would be located in a sensitive area.
Safety:	✓	The provision of a new runway would improve the reliability and potentially the safety of the air service in terms of reducing exposure to crosswinds.
Economy:	✓	The new runway would clearly support the economy criterion, but the overall magnitude of the improvement is likely to be relatively limited.
Integration:	✓	This option would support the Fair Isle Development Plan through enhancing the reliability of the air service.
Accessibility and Social Inclusion:	✓	The new runway would enhance accessibility and social inclusion through improving the overall reliability of the service. However, any such impact is likely to be very minor.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO1 – Increase the service frequency of the current Fair Isle ferry.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This option would involve increasing the service frequency to two rotations per week in winter and 3-4 weekly rotations in the summer. As the current vessel crew have other commitments on the island, it is assumed that these additional sailings would be provided by a second crew.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00.</td></tr>
<tr><td>Current revenue support
£315k (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£473k (rounded) per annum.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
<tr><td>Geographic Context:</td><td colspan="3">Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.</td></tr>
<tr><td>Social Context:</td><td colspan="3">Fair Isle’s population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island’s Development Plan

Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in</td></tr>
</table>

	relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** This option would effectively provide a 50% increase of the current service to Fair Isle, so would in turn increase the capacity in any given week. It therefore provides a moderate positive in terms of this objective.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Fair Isle.

connections provided should reliably facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre, the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week	***Performance against Transport Planning Objective: Moderate Positive*** This option would make a moderate positive contribution to this objective. The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service).
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** This option would provide a significant increase in frequency on the Fair Isle service, particularly in the winter where there is currently only one scheduled connection per week.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against***. ***Transport Planning Objective: Minor Positive*** The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service).
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service). This would enhance the number of days when an onward connection to the Scottish mainland by air or ferry could be made.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. Whilst this option has human resource implications, if offers increased ferry-based connectivity and should not be ruled out. It should be noted though that a basic requirement of the RSM is the provision of a 7-day service which Fair Isle does not currently have.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	The current Fair Isle crew hold more than one job and thus there could be crew availability challenges with scaling the service up.

	The MV *Good Shepherd IV* currently carries a crew of 3-4 (minimum 2) and thus an additional crew (four in total plus reliefs) would likely be required, a key challenge with island-based crewing.	
Financial:	Annual revenue support would equate to £473k per annum, an increase of £158k per annum on current costs.	
Public:	There was no obvious groundswell of support for increased ferry frequency. The priority was the replacement of the vessel itself.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	There would be a small negative safety impact associated with the additional sailings generated under this option. Any impact would however be minimal.
Economy:	✓	There would be minor TEE benefits associated with this option associated with the increased frequency and capacity of the service. There would also be wider positive impacts for island residents and businesses, whilst tourist access would be enhanced (a key sector for the economic sustainability of the island).
Integration:	✓	This option would have a highly positive impact on the Fair Isle economy and would also support the Fair Isle Development Plan. It would also move Fair Isle closer to the RSM defined service levels. This option would also make a minor contribution to strategic transport integration (see TPO5)
Accessibility and Social Inclusion:	✓✓	This option would enhance the accessibility and social inclusion of Fair Isle. Residents could travel more frequently to Shetland mainland, whilst tourists would also benefit from these connections, supporting different durations of stay.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO2 – Increase the frequency of the air service to three rotations per day, seven days a week in summer and two rotations per day, seven days a week in winter</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="4">Proposal Description:</td><td rowspan="4">This option would provide nine extra connections per week in summer and four extra connections in winter. The existing three rotations on a Monday would be retained.

The Fair Isle airfield resource would need to be increased to accommodate this step change in service levels. In addition, Tingwall airfield is currently closed on a Sunday from May to September and on both Saturday and Sunday from October to April but would have to be opened and staffed appropriately to accommodate this option.

Additional weekend fire cover would also be required on Fair Isle.</td><td rowspan="4">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00.</td></tr>
<tr><td>Current revenue support
Air service revenue support is not disaggregated by route</td></tr>
<tr><td>Annual revenue support
Air service revenue support is not disaggregated by route</td></tr>
<tr><td>Funding Sought From:</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.</td></tr>
</table>

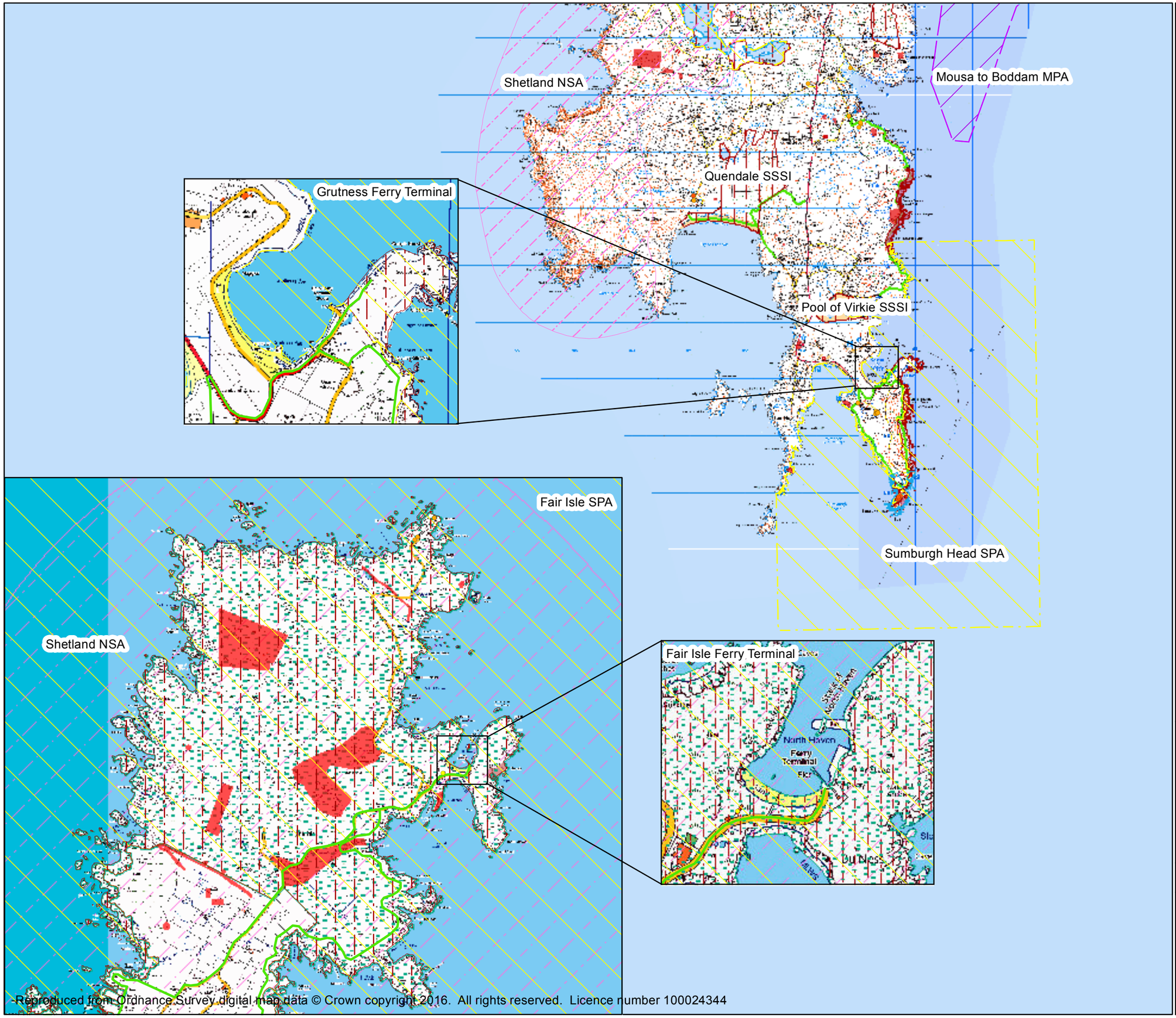
(if applicable)			Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	Fair Isle lies about 20 miles south-west of the imposing Sumburgh Head. Just five kilometres long and three kilometres wide, it is mostly surrounded by cliffs, rising over 100 metres at Sheep Rock and almost 200 metres on the heavily indented west coast. The National Trust for Scotland took over ownership of the island in 1955 and prospective in-migrants must apply to the Trust for residency. Facilities include a shop & Post Office, the high quality bird observatory with accommodation, museum, pier, airfield and marina.		
Social Context:	Fair Isle's population had shown relatively strong growth between 1981 and 2011, but the cumulative growth was wiped out between the 2011 and 2015, with the population now down to 55. The Fair Isle population is also both ageing and declining. Fostering population growth is a key element of the island's Development Plan Fair Isle is owned by the National Trust for Scotland and anyone who wishes to move there must apply to the Trust. The 2011 Census noted that Fair Isle has 26 households. The Community Profile suggests that housing in Fair Isle is in relatively low demand, although it is believed that consultation is required to identify the island's future housing need. Health indicators for Fair Isle are generally good, although there are concerns over various aspects of health provision consistent with other rural communities. The roll at Fair Isle primary school and nursery has declined in recent years, which is in keeping with the general decline and ageing of the population.		
Economic Context:	The economic & occupational structure of Fair Isle reflects the predominance of self-employment and cottage industries on the island. The Fair Isle Development Plan has set out a number of ambitious projects to secure the future of the island. The aim is to reverse the recent population decline and address the issue of an ageing population and the threat which that poses to the sustainability of services. The plan's proposals for developing the island include attracting up to 10 new people to the island in the next three to five years (growing the population by almost 20%), as well as creating and improving properties in the isle. There are also plans to upgrade and future-proof the island's electricity supply, whilst the islanders are working with Community Broadband Scotland to improve digital connectivity. Fair Isle will also continue to be attractive to tourists, particularly those visiting the high quality bird observatory on the island. Whilst there are a range of ambitious plans for Fair Isle, the Development Plan and numerous consultations over the years have highlighted the current transport connectivity of the island as a key constraint. The capacity limited air service coupled with the long, exposed and relatively uncomfortable ferry crossing is seen to be a deterrent to growing the		

	population and attracting investment into the island. It can be argued that this issue requires to be resolved if the objectives of the development plan are to be delivered.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The air service is the lifeline mode of transport for Fair Isle, with the majority of personal and business travel made by air. The service is well used throughout the year, with tourism peaks in the summer and around avian migration periods. At present, capacity is a key issue on Fair Isle services and the addition of nine extra connections per week in summer and four in winter would provide a significant enhancement in this respect.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Fair Isle.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Major Positive*** This option would make a major positive contribution to this objective. The additional air connections proposed would provide the required half day in Lerwick seven days week. There would also be an opportunity for 'full day' trips in summer.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** This option would provide a significant increase in frequency on the Fair Isle service - nine extra connections per week in summer and four extra connections in winter.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against*. *Transport Planning Objective: Major Positive*** This option would provide a consistent week round timetable – 3 connections per day in summer / 2 connections per day in winter.
TPO5: Where practicable, islanders should	***Performance against Transport Planning Objective: Moderate Positive***

be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	This option would generate a moderate positive in terms of its contribution to strategic transport integration. It would allow seven day connections with onward services throughout the year, although reliability issues would continue to mean that some people would travel the day before a connecting flight or ferry.	
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. A 7-day per week service may have disproportionate costs associated with the all-year weekend opening of Tingwall. However, the principle of increasing the number of weekday flights to Fair Isle should be explored further, particularly in conjunction with any move to a shared ferry service. It should also be noted that a basic requirement of the RSM is the provision of a 7-day service which Fair Isle does not currently have.	
Implementability Appraisal		
Technical:	There are no technical feasibility issues associated with this option.	
Operational:	There are likely to be a range of operational issues with this option in terms of flying hours, aircraft utilisation, reliability and recovery time. In addition, Tingwall airfield would need to be opened and crewed at the weekend, whilst additional weekend fire cover would be required on Fair Isle. Alternatively the weekend service could potentially operate from Sumburgh.	
Financial:	Air service revenue support is not disaggregated by route. This option could however be relatively expensive, as it would require additional fuel and potentially additional pilot hours. It would also require the opening and crewing of Tingwall airfield at the weekend, whilst weekend fire cover would also be required on Fair Isle.	
Public:	Some concerns were expressed regarding the resource implications for those who currently operate the airstrip of a full 7-day service but there is support for more flights in principle.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating additional flights.
Safety:	✗	There would be a small negative safety impact associated with the additional flights generated under this option. Any impact would however be minimal.
Economy:	✓✓✓	A significant enhancement to the air service would be transformative to the Fair Isle economy, so long

		as the service was reliable and provided sufficient recovery capability during periods of poor weather. The principal benefit of an enhanced air service is that it would assist in tackling the significant capacity constraints associated with the current services, supporting resident and tourism travel. There would be a series of TEE benefits associated with enhanced frequency, whilst EALI benefits would emerge in terms of residents, tourists, locally traded services and manufacturing & processing (e.g. Fair Isle crafts).
Integration:	✓✓	This option would have a highly positive impact on the Fair Isle economy and would also support the Fair Isle Development Plan. It would also be consistent with the RSM defined service levels. This option would also make a moderate contribution to strategic transport integration (see TPO5)
Accessibility and Social Inclusion:	✓✓✓	The enhanced air service would make a significant contribution to improving both community and comparative accessibility. Fair Isle residents would be better able to access key personal services, business opportunities and onward travel connections, whilst travel to the island would become less problematic.

Environmental Constraint Map(s)



Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)

Listed Buildings:

- Category A
- Category B
- Category C

- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Air Network Option 3
Fair Isle Options C2 & C5

N

1:63,360 @ A3

0 0.250.5 1 1.5 km

DRAFT

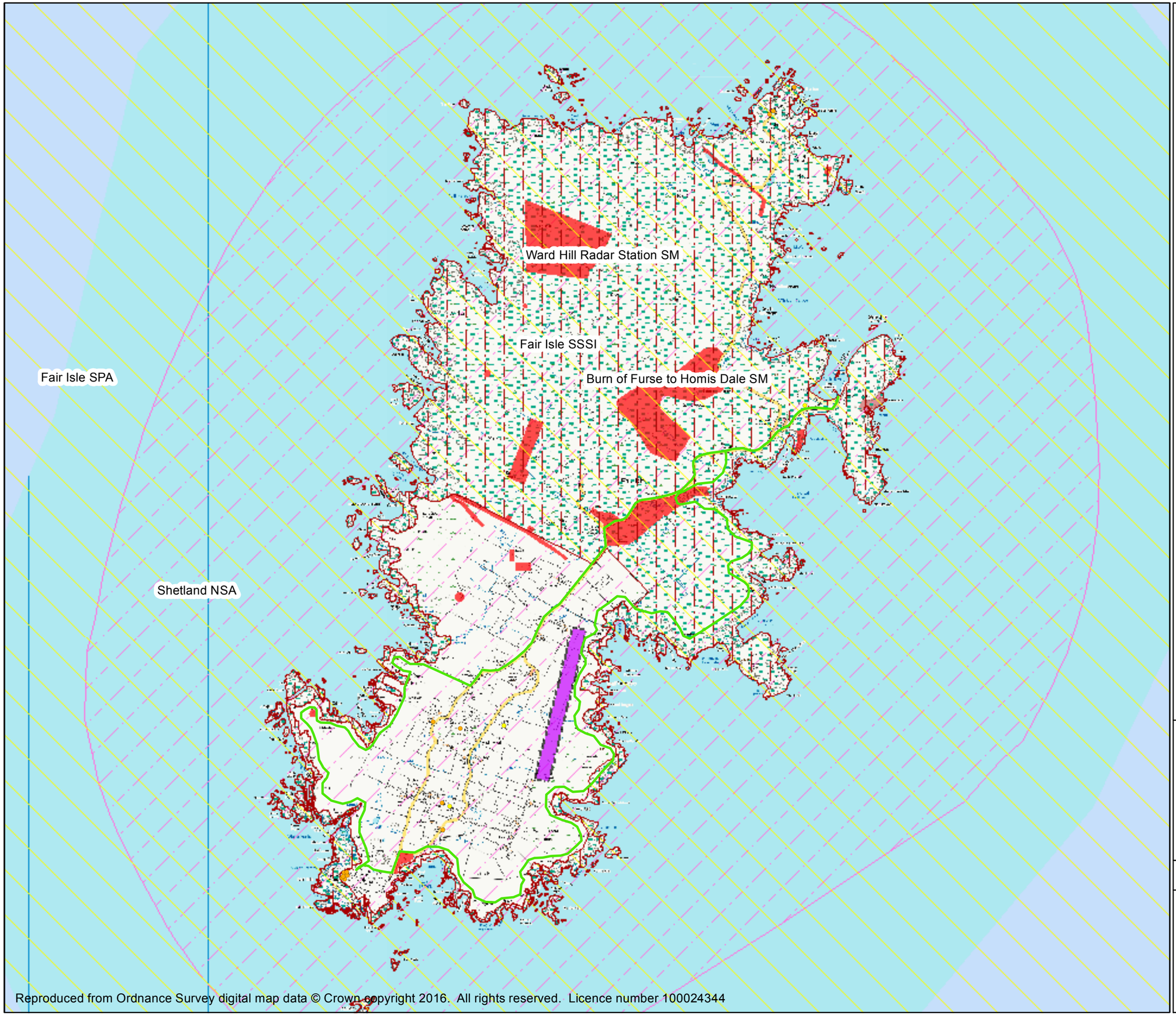
Shetland Inter-Island Transport Study

Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 2: Environmental Constraints Plan

Fair Isle and Grutness Ferry Terminals



Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Proposed New Airstrip
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)

Listed Buildings:

- Category A
- Category B
- Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Fair Isle Option C6

N

1:63,360 @ A3

0 0.250.5 1 1.5 km

DRAFT

Shetland Inter-Island Transport Study

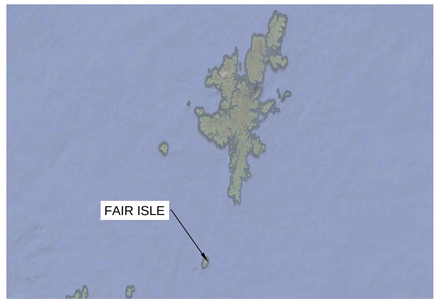
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

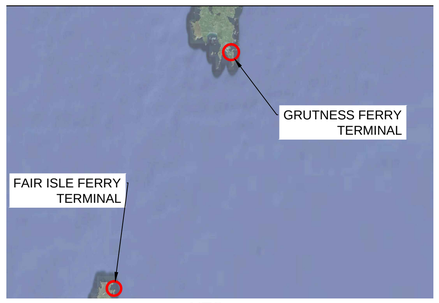
Figure 10: Environmental Constraints Plan

Fair Isle Proposed New Airstrip

Harbour Drawing(s)



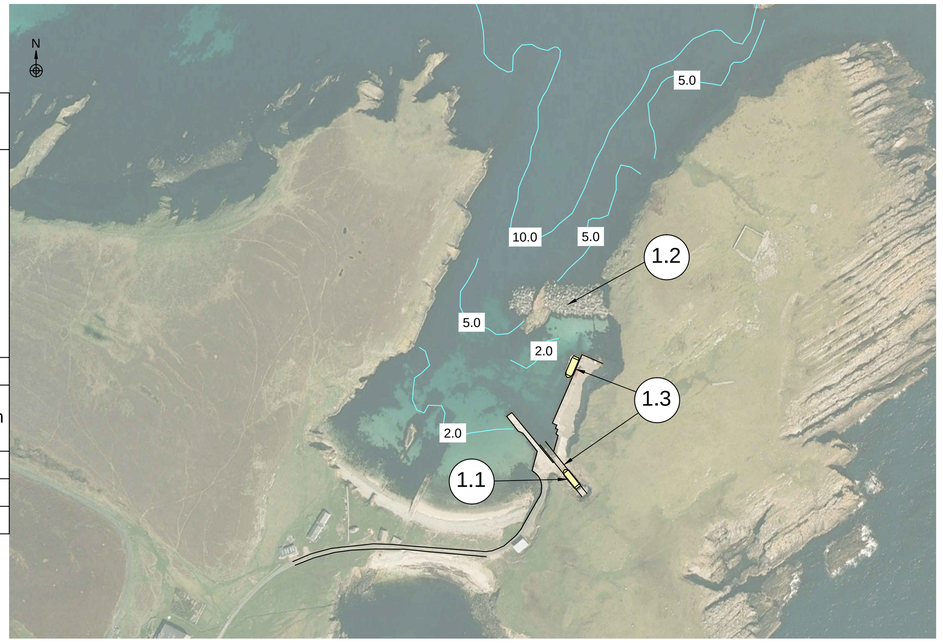
NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	MV GOOD SHEPHERD IV Size: • Loa = 18 m • Beam = 6 m • Draught = 2.63 m Capacity: • 12 passengers • 1 PCU
1.2	Breakwater	Rubble mound 175m long
1.3	Ferry Berth	• 60 m long concrete quay • Slipway cradle to remove vessel from water when rough weather is expected.
1.4	Linkspan	None
1.5	Parking/waiting area	None dedicated
1.6	Facilities	None

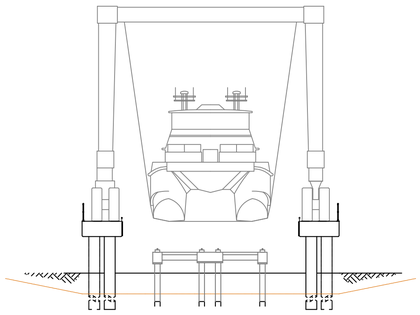


Scale approx. 1:2500

2) RO-RO VESSEL OPTION
Terminal upgrades

2.1	Vessel	Specific vessel ***Catamaran*** type: • Loa = 20-22 m • Beam = 6 m • Draught = 1.5 m Capacity: • 12 passengers • 6 PCU
2.2	RoRo ramp	Provide the quay with a hard ramp (block). See note 7. Please note that the block arrangement is suitable for operations under an specific tide level range and under calm conditions.
2.3	Slipway	• Extension of the current slipway cradle to allow for a 70 t deadweight vessel (see note 7). • Additional power required could be provided with the use of a generator. • If complete replacement of the slipway is required, it is recommended to evaluate the use of a boat hoist.

Scale approx. 1:1000



Boat Hoist Indicative Section
NTS

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3299 PLANS IN THE SHETLAND ISLANDS.

7. ALL STRUCTURES REQUIRE FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Fair Isle	2.2	1.7	1.0	0.6

0 10 20 30 40 50
1:1000 m

0 25 50 75 100 125
1:2500 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	14/06/16	PBA comments
A	22/04/16	Minor corrections

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

FAIR ISLE
OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

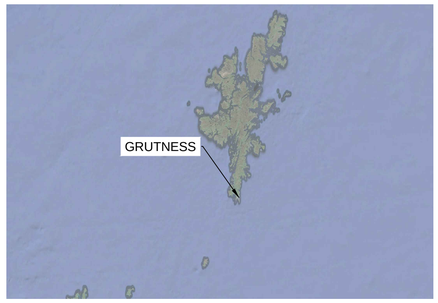
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

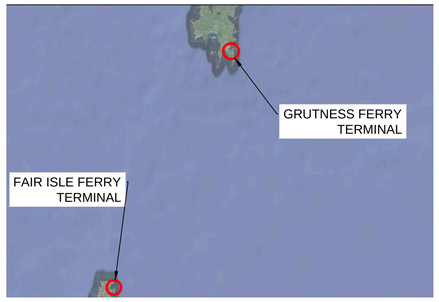
Drawn:	Checked:	Date:
DP	GR	22/03/16

Drawing Number:	Revision:
1537-01-201	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Brett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-201 REV B



NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	MV GOOD SHEPHERD IV Size: • Loa = 18 m • Beam = 6 m • Draught = 2.63 m Capacity: • 12 passengers • 1 PCU
1.2	Breakwater	Rubble and armourstone revetment to protect the quay (approx. 45m long)
1.3	Ferry Berth	• 50 m long solid quay constructed from a concrete grillage with a rock infilling. • The quay is faced with a row of vertical D section rubber fenders.
1.4	Parking/waiting area	None dedicated
1.5	Facilities	Toilet, waiting room & freight store

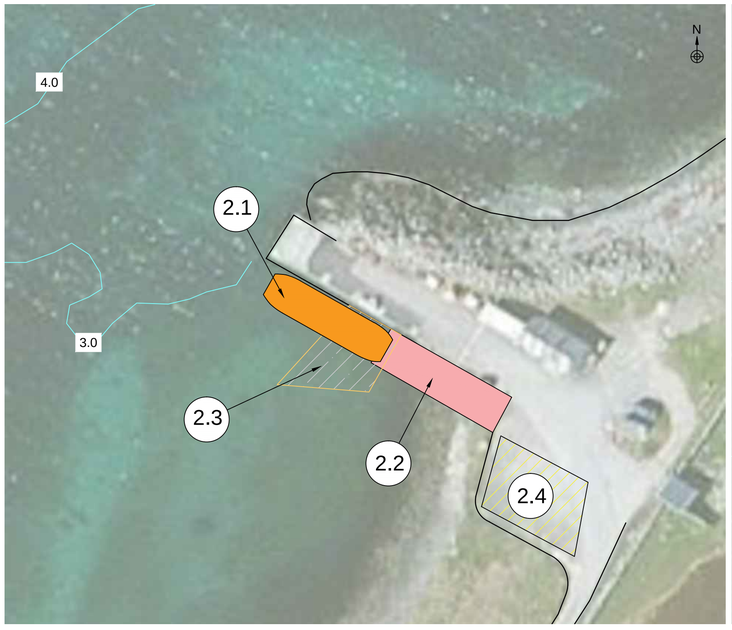
Scale approx. 1:1250

2) RO-RO OPTION
Terminal upgrades

2.1	Vessel	Specific vessel ***Catamaran*** type: • Loa = 20-22 m • Beam = 6 m • Draught = 1.5 m Capacity: • 12 passengers • 6 PCU
2.2	Hard ramp	Provide the quay with a hard ramp (block). See note 7. Please note that the block arrangement is suitable for operations under an specific tide level range and under calm conditions.
2.3	Dredging	Some minimum dredging may be required in the vicinity of the ramp.
2.4	Parking/waiting area	Recommended provision of dedicated parking/waiting area.

2) OVERNIGHT BERTH
Terminal upgrades

3.1	Overnight berth	• If additional sheltering is required the existing breakwater could be extended. • Provision of bollards and fenders for overnight berthing.



Scale approx. 1:500

Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM DRAWINGS PROVIDED BY THE CLIENT REFERRED TO CD.

7. ALL STRUCTURES REQUIRE FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Grutness	1.8	1.4	0.7	0.4

0 5 10 15 20 25
1:500 m

0 10 20 30 40 50
1:1000 m

0 25 50
1:1250 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
A	14/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

GRUTNESS OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	22/04/16

Drawing Number:	Revision:
1537-01-202	A

T:\2015\1537 - Shetland Inter-Island Transport Study - Brett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-202 REV A

Appendix F Foula (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1a: (Do Minimum): Replace the MV *New Advance* with a like-for-like vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This vessel would be a similar replacement for the MV *New Advance* in terms of dimensions and carrying characteristics. The vessel would carry 12 passengers and one PCU, and would have a workboat classification. This option would not require harbour works other than remedial dredging at Foula.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £950k. *Current revenue support* Revenue costs not available as service contracted out *Annual revenue support* Revenue costs not available as service contracted out
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth.		

	Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** As the proposed vessel would be a like-for-like replacement, this option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on time ashore.

TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. Given the constrained nature of the harbour and overnight berthing arrangements at Foula, this option cannot be ruled out.
Implementability Appraisal	
Technical:	There would be no technical feasibility issues associated with this option.
Operational:	There would be no operational feasibility issues associated with this option.
Financial:	Capital cost – £950k.
Public:	The initial community council and subsequent public consultation noted that this option would be acceptable.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *New Advance* with a more modern vessel would give rise to a potential reduction in emissions. There would be no other environmental issues associated with this option. **Environmental Constraints** The environmental constraints for the Foula route are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location

		• Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA • One listed building within 50m of pier • Coastal flooding risk • Good air quality Walls Constraints • Residential properties within 50m of the pier • Walls Harbour within Vaila Sound Shellfish Water Protected Area and Grunting Voe Shellfish Water Protected Area approximately 4km south of Walls • Scheduled monument and listed buildings in proximity to the harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety.
Economy:	✓	This option would deliver a minor positive impact in terms of the economy criterion. The improved perception of the vessel and the crossing to / from Foula (particularly for tourists) could encourage increased sea-based travel, but any such impact would be very minor.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	This option would offer a minor positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a Lo-Lo vessel operating within the existing infrastructure). However, any such impact is likely to be very minor.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1b: Replace the MV *New Advance* with a similar but materially faster Lo-Lo vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This vessel would be a similar replacement for the MV *New Advance* in terms of carrying capacity. However, this vessel would travel faster at e.g. 10-12 knots. This option would not require harbour works other than remedial dredging at Foula, assuming the vessel dimensions and characteristics are similar to the MV *New Advance* and the vessel can be lifted out of the water on the current davits.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £1.25m *Current revenue support* Revenue costs not available as service contracted out *Annual revenue support* Revenue costs not available as service contracted out
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		

Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** As the proposed vessel would be a like-for-like replacement, this option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Minor Positive*** The provision of a materially faster Lo-Lo vessel would make a minor contribution to this objective. Working on

employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	the basis of the same arrival / departure times to and from Foula, a materially faster vessel would marginally extend time on mainland. In addition, a faster vessel may provide limited opportunities for taking greater advantage of weather windows.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. It is considered that this option is technically infeasible as it would not be possible to design a vessel which achieves higher speeds with the same hull form. This option also makes very little contribution to the objectives and STAG criteria.
Implementability Appraisal	
Technical:	It is considered that this option is technically infeasible as it would not be possible to design a vessel which achieves higher speeds with the same hull form.
Operational:	There would be no operational feasibility issues associated with this option.
Financial:	Capital cost - £1.25m
Public:	The initial community council and subsequent public consultation noted that this option would be acceptable.

STAG Criteria

Criterion	Assessment Summary	Supporting Information
Environment:	✓	The replacement of the MV *New Advance* with a more modern vessel would give rise to a potential reduction in emissions, although this could to some extent be offset by the increase in operating speed. There would be no other environmental issues associated with this option.

		Environmental Constraints The environmental constraints for the Foula route are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location • Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA • One listed building within 50m of pier • Coastal flooding risk • Good air quality Walls Constraints • Residential properties within 50m of the pier • Walls Harbour within Vaila Sound Shellfish Water Protected Area and Grunting Voe Shellfish Water Protected Area approximately 4km south of Walls • Scheduled monument and listed buildings in proximity to the harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety.
Economy:	✓✓	This option would deliver a minor positive impact in terms of the economy criterion. The reduction in journey times associated with a faster vessel would provide TEE benefits, whilst there may also be marginal enhancements to reliability if a faster vessel can take better advantage of weather windows. The improved perception of the vessel and the crossing to / from Foula (particularly for tourists) could encourage increased sea-based travel, but any such impact would be very minor.
Integration:	✓	This option would support a range of policies focussed on island sustainability and development.
Accessibility and Social Inclusion:	✓✓	This option would offer a minor positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a Lo-Lo vessel operating within the existing infrastructure). However, any such impact is likely to be very minor.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO2: Replace the MV New Advance with a Ro-Ro vessel.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This vessel would be a catamaran of approximately 20-25m length and 6m beam. This vessel would be capable of carrying approximately 50 passengers and 5 PCUs. It would operate at around 14 knots, although would have a design speed of around 18 knots.

A new harbour would need to be built at Foula which would include a new breakwater, new piled jetty, provision of a new jetty / Ro-Ro ramp, sheltered overnight berth and dredging.

The Ro-Ro ferry could either travel to West Burrafirth or, if it continued to go to Walls, harbour works would be needed. For the purpose of this study, it is assumed that Walls is the continued mainland terminus of the service.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£18.1m.</td></tr>
<tr><td>Current revenue support
Revenue costs not available as service contracted out</td></tr>
<tr><td>Annual revenue support
Revenue costs not available as service contracted out</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
</table>

Background Information	
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a Ro-Ro vessel for Foula would make a moderate positive contribution to this objective. The current MV *New Advance* can carry one small car, which has to be craned on. The proposed Ro-Ro vessel therefore offers a significant uplift in capacity, with the significant added benefit that vehicles could drive on and off the ferry.

TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The provision of a significantly faster vessel would make a minor contribution to this objective. Working on the basis of the same arrival / departure times to and from Foula, a materially faster vessel (average speed 14 knots) would marginally extend time on mainland. In addition, a 14 knot vessel may provide opportunities for taking greater advantage of weather windows.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. The technical difficulties and cost of harbour works at Ham are considered to be disproportionately large to justify scaling up to a Ro-Ro solution for Foula.
Implementability Appraisal	
Technical:	A new harbour would be required at Foula to accommodate Ro-Ro operations and sheltered overnight berthing. This would include a new breakwater, a piled jetty, land reclamation and dredging.
Operational:	The harbour at Foula would require frequent dredging.
Financial:	Capital cost - £18.1m.

Public:	There appeared to be very little appetite in Foula for a major RoRo conversion.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	××	The replacement of the MV *New Advance* with a more modern vessel would give rise to a potential reduction in emissions, although this could to some extent be offset by the increase in operating speed. Nonetheless, medium-speed catamarans tend to be more fuel efficient vessels than monohulls and it is therefore likely that there will be an overall reduction in emissions. The following impacts in relation the harbour works at Foula & Walls have been identified in terms of the environmental sub-criteria: • Noise & vibration: Short term impacts at closest properties and on wildlife during construction. • Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities (if required) but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required. • Biodiversity & habitats: Potential for disturbance of qualifying features of SPA during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour Impacts on marine habitats likely to be limited as new works in existing harbour • Landscape: New works of relatively small scale and if implemented sensitively unlikely to be significant effects on NSA • Visual amenity: Short term impacts during construction. Permanent works unlikely to be significant in the context of working harbour if implemented sensitively. • Cultural heritage: Works unlikely to be of a scale to impact on setting of listed building. **Environmental Constraints** The environmental constraints for the Foula route are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location • Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA

		• One listed building within 50m of pier • Coastal flooding risk • Good air quality Walls Constraints • Residential properties within 50m of the pier • Walls Harbour within Vaila Sound Shellfish Water Protected Area and Grunting Voe Shellfish Water Protected Area approximately 4km south of Walls • Scheduled monument and listed buildings in proximity to the harbour • Coastal flooding risk • Good air quality
Safety:	✓	This option would have a minor safety benefit as it would convert the route to Ro-Ro, removing the risks / challenges associated with Lo-Lo operations.
Economy:	✓✓✓	This option would deliver a major positive impact in terms of the economy criterion. The significant reduction in journey times associated with a 14 knot vessel would provide TEE benefits, whilst there would also be enhancements to reliability if a faster vessel can take better advantage of weather windows. The improved perception of the vessel (particularly the ability to drive on and drive off) and the crossing to Foula, coupled with reduced journey times, could also encourage increased sea-based travel to Foula. The provision of Ro-Ro could be of significant benefit to Foula overall. Evidence from a range of islands which have converted from Lo-Lo to Ro-Ro (for example in the Orkney Islands in the 1980s or the Small Isles in the early 2000s) suggests that such a transition contributes positively to economic development. Car based access to / from Foula would be beneficial, although it is important to note that the road infrastructure on the island is relatively poorly developed.
Integration:	✓✓	This option would support a range of policies focussed on island sustainability and development.
Accessibility and Social Inclusion:	✓✓✓	This option would offer a major positive in terms of accessibility. As well as the enhanced access to the island & mainland (see above), accessibility to the ferry itself would be substantially improved. This would be the case for both vehicles (which could be driven rather than craned on) and passengers.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO3: Replace the MV New Advance with a Lo-Lo freight vessel shared with Fair Isle.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This vessel would be based on the current MV Snolda which has a track record of accessing Foula and Fair Isle. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots.

The new vessel has been estimated to cost in the region of £3m.

Both the MV New Advance and MV Good Shepherd IV would no longer be required.

It is assumed the vessel would be mainland based, either at a new facility at Grutness or Walls, or using an existing berth at Scalloway (the latter assumed for the purposes of costing).

There would be no need for major harbour works at Foula or Fair Isle. However, dredging would be</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£3m.</td></tr>
<tr><td>Current revenue support
Revenue costs not available as service contracted out</td></tr>
<tr><td>Annual revenue support
Revenue costs not available as service contracted out</td></tr>
</table>

	required at Foula, where there would also be tidal restrictions.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).		
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should not act as a constraint to regular and	***Performance against Transport Planning Objective: Moderate Positive***		

essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	The provision of a shared freighter with Fair Isle would make a moderate positive contribution to this objective. The current MV *New Advance* can carry one small car, which has to be craned on. The proposed shared freighter therefore offers a significant uplift in capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on time on the mainland. However, it is worth noting that a key benefit of an island-based vessel & crew is that it allows the service to take advantage of weather windows. This flexibility would be reduced if the only service was offered by a shared freight vessel.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. A shared freighter would materially affect the potential to sail during weather windows affecting the viability of the island, and is therefore rejected.
Implementability Appraisal	

Technical:		The freight vessel could overnight at Scalloway, Walls or potentially Grutness. Dredging would be required at Foula but no harbour works would be required at Fair Isle.
Operational:		A mainland based crew would be required for the new vessel. There would be uncertainty over the future of the current Fair Isle and Foula based crews. The harbour at Foula would require frequent dredging. Freighter harbour access at Foula could be tidally constrained. Weather constraints would impact on the viability of this service if timetabled
Financial:		Capital cost - £3 million.
Public:		The initial community council and subsequent public consultation noted that this option would not be acceptable.
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *New Advance* with a freight vessel would have a moderate negative environmental impact, principally associated with the required dredging work at Foula. The reduction of the Foula and Fair Isle services to a single vessel could potentially lead to a reduction in emissions but it is anticipated that any such reduction would be offset by the new freighter, which would be operating a similar number of operating hours as the existing two vessels combined. **Environmental Constraints** The environmental constraints for the Foula route are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location • Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA • One listed building within 50m of pier • Coastal flooding risk • Good air quality Walls Constraints

		• Residential properties within 50m of the pier • Walls Harbour within Vaila Sound Shellfish Water Protected Area and Grunting Voe Shellfish Water Protected Area approximately 4km south of Walls • Scheduled monument and listed buildings in proximity to the harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety.
Economy:	✓	This option would deliver a minor positive impact in terms of the economy criterion. The increased capacity of the vessel would alleviate a current constraint on Foula. However, this benefit would, to some extent, be offset by the loss of important island-based ferry jobs. There would also be a loss in service flexibility if the vessel was not based on the island.
Integration:	✓	Whilst, this option would support a range of policies focussed on island sustainability and development, these benefits would to some extent be offset by the loss of island jobs and reduced service flexibility.
Accessibility and Social Inclusion:	✗	This option would give rise to a minor negative in terms of accessibility. Whilst physical accessibility to the new freight vessel is likely to represent an enhancement on the MV *New Advance*, the loss of flexibility to take advantage of weather windows (due to the vessel not being based on the island) would negatively impact on the community.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO4: Replace the MV *New Advance* with a passenger vessel and a freight vessel shared with Fair Isle.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The MV *New Advance* would be replaced by a dedicated Foula passenger vessel (MV *New Advance* equivalent) and a freight vessel shared with Fair Isle. The freight vessel would be based on the current MV *Snolda* which has a track record of accessing Foula. The new vessel would be 25m long and would carry 12 passengers and 6 PCUs. The vessel would operate at 9 knots. Both the MV *New Advance* and MV *Good Shepherd IV* would no longer be required. It is assumed the vessel would be mainland based, either at a new facility at Grutness or Walls, or using an existing berth at Scalloway (the latter assumed for the purposes of costing). There would be no need for major	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £3.95m *Current revenue support* Revenue costs not available as service contracted out *Annual revenue support* Revenue costs not available as service contracted out

	harbour works at Foula or Fair Isle. However, dredging would be required at Foula, where there would also be tidal restrictions.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).		
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should	***Performance against Transport Planning Objective: Moderate Positive***		

not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	A passenger only vessel based on Foula would continue to offer the current levels of passenger capacity and could also likely take small pieces of freight (i.e. parcels and packages). The provision of a shared freighter with Fair Isle would make a moderate positive contribution to this objective. The current MV *New Advance* can carry one small car, which has to be craned on. The proposed shared freighter therefore offers a significant uplift in capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the time on mainland.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** This option would effectively represent a two vessel solution for Foula. It is assumed that the passenger only vessel would operate at least the current timetable. Calls by the freight vessel would be additional to the current timetable and would thus represent an increase in frequency.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact in terms of timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.

Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. The rationale for rejecting Option C3 (shared freight vessel only) is also appropriate to this option. However, a dedicated passenger vessel would provide a bespoke option for Foula, mitigating somewhat against the freighter being based off-island. A shared freighter would provide capacity to cater for heavier items / vehicles etc and would improve reliability. Further analysis of sailing patterns would be required to quantify the extent of the reliance on 'weather windows'.	
Implementability Appraisal		
Technical:	The freight vessel could overnight at Scalloway, Walls or potentially Grutness. Dredging would be required at Foula but no harbour works would be required at Fair Isle. The passenger vessel would be based on Foula.	
Operational:	A crew would be required for the new vessel. The harbour at Foula would require frequent dredging. Freighter harbour access at Foula could be tidally constrained. Weather constraints would impact on the viability of the freighter service if timetabled although the passenger ferry could be flexible.	
Financial:	Capital cost - £3.95 million	
Public:	The initial community council and subsequent public consultation noted that this option would not be acceptable.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *New Advance* with a new passenger only vessel and shared freight vessel would have a moderate negative environmental impact, principally associated with the required dredging work at Foula. **Environmental Constraints** The environmental constraints for the Foula route are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location • Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA • One listed building within 50m of pier • Coastal flooding risk • Good air quality

		Walls Constraints • Residential properties within 50m of the pier • Walls Harbour within Vaila Sound Shellfish Water Protected Area and Grunting Voe Shellfish Water Protected Area approximately 4km south of Walls • Scheduled monument and listed buildings in proximity to the harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety. It should however be noted that there would be a marginal increase in total sailing hours with this option, which would have a negative safety impact. However, the scale of this impact is likely to be extremely small.
Economy:	✓	This option would deliver a moderate positive impact in terms of the economy criterion. Firstly, there would be at least a single additional connection over the course of the week. The improved perception of the vessels and the crossing to Foula could also encourage increased sea-based travel, but any such impact would be very minor. The increased capacity of the freight aspect of the service would also alleviate a current constraint on Foula.
Integration:	✓	This option would support a range of policies focussed on island sustainability and development.
Accessibility and Social Inclusion:	✓	This option would offer a moderate positive in terms of accessibility as it is assumed that access would be improved (as far as is reasonably possible with a passenger vessel operating within the existing infrastructure). The increased carrying capacity of the freighter compared to the current vessel would also enhance freight based accessibility to the island. However, as the vessel would not be based in the island, there would be a loss of flexibility to take advantage of weather windows.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO1 – Increase the service frequency of the current Foula ferry.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would involve increasing the service frequency to 3-4 weekly rotations year round.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00.
			Current revenue support Revenue costs not available as service contracted out
			Annual revenue support Revenue costs not available as service contracted out
Funding Sought From: (if applicable)	Transport Scotland	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth.		

	Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** This option would provide a significant step-up in the current service to Foula, so would in turn generally significantly increase the available capacity in any given week. It therefore provides a moderate positive in terms of this objective.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Moderate Positive*** This option would make a moderate positive contribution to this objective. The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service).

TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** This option would provide a significant increase in frequency on the Foula service by one sailing per week in summer and winter.	
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against***. ***Transport Planning Objective: Minor Positive*** The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service).	
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** The additional connections proposed would operate on days where there is not currently a ferry connection (and could potentially be timetabled to fill gaps in the air service). This would enhance the number of days when an onward connection to the Scottish mainland by air or ferry could be made.	
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. Whilst this option has human resource implications for Foula residents, increased ferry-based connectivity should not be ruled out. It should be noted though that a basic requirement of the RSM is the provision of a 7-day service which Foula does not currently have.	
Implementability Appraisal		
Technical:	There are no technical feasibility issues associated with this option.	
Operational:	There would be a need for additional crew hours and fuel.	
Financial:	This would be a relatively low cost option given the small vessel, low crew compliment and small increase in the number of sailings.	
Public:	The community does not consider an increase in the use of the current ferry service as appropriate as it would have an impact on the other jobs undertaken by island residents.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**

Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	There would be a small negative safety impact associated with the additional sailings generated under this option. Any impact would however be minimal.
Economy:	✓	There would be minor TEE benefits associated with this option associated with the increased frequency and capacity of the service. There would also be wider positive impacts for island residents and businesses, whilst tourist access would be enhanced.
Integration:	✓	This option would support a range of policies focussed on island sustainability and development. It would also move Foula closer to the RSM defined service levels. This option would also make a minor contribution to strategic transport integration (see TPO5)
Accessibility and Social Inclusion:	✓✓	This option would enhance the accessibility and social inclusion of Foula. Residents could travel more frequently to Shetland mainland, whilst tourists would also benefit from these connections, supporting different durations of stay.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO2 – Increase the frequency of the air service to two rotations per day, seven days a week in summer and winter.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="4">Proposal Description:</td><td rowspan="4">This option would involve increasing the number of rotations to Foula to two per day in the summer and winter.

This option would provide seven or eight extra connections per week in summer and winter.

The airfield is likely to have to be licensed to accommodate this step change in service levels. In addition, Tingwall airfield is currently closed on a Sunday from May to September and on both Saturday and Sunday from October to April but would have to be opened and staffed appropriately to accommodate this option.

Additional weekend fire cover would also be required on Foula.</td><td rowspan="4">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00.</td></tr>
<tr><td>Current revenue support
Air service revenue support is not disaggregated by route</td></tr>
<tr><td>Annual revenue support
Air service revenue support is not disaggregated by route</td></tr>
<tr><td></td></tr>
<tr><td>Funding Sought From:</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.</td></tr>
</table>

(if applicable)			Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).		
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The air service is the lifeline mode of transport for Foula, with the majority of personal and business travel made by air. The service is relatively well used throughout the year, although patronage is less than that to Fair Isle. At present, capacity is a key issue on Foula services and the addition of seven or eight extra connections per week in summer and winter would provide a significant enhancement in this respect.		

TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Major Positive*** This option would make a major positive contribution to this objective. The additional air connections proposed would provide the required half day in Lerwick seven days week.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** This option would provide a significant increase in frequency on the Foula service – seven or eight extra connections per all year round.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against***. ***Transport Planning Objective: Major Positive*** This option would provide a consistent week and year round timetable apart from timing changes for daylight hours.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Moderate Positive*** This option would generate a moderate positive in terms of its contribution to strategic transport integration. It would allow seven day connections with onward services throughout the year, although reliability issues would continue to mean that some people would travel the day before a connecting flight or ferry.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. A 7-day per week service may have disproportionate costs associated with the weekend opening of Tingwall. However the principle of increasing the number of weekday flights to Foula should be explored further, particularly in conjunction with any move to a shared ferry service. It should be noted though that a basic requirement of the RSM is the provision of a 7-day service which Foula does not currently have, and this may necessitate weekend operation at Tingwall.
Implementability Appraisal	

Technical:	This option would likely require Foula airfield to be licensed.	
Operational:	There are likely to be a range of operational issues with this option in terms of flying hours, aircraft utilisation, reliability and recovery time. In addition, Tingwall airfield would need to be opened and crewed at the weekend, whilst additional weekend fire cover would be required on Foula. Alternatively the weekend service could potentially operate from Sumburgh.	
Financial:	This option could be relatively expensive, as it would require the additional fuel and potentially additional pilot hours. It would also require the opening and crewing of Tingwall airfield at the weekend, whilst weekend fire cover would also be required on Foula. Detailed costs are not available at this stage due to a lack of operator data.	
Public:	Some concerns were expressed regarding the resource implications for those who currently operate the airstrip of a full 7-day service but there is support for more flights in principle.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating additional flights.
Safety:	✗	There would be a small negative safety impact associated with the additional flights generated under this option. Any impact would however be minimal.
Economy:	✓✓	A significant enhancement to the air service would be transformative to the Foula economy, so long as the service was reliable and provided sufficient recovery capability during periods of poor weather. The principal benefit of an enhanced air service is that it would assist in tackling the capacity constraints associated with the current services, supporting resident and tourism travel. There would be a series of TEE benefits associated with enhanced frequency, whilst EALI benefits would emerge in terms of residents, tourists and locally traded services.
Integration:	✓✓	This option would support a range of policies focussed on island sustainability and development. It would also move Foula closer to the RSM defined service levels. This option would also make a minor contribution to strategic transport integration (see TPO5)
Accessibility and Social Inclusion:	✓✓	The enhanced air service would make a significant contribution to improving both community and comparative accessibility. Foula residents would be better able to access key personal services, business opportunities and onward travel connections, whilst travel to the island would become less problematic.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO3: Replace current operation with a mainland based Foula ferry service shared with Papa Stour.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would provide a combined Papa Stour / Foula service using the current and future Papa Stour vessel, potentially running on alternate days. This option may be tidally constrained at Foula. The vessel would continue to provide a Lo-Lo service to Foula and this more substantial vessel could offer improved capacity, reliability and improved passenger comfort. The MV *New Advance* would no longer be required. The vessel would continue to overnight at West Burrafirth and the crew would therefore be mainland based as they are at present. It is assumed that this service would provide for 2-3 crossings per week.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* Costs would be covered in the Papa Stour capital options. *Current revenue support* Revenue costs not available as service contracted out *Annual revenue support* Revenue costs not available as service contracted out

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Foula lies 20 miles to the west of Walls on the Shetland mainland. The island, which is still lairded, is about 2.5 miles long by 3.5 miles wide. Transport connections are provided by the workboat MV *New Advance* and an air service from Tingwall.		
Social Context:	The population of Foula is small but has been relatively resilient over the years, despite limited on-island opportunities. The population was recorded as 38 in the 2011 Census. The shortage of housing stock in Foula is a key constraint on population sustainability and growth. Foula retains its primary school and recently attracted a teacher to go and live on the island. The school roll has increased over the last two years. Health provision on Foula is limited, although this is perhaps to be expected given the remoteness of the island. The main need of the island appears to be enhanced emergency cover. The lack of on-island services is a challenge for Foula residents, although this is not a new issue and has not had a noticeable impact on the population level (although it may be a deterrent to in-migration).		
Economic Context:	Employment opportunities on Foula are limited, with employment concentrated in public sector posts, small scale crofting and seasonal tourism. Given the geography, population and industrial base of Foula, there is unlikely to be any significant developments on the island over the period of the plan. The key for Foula is likely to be maintaining the population base, lowering the average age of residents and retaining key services.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a mainland-based freighter would make a moderate positive contribution to this objective. The current MV *New Advance* can carry one small car. The proposed shared vessel with Papa Stour would therefore offer a significant uplift in capacity.		

TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Foula.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Major Negative*** Assuming the current maximum of one return trip per day on this route, this option would have a major negative impact on time on mainland. As the vessel would commence operation at West Burrafirth, there would be no opportunity for a day return to the mainland by ferry.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. This option would allow a larger vessel with better seakeeping to operate to Foula from a mainland overnight berth. The impact on island based crew needs further investigation and this options needs to be tested for public acceptability. There may be a loss of flexibility in operating during weather windows.
Implementability Appraisal	
Technical:	Regular dredging would be required at Foula.
Operational:	• Additional crew / crewing hours on the Papa Stour vessel. • Potential tidal restrictions with access to Foula.

	• The flexibility to make use of weather windows will also be compromised from Foula's perspective. • The current crew of the MV *New Advance* would no longer be required.	
Financial:	The current Foula contract would be withdrawn with resulting cost savings and 'fixed' route costs would be shared with Papa Stour. There would be additional crew and fuel costs for the Papa Stour vessel associated with Foula calls.	
Public:	This option would not be acceptable to the Foula public given the implications for flexibility of service and island based employment.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the MV *New Advance* with a mainland-based freight vessel would have a minor negative environmental impact, principally associated with the required dredging at Foula. **Environmental Constraints** The environmental constraints for Foula are provided below for information Foula Constraints • Residential properties in proximity to ferry terminal and airstrip • Core path CPPWS03 in proximity to pier and to the runway location • Foula GCR follows island coast in proximity to runway location (but at Ham Harbour) • Foula is entirely designated as Special Protection Area (SPA) and SSSI • Foula is entirely within an NSA • One listed building within 50m of pier • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact on safety.
Economy:	x	This option would deliver a minor positive impact in terms the increased capacity of the vessel, which would alleviate a current constraint on Foula. However, this benefit would, to some extent, be offset by the loss of important island-based ferry jobs. There would also be a loss in service flexibility if the vessel was not based on the island.
Integration:	x	This option would record a minor negative in terms of policy integration due to the loss of island-based jobs.
Accessibility and Social Inclusion:	xx	This option would give rise to a major negative in terms of accessibility. Whilst physical accessibility to the new freight vessel is likely to represent an enhancement on the MV *New Advance*, the loss of flexibility to take advantage of weather windows (due to the vessel not being based on the island)

		would negatively impact on the community. There would however be a benefit in terms of enhanced accessibility to Foula, albeit for a very small number of hours if making a day return trip.

Environmental Constraint Map(s)

Walls Ferry Terminal

Vaila Sound SWPA

Ward of Culswick SSSI

Foula GCR

Foula SSSI

Foula

Shetland NSA

Foula SPA

Foula Ferry Terminal

Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Air Network Option 3
Foula Options C2 & C3

N

1:50,000 @ A3

0 0.25 0.5 1 1.5 km

DRAFT

Shetland Inter-Island Transport Study

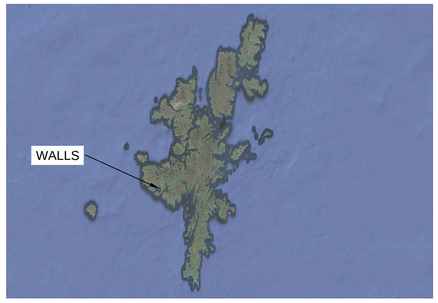
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

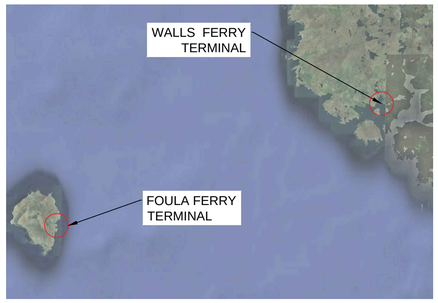
Figure 5: Environmental Constraints Plan

Foula and Walls Ferry Terminals

Harbour Drawing(s)



NTS



NTS

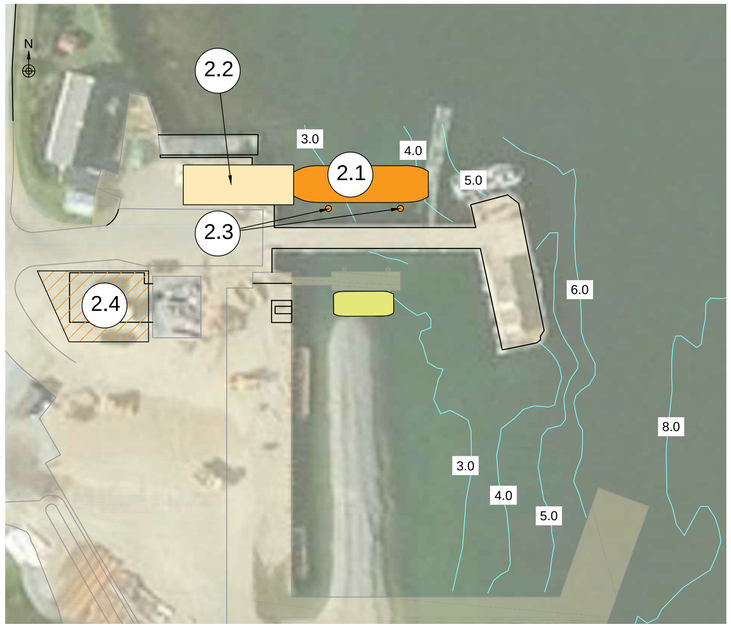
1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV NEW ADVANCE • Loa = 9.8m • Beam = 4.05 m • Draught = 1.72 m Capacity: • 12 passengers • 1 (small) PCU
1.2	Breakwater	120m long
1.3	Ferry Berth	• Pontoon held in position by two piles, with passengers access via a canting brow. • The vessel moves longside the quay for freight loading.
1.4	Parking/waiting area	Dedicated
1.5	Facilities	Toilet, waiting room & freight store

Scale approx. 1:1000

2) FULL OR PARTIAL RO-RO SERVICE
Possible upgrade

2.1	Vessel	Assumed a ***catamaran*** type Loa = 20m, B = 6m.
2.2	Hard ramp	Provide the quay with a hard ramp (block). See note 7. Please note that the block arrangement is suitable for operations under an specific tide level range and under calm conditions.
2.3	Safety piles	Safety (berthing) piles to avoid possible ship impact to the jetty.
2.4	Parking/waiting area	Ferry related parking area will have to be relocated. It is proposed to move it in front of the waiting room. Existing storage compound will need to be relocated.



Scale approx. 1:500

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM WALLS PIER DEVELOPMENT/GENERAL ARRANGEMENT DRAWING PROVIDED BY THE CLIENT.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Bay of Quendale	1.7	1.4	0.9	0.6
Hillswick	2.0	1.6	0.8	0.4

0 5 10 15 20 25
1:500 m

0 10 20 30 40 50
1:1000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WALLS OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

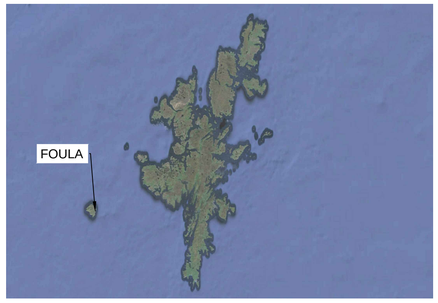
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

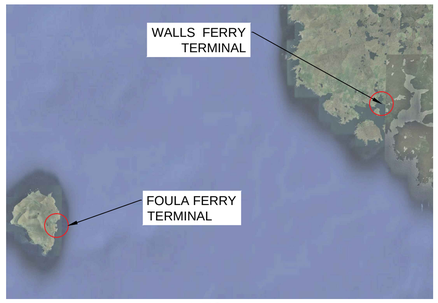
Drawn:	Checked:	Date:
DP	GR	22/03/16

Drawing Number:	Revision:
1537-01-402	A

T:\2015\1537 - Shetland Inter-Island Transport Study - Beet Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-402 REV A



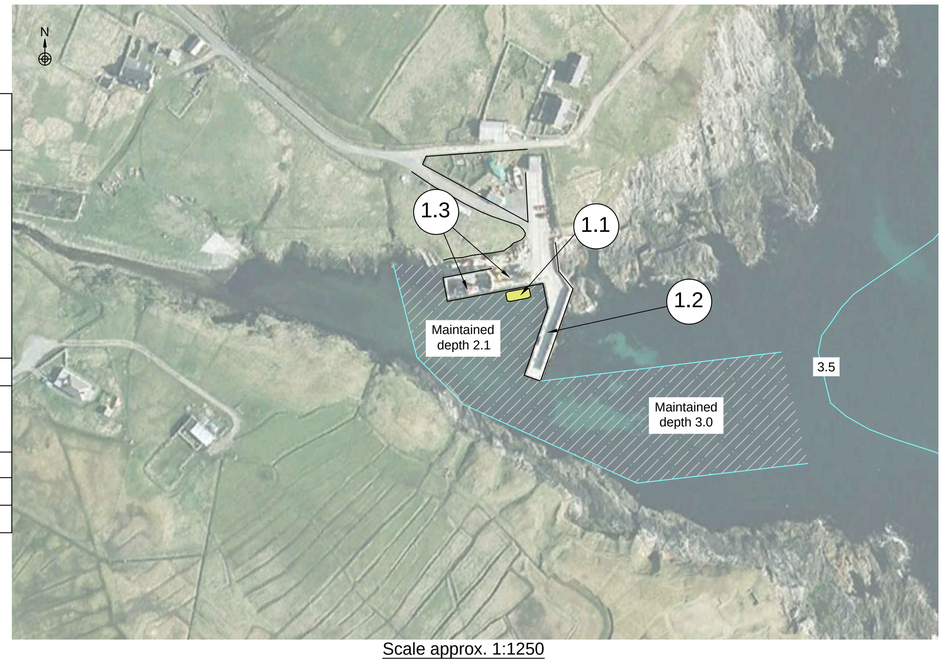
NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV NEW ADVANCE • Loa = 9.8m • Beam = 4.05 m • Draught = 1.72 m Capacity: • 12 passengers • 1 (small) PCU
1.2	Breakwater	40m long
1.3	Ferry Berth	• 20m long concrete quay provided with a crane. • Vessel lifted out of the water on davits in times of rough weather.
1.4	Linkspan	None
1.5	Parking/waiting area	None
1.6	Facilities	None

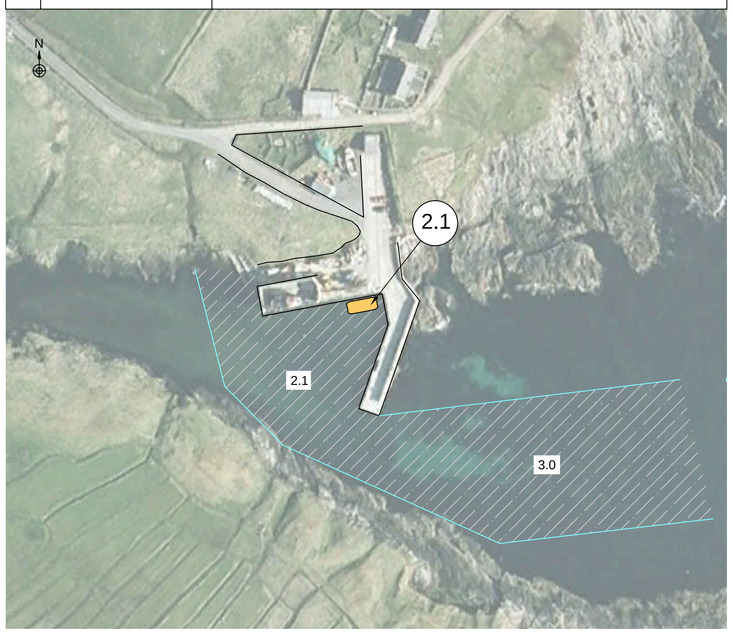


Scale approx. 1:1250

2) LIKE FOR LIKE OPTION

No Terminal upgrades

2.1	Vessel	Same size and capacity as per existing due to access restrictions (depth, entrance width, limited manoeuvring area) and davits.



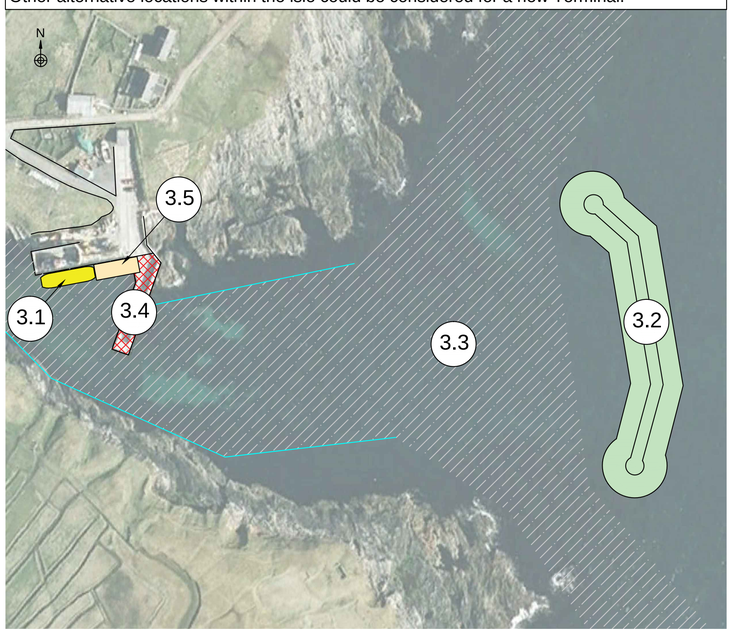
Scale approx. 1:1000

3) FULL OR PARTIAL RO-RO SERVICE

Possible upgrade

3.1	Vessel	Assumed a ***catamaran*** type Loa = 20m, B = 6m. Additional shelter may be required during storm conditions. Proposed catamaran not suitable for lifting out of the water by the existing davits.
3.2	Detached breakwater	120 m approx. long of a detached rubble mound breakwater to protect the harbour from easterly waves. Further studies are needed (physical modeling) to determine if suitable shelter under storm conditions is achieved. The breakwater layout could be optimized possibly by linking it to the shore at one end and having just one entrance channel.
3.3	Dredging	Required dredging of navigational channel and inner harbour up to -3.5m CD.
3.4	Demolition	Demolition of existing quay to improve vessels access.
3.5	Fixed ramp	Possible provision of fixed ramp.

Other alternative locations within the isle could be considered for a new Terminal.



Scale approx. 1:1250

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM FOULA HARBOUR/GENERAL LAYOUT DRAWING PROVIDED BY THE CLIENT.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Foula	2.0	1.6	0.9	0.5

0 10 20 30 40 50
1:1000 m

0 25 50
1:1250 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
C	18/07/16	SIC comments
B	15/06/16	PBA comments
A	25/04/16	Included RoRo vessel / corrections

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

FOULA
OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	22/03/16

Drawing Number:	Revision:
1537-01-401	C

T:\2015\1537 - Shetland Inter-Island Transport Study - Brent Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-401 REV C

Appendix G Papa Stour (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1 (Do Minimum): Replace the MV *Snolda* on a like-for-like basis	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The new vessel would be approximately 25m long and would carry 12 passengers and 6 PCUs. The vessel would run at 9 knots, would be twin-screwed and would be a Class VIIIA cargo ship. On life expiry the current linkspans would need to be replaced at both Papa Stour and West Burrafirth.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £3.25m. *Current revenue support* £428k per annum *Annual revenue support* £415k per annum
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Papa Stour lies to the north of Shetland West Mainland. The Papa Stour ferry departs from West Burrafirth on Shetland West Mainland and the crossing to the island takes around 40 minutes. The island can also be accessed by an air service from Tingwall airstrip.		
Social Context:	Papa Stour has the smallest population of the islands served by the Council inter-island transport network. The island has a population of 15 spread across nine households. There is a problem for landowners, who own property on the island but rarely live there as a result of poor connectivity and job opportunities. There is no fire cover within the island as well as no ambulance cover. There is one child in the primary school. There is no shop on the island, although there is a Post Office at the pier.		

Economic Context:	The Papa Stour economy is almost wholly dependent on small scale crofting and a handful of public sector jobs. The cost of living is higher on Papa Stour than most other areas of Shetland due to the added expense of delivering materials, fuel, food and supplies. This often has a detrimental impact on the island and adds to the challenges for the local population. Access to services and social events is also highly restricted.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** A like-for-like replacement for the MV *Snolda* would offer the same capacity as the current vessel - 12 passengers and 6 PCUs.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Papa Stour.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would not increase connectivity to the mainland or time in Lerwick. However, the provision of a new vessel would remove the risk of a catastrophic failure of the current vessel as she gets older.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.

TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.		***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:		This option will be taken forward for further consideration as it offers the minimum required like-for-like replacement of the current vessel. The current vessel is generally adequate for Papa Stour. A newer vessel of similar design could presumably be certified for a slightly higher number of passengers which would address the very occasional problems in this respect. A new vessel could potentially be shared with Foula, making more intensive use of the asset.
Implementability Appraisal		
Technical:		There are no technical feasibility issues associated with this option.
Operational:		Crew induction training in the new vessel would be required.
Financial:		The capital cost would be £3.25 million, with annual revenue support estimated at £415k per annum, a reduction of approximately £13k per annum on the current day figure.
Public:		Initial public consultation suggested that this option would be acceptable to the Papa Stour community, although it is likely that a vessel certified to carry more passengers would be preferred.
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the ageing MV *Snolda* with a more modern vessel gives rise to a potential reduction in emissions. There would be no other environmental issues associated with this option. **Environmental Constraints** The environmental constraints at the ports on the Papa Stour route are provided below for information: Papa Stour Constraints • Residential properties in proximity to terminal • Core path CPPWS10 passes close to ferry terminal • Harbour within Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) and within 200m of a Special Protection Area (SPA) • Scheduled monument and listed buildings in proximity (200m) • Coastal flooding risk • Good air quality

		West Burrafirth One residential property within 250m of pier Scheduled Monument within 200m north east of harbour Coastal flooding risk Good air quality
Safety:	✓	The current vessel, the MV *Snolda*, is single screwed. This presents a safety risk if the single propeller were to fail. Any new vessel would be built as a twin-screwed vessel, reducing / minimising this risk.
Economy:	Neutral	This option would not, on the whole, have any notable economic impact as it simply provides continuity of service. The provision of a new vessel would perhaps increase the attractiveness of Papa Stour as a place to live, visit and do business, but any such impact would be marginal and not possible to quantify.
Integration:	Neutral	This option would have no net impact on integration.
Accessibility and Social Inclusion:	Neutral	This option would have no net impact on accessibility & social inclusion.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO2: Replace the MV *Snolda* with one larger vessel.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The smallest of the 'generic' vessel types being considered is the TYPE 1 35m double ended ferry. This would however represent a major scaling up from the current MV *Snolda*, which would seem excessive in the context of an island with a very low population. The vessel considered here is therefore similar in design to the current MV *Filla*. The new vessel would therefore be 35m long and would carry 30 passengers and nine PCUs. The vessel would operate at 9.5 knots and be an EU B Class vessel operating without restriction. The provision of a dedicated parking and waiting area would be required at West Burrafirth as there is very limited provision at present.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £4.45m. *Current revenue support* £428k per annum *Annual revenue support* £673k per annum
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.

Background Information	
Geographic Context:	The island of Papa Stour lies to the north of Shetland West Mainland. The Papa Stour ferry departs from West Burrafirth on Shetland West Mainland and the crossing to the island takes around 40 minutes. The island can also be accessed by an air service from Tingwall airstrip.
Social Context:	Papa Stour has the smallest population of the islands served by the Council inter-island transport network. The island has a population of 15 spread across nine households. There is a problem for landowners, who own property on the island but rarely live there as a result of poor connectivity and job opportunities. There is no fire cover within the island as well as no ambulance cover. There is one child in the primary school. There is no shop on the island, although there is a Post Office at the pier.
Economic Context:	The Papa Stour economy is almost wholly dependent on small scale crofting and a handful of public sector jobs. The cost of living is higher on Papa Stour than most other areas of Shetland due to the added expense of delivering materials, fuel, food and supplies. This often has a detrimental impact on the island and adds to the challenges for the local population. Access to services and social events is also highly restricted.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Positive*** This option would offer a significant uplift in passenger capacity, increasing the passenger certificate from 12 to 30 passengers. The number of PCUs which could be carried would also be increased by 50%. Our analysis suggests that capacity is rarely a major issue in Papa Stour, although the 12 passenger certificate can be an issue during the summer tourist season. This issue is amplified by the low service frequency. Therefore, any option which increases capacity will have a positive impact against this objective.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Papa Stour.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This option would not increase connectivity to the mainland or time in Lerwick. However, the provision of a new

employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	vessel would remove the risk of a catastrophic failure of the current vessel as she gets older.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. There is no requirement for a vessel with a higher carrying capacity for Papa Stour so this option should not be pursued further.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	Higher crew training costs associated with moving to a higher certification vessel.
Financial:	The capital cost would be £4.45 million, with annual revenue support estimated at £673k per annum, an increase of approximately £245k per annum on the current day figure.
Public:	Initial public consultation suggested that this option would be acceptable to the Papa Stour community.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	Neutral	The replacement of the ageing MV *Snolda* with a more modern vessel gives rise to a potential reduction in emissions. However, the new vessel would be larger so it is likely that any benefit would be offset. There would be no other environmental issues associated with this option.

		Environmental Constraints The environmental constraints at the ports on the Papa Stour are provided below for information: Papa Stour Constraints • Residential properties in proximity to terminal • Core path CPPWS10 passes close to ferry terminal • Harbour within Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) and within 200m of a Special Protection Area (SPA) • Scheduled monument and listed buildings in proximity (200m) • Coastal flooding risk • Good air quality West Burrafirth One residential property within 250m of pier Scheduled Monument within 200m north east of harbour Coastal flooding risk Good air quality
Safety:	✓	The current vessel, the MV *Snolda*, is single screwed. This presents a safety risk if the single propeller were to fail. Any new vessel would be built as a twin-screwed vessel, reducing / minimising this risk.
Economy:	✓	There would be minor benefits associated with the enhanced capacity and a new vessel, for example being able to reliably secure a space on the vessel, increasing tourism to the island etc.
Integration:	Neutral	This option would have no net impact on integration.
Accessibility and Social Inclusion:	✓	The provision of a larger capacity ferry would ensure that Papa Stour residents (as well as visitors to the island) could be all but ensured a space on the ferry, improving community accessibility.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Replace the MV *Snolda* with the MV *Filla*.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would be dependent on the provision of a new vessel for Skerries, which would precede the redeployment of the MV *Filla*. The MV *Filla* was built in 2003 and could potentially serve this low intensity route for well into the appraisal period, or indeed the full 30 year period. The provision of a dedicated parking and waiting area would be required at West Burrafirth as there is very limited provision at present.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £350K, although there would be capital costs associated with a new Skerries vessel. *Current revenue support* £428k per annum *Annual revenue support* £730k per annum
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Papa Stour lies to the north of Shetland West Mainland. The Papa Stour ferry departs from West Burrafirth on Shetland West Mainland and the crossing to the island takes around 40 minutes. The island can also be accessed by an air service from Tingwall airstrip.		

Social Context:	Papa Stour has the smallest population of the islands served by the Council inter-island transport network. The island has a population of 15 spread across nine households, There is a problem for landowners, who own property on the island but rarely live there as a result of poor connectivity and job opportunities. There is no fire cover within the island as well as no ambulance cover. There is one child in the primary school. There is no shop on the island, although there is a Post Office at the pier.
Economic Context:	The Papa Stour economy is almost wholly dependent on small scale crofting and a handful of public sector jobs. The cost of living is higher on Papa Stour than most other areas of Shetland due to the added expense of delivering materials, fuel, food and supplies. This often has a detrimental impact on the island and adds to the challenges for the local population. Access to services and social events is also highly restricted.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Positive*** This option would offer a significant uplift in passenger capacity, increasing the passenger certificate from 12 to 30 passengers. The number of PCUs which could be carried would also be increased by 50%. Our analysis suggests that capacity is rarely a major issue in Papa Stour, although the 12 passenger certificate can be an issue during the summer tourist season. This issue is amplified by the low service frequency. Therefore, any option which increases capacity will have a positive impact against this objective.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Papa Stour.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would not increase connectivity to the mainland or time in Lerwick. However, the provision of the newer MV *Filla* would remove the risk of a catastrophic failure of the current vessel as she gets older.
TPO3: The scheduled time between connections should be minimised to	***Performance against Transport Planning Objective: Neutral***

increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. The low intensity of this route would be suitable for this vessel.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	Higher crew training costs associated with moving to a higher certification vessel. Skerries would clearly require a new vessel and it is assumed that the existing Skerries crew would transfer to that vessel.
Financial:	The capital cost would be £350k (although there would be capital costs associated with a new Skerries vessel), with annual revenue support estimated at £730k per annum, an increase of approximately £302k per annum on the current day figure.
Public:	Initial public consultation suggested that this option would be acceptable to the Papa Stour community.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	The replacement of the ageing MV *Snolda* with the MV *Filla* gives rise to a minor negative environmental impact, as the MV *Filla* has much higher fuel consumption (225 l/hr) than the MV *Snolda* (101 l/hr). There would be no other environmental issues associated with this option. **Environmental Constraints**

		The environmental constraints at the ports on the Papa Stour are provided below for information: Papa Stour Constraints • Residential properties in proximity to terminal • Core path CPPWS10 passes close to ferry terminal • Harbour within Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) and within 200m of a Special Protection Area (SPA) • Scheduled monument and listed buildings in proximity (200m) • Coastal flooding risk • Good air quality West Burrafirth One residential property within 250m of pier Scheduled Monument within 200m north east of harbour Coastal flooding risk Good air quality
Safety:	✓	The current vessel, the MV *Snolda*, is single screwed. This presents a safety risk if the single propeller were to fail. The MV *Filla* is twin-screwed reducing / minimising this risk.
Economy:	✓	There would be minor economic benefits associated with the enhanced capacity offered by the MV *Filla*, for example being able to reliably secure a space on the vessel, increasing tourism to the island etc.
Integration:	Neutral	This option would have no net impact on integration.
Accessibility and Social Inclusion:	✓	The provision of a larger capacity ferry would ensure that Papa Stour residents (as well as visitors to the island) could be all but ensured a space on the ferry, improving community accessibility.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO1a: Increase the frequency of the service to two return crossings seven days per week.

Option RO1b: Option RO1a combined with the withdrawal of the Papa Stour air service.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Option RO1a – The current timetable would be expanded to provide a twice daily return sailing between Shetland mainland and Papa Stour (7 or 8 additional sailings per week). At present, there are two return crossings three days per week and one return crossing on a Sunday. (Saturday pm sailing does not operate in winter)

Option RO1b – Option RO1a but with the withdrawal of the air service to Papa Stour (two return flights on a Tuesday)</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00</td></tr>
<tr><td>Current revenue support
£428k per annum</td></tr>
<tr><td>Annual revenue support
£709k per annum</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
</table>

Geographic Context:	The island of Papa Stour lies to the north of Shetland West Mainland. The Papa Stour ferry departs from West Burrafirth on Shetland West Mainland and the crossing to the island takes around 40 minutes. The island can also be accessed by an air service from Tingwall airstrip.
Social Context:	Papa Stour has the smallest population of the islands served by the Council inter-island transport network. The island has a population of 15 spread across nine households, There is a problem for landowners, who own property on the island but rarely live there as a result of poor connectivity and job opportunities. There is no fire cover within the island as well as no ambulance cover. There is one child in the primary school. There is no shop on the island, although there is a Post Office at the pier.
Economic Context:	The Papa Stour economy is almost wholly dependent on small scale crofting and a handful of public sector jobs. The cost of living is higher on Papa Stour than most other areas of Shetland due to the added expense of delivering materials, fuel, food and supplies. This often has a detrimental impact on the island and adds to the challenges for the local population. Access to services and social events is also highly restricted.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Option RO1a - Performance against Transport Planning Objective: Moderate Positive*** The operation of a twice daily return between West Burrafirth and Papa Stour would provide wholly additional ferry capacity on a Monday, Tuesday and Thursday, as well as one additional sailing on a Sunday and on a winter Saturday. With the current vessel, this would equate to at least 84 additional passenger spaces and 42 additional PCU spaces over the course of a week. Total one direction ferry capacity over the week would be 168 passenger spaces and 84 car spaces, a significant uplift on the currently available summer capacity (84 passenger spaces and 42 PCUs). Our analysis suggests that capacity is rarely a major issue in Papa Stour, although the 12 person passenger certificate can be an issue during the summer tourist season. This issue is amplified by the low service frequency. Therefore, any option which increases capacity will have a positive impact against this objective. ***Option RO1b - Performance against Transport Planning Objective: Moderate Positive*** There are two return flights between Papa Stour and Tingwall per week, both on a Tuesday. Whilst the removal of the air service would lead to a loss of up to 16 one-direction passenger seats per week, this would be more than offset by the increase in ferry provision.
TPO2a: Where an island has a 'commutable' combined ferry or drive /	***Option RO1a - Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Papa Stour.

public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Option RO1b: Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Papa Stour.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Option RO1a - Performance against Transport Planning Objective: Major Positive*** The provision of a twice daily return would significantly enhance the connectivity of Papa Stour – residents would be able to access the mainland daily and the island would be similarly accessible to those travelling from the mainland. A timetable could be designed which would facilitate a half day in Lerwick seven days a week. ***Option RO1b: Performance against Transport Planning Objective: Moderate Positive*** The benefits of Option RO1a would still stand, although the loss of the Tuesday air service return would have a negative impact on the island, in that it would remove the connection which facilitates the longest amount of time in Lerwick on any given day (around 5 hours in summer).
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Option RO1a - Performance against Transport Planning Objective: Minor Positive*** This option would not significantly change the scheduled time between services on days where there are currently two return sailings (i.e. Wednesday, Friday and Saturday (summer)). However, by adding additional connections into the timetable, it would reduce daily gaps in connectivity experienced on a Sunday and winter Saturday (one return sailing only), Monday, Tuesday (although there is an air service) and Thursday. ***Option RO1b: Performance against Transport Planning Objective: Minor Positive*** The benefits of Option RO1a would still stand, although the possibility of a combined air / ferry trip on a Tuesday would no longer exist.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Option RO1a - Performance against Transport Planning Objective: Major Positive*** This option would provide a consistent number of crossings by day and, if desired, timetable across the week. ***Option RO1b: Performance against Transport Planning Objective: Moderate Positive*** The benefits of Option RO1a would still stand, although Tuesday connectivity would be reduced.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Option RO1a - Performance against Transport Planning Objective: Moderate Positive*** This option would: • Remove gaps by day in terms of connectivity, allowing Papa Stour residents same day connections with NorthLink ferry services and air services on Mondays and Thursdays. • Residents would also be able to take a car on a Tuesday, where currently only an air connection is available. • Residents would be able to connect with the Sunday evening NorthLink departure, which is not currently possible without leaving on the Saturday evening (Saturday morning in winter).

	The enhanced ferry services would not, however, allow connections from Papa Stour to the first morning outbound flights or from the last evening inbound flights back to Papa Stour. ***Option RO1b: Performance against Transport Planning Objective: Moderate Positive*** The impacts would be as per Option RO1a.
Rationale for Selection or Rejection of Proposal:	***Option RO1a*** This option will be retained for further consideration. The option meets the RSM requirement of a 7-day service but not the Model number of sailings per day. It would also enable substantial time in Lerwick on a daily basis. It should be noted though that previous investment in connections to Papa Stour has not stemmed the recent trend in depopulation. ***Option RO1b*** This option will be retained for further consideration. There would be very little rationale for the continuation of the current minimal air service if the ferry service frequency was increased given the relatively short journey times to Lerwick.
Implementability Appraisal	
Technical:	There are no technical feasibility issues in relation to Option RO1a. The only technical issue surrounding Option RO1b is the fate of the Papa Stour airstrip, specifically whether this should be maintained in the longer-term.
Operational:	Both Options RO1a and RO1b would require additional ferry crew / crewing hours. The resource / crew availability implications of this option would need to be considered further. Option RO1b remove the Papa Stour rotation from the timetable and potentially free-up aircraft and crew flying hours.
Financial:	Annual revenue support would be in the region of £709k per annum, an increase of £281k per annum. The cost associated with running Papa Stour Airstrip in 2015/16 was budgeted at £4,600 so the savings here would be modest. The saving in flying hours would also be very low given the current timetable and there may be no net saving if the aircraft is deployed elsewhere during the time that it is currently serving Papa Stour.
Public:	• Initial feedback suggests that Option RO1a is acceptable to the Papa Stour population. • Initial feedback suggests that the withdrawal of the air services is not acceptable to the Papa Stour population.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	**Option RO1a -** ✗ **Option RO1b -** ✗	**Option RO1a** There would be a minor negative environmental impact associated with the increased sailing frequency **Option RO1b** As per Option RO1a, but with a very marginal reduction in emissions associated with the discontinuation of the air service.
Safety:	**Option RO1a -** ✗ **Option RO1b -** ✓	**Option RO1a** Whilst this option would increase the number of sailing hours, we have not identified any major safety impacts. There could however be an increase in vehicle kilometres due to the doubling of the sailing frequency. **Option RO1b** As per Option RO1a. However, there is a safety benefit in that there would no longer be an air service flying into an unlicensed airfield with no fire cover.
Economy:	**Option RO1a -** ✓✓✓ **Option RO1b -** ✓✓	**Option RO1a** There would be minor TEE benefits associated with this option associated with the increased frequency of the service and the addition of connections on days where there are currently no connections. There would be significant wider benefits associated with this option. These would include positive impacts for tourists, residents, shopping and locally traded services (including on Shetland West Mainland). **Option RO1b** As per Option RO1a, although the withdrawal of the air service would reduce the scale of the benefits by removing two return connections to Shetland Mainland.
Integration:	**Option RO1a -** ✓✓ **Option RO1b -** ✓	**Option RO1a** This option would significantly enhance the transport integration of Papa Stour by permitting daily access to onward strategic transport connections (see TPO5 above). It would also support a range of policies aimed promoting the sustainability and economic development of the islands. **Option RO1b**

		This option would offer the benefits of Option RO1a, although the withdrawal of the air service would reduce the number of connections offered and thus the overall transport integration impact.
Accessibility and Social Inclusion:	**Option RO1a -** ✓✓✓ **Option RO1b -** ✓✓	**Option RO1a** This option would represent a major improvement to the accessibility of Papa Stour residents, as well as for those travelling to the island. At present, a day return can only be made to the island on four days (three in winter), but this option would permit seven days-a-week access. **Option RO1b** As per Option RO1a, although the accessibility benefits are reduced by the loss of the air service.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td>Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="3">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO2a – Increase the frequency of the service on days where there is a sailing to three return connections per day.

Option RO2b – Option RO2a combined with the withdrawal of the Papa Stour air service.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Option RO2a – The current timetable would be expanded to provide three return crossings on a Wednesday, Friday, Saturday and Sunday, where currently there are one or two.

Option RO2b – Option RO2a but with the withdrawal of the air service to Papa Stour (two return flights on a Tuesday).</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00</td></tr>
<tr><td>Current revenue support
£428k per annum</td></tr>
<tr><td>Annual revenue support
£501k per annum</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
<tr><td>Geographic Context:</td><td colspan="3">The island of Papa Stour lies to the north of Shetland West Mainland. The Papa Stour ferry departs from West Burrafirth on Shetland West Mainland and the crossing to the island takes around 40 minutes. The island can also be accessed by an air service from Tingwall airstrip.</td></tr>
</table>

Social Context:	Papa Stour has the smallest population of the islands served by the Council inter-island transport network. The island has a population of 15 spread across nine households, There is a problem for landowners, who own property on the island but rarely live there as a result of poor connectivity and job opportunities. There is no fire cover within the island as well as no ambulance cover. There is one child in the primary school. There is no shop on the island, although there is a Post Office at the pier.
Economic Context:	The Papa Stour economy is almost wholly dependent on small scale crofting and a handful of public sector jobs. The cost of living is higher on Papa Stour than most other areas of Shetland due to the added expense of delivering materials, fuel, food and supplies. This often has a detrimental impact on the island and adds to the challenges for the local population. Access to services and social events is also highly restricted.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Option RO2a - Performance against Transport Planning Objective: Moderate Positive*** The operation of a thrice daily return between West Burrafirth and Papa Stour on days where there are currently a connection would provide at least an additional one-direction 60 passenger spaces and 30 PCU spaces over the course of the week. Total one direction ferry capacity over the week would be 144 passenger spaces and 72 car spaces, a significant uplift on the currently available summer capacity (84 passenger spaces and 42 PCUs). Our analysis suggests that capacity is rarely a major issue in Papa Stour, although the 12 PC can be an issue during the summer tourist season. This issue is amplified by the low service frequency. Therefore, any option which increases capacity will have a positive impact against this objective. This is particularly the case where the additional capacity is concentrated on days where there is already a connection, therefore providing additional capacity for day-trippers. ***Option RO2b - Performance against Transport Planning Objective: Minor Positive*** There are two return flights between Papa Stour and Tingwall per week, both on a Tuesday. Whilst the removal of the air service would lead to a loss of up to 16 one-direction passenger seats per week, this would be somewhat offset by the increase in ferry provision (although that additional capacity is concentrated on different days – see TPO2b below).
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Option RO2a - Performance against Transport Planning Objective: Not Applicable*** This objective is not considered relevant for Papa Stour. ***Option RO2b: Performance against Transport Planning Objective: Not Applicable*** This objective is not considered relevant for Papa Stour.

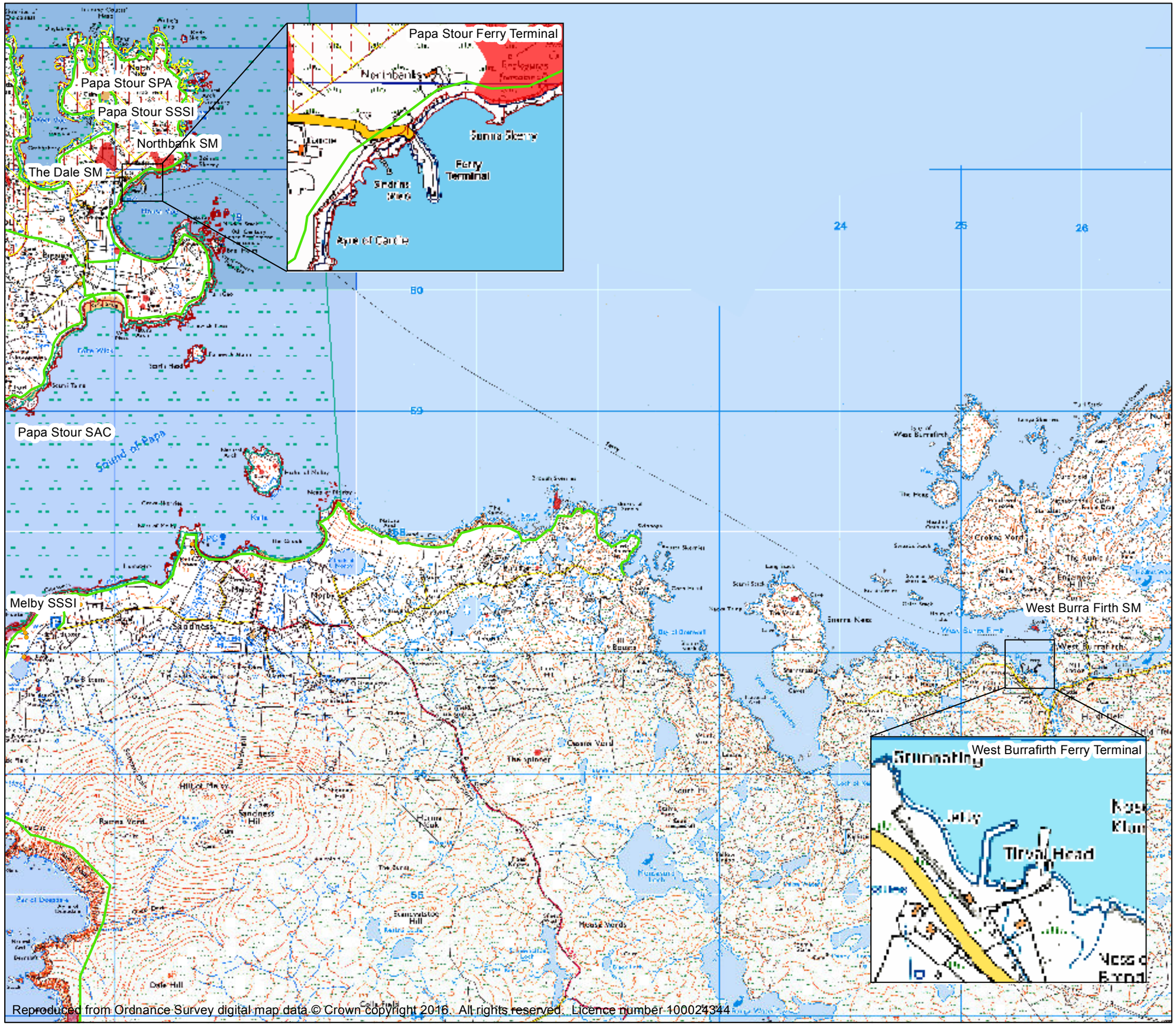
facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Option RO2a - Performance against Transport Planning Objective: Neutral*** The increase in ferry provision to three return connections four days per week could potentially extend the time available in Lerwick assuming the timetable was reworked to offer a full day or AM / PM half days. However, it would not provide 7-days a week connectivity. ***Option RO2b: Performance against Transport Planning Objective: Minor Negative*** The withdrawal of the air service on a Tuesday would remove Papa Stour's connections on that day. This would reduce the number of days on which effective time could be spent on the mainland from five (under option RO2a) to four, which represents a negative contribution to this objective. There would also be a 'connectivity gap' between a Sunday evening and Wednesday morning.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Option RO2a - Performance against Transport Planning Objective: Moderate Positive*** The addition of a third return sailing on the days where there is a connection would increase the overall frequency on those days and thus minimise the scheduled time between connections. ***Option RO2b: Performance against Transport Planning Objective: Minor Positive*** As per Option RO2a, although Tuesday connectivity would be lost altogether.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Option RO2a - Performance against Transport Planning Objective: Minor Positive*** This option would ensure a consistent timetable on days where there is a sailing, which compares with the current situation where there is only one return sailing on a Sunday and winter Saturday. ***Option RO2b: Performance against Transport Planning Objective: Minor Negative*** The withdrawal of the air service would have a negative impact in that it would remove all of the connections on one day of the week (Tuesday), this increasing the variation within the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Option RO2a - Performance against Transport Planning Objective: Moderate Positive*** The extension of the timetable to three sailings per day on a Sunday and winter Saturday would allow Papa Stour residents to connect with the Sunday evening NorthLink departure and flights without having to leave on the Saturday evening. A potential reworking of the timetable to extend the operating day may also improve access to strategic transport connections. ***Option RO2b: Performance against Transport Planning Objective: Moderate Negative*** As per Option RO2a, although strategic transport connectivity would be lost altogether on a Tuesday, meaning that Papa Stour residents could not travel off of Shetland mainland between Sunday evening and Wednesday morning without the need for an overnight stay.

Rationale for Selection or Rejection of Proposal:	***Option RO2a*** This option will not be retained for further consideration. This option only provides additional frequency on existing sailing days and there is little evidence that this is a priority issue for Papa Stour. ***Option RO2b*** This option will not be retained for further consideration as it is inferior to Option RO2a.	
Implementability Appraisal		
Technical:	There are no technical feasibility issues in relation to Option RO2a. The only technical issue surrounding Option RO2b is the fate of the Papa Stour airstrip, specifically whether this should be maintained in the longer-term.	
Operational:	Both Options RO2a and RO2b would require additional ferry crew / crewing hours. The resource / crew availability implications of this option would need to be considered further. Option RO2b removes the Papa Stour rotation from the timetable and potentially free-up aircraft and crew flying hours.	
Financial:	Annual revenue support would be in the region of £501k per annum, an increase of £73k per annum. The cost associated with running Papa Stour Airstrip in 2015/16 was budgeted at £4,600 so the savings here would be modest. The saving in flying hours would also be very low given the current timetable and there may be no net saving if the aircraft is deployed elsewhere during the time that it is currently serving Papa Stour.	
Public:	• Initial feedback suggests that Option RO2a is acceptable to the Papa Stour population. • Initial feedback suggests that the withdrawal of the air services is not acceptable to the Papa Stour population.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	**Option RO2a -** ✗ **Option RO2b -** ✗	**Option RO2a** There would be a minor negative environmental impact associated with the increased sailing frequency **Option RO2b** As per Option R1a, but will a very marginal reduction in emissions associated with the discontinuation of the air service.

Safety:	**Option RO2a -** ✗ **Option RO2b -** ✓	**Option RO2a** Whilst this option would increase the number of sailing hours, we have not identified any major safety impacts. There could however be an increase in vehicle kilometres due to the increased sailing frequency, although this would be less than would be the case under Options R1a and R1b. **Option RO2b** As per Option RO2a. However, there is a safety benefit in that there would no longer be an air service flying into an unlicenced airfield with no fire cover.
Economy:	**Option RO2a -** ✓✓ **Option RO2b -** ✓	**Option RO2a** There would be minor TEE benefits associated with this option associated with the increased frequency and capacity of the service. There would be moderate (in the context of Papa Stour) wider benefits associated with this option. These would include positive impacts for tourists, residents, shopping and locally traded services (including on Shetland West Mainland). **Option RO2b** As per Option RO2a, although the withdrawal of the air service would effectively cut Papa Stour off from a Sunday evening to a Wednesday morning, significantly diluting the benefits of enhancing the ferry service on days where there is currently a connection.
Integration:	**Option RO2a -** ✓ **Option RO2b -** ✗	**Option RO2a** The extension of the timetable to three sailings per day on a Sunday and winter Saturday would allow Papa Stour residents to connect with the winter Saturday / Sunday evening NorthLink departure and flights without having to leave on the Friday / Saturday evening. A potential reworking of the timetable to extend the operating day may also improve access to strategic transport connections. **Option RO2b** As per Option RO2a, although strategic transport connectivity would be lost altogether on a Tuesday, meaning that Papa Stour residents could not travel off of Shetland mainland between Sunday evening and Wednesday morning without the need for an overnight stay.
Accessibility and Social Inclusion:	**Option RO2a -** ✓✓ **Option RO2b -** ✓	**Option RO2a** This option would represent a moderate improvement to the accessibility of Papa Stour residents, as well as for those travelling to the island on days where there is currently a sailing. **Option RO2b** As per Option RO2a, although the accessibility benefits are reduced by the loss of the air service.

		In particular, the connectivity gap which would emerge between a Sunday evening and Wednesday morning would be a significant disbenefit for the community.

Environmental Constraint Map(s)



Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Air Network Option 3
Papa Stour Options C1, C2 & C3

1:30,000 @ A3

N

0 0.25 0.5 1 km

DRAFT

Shetland Inter-Island Transport Study

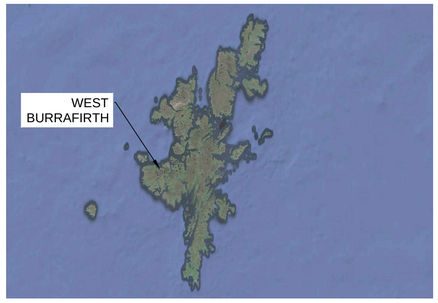
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

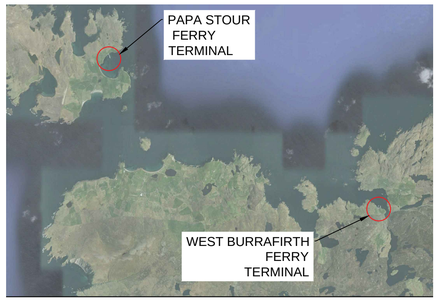
Figure 6: Environmental Constraints Plan

Papa Stour and
West Burrafirth Ferry Terminals

Harbour Drawing(s)



NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV SNOLDA • Loa = 24.4 m • Beam = 7 m • Draught = 3.36 m Capacity: • 12 passengers • 6 PCU
1.2	RoRo Ferry Berth	• 45m long concrete piled jetty. It extends 35 m form the end of the linkspan. • Vertical and horizontal rubber D type fenders.
1.3	Linkspan	Small 4.5 m wide x 13.915 m long
1.4	Lay-by berth	Approx. 45m
1.5	Parking/waiting area	Non dedicated
1.6	Facilities	Toilet, waiting room & freight store

Scale approx. 1:2000

2) LIKE FOR LIKE OPTION

No Terminal upgrades

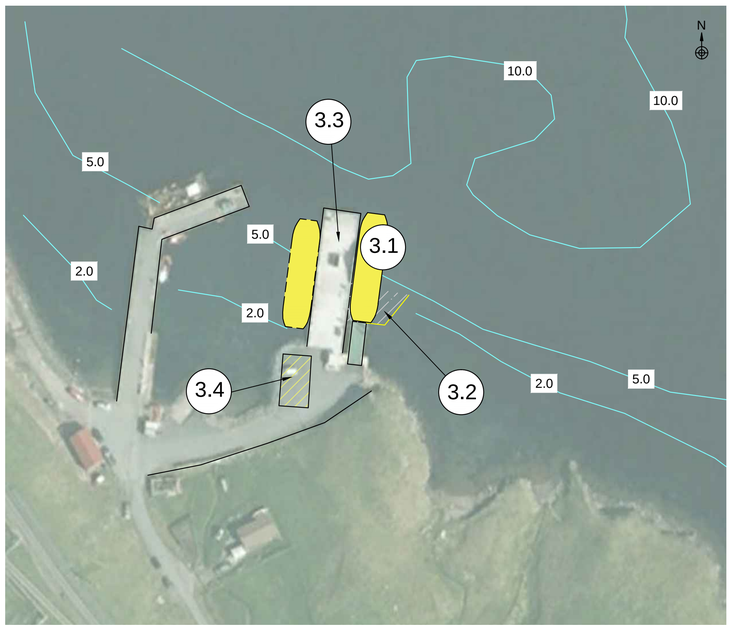
2.1	Vessel	Specific vessel based on ***MV SNOLDA***: • Loa = 25 m • Beam = 10 m • Draught = 3.36 m Capacity: • 12 passengers • 6 PCU
2.2	Dredging	Some minimum dredging may be required.
2.3	Lay-by Berth	Well sheltered. Safely overnight berthing. See notes 7 & 8.

Scale approx. 1:1000

3) LARGER VESSEL

Terminal upgrades

3.1	Vessel	Specific vessel based on ***MV Filla***: • Loa = 35 m • Beam = 9 m • Draught = 3.05 m Capacity: • 30 passengers • 8 PCU
3.2	Dredging	Some minimum dredging may be required.
3.3	RoRo Ferry Berth	Installation new bollards and fenders (see notes 7, 8 & 9).
3.4	Parking	Recommended provision of a dedicated parking/waiting area.



Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3299 PLANS IN THE SHETLAND ISLANDS.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH REQUIRES ANY MODIFICATION FOR A 30 YEARS SERVICE LIFE EXTENSION, IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Hillswick	2.0	1.6	0.8	0.4

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WEST BURRAFIRTH OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

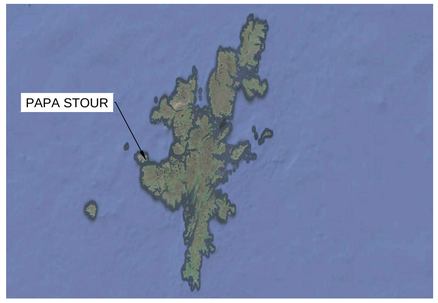
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

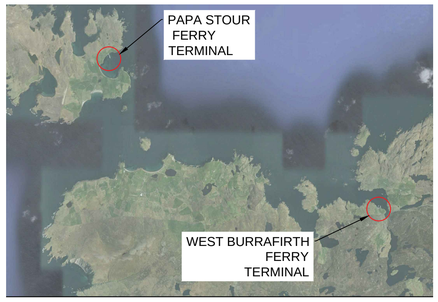
Drawn:	Checked:	Date:
DP	GR	24/03/16

Drawing Number:	Revision:
1537-01-502	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Beett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-502 REV B



NTS



NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV SNOLDA • Loa = 24.4 m • Beam = 7 m • Draught = 3.36 m Capacity: • 12 passengers • 6 PCU
1.2	Breakwater	Rubble mound 130m long
1.3	RoRo Ferry Berth	• 50m long concrete jetty. • Vertical and horizontal rubber D type fenders.
1.4	Linkspan	Small 4.5 m wide x 13.915 m long
1.5	Parking/waiting area	Non dedicated
1.6	Facilities	Toilets & waiting room

Scale approx. 1:2000

2) LIKE FOR LIKE OPTION

No Terminal upgrades

2.1	Vessel	Specific vessel based on ***MV SNOLDA***: • Loa = 25 m • Beam = 10 m • Draught = 3.36 m Capacity: • 12 passengers • 6 PCU
2.2	Dredging	Maintained depth -4.0mCD
2.3	RoRo Ferry Berth	Well sheltered. Safely overnight berthing. See notes 7, 8 & 9.

Scale approx. 1:1000

3) LARGER VESSEL

Terminal upgrades

3.1	Vessel	Specific vessel based on ***MV Filla***: • Loa = 35 m • Beam = 9 m • Draught = 3.05 m Capacity: • 30 passengers • 8 PCU
3.2	Dredging	Maintained depth -4.0m CD.
3.3	RoRo Ferry Berth	Vessel slightly overhangs from berth. If strengthen works are required, extension of the berth could be undertaken (see notes 7, 8 & 9)

Scale approx. 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3299 PLANS IN THE SHETLAND ISLANDS.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH REQUIRES ANY MODIFICATION FOR A 30 YEARS SERVICE LIFE EXTENSION, IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Hillswick	2.0	1.6	0.8	0.4

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

PAPA STOUR OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	22/03/16

Drawing Number:	Revision:
1537-01-501	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Beet Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-501 REV B

Appendix H Skerries (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1 (Do Minimum): Replace the MV *Filla* on a like-for-like basis at life expiry.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The MV *Filla* would be replaced in 2033 by a new vessel which would be approximately 35m long and would carry 30 passengers and 9 PCUs. The vessel would operate at 9.5 knots. As well as general replacement of life-.expired assets, there would be a need for the extension of the berthing platform (an additional dolphin) at Skerries and refendering. Refendering and the provision of a dedicated parking & waiting area would also be required at Vidlin.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £4.9 million. *Current revenue support* £924k (rounded) per annum. *Annual revenue support* £828k (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago.		

	In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request. The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economic activity outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.

travel between the island(s) and Shetland Mainland	
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on this objective. The current vessel is capable of delivering this objective if allied with additional revenue funding.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. A replacement vessel of a similar size could meet the needs of Skerries. A more modern design without the requirement to carry fresh water or refrigerated fish may be more efficient.
Implementability Appraisal	

Technical:		As well as general replacement of life-.expired assets, there would be a need for the extension of the berthing platform (an additional dolphin) at Skerries and refendering. Refendering and the provision of a dedicated parking & waiting area would also be required at Vidlin.
Operational:		There are no operational feasibility issues associated with this option, although it should be noted that a vessel of this size could not lie in Skerries overnight.
Financial:		The capital cost would be £4.9 million, with annual revenue support estimated at £828k, a reduction of £96k per annum on the current day figure.
Public:		This option would only be acceptable to the community if the vessel was based at Skerries.
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Filla* with a more modern vessel at life expiry would give rise to a potential reduction in emissions. It is assumed that any new vessel would also have a more efficient design as there would not be an ongoing need to carry fresh water or refrigerated fish. **Environmental Constraints** The environmental constraints for the Skerries route are provided below for information Skerries Constraints • Residential properties in proximity to terminal • Core path CPPSK01 follows coast near terminal • Listed building within 100m of harbour area • Coastal flooding risk • Good air quality Vidlin Constraints • Residential properties within 50m of the harbour • Core paths CPPNL01 passes ferry terminal • Vidlin Broch Scheduled Monument on edge of harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact on safety.
Economy:	Neutral	This option would have no impact in terms of economy, except in terms of the potential perception

		benefits from having a new modern vessel.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	Neutral	This option would have no impact on accessibility & social inclusion.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO2: Replace the MV Filla immediately with a smaller vessel which could berth overnight at Skerries. The MV Filla would be redeployed or sold.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">A new vessel would be approximate 25m long and would carry six PCUs. Passenger capacity would be dependent on design and would be kept as high as practicable (aiming to be over 20). The vessel would run at 9.5 knots and would be capable of operating through the south mouth, reducing the voyage distance to Vidlin and Lerwick.

This option would require an island based crew and could remove the current dead legging in the timetable between Whalsay and Skerries / Vidlin.

On life expiry, there would be harbour works required at Vidlin – the berthing structure and (large) linkspan would be replaced and a new small linkspan would also be</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£5.8 million.</td></tr>
<tr><td>Current revenue support
£924k (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£617k (rounded) per annum.</td></tr>
</table>

	required at Skerries.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago. In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request. The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).		
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.		
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily		

	commuting options and on-island work is limited.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Negative*** Capacity has not been identified as a problem on the Skerries route. However, the research undertaken as part of this study highlights the desire and need of the Skerries community to grow, and thus ferry capacity has to be able to accommodate this. A move to a smaller vessel would represent a minor negative in terms of capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** Basing the vessel in Skerries would provide a minor positive in terms of time on mainland. The vessel currently overnights in Symbister (Whalsay) and thus there is an element of 'dead-legging' on service days as the vessel positions to Skerries / Vidlin. An island based vessel would allow an earlier morning departure / later return connection to the island within current crewing hours.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** The island based vessel would allow the time consumed by the Symbister dead-legging to be recycled into additional (request) connections across the week.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Positive*** This option would significantly simplify the timetable as it would remove the morning & evening connections from / to Symbister.
TPO5: Where practicable, islanders should be provided with links to strategic onward	***Performance against Transport Planning Objective: Neutral***

transport connections without the need for an overnight stay on Shetland mainland.	This option would have no impact on strategic connectivity, except to the extent which additional hours could be used to provide more connections.	
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. This option would allow the vessel to be island based, bringing local employment opportunities and would permit a more direct sailing through the South Mouth. The potential reliability of this vessel compared to a larger vessel would need further investigation. This option is widely supported by the Skerries community.	
Implementability Appraisal		
Technical:	On life expiry, there would be harbour works required at Vidlin – the berthing structure and (large) linkspan would be replaced - and a new small linkspan would also be required at Skerries.	
Operational:	This option would require a Skerries-based crew. The current crew were asked in 2013 whether they would be willing to be based in Skerries (either permanently or during duty periods) and rejected this suggestion. Crewing the vessel from Skerries could present a significant challenge given the very small population of the island, although it could at the same time provide an important opportunity to introduce relatively high paid jobs into the archipelago. The current vessel, MV *Filla* would have to redeployed, chartered or sold. This would clearly have an impact on the existing crew of that vessel, an issue which would have to be taken into account.	
Financial:	The capital cost would be £5.8 million, with annual revenue support estimated at £617k, a reduction of £307k per annum on the current day figure.	
Public:	The Skerries community provided highly detailed feedback and indicated that this is one of two potential preferred options.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Filla* with a smaller and more modern vessel would give rise to a potential reduction in emissions. **Environmental Constraints** The environmental constraints for the Skerries route are provided below for information Skerries Constraints • Residential properties in proximity to terminal • Core path CPPSK01 follows coast near terminal • Listed building within 100m of harbour area

		• Coastal flooding risk • Good air quality Vidlin Constraints • Residential properties within 50m of the harbour • Core paths CPPNL01 passes ferry terminal • Vidlin Broch Scheduled Monument on edge of harbour • Coastal flooding risk • Good air quality
Safety:	✗	The impact of this option on safety would require further investigation. However, it is anticipated that it would generate a minor negative as a smaller vessel would be making the long and exposed crossing, particularly on the days where the ferry sails to Lerwick. Conversely, a smaller ship would have the choice of using the south mouth entrance to Skerries, which is more sheltered from north-easterly winds. Overall, whilst the vessel would be classified for the waters in which she operates, the journey would be less comfortable and reliability could be affected.
Economy:	✓	This option would deliver a minor positive in terms of the economy criterion. There would be TEE benefits associated with this option, both in terms of potential additional connections and journey time saving associated with the use of the South Mouth (although the proposed smaller vessel would be slower). There may also be offsetting disbenefits in terms of reduced reliability. As the crew would be Skerries based, the archipelago would benefit from a small number of full-time, long-term and comparatively well-paid jobs. This would be of significant benefit to Skerries given the recent economic difficulties faced by the island.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	This option would generate a minor positive in terms of accessibility & social inclusion through offering scope for increased connections across the week.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Develop an overnight berth at Vidlin for the Skerries ferry.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option could be combined either with Skerries Option C1 or in partnership with options for Whalsay (see Whalsay ASTs). The Skerries ferry would overnight at Vidlin rather than Symbister on Whalsay. The purpose of this is to remove the current dead legging in the timetable between Whalsay and Skerries. The crew would become mainland based The provision of a new overnight berth at Vidlin would involve construction of a 75m long jetty to provide a ferry berth and overnight berth. If additional shelter is required a breakwater could be provided but has not been costed here. This option would also require the provision of a large linkspan, land reclamation to provide approximately 0.12 ha of additional area and some minimal dredging to provide a suitable berth pocket.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £5.7 million. *Current revenue support* £0.00 *Annual revenue support* Ongoing maintenance of overnight berth would be required over its lifetime.

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago. In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request. The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).		
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.		
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.		

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** Basing the vessel overnight at Vidlin would provide a minor positive in terms of time on mainland. The vessel currently overnights in Symbister (Whalsay) and thus there is an element of 'dead-legging' on service days as the vessel positions to Skerries. The overnight berth at Vidlin would allow direct connections to / from Skerries. It should be noted that the positive impact associated with this option would be less than that offered by overnighting the ferry in Skerries. As the first connection would be outbound to Skerries, the total potential hours per day on Shetland mainland for Skerries residents would be reduced.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** The Vidlin-based vessel would allow the time consumed by the Symbister dead-legging to be recycled into additional (request) connections across the week.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Positive*** This option would significantly simplify the timetable as it would remove the morning & evening connections from / to Symbister.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity, except to the extent which additional hours could be

an overnight stay on Shetland mainland.	used to provide more connections.	
Rationale for Selection or Rejection of Proposal:	This option on its own will not be retained for further consideration although it could be reconsidered as part of an improvement to the Vidlin terminal for the Whalsay service. As a measure in its own right, this would not be likely to generate sufficient benefits for Skerries to justify the capital cost. Crew would also continue to be based away from Skerries. The improvement of facilities at Vidlin could be of merit from the perspective of the Whalsay route.	
Implementability Appraisal		
Technical:	The provision of a new overnight berth at Vidlin would involve construction of a 75m long jetty to provide a ferry berth and overnight berth. If additional shelter is required a breakwater could be provided but has not been costed here. This option would also require the provision of a large linkspan, land reclamation to provide approximately 0.12 ha of additional area and some minimal dredging to provide a suitable berth pocket.	
Operational:	A mainland-based crew would be required.	
Financial:	This option would have a capital cost of £5.7 million. Any vessel related enhancements would be in addition to this.	
Public:	Feedback from the Skerries community found that the single benefit of this option is that the ferry would be based at one end of the route, which would save time on the Skerries – Vidlin journey. However, the downside is that the unproductive positioning time will actually be increased for the Skerries – Lerwick route, which will further reduce the time available in Lerwick. The issues identified with berthing the vessel away from Out Skerries will also remain. In addition, infrastructure improvements will be required at Vidlin; these improvements are seen to be of no value to the Vidlin community whereas similar investment in the Out Skerries would be of high value to its community. The Community Council does not believe that this option should be taken forward.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The development of a new overnight berth at Vidlin would give rise to significant environmental effects during construction. There would also be seascape and visual impacts in longer term, although these would decrease as the structures became weathered. The following impacts have been identified in terms of environmental sub-criteria • Noise & vibration: Short term impacts at closest properties and on wildlife during construction. • Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction of breakwater at Vidlin. • Biodiversity & habitats: Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing Vidlin harbour

		• Landscape: Impacts on seascape from new breakwater, but fitting in the marine working environment of the harbour. • Visual amenity: Short term impacts during construction. Permanent works could be significant particularly on completion of construction. • Cultural heritage: Works unlikely to significantly affect setting of scheduled monument because of location in working harbour. **Environmental Constraints** The environmental constraints at Vidlin are provided below for information Vidlin Constraints • Residential properties within 50m of the harbour • Core paths CPPNL01 passes ferry terminal • Vidlin Broch Scheduled Monument on edge of harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact on safety.
Economy:	✓	This option would deliver a minor positive in terms of the economy criterion. There would be TEE benefits associated with this option in terms of potential additional connections.
Integration:	Neutral	This option would have no impact on integration.
Accessibility and Social Inclusion:	✓	This option would generate a minor positive in terms of accessibility & social inclusion through offering scope for increased connections across the week.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO1: Do Minimum – continue with the current level of timetabled service.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	Continue with the current level of timetabled service. It should be noted that the Do Minimum in this instance includes the reinstatement of the air service to a level prior to the Rescue & Fire Fighting Service reductions. However, this is dependent on a scenario where sufficient resources are available in the island to provide this function. The air service would operate on a Monday, Wednesday and Thursday.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00, although investment will be required in airfield licensing and RFFS services if the Do Minimum is to be delivered. *Current revenue support* £924k (rounded) per annum (exclusive of air service as costs are not disaggregated by route). *Annual revenue support* Assumed to be as per current revenue support.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago. In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request.		

	The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Positive*** Whilst this option is effectively the continuation of the Do Minimum, it provides a minor positive in terms of capacity as it would lead to the reinstatement of the air service, which is not currently operational. The air only provides very little additional capacity in absolute terms, but any given flight could accommodate around 10% of the permanent resident population of Skerries.

TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Minor Positive*** The reinstatement of the air timetable to the pre-RFFS timetable would address the Thursday gap in the timetable, leaving Tuesday as the only day where a connection is not available to / from Skerries.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The reinstated air service would fill the current Thursday gap in the timetable and provide additional connections to / from Skerries on a Monday & Wednesday.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Positive*** This reinstated air service would fill the current Thursday gap in the timetable, leaving Tuesday as the only day where a connection is not available to / from Skerries.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** The reinstatement of the air service would allow for onward connections from Skerries to the Scottish mainland on a Thursday and would provide additional connections on a Monday and Wednesday.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. All means to restore the air service should be considered. Should the air service be reinstated on a sustainable basis, the option to increase the number of flights serving Skerries beyond three days per week should be considered.
Implementability Appraisal	
Technical:	There would be no technical issues associated with this option.

Operational:	The community cannot currently provide the level of resource required for RFFS, although if the ferry was based on Skerries, the island-based crew could provide cover if scheduling allows but not when both air and ferry services are operating. There may also be a need for airfield licensing if the air service was to be reinstated.
Financial:	Potential costs associated with licensing (network wide) and RFFS equipment and training.
Public:	The community consultation found that this option is not acceptable. There is a view amongst the community that the level of service has be extended beyond that offered by the Do Minimum if Skerries is to be sustainable in the long-term.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	Neutral	The reinstatement of the air service would lead to an increase in emissions associated with the air service, but this would be extremely minor. In addition, emissions would only return to their pre-RFFS service reductions level.
Safety:	✗✗	This option would have a moderate negative impact in terms of safety. As well as increasing the overall number of connections, the reinstatement of the air service (included as part of the Do Minimum) would involve flying into a very short and unlicensed airfield (although the airfield could be licensed as part of this option).
Economy:	✓	The reinstatement of the air service as part of the Do Minimum would support the economy of Skerries through enhancing connectivity, particularly for those seeking to make short duration trips to / from the island. There would be TEE benefits associated with the additional connections, with a particular benefit on a Thursday where there are currently no ferry connections to/from Skerries.
Integration:	✓	As well as improving strategic integration (see TPO5), this option would contribute towards a wide range of policies aimed at sustaining and developing Shetland's island communities.
Accessibility and Social Inclusion:	✓	This option would generate a minor positive in terms of accessibility & social inclusion through offering scope for increased connections across the week. This would particularly be the case on a Thursday where there are not currently ferry connections to/from Skerries.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO2: Offer one return sailing from Skerries to either Lerwick or Vidlin on days where there is not currently a service (Tuesday and Thursday).	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option would include a single return sailing from Skerries to either Lerwick or Vidlin on a Tuesday and Thursday. The connections would permit the maximum amount of time available on the mainland within the available crewing hours.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 *Current revenue support* £924k (rounded) per annum. *Annual revenue support* £908k (rounded) per annum, based on new vessel under option CO1.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago. In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request. The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting		

	Services (RFFS).
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** The Skerries service does not demonstrate capacity issues and thus this option has no impact in capacity. It does however increase the total supply of capacity over the course of a week.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.

employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries. This would provide a seven day service. The provision of a half day on mainland seven days a week come close to being provided, although there would remain a shortfall on certain days of the week (e.g. Monday).
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries. This would provide a seven day per week ferry service for Skerries.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** The provision of a daily return service from Skerries would allow for onward connections from Skerries to the Scottish mainland seven days a week. A day return trip would not be possible every day.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. Any additional connections would be of benefit to Skerries and this option would plug gaps in the timetable.
Implementability Appraisal	
Technical:	There would be no technical issues associated with this option.
Operational:	This option would require a full second crew.
Financial:	Estimated at £908k per annum based on new vessel under Option CO1. Higher cost with existing vessel.
Public:	This option offers seven day/week sailings and therefore either option will overcome the problems identified with RO1. The Community Council therefore noted that this option should be taken forward for further consideration.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	The increase in the number of sailings (and sailing days) would generate a very minor negative environmental impact in terms of increased emissions.
Safety:	✗	The increase in the number of sailings (and sailing days) would generate a very minor negative safety impact in terms of increased ferry running hours and potentially additional vehicle kilometres.
Economy:	✓✓	The provision of return sailings on a Tuesday and Thursday would provide a moderate positive economic impact for Skerries. Firstly, there would be TEE benefits associated with the additional connections. These would extend into direct financial benefits for Skerries residents who have business on the mainland on one of the current non-sailing days (e.g. reduced need for overnight hotel stays, subsistence etc). The ability to conduct a half day of business on most days of the week would be of benefit to Skerries. This level of connectivity would also benefit those travelling to Skerries, including tourists (albeit small in number), tradespeople and Council staff visiting the island.
Integration:	✓	As well as improving strategic integration (see TPO5), this option would contribute towards a wide range of policies aimed at sustaining and developing Shetland's island communities. It would also deliver the RSM requirement of a seven day service but not the Model number of sailings or length of operating day every day.
Accessibility and Social Inclusion:	✓✓	This option would generate a moderate positive in terms of accessibility & social inclusion through offering scope for increased connections across the week. The increased connections would support both car & passenger-based access to / from the island group. As noted above, access would be improved both for Skerries residents and those visiting the islands, be it tourists, tradespeople or Council staff.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td>Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="3">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO3: Introduce two return sailings to / from Vidlin a day or one return sailing from Skerries to / from Lerwick a day with either Vidlin or Lerwick sailings operating seven days a week.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This option would include two return sailings to / from Vidlin a day or one return sailing from Skerries to/from Lerwick a day with either Vidlin or Lerwick sailings operating seven days a week.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00</td></tr>
<tr><td>Current revenue support
£924k (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£1.03m (rounded) per annum, based on new vessel under option CO1.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
<tr><td>Geographic Context:</td><td colspan="3">The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago.

In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request.</td></tr>
</table>

	The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).
Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** The Skerries service does not demonstrate capacity issues and thus this option has no impact in capacity. It does however increase the total supply of capacity over the course of a week.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.

employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Major Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries. This would provide a seven day service. The provision of additional connections on other days would permit a half day in Lerwick seven days a week if the timetable is designed to achieve this.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries. The provision of additional services over the week would represent a significant increase in timetable connections overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** The provision of a daily return service from Skerries would fill the existing timetable gap on a Tuesday and Thursday, where there are currently no services from Skerries. This would provide a seven day per week ferry service for Skerries. The provision of additional services over the week could allow for a relatively consistent timetable to be offered to / from Skerries across the week.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a daily return service from Skerries would allow for onward connections from Skerries to the Scottish mainland seven days a week, with enhanced frequency across the week providing a further benefit. A day return trip would not be possible.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration as it would provide the 7-day connection required by the RSM and performs well against the objectives and STAG criteria.
Implementability Appraisal	
Technical:	There would be no technical issues associated with this option.
Operational:	This option would require a full second crew.

Financial:	Estimated at £1.03m per annum based on new vessel under Option CO1, an increase of £107k on the current costs.	
Public:	This option offers seven day/week sailings and therefore either option will overcome the problems identified with RO1. The Community Council therefore noted that this option should be taken forward for further consideration.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	The increase in the number of sailings (and sailing days) would generate a very minor negative environmental impact in terms of increased emissions.
Safety:	✗	The increase in the number of sailings (and sailing days) would generate a very minor negative safety impact in terms of increased ferry running hours and potentially additional vehicle kilometres.
Economy:	✓✓✓	The provision of return sailings on a Tuesday & Thursday and additional services on other days would provide a major positive economic impact for Skerries. Firstly, there would be TEE benefits associated with the additional connections. These would extend into direct financial benefits for Skerries residents who have business on the mainland on one of the current non-sailing days (e.g. reduced need for overnight hotel stays, subsistence etc). The ability to conduct a half day of business in Lerwick seven days per week, provided the timetable is designed to achieve this, would be of benefit to Skerries. Daily connectivity would also benefit those travelling to Skerries, including tourists (albeit small in number), tradespeople and Council staff visiting the island.
Integration:	✓✓	As well as improving strategic integration (see TPO5), this option would contribute towards a wide range of policies aimed at sustaining and developing Shetland's island communities. It would also deliver the RSM requirement of a seven day service, and make a positive contribution towards the implied frequency and length of operating day in the RSM.
Accessibility and Social Inclusion:	✓✓✓	This option would generate a major positive benefit in terms of accessibility & social inclusion through offering scope for increased connections across the week. The increased connections would support both car & passenger-based access to / from the island group. As noted above, access would be improved both for Skerries residents and those visiting the islands, be it tourists, tradespeople or Council staff.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO4: Permanently discontinue the air service from Skerries.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The Skerries air service is currently suspended due to lack of Rescue & Fire Fighting Services (RFFS). This option would involve the permanent discontinuation of the service.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 *Capital costs/grant* £0.00. *Current revenue support* Air service revenue support is not disaggregated by route
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The Skerries are an outlying archipelago in the north-east of the Shetland Islands. The island group is the easternmost of the Shetland archipelago. In terms of transport, Skerries is connected to the Shetland mainland by a Ro-Ro ferry service. There are connections to Vidlin on a Monday, Friday, Saturday and Sunday and one return connection per week to Lerwick on a Wednesday. All services are on-request. The Skerries air service was suspended on 23rd November 2015 due to a lack of sufficient Rescue & Fire Fighting Services (RFFS).		

Social Context:	The Skerries population has been in steady decline since 1981 and is now believed to number less than 60. There are limited data available on housing in Skerries, although house prices are believed to be low and the property market slow. Medical cover for Skerries is provided by the Whalsay Health Centre. There has been a gradual decline in numbers at both primary and secondary school level, with just 2 children enrolled at the Primary School in 2014. The declining school rolls, closure of the high school and general population decline present a serious threat to the future sustainability of the island chain.
Economic Context:	Skerries has a relatively low economic activity rate (although perhaps underestimated by the official figures). Skerries has typically had a dependence on fishing and aquaculture for its livelihood. There was a community salmon farm in the islands employing six people, which was bought over and subsequently closed in early 2015, at a cost of six jobs. The loss of this farm led in turn to the closure of the small processing factory on the islands. There remain a couple of whitefish and shellfish boats resident to the islands, but the loss of the salmon industry was a significant blow to the community. There is very little formal economy outwith fishing. The land is not particularly fertile, although there is some small scale agriculture. Commuting has now become important to the island chain, with many residents leaving on a Monday and returning on a Friday, putting further pressure on local services. There has been a substantial increase in the number of people working from home in Skerries, which suggests that daily commuting options and on-island work is limited.

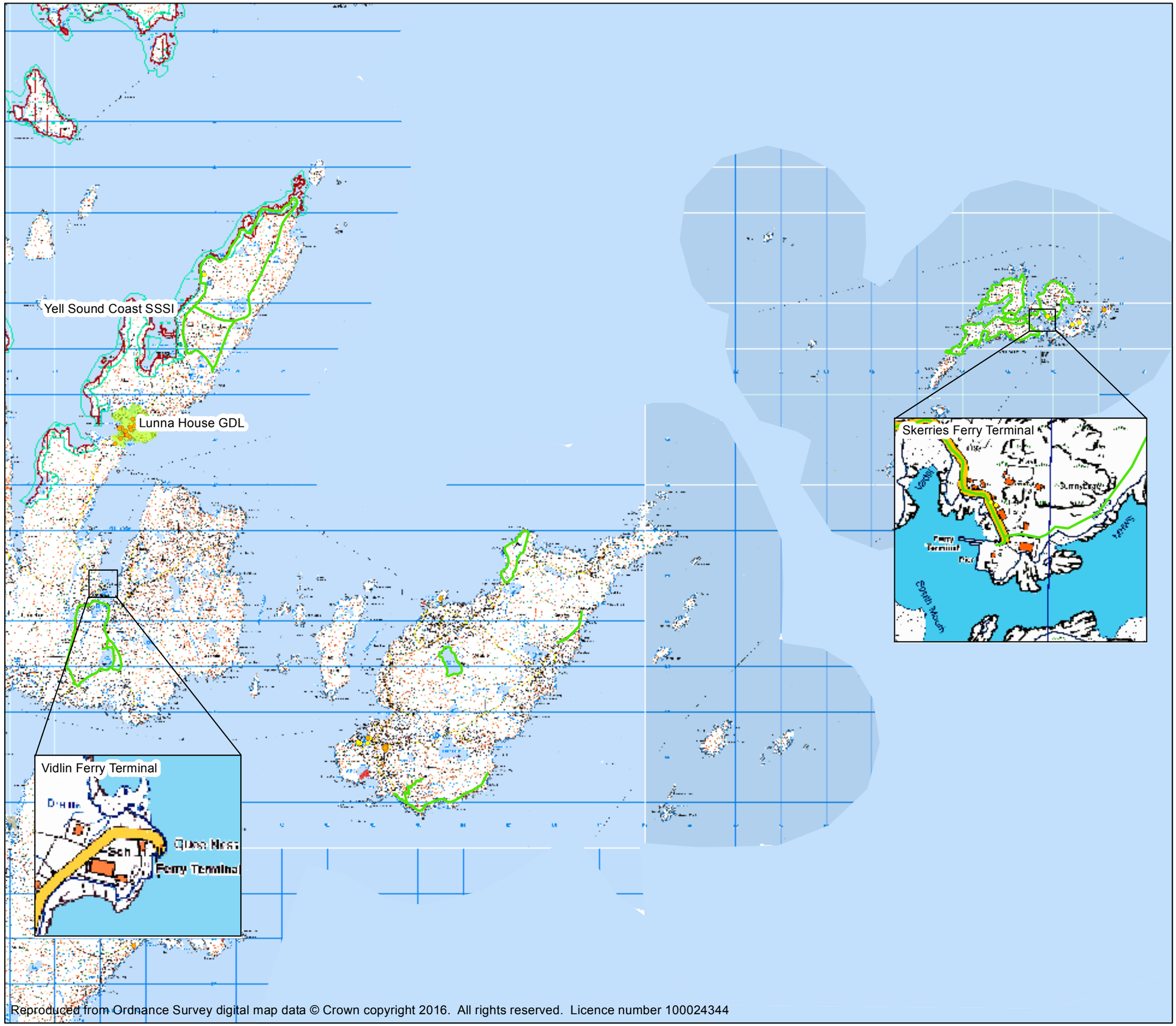
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Negative*** This option would result in a small reduction of capacity for Skerries. The ferry would, however, continue to comfortably meet the capacity needs of the island.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Performance against Transport Planning Objective: Neutral*** This objective is not relevant for Skerries.

facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Moderate Negative*** The pre-RFFS air service provided the only connection from Skerries on a Thursday as well as additional connections on a Monday and Wednesday. The permanent discontinuation of this service would result in a reduction of time on mainland.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Negative*** The permanent discontinuation of the air service would reduce the frequency of connections from Skerries and would create a timetable gap on Thursdays.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Minor Negative*** The permanent discontinuation of the air service would reduce the number of connections from Skerries on a Monday and Wednesday, increasing timetable variation. There would also be no connections to / from the island on a Thursday.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Negative*** The permanent discontinuation of the air service would mean that it would not be possible to travel from Skerries to the Scottish mainland on a Thursday.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration, although could be combined with Skerries options RO2 or RO3 to provide 7-day connectivity. Although clearly negative to the island, this has to be an option in the event that the air service cannot be operated on a sustainable basis in the medium term.
Implementability Appraisal	
Technical:	There would be no technical issues associated with this option.
Operational:	There would be no operational issues associated with this option. The flying hours reserved for serving Skerries could be utilised elsewhere.
Financial:	Air service costs are not disaggregated by route. However, given the limited number of rotations to Skerries, it is

	likely that only a small fuel saving and a reduction in airfield costs would be achieved.
Public:	Skerries Community Council noted that no decision should be made on the future of the air service until stakeholders have had the opportunity to review in detail: • the need for, and the requirements of, an air service to Skerries. • if the service is to continue, how it can be best reinstated. • if the service is no longer required, how the capability to reinstate it in the future can be retained.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The permanent discontinuation of the air service would lead to a very small reduction in emissions compared to the pre RFFS service suspension.
Safety:	✓	This option would have a minor positive impact in terms of safety as it would remove the risks associated with flying into a very short and unlicensed airfield.
Economy:	××	The permanent discontinuation of the air service would have a negative impact on Skerries through reducing overall connectivity, particularly for those seeking to make short duration trips to / from the island. There would be TEE disbenefits associated with the reduction in connections, with a particular disbenefit on a Thursday where there would be no connections to/from Skerries.
Integration:	××	As well as worsening strategic integration (see TPO5), this option would not support a wide range of policies aimed at sustaining and developing Shetland's island communities. In addition, it would weaken the current services in relation to the RSM requirements.
Accessibility and Social Inclusion:	××	This option would generate a moderate negative effect in terms of accessibility & social inclusion through reducing connections across the week. This would particularly be the case on a Thursday where there are not currently ferry connections to/from Skerries.

Environmental Constraint Map(s)



Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Air Network Option 3
Skerries Options C1, C2 & C3

N

1:80,000 @ A3

0 0.25 0.5 1 1.5 km

Shetland Inter-Island Transport Study

Environmental Appraisal

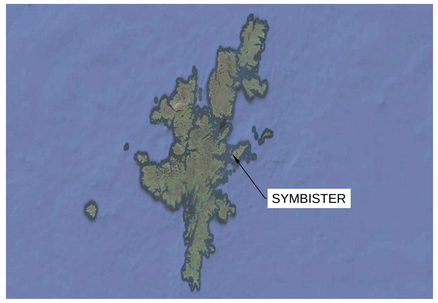
DRAFT

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 7: Environmental Constraints Plan

Vidlin and Skerries Ferry Terminals

Harbour Drawing(s)

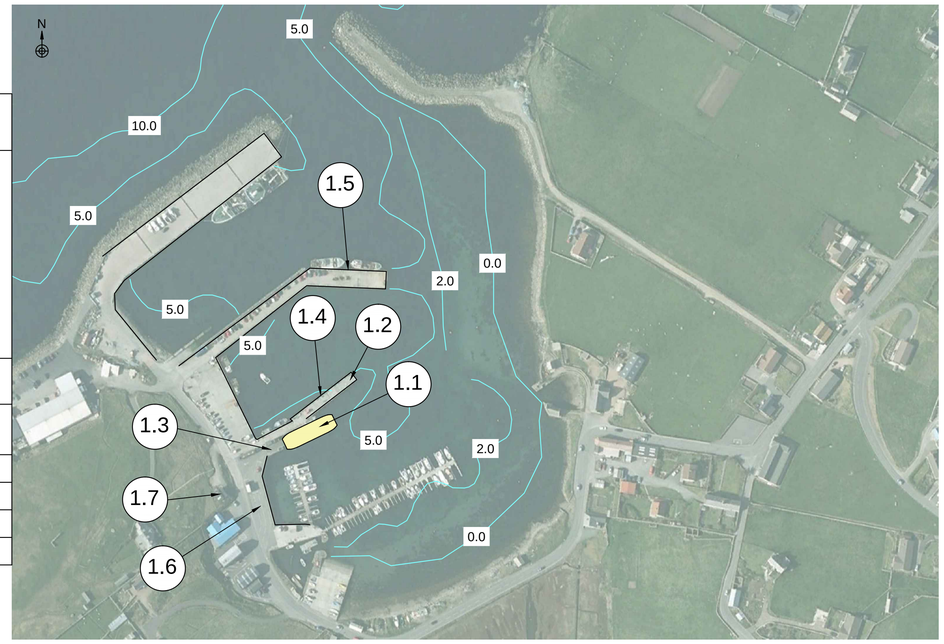


NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV HENDRA • Loa = 33.6 m • Beam = 9.4 m • Draught = 2.61 m MV LINGA • Loa = 36.21m • Beam = 10.8m • Draught = 3.19m Capacity: • 95 passengers • 12PCU • 95 passengers •18PCU
1.2	RoRo Ferry Berth	• Inner side of a concrete jetty. • 27m of available berthing length
1.3	Linkspan	Large 9.3m wide x 20.47 m long
1.4	Lay-by berth	for Whalsay day vessel
1.5	Lay-by berth	for Skerries ferry
1.6	Parking/waiting area	125 lane meters
1.7	Facilities	Toilets & waiting room



Approx. scale 1:2000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3284 MOUL OF ESWICK LUNNA HOLM INCLUDING OUT SKERRIES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Dury Voe	2.1	1.6	0.9	0.3

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

0 25 50 75 100 125
1:2500 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

2) LIKE FOR LIKE OPTION
No Terminal upgrades

2.1	Vessel	**TYPE 1**
See note 7.		

3) LARGER VESSEL
Terminal upgrades

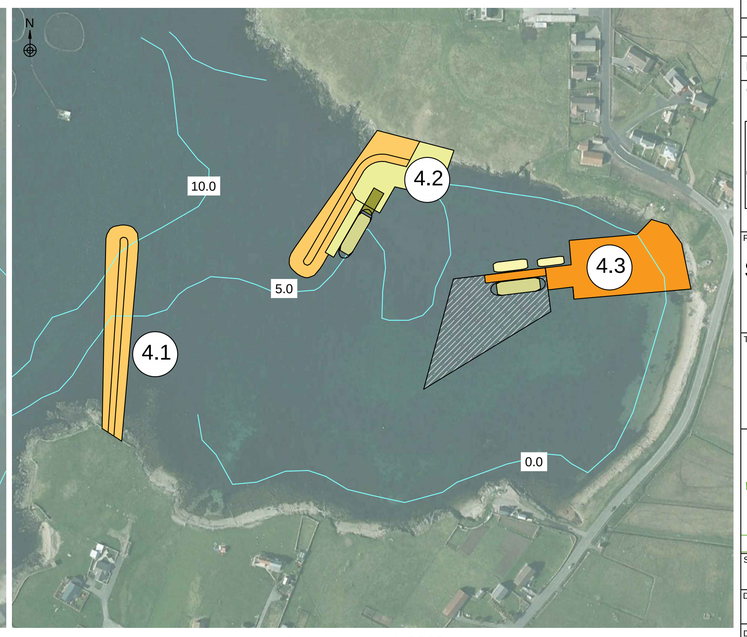
3.1	Vessel	**TYPE 2**
3.2	RoRo Ferry Berth	• Recommended to extend berthing platform aligned to vessel or improve mooring arrangement. See notes 7 & 8.

4) NEW HARBOUR AT WHALSAY (NORTH VOE)
Indicative layout

4.1	Breakwater	350m approx. to create circa 9 ha of protected waters. Breakwater layout is indicative.
4.2	RoRo Ferry Berth (op 1)	Jetty located inner side the breakwater to avoid dredging. This location will require construction of road access and dedicated parking/waiting area.
4.3	RoRo Ferry Berth & 2 lay-by berths (op 2)	This location will provide significant area for all the facilities that may be required. Dredging will need to be undertaken.

Approx. scale 1:1000

Approx. scale 1:1000



Approx. scale 1:2500

Rev	Date	Details
C	18/07/16	SIC comments
B	15/06/16	PBA comments
A	25/04/16	Minor corrections

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WHALSAY
SYMBISTER
OPTIONEERING

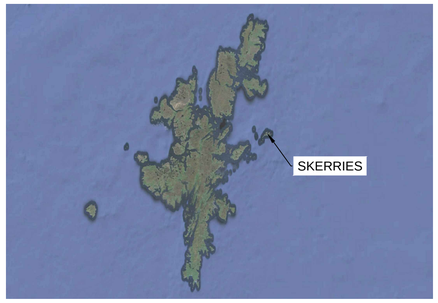
BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS

www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN
Drawn: DP / Checked: GR	Date: 07/03/16
Drawing Number: 1537-01-701	Revision: C

T:\2015\1537 - Shetland Inter-Island Transport Study - Brent Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-701 REV C

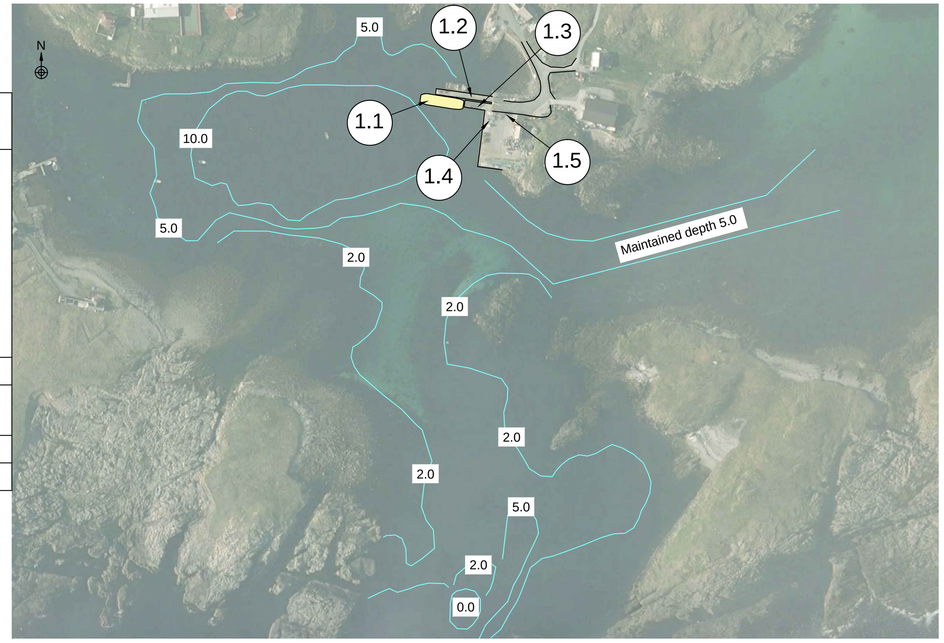


NTS

NTS

1) CURRENT CONDITION

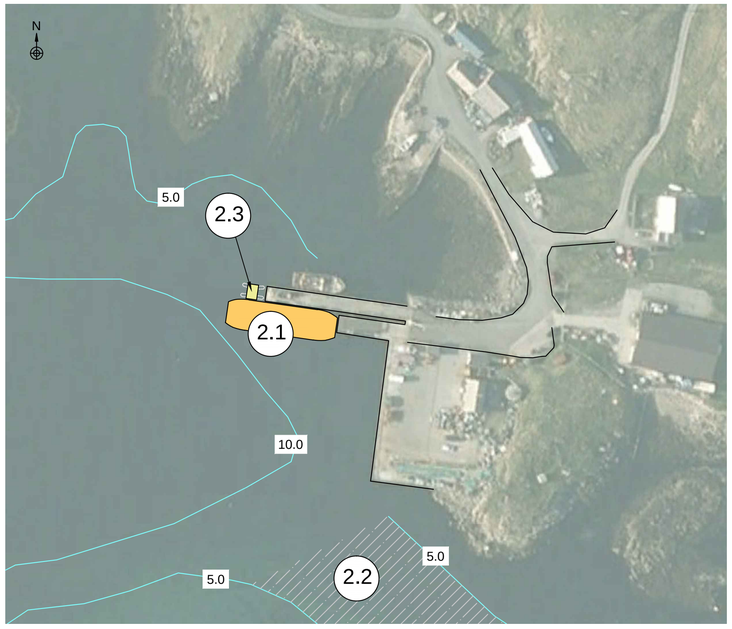
1.1	Current Main Vessel	Size: MV FILLA • Loa = 35.5 m • Beam = 9 m • Draught = 3.05 m Capacity: • 30 passengers • 8 PCU
1.2	RoRo Ferry Berth	Concrete piled jetty of approx. 46m long
1.3	Linkspan	Small 4.5m wide x 13.915 m long
1.4	Parking/waiting area	Non dedicated
1.5	Facilities	Toilets



Approx. scale 1:2500

2) LIKE FOR LIKE OPTION
Terminal upgrades

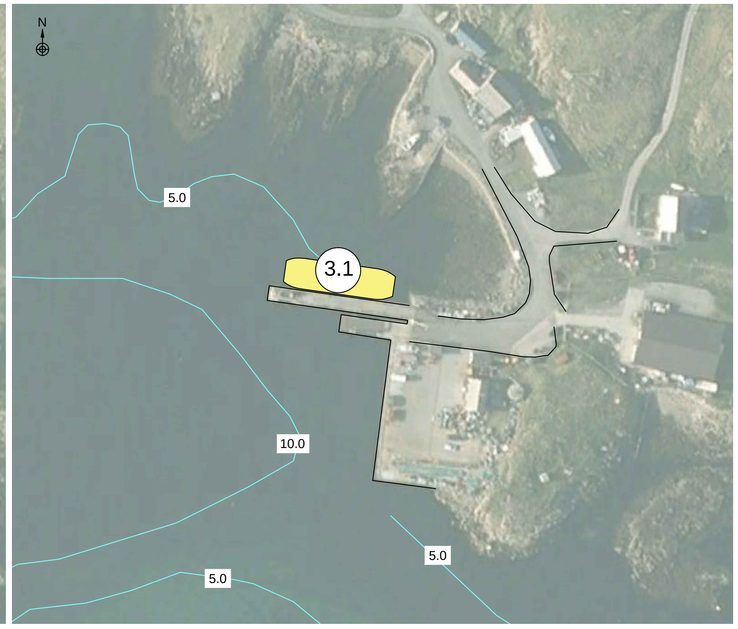
2.1	Vessel	Specific vessel based on ***MV Filla***: • Loa = 36 m • Beam = 10 m • Draught = 3.10 m Capacity: • 30 passengers • 8 PCU
2.2	NE entrance	Maintained depth 5.0mCD
2.3	RoRo Ferry Berth	• Extension of RoRo berth with a dolphin (see note 7 & 9). • Installation new bollards and fenders (see note 8). • Berth exposed to southerly waves.



Approx. scale 1:1000

3) OVERNIGHT BERTH AT SKERRIES
Possible location

3.1	Partially sheltered from southerly incoming waves. Further climate assessment is needed to determine of wave conditions are suitable for overnight berthing. If necessary a wave screen could be added to the existing structure to provide some improved protection.



Approx. scale 1:1000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3284 MOUL OF ESWICK LUNNA HOLM INCLUDING OUT SKERRIES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Out Skerries	2.2	1.7	0.9	0.4

0 10 20 30 40 50
1:1000 m

0 25 50 75 100 125
1:2500 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

SKERRIES OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	22/03/16

Drawing Number:	Revision:
1537-01-601	B

T:\2015\1537 - Shetland inter-island Transport Study - Brett Consulting\01 - Shetland inter-island Transport Study\01 Drawings\01 Working Drawings\1537-01-601 REV B

Appendix I Whalsay (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1 (Do Minimum): Replace the MV *Hendra* and MV *Linga* on a like-for-like basis.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The new vessels would be 35m TYPE 1 and would provide similar capacity to the current vessels. Harbour works would be required at Laxo, including the replacement of the berthing structure and linkspan. Minor harbour works would also be required at Vidlin, including the provision of a dedicated parking & waiting area. No harbour works would be immediately required at Symbister.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £15.65 million. *Current revenue support* £2.25m (rounded) per annum. *Annual revenue support* £2.30m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe.		

	The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or air & drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.

facilitate commuting.	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable and realistic, islanders should be provided with links to strategic onward connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. The capacity issues identified on the route would not be resolved with two vessels of similar vehicle carrying capacity. The vessels are fully utilised during the peak periods therefore there is no possibility of providing additional services when most required.
Implementability Appraisal	
Technical:	Harbour works would be required at Laxo, including the replacement of the berthing structure and linkspan. Minor harbour works would also be required at Vidlin, including the provision of a dedicated parking & waiting area. No harbour works would be immediately required at Symbister.
Operational:	• Crew induction training would be required. • The MV *Linga* could be redeployed

Financial:	The capital cost would be £15.65 million, with annual revenue support estimated at £2.30m, an increase of £500k per annum on the current day figure.	
Public:	This option would not be acceptable to the public as it does not address the capacity issue. A fixed link is however identified as the preferred option of the community.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the ageing MV *Hendra* and MV *Linga* with more modern vessels gives rise to a potential reduction in emissions. There would be no other environmental constraints associated with this option. **Environmental Constraints** The environmental constraints for the Whalsay route are provided below for information (note – the constraints at Vidlin are listed in the Skerries ASTs. Symbister Constraints • Residential properties in proximity to harbour • Scheduled monument and listed buildings within 200m • Coastal flooding risk • Good air quality Laxo Constraints • Residential properties within 150m of the harbour • Laxo Burn SSSI within 1km of terminal • Coastal flooding risk • Good air quality
Safety:	✓	The MV *Hendra* has passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a minor safety benefit associated with this option.
Economy:	Neutral	This option would have no impact in terms of economy, except in terms of the potential perception benefits from having new modern vessels.
Integration:	✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access.
Accessibility and Social Inclusion:	✓	This option would support enhanced disabled access to the Whalsay services currently operated by the MV *Hendra*, helping to tackle the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO2 – Replace MV Hendra and MV Linga with two larger vessels</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">The MV Hendra and MV Linga would be replaced by two 45m TYPE 2 vessels.

There would be a need for major harbour works at Laxo and Vidlin. To scale up to a TYPE 2 vessel, Laxo would require a new piled jetty, breakwater extension, a replacement linkspan and dredging.

The required works at Vidlin for a TYPE 2 vessel would include the replacement of the berthing structure & linkspan and the provision of a dedicated parking & waiting area.

No harbour works would be immediately required at Symbister. However, the TYPE 2 vessels would be at the upper range of what the current Symbister Harbour could currently accommodate in terms of overall dimensions.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£23.20 million.</td></tr>
<tr><td>Current revenue support
£2.25m (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£2.32m (rounded) per annum.</td></tr>
</table>

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.		
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should	***Performance against Transport Planning Objective: Moderate Positive***		

not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	The introduction of two larger vessels would increase capacity on the Whalsay route – each individual sailing could accommodate 4 (MV *Linga)* to 10 (MV *Hendra*) additional cars over and above the current vessels. This would alleviate the capacity peaks identified on this crossing (e.g. the 0630 and 0750 ex Symbister and the 1755 ex Laxo).
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** Whilst this option would not improve the ability to commute *per se*, it would assist in addressing occasions where a lack of capacity acts as a constraint and thus nullifies the benefit of the connection.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. Two larger vessels would provide significant additional capacity and this option should be considered further.

Implementability Appraisal	
Technical:	There would be a need for major harbour works at Laxo and Vidlin. To scale up to a TYPE 2 vessel, Laxo would require a new piled jetty, breakwater extension, a replacement linkspan and dredging. The required works at Vidlin for a TYPE 2 vessel would include the replacement of the berthing structure & linkspan and the provision of a dedicated parking & waiting area. No harbour works would be immediately required at Symbister. However, the TYPE 2 vessels would be at the upper range of what the current Symbister Harbour could currently accommodate in terms of overall dimensions.
Operational:	• Higher crew training costs associated with moving to a higher certification vessel. • Crew induction training would be required • The MV *Linga* could be redeployed.
Financial:	The capital cost would be £23.20 million, with annual revenue support estimated at £2.32m, an increase of £700k per annum on the current day figure.
Public:	Of those who commented on the ferry options, this option was supported. A fixed link is however identified as the preferred option of the community

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the ageing MV *Hendra* and MV *Linga* with more modern vessels gives rise to a potential reduction in emissions, although this could be offset to some extent by the use of larger vessels. There would be no other environmental constraints associated with this option. **Environmental Constraints** The environmental constraints for the Whalsay route are provided below for information (note – the constraints at Vidlin are listed in the Skerries ASTs. Symbister Constraints • Residential properties in proximity to harbour • Scheduled monument and listed buildings within 200m • Coastal flooding risk • Good air quality Laxo Constraints • Residential properties within 150m of the harbour

		• Laxo Burn SSSI within 1km of terminal • Coastal flooding risk • Good air quality
Safety:	✓	The MV *Hendra* has passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a minor safety benefit associated with this option.
Economy:	✓	The provision of two larger vessels would assist in alleviating the vehicle capacity issues identified on the Whalsay route. This would give rise to minor TEE benefits, where residents can now travel on a ferry they could not previously travel on. The additional capacity would also give rise to minor wider / EALI benefits for residents, locally traded services and tourism. Moreover, two larger and modern vessels would improve the perception of Whalsay as a place to live, work and do business.
Integration:	✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access.
Accessibility and Social Inclusion:	✓	The provision of two larger ferries would improve community accessibility through reducing the capacity issues identified on the Whalsay route. This option would also support enhanced disabled access to the Whalsay services currently operated by the MV *Hendra*, helping to tackle the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO3: Replace the MV Hendra and MV Linga with three new vessels.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">The working assumption with this option is that the MV Hendra and MV Linga would be replaced with 3 * 35m TYPE 1 vessels. However, various vessel size mixes could apply and the final decision should be informed by analysis of demand in the Final Business Case (FBC), which would be used to determine this.

The harbour works at Laxo and Vidlin would be equivalent to those required under Option C1.

There would not be a physical need for harbour works at Symbister with this option. However, it is unlikely that the three Whalsay ferries and the Skerries ferry MV Filla could be accommodated within the current harbour given existing congestion. There are a variety of potential solutions to this, ranging from reorganising the existing harbour (e.g. relocating the marina elsewhere) to basing one of the ferries elsewhere (e.g. developing an overnight berth at Vidlin). The additional costs associated with this are not factored into this option.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£21.15 million.</td></tr>
<tr><td>Current revenue support
£2.25m (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£3.86m (rounded) per annum, although this reflects a higher frequency service.</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those</td></tr>
</table>

			set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary school & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.		
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight	***Performance against Transport Planning Objective: Major Positive*** A three vessel solution would offer an almost turn-up-and-go frequency on the Whalsay route, significantly reducing the scheduled time between connections. This would generate major positive benefits for Whalsay in		

travel between the island(s) and Shetland Mainland	that the increased frequency would mitigate the capacity issues currently experienced and would likely future proof the route against traffic growth. A third vessel would also make a contribution to minimising timetable variation, providing flexibility and standing in during e.g. meal breaks, scheduled maintenance, drydock periods etc.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Minor Positive*** Whilst this option would not improve the ability to commute *per se*, it would assist in addressing occasions where a lack of capacity acts as a constraint and thus nullifies the benefit of the connection.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** The provision of a three vessel solution on the Whalsay route would offer an almost 'turn-up-and-go' timetable. The current day boat on the Whalsay route offers seven return sailings per day on a typical weekday, with the shift vessel offering up to eleven return sailings. The third vessel would add a further 7-11 connections per day (or more if run more intensively) and would ensure at least the current Tuesday, Thursday and Friday timetable is maintained during periods of refit, scheduled maintenance etc.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** A three vessel solution would provide sufficient flexibility to allow for the maintenance of a two vessel service during scheduled maintenance meal breaks (if a suitable standby berth were available), ensuring consistency across the working week.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity, although the service frequency would be higher for residents travelling to / from Sumburgh and Lerwick.

Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. Three vessels would provide a step change in frequency and flexibility, albeit the capacity of any one sailing would be similar to the present day. These three vessels could be a mix of TYPE 1 and TYPE 2 vessels if required. The exact specification would require detailed analysis of present and future demand. There may be a need for further investment to relieve congestion in Symbister Harbour if a three vessel solution is adopted.	
Implementability Appraisal		
Technical:	The harbour works at Laxo and Vidlin would be equivalent to those required under Option CO1. There would not be a physical need for harbour works at Symbister with this option. However, it is unlikely that the three Whalsay ferries and the Skerries ferry MV *Filla* could be accommodated within the current harbour given existing congestion. There are a variety of potential solutions to this, ranging from reorganising the existing harbour (e.g. relocating the marina elsewhere) to basing one of the ferries elsewhere (e.g. developing an overnight berth at Vidlin). The additional costs associated with this are not factored into this option.	
Operational:	• Additional crew and fuel would be required to support a three vessel operation. • Crew induction training would be required • The MV *Linga* could be redeployed.	
Financial:	The capital cost would be £21.15 million, with annual revenue support estimated at £3.86m, an increase of £1.61m per annum on the current day figure.	
Public:	Of those who commented on the ferry options there was no obvious public clamour for a three vessel solution. A fixed link is however identified as the preferred option of the community.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	x	The replacement of the ageing MV *Hendra* and MV *Linga* with three vessels would record a minor disbenefit as it would increase the total number of sailing hours. **Environmental Constraints** The environmental constraints for the Whalsay route are provided below for information (note – the constraints at Vidlin are listed in the Skerries ASTs). Symbister Constraints • Residential properties in proximity to harbour

		• Scheduled monument and listed buildings within 200m • Coastal flooding risk • Good air quality Laxo Constraints • Residential properties within 150m of the harbour • Laxo Burn SSSI within 1km of terminal • Coastal flooding risk Good air quality
Safety:	✗	The MV *Hendra* has passenger accommodation below the waterline. Regulations require that any new tonnage has passenger accommodation above the waterline, and thus there would be a minor safety benefit associated with this option. However, operating a three vessel solution would increase the risk of a close quarters incident. Moving to a three vessel solution would statistically increase the possibility of marine accidents (due to more ferry journeys being undertaken), particularly in the relatively congested and mixed-use Symbister Harbour. It should also be noted that a three vessel solution could potentially have a marginally negative impact on safety through increasing vehicle kilometres. In previous examples where the service frequency has been increased, there has been an uplift in car carryings. Whilst increased car journeys are likely to increase with this option, any impact is likely to be marginal.
Economy:	✓✓	A three vessel solution would contribute positively to the STAG economy criterion. The frequency increase would offer minor TEE benefits. Perhaps more significantly, a three vessel service would offer moderate wider / EALI benefits, particularly if the third vessel was used to fill existing gaps in the timetable (e.g. Monday and Wednesday maintenance, lunch breaks, weekend connectivity etc). Benefits would accrue in terms of residents (particularly in terms of commuting), tourism and locally traded services. Given the prominence of the fishing sector on Whalsay, a higher frequency service would support the manufacturing & processing sector, and could encourage inward investment into the island.
Integration:	✓	This option would have a positive impact in terms of policy integration, in that it contributes positively to enhanced disabled access. It would also support a range of policies designed to support and promote the sustainability of the island.
Accessibility and Social Inclusion:	✓✓	The provision of additional capacity by operating three ferries would improve community accessibility through reducing the capacity issues identified on the Whalsay route, which are seen to be the key constraint to economic growth.

		This option would also support enhanced disabled access to the Whalsay services currently operated by the MV *Hendra*, helping to tackle the issue of social exclusion experienced by this group.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option Co4 – Construct new North Voe Harbour on Whalsay which would accommodate the ferry service.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">This option would involve the construction of a new harbour in North Voe which would accommodate the Whalsay ferry services and, depending on options for Skerries, the vessel for that island.

The existing Symbister harbour would be converted to leisure and commercial uses and could act as a focus of any regeneration project.

This option would only likely be progressed in tandem with one of the ferry-based options CO1-CO3.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£15.5 million.</td></tr>
<tr><td>Current revenue support
Not applicable</td></tr>
<tr><td>Annual revenue support
Not applicable</td></tr>
<tr><td>Funding Sought From:
(if applicable)</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.
Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.</td></tr>
<tr><th colspan="4">Background Information</th></tr>
</table>

Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would have no impact in terms of capacity.
TPO2a: Where an island has a	***Performance against Transport Planning Objective: Neutral***

'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	This option would have no impact in terms of the ability to commute.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. This option provides a means of addressing congestion and marine safety issues associated with Symbister Harbour. The construction of North Voe would also be required if any vessels larger than the TYPE 2 are to be deployed on the Whalsay route.
Implementability Appraisal	
Technical:	There would be no technical feasibility issues associated with this option outwith those associated with the construction of the harbour.
Operational:	There would be an operational benefit as the ferries would have a dedicated harbour and would not need to work

	around other traffic.	
Financial:	The capital cost of this option would be £15.5m.	
Public:	There was some support for this option expressed through the public consultation. A fixed link is however identified as the preferred option of the community.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗✗	Overall, this option would record a negative moderate impact as the works would have the potential for significant effects involving the construction of a new harbour facility in an as yet undeveloped area. The long-term impact may be slightly less negative providing the works are implemented sensitively. The following impacts have been identified in terms of environmental sub-criteria: • Noise & vibration: Short term impacts at closest properties and on wildlife during construction. • Local air quality: No significant long term effects predicted. Potential for dust during construction. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction and from dredging activities but unlikely to be significant in longer term. • Geological features: Some loss of marine sediment if dredging is required. • Biodiversity & habitats: Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Effects on marine habitats not known. • Landscape: New works of major scale with potential for significant effects including new access. • Visual amenity: Short term impacts during construction and the permanent works would have a significant impact.
Safety:	✓✓	The option would have a positive safety impact through reducing current marine congestion issues in Symbister Harbour, reducing the likelihood of an accident.
Economy:	-	There would be no economic impact associated with this option in its own right, but it could act as an enabler to other ferry related options.
Integration:	✓	This option would give rise to a minor integration benefit through support the enhancement of the ferry service, which is critical to the economic performance and development of Whalsay.

Accessibility and Social Inclusion:	-	There would be no accessibility & social inclusion impacts associated with this option in its own right, but it could act as an enabler to other ferry related options.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO5 – Fixed link (tunnel) between Whalsay and Shetland mainland.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">There is at present uncertainty over the precise design and alignment of a fixed link to Whalsay. The most recent tunnel feasibility work was carried out in 2010 and established the potential for a tunnel as the preferred option.

This option would permit the redeployment of the MV Linga (and potentially the shoreside infrastructure to another route). The MV Hendra is life-expired.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant:

A range of capital costs have been provided for a fixed link, as set out in the main report:
Unlined UK: £108.1m (£201.0m including optimism bias & contingency)
Unlined Norwegian: £86.3m (£160.4m including optimism bias & contingency)
1/3 Lined UK: £115.1m (£214.1m including optimism bias & contingency)
1/3 Lined Norwegian: £91.0m (£169.3m including optimism bias & contingency)</td></tr>
<tr><td>Current revenue support: £0</td></tr>
<tr><td>Annual revenue support:

It is likely that a fixed link of this nature would require revenue support for ongoing maintenance. However, as this option is rejected from further consideration, an estimation of these costs and a determination of who would meet the costs has not been undertaken</td></tr>
</table>

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.		
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.		
Planning Objectives			
Objective:	Performance against planning objective:		

TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link to Whalsay would remove all capacity related constraints associated with the current ferry service. The evidence suggests that the current capacity constraints are significantly constraining the economic development of the island.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Major Positive*** The current Whalsay service supports commuting to Sullom Voe and Lerwick. However, the provision of a fixed link would significantly reduce commuter journey times, allow for 24 hour travel-to-work and offer a high-degree of reliability (i.e. a tunnel would not be negatively impacted by weather as the ferry service often can be).
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any frequency related considerations associated with the ferry.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any timetable related variations associated with the current Whalsay ferry service.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would allow twenty-four hour access to Lerwick and Sumburgh Airport.

Rationale for Selection or Rejection of Proposal:	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Implementability Appraisal	
Technical:	A number of fixed link suggestions have been examined in varying levels of detail over the years; but none of the studies commissioned to date has had the benefit of any supporting ground / seismic investigation. This necessarily limits the engineering accuracy of design assumptions and consequently the robustness of any cost assessments. Proposals remain conceptual in nature.
Operational:	A proposal of this nature could not be funded independently by Shetland Islands Council and a bid for funding support would therefore have to be made to Transport Scotland. A scheme of this nature would be considered a nationally significant infrastructure project, similar in scale to e.g. the Airdrie – Bathgate Rail Link (£300 million) and Borders Rail (£353 million). To this end, the project would need to go through several steps to secure funding and it should be noted that it is not included as one of Transport Scotland's 29 strategic transport priorities through to 2032 (identified by the Strategic Transport Projects Review). The project is also not cited in the Infrastructure Investment Plan 2011. The lead time for a fixed link of this nature would also be considerable, with an elapsed time of several years from initial planning through to scheme opening. The combination of a lack of funding certainty, the absence of a supporting policy commitment and the long lead-times for such a scheme give rise to significant operational risks associated with a Whalsay fixed link. A basic ferry infrastructure would also need to be maintained to ensure continuity during times of tunnel closure / maintenance or where there is a catastrophic failure of the asset (akin to that experienced on the Forth Road Bridge in December 2015). The current ferry infrastructure on the Whalsay route is approaching the end of its operational life – cascade opportunities would therefore be limited with the exception of the MV *Linga.*

Financial:	A range of capital costs have been provided for a fixed link, as set out in the main report: • Unlined UK: £108.1m (£201.0m including optimism bias & contingency) • Unlined Norwegian: £86.3m (£160.4m including optimism bias & contingency) • 1/3 Lined UK: £115.1m (£214.1m including optimism bias & contingency) • 1/3 Lined Norwegian: £91.0m (£169.3m including optimism bias & contingency) Ongoing maintenance costs would be in addition to the up-front capital costs.
Public:	A fixed link was the preferred option identified by the community at the public drop-in sessions.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	×××	Overall, this option would record a major negative impact with potential for significant effects from permanent development of new infrastructure. This option would also generate increased traffic movements on Whalsay and between Whalsay and the mainland The following impacts have been identified in terms of environmental sub-criteria: • Noise & vibration: Short term impacts at closest properties during construction of tunnel and new road links. Traffic on new sections of road may have noise impacts on nearby sensitive receptors. • Local air quality: Traffic on new sections of road has potential to generate increased emissions but unlikely to impact significantly on local air quality. • Water quality, drainage & flood defence: Significant impacts on water resources not predicted provided works sensitively planned. • Geological features: Impact from tunnel from removal of geological deposits. Would be negative. However, surplus spoil could potentially be used in construction. • Biodiversity & habitats: Disturbance of protected species during construction. New roads have potential for local impacts on biodiversity including peatland habitats. • Landscape: Potential for adverse permanent effects from new tunnel portals if not sensitively designed. Wider negative landscape impact of new road. • Visual amenity: Short term impacts during construction. Impacts from increased traffic on approach road on closest receptors. • Agriculture & Soils: Some permanent loss of peat soils for new road.

		• Cultural Heritage: Works unlikely to be of a scale to impact on the setting of listed buildings in proximity to the works
Safety:	✗	The provision of a fixed link would lead to an increase in car trips to and from Whalsay, which would lead to a marginally higher accident rate. The removal of the ferry service would remove any potential for marine accidents, particularly in the crowded Symbister Harbour.
Economy:	✓✓✓	The provision of a fixed link would be of a significant benefit to Whalsay. Firstly, there would be substantial TEE benefits, associated with the removal of capacity constraints and journey time savings associated with not having to wait for or travel on a ferry. In addition, Shetland mainland would be accessible 24 hours per day and there would be no frequency related issues associated with waiting for a ferry. The wider / EALI benefits to Whalsay would also be considerable. First and foremost, Whalsay would effectively become an 'extension' of Shetland mainland, more fully integrating the island's economy with the wider Shetland economy. This could create additional job opportunities for Whalsay and would encourage both inward investment and in-migration / population retention. A fixed link would also lead to cost reductions / productivity enhancements for Whalsay businesses, particularly the strategically important fishing sector. Other sectors which would benefit include tourism and locally traded services.
Integration:	✓✓	A fixed link would significantly enhance transport integration with the Shetland and indeed Scottish mainland. A fixed link could also promote land-use development in Whalsay (in the 'Area of Best Fit' in Symbister), alleviating the current housing pressures on the island.
Accessibility and Social Inclusion:	✓✓✓	The provision of a fixed link would fundamentally transform the community accessibility of Whalsay, effectively making the island an extension of Shetland mainland. The impacts are likely to be similar in nature to that experienced by Skye when the bridge was opened, albeit the magnitude of those benefits are likely to be smaller given that a Whalsay fixed link would connect an island with an island rather than with the Scottish mainland and Skye Bridge provided a link onwards to the Western Isles.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO1 – On-request early morning departure from Whalsay.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option involves the operation of a 0500 return on-request departure from Symbister to Laxo (Vidlin in inclement weather) Monday to Friday, thus allowing connection with the first morning flights from Sumburgh.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.25m (rounded) per annum. *Annual revenue support* £2.37m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		

Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide a sailing at a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the ability to commute – the first ferry departs Symbister at 0630 every day which already facilitates commuting.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main	***Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Whalsay.

employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** An early morning on-request service would extend the length of the operating day by adding an additional morning connection into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation. .
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** This option of an early morning request sailing from Whalsay would contribute significantly to this objective. An 0500 departure from Symbister would allow Whalsay residents to catch the first morning flights to Aberdeen, Edinburgh and Inverness. This in turn would allow the residents of Whalsay to make a day return trip to the Scottish mainland, removing the need for an off-island overnight stay.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. This is a relatively low cost option which could meet a specific requirement for early connections to Sumburgh from the island. The crewing issues surrounding this should be considered further.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	There would be no operational issues associated with this option, although crew overtime and additional fuel would be required (see below).
Financial:	This option would cost increase operating costs to £2.37m per annum, an increase of £120k per annum on the current situation.
Public:	No opposition to any of the revenue options was expressed during the public consultation.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**

Environment:	✗	There would be a very minor environmental disbenefit associated with the additional sailing hours.
Safety:	✗	There would be a small negative safety impact associated with this option. Whilst this option would not necessarily generate additional road kilometres, it may displace trips to the early hours of the morning, which could be an issue in winter if people are travelling in the dark and / or before the roads are treated.
Economy:	✓	The principal economic benefit of this option is that it would allow Whalsay residents to make a day return trip the Scottish mainland. This would potentially give rise to small TEE and wider / EALI benefits for Whalsay, although there would be a small loss for Shetland mainland hoteliers. There would be a direct financial benefit for the NHS. Whalsay patients would be able to make a day return to Aberdeen for hospital appointments, thus eliminating the overnight accommodation costs which the NHS currently has to fund.
Integration:	✓✓	This option would significantly enhance transport integration (see TPO5).
Accessibility and Social Inclusion:	✓	There would be a minor positive in terms of community accessibility, with Whalsay residents able to both access the Scottish mainland relatively early in the morning and make a day return trip.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO2: Additional Friday and Saturday evening request sailings.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	Offer additional request sailings on Friday and Saturday evenings through to 0200.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.25m (rounded) per annum. *Annual revenue support* £2.33m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		

Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide sailings at a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** The late evening nature of this service means it would have no impact on commuting.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the	***Performance against Transport Planning Objective: Neutral*** This objective is not considered applicable to Whalsay.

connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** Late evening request sailings on a Friday and Saturday would extend the length of the operating day by adding additional evening connections into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. This is a relatively low cost option which could meet a specific requirement for late connections to the mainland from the island. The crewing issues surrounding this should be considered further.
Implementability Appraisal	
Technical:	There is no technical feasibility issues associated with this option.
Operational:	There would be no operational issues associated with this option, although crew overtime and additional fuel would be required (see below)
Financial:	This option would cost increase operating costs to £2.33m per annum, an increase of £80k per annum on the current situation.
Public:	No opposition to any of the revenue options was expressed during the public consultation.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	×	There would be a very minor environmental disbenefit associated with the additional sailing hours.
Safety:	×	There would be a very minor safety disbenefit associated with this option as it would likely encourage

		a very small number of additional road kilometres.
Economy:	✓	There would be minor wider / EALI benefits for residents. The late evening on request sailings on a Friday and Saturday would allow Whalsay residents to partake in evening social activities in Lerwick, potentially making the island a more attractive place to live.
Integration:	-	This option would have no impact in terms of integration.
Accessibility and Social Inclusion:	✓✓	This option would contribute towards improved community accessibility, allowing Whalsay residents to participate in evening social activities in Lerwick. It would also improve the comparative accessibility of the island, bringing it closer into line with communities on Shetland Mainland.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO3 – Operate standard weekday timetable seven days per week.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	At present the Whalsay route is operated by a 'day boat' and a 'shift boat' Monday – Friday. This provides 17 (plus 1 request) connections on Tuesday, Thursday & Friday and 16+1 on a Monday and Wednesday due to scheduled maintenance. The weekend service is only run by the shift vessel, reducing connections to 10 (+1) on a Saturday and Sunday. This proposal would involve running the weekday timetable seven days per week.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.25m (rounded) per annum. *Annual revenue support* £2.51m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe.		

	The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen to be a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** This option would significantly enhance the available capacity on the Whalsay route at the weekend. The carryings analysis identified capacity issues on the 0915 and 1115 ex Symbister on a Saturday and Sunday (summer and winter) which this option would alleviate.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Performance against Transport Planning Objective: Minor Positive*** This option would have no impact on the ability to commute on weekdays, although it would increase the AM and PM peak frequency for weekend commuters.

facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered applicable to Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The option of running the weekday timetable seven days a week would make a moderate contribution to this objective by increasing the weekend service frequency to a level commensurate with weekdays.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** This option would equalise the level of connectivity across every day of the week, providing consistency on Whalsay services.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** This option would enhance the weekend service frequency, facilitating generally better connectivity with strategic transport connections.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. This option would largely reverse the 2013 service revisions by re-instating the 7-day operation of the second vessel. This option should be considered further in relation to the costs and benefits of this option. Historic carryings data could be used to determine the impact of the service changes and hence the likely increase if these changes were reversed.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	There would be no operational issues associated with this option, although additional crew and fuel would be required (see below).
Financial:	This option would increase operating costs to £2.51m per annum, an increase of £263k per annum on the current situation.
Public:	No opposition to any of the revenue options was expressed during the public consultation.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗✗	There would be a moderate environmental disbenefit associated with the additional sailing hours and the likely additional vehicle kilometres generated.
Safety:	✗	The increase in service frequency at weekends is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor.
Economy:	✓	There would be relatively minor wider / EALI benefits associated with this option. Whilst the length of the operating day would remain the same, the increased number of connections could have benefits for residents, tourists and locally traded services. A increased weekend operating frequency would also reduce the economic disadvantage of living on an island and could promote population retention and growth.
Integration:	✓	The increased frequency at the weekend would support improved transport connectivity through offering improved connections throughout the day.
Accessibility and Social Inclusion:	✓✓	The operation of the weekday timetable at the weekend would significantly enhance community accessibility, providing seven additional connections to Shetland mainland on each of Saturday and Sunday. It would also improve the comparative accessibility of the island, bringing it closer into line with communities on Shetland Mainland.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO4a – Run both vessels for the full operating day, seven days a week.

Option RO4b – Run both vessels for the full operating day, five days a week.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">At present the Whalsay route is operated by a ‘day boat’ and a ‘shift boat’ Monday – Friday. This provides 17 (plus 1 request) connections on Tuesday, Thursday & Friday and 16+1 on a Monday and Wednesday due to scheduled maintenance.

Option RO4a would involve running both vessels for the full operating day. This would increase total connections to 21 per day, seven days a week.

Option RO4b is a variation on the above, offering 21 connections per day Monday – Friday (potentially less on a Monday & Wednesday due to maintenance) and the current weekend timetable.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00 million.</td></tr>
<tr><td>Current revenue support
£2.25m (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
RO4a: £2.93m (rounded) per annum.
RO4b: £2.60m (rounded) per annum.</td></tr>
</table>

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Whalsay, the most populous of the isles, lies to east of Shetland mainland. The largest settlement on the island is Symbister, which is also where the main harbour is located. As well as having a vibrant pelagic fishing fleet based in the island, the relatively short ferry crossing to Shetland mainland means that there is considerable commuting between the island and Lerwick & Sullom Voe. The island is connected to Shetland mainland via a ferry service between Symbister and Laxo, a sheltered voe on the east side of Shetland mainland. The Symbister – Laxo crossing is very exposed to south-easterly winds and thus a diversion port is maintained at Vidlin (also the destination for the Skerries ferry) to the north-east of Laxo. The timetable is designed with sufficient contingency to ensure that when the vessel diverts to Vidlin, there is no disruption to the timetable.		
Social Context:	Whalsay has a stable population, although islanders do have concerns that limited ferry capacity and a lack of affordable housing are causing out-migration amongst younger residents. Whalsay has one primary & junior high school and nursery, three shops (one of which incorporates the post office), a police station, care centre, health centre (with dental practice) and leisure centre. The Whalsay Learning Centre, operated by Shetland College, uses the clubroom in the leisure centre to deliver learning opportunities for the community. The island also has access to a weekly mobile banking service. Childcare provision is seen to be very limited and is seen as a constraint in terms of residents taking up jobs and / or further education. A small marina is located within Symbister harbour. Whilst school rolls have generally been in decline since the 1980s, there are promising signs for the island, with a doubling of the number of children in the nursery between 2013 and 2014.		
Economic Context:	Whalsay has a relatively healthy economy, although it is quite dependent on the fishing industry for its economic wellbeing. The ability to commute off-island does however remain critical, particularly in terms of providing a diversified economy and there are concerns from the community that current capacity issues and fares are undermining this. Whalsay has a relatively healthy economic activity rate, although there are a higher proportion of retirees amongst the population than on Shetland as a whole.		
Planning Objectives			
Objective:	Performance against planning objective:		
TPO1: The capacity of the services should	***Option RO4a: Performance against Transport Planning Objective: Moderate Positive***		

not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	The provision of additional capacity on a weekday may alleviate occasional capacity issues but any such impact would be minor as the majority of the capacity constrained sailings occur when both vessels are operating. This option would significantly enhance the available capacity on the Whalsay route at the weekend. The carryings analysis identified capacity issues on the 0915 and 1115 ex Symbister on a Saturday and Sunday (summer and winter) which this option would alleviate. ***Option RO4b: Performance against Transport Planning Objective: Minor Positive*** As per paragraph 1 above.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Option RO4a: Performance against Transport Planning Objective: Minor Positive*** This option would increase AM and PM frequency for weekend commuters and better support shift works on weekday evenings ***Option RO4b: Performance against Transport Planning Objective: Minor Positive*** This option would better support shift works on weekday evenings
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Option RO4a: Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Whalsay. ***Option RO4b: Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Whalsay.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Option RO4a: Performance against Transport Planning Objective: Major Positive*** The option of running both vessels for the full operating day seven days a week would make a major contribution to this objective by significantly increasing the overall level of service (up to 21 return crossings per day). This compares to the current 16/17(+1) on a typical weekday and 10(+1) on a Saturday and Sunday. ***Option RO4b: Performance against Transport Planning Objective: Moderate Positive*** The option of running both vessels for the full operating day five days a week would make a moderate contribution to this objective by significantly increasing the overall level of service (up to 21 return crossings per day). This compares to the current 16/17(+1) on a typical weekday.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Option RO4a: Performance against Transport Planning Objective: Major Positive*** This option would equalise the level of connectivity across every day of the week, providing consistency on Whalsay services.

	Option RO4b: Performance against Transport Planning Objective: Neutral This option would not have any impact on this objective.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Option RO4a: Performance against Transport Planning Objective: Minor Positive*** This option would enhance the overall service frequency, facilitating generally better connectivity with strategic transport connections. ***Option RO4b: Performance against Transport Planning Objective: Minor Positive*** This option would enhance the overall service frequency, facilitating generally better connectivity with strategic transport connections.
Rationale for Selection or Rejection of Proposal:	***Option RO4a*** This option will not be retained for further consideration. This option represents the maximum level of service with 2-vessels, with both ferries running a 16-18 hour operating day 7-days per week. This level of service would seem excessive during off-peak periods, particularly if there are larger capacity vessels deployed on the route ***Option RO4b*** This option will be retained for further consideration. This option would provide a 16-18-hour 2-vessel service on weekdays providing increased capacity and frequency during the evening. The potential demand for this should be explored further.
Implementability Appraisal	
Technical:	There are no technical feasibility issues with either Option RO4a or RO4b.
Operational:	There would be no operational issues associated with either Option RO4a or RO4b, although additional crew and fuel would be required (see below), particularly for Option RO4a, which represents a significant step change to the current level of service.
Financial:	Option RO4a would increase operating costs to £2.93m per annum, an increase of £684k per annum on the current situation. Option RO4b would increase operating costs to £2.60m per annum, an increase of £354k per annum on the current situation.
Public:	No opposition to any of the revenue options was expressed during the public consultation. The increase in frequency offered by these options is likely to be widely welcomed.
STAG Criteria	

Criterion	**Assessment Summary**	**Supporting Information**

Environment:	**Option RO4a -** ✗✗ **Option RO4b -** ✗✗	**Option RO4a** There would be a moderate environmental disbenefit associated with the additional sailing hours and the likely additional vehicle kilometres generated. **Option RO4b** There would be a moderate environmental disbenefit associated with the additional sailing hours and the likely additional vehicle kilometres generated.
Safety:	**Option RO4a -** ✗ **Option RO4b -** ✗	**Option RO4a** The increase in service frequency is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor. **Option RO4b** The increase in service frequency is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor.
Economy:	**Option RO4a -** ✓✓✓ **Option RO4b -** ✓✓	**Option RO4a** There would be relatively major wider / EALI benefits associated with this option. Whilst the overall length of the operating day would remain the same, the number of connections over the length of that day would increase significantly. This would give rise to significant benefits for residents, tourists and locally traded services. A high frequency 7-day a week, (approximately) 17 hours operating day would also reduce the economic disadvantage of living on an island and could promote population retention and growth. The increased ferry frequency would also give rise to significant TEE benefits through doubling the frequency of the service at times when the 'day boat' does not currently operate. **Option RO4b** The nature of the benefits of this option to the Economy criterion would be the same as for Option RO4a, although of a slightly lesser magnitude given the five day as opposed to seven day nature of this option.
Integration:	**Option RO4a -** ✓✓ **Option RO4b -** ✓✓	**Option RO4a** The increased frequency on weekdays and at the weekend would support improved transport connectivity through offering improved connections throughout the day, in the evening and over the weekend. This option would also support a wide range of policies intended to promote and sustain the island.

		Option RO4b The increased frequency on weekdays would support improved transport connectivity through offering improved connections. This option would also support a wide range of policies intended to promote and sustain the island.
Accessibility and Social Inclusion:	**Option RO4a -** ✓✓✓ **Option RO4b -** ✓✓	**Option RO4a** The operation of the two vessels for the full operating day, seven days a week, would significantly enhance community accessibility, providing numerous additional connections to Shetland mainland over the week. It would also improve the comparative accessibility of the island, bringing it closer into line with communities on Shetland Mainland. **Option RO4b** The nature of the benefits of this option to the Accessibility & Social Inclusion criterion would be the same as for Option RO4a, although of a slightly lesser magnitude given the five day as opposed to seven day nature of this option.

Environmental Constraint Map(s)

Yell Sound Coast SSSI

Lunna House GDL

Vidlin Ferry Terminal

Laxo Burn SSSI

Laxo Ferry Terminal (Vehicular)

Laxo Ferry Terminal

Symbister Ferry Terminal

Sandwick SM

Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)

Listed Buildings:

- Category A
- Category B
- Category C

- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Whalsay Options C1, C2, C3, C4 & C5

N

1:40,000 @ A3

0 0.25 0.5 1 km

DRAFT

Shetland Inter-Island Transport Study

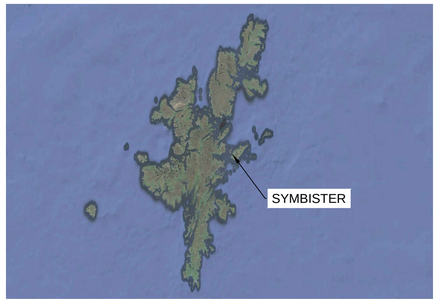
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 8: Environmental Constraints Plan

Laxo, Vidlin and Symbister Ferry Terminals

Harbour Drawing(s)

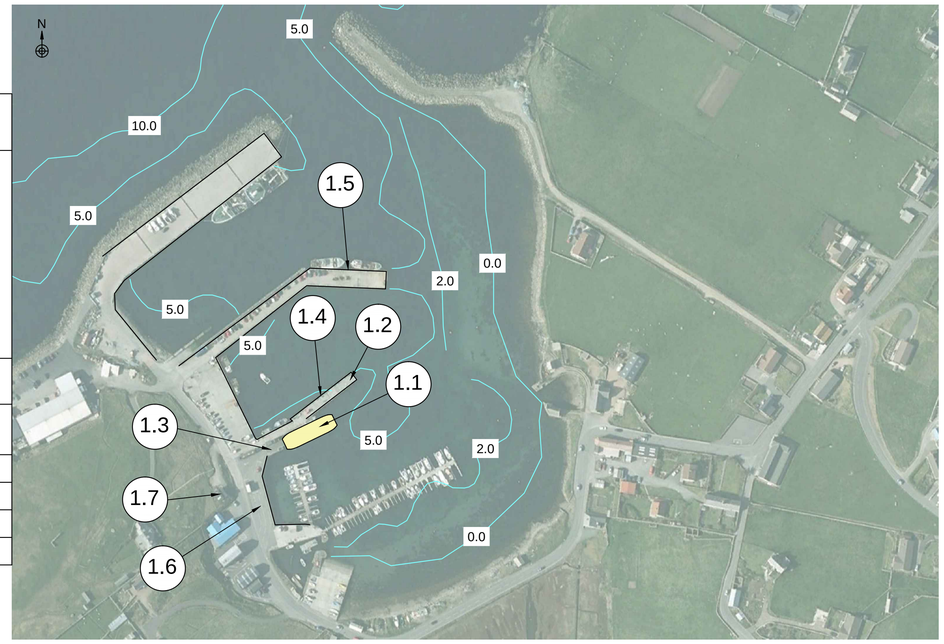


NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV HENDRA • Loa = 33.6 m • Beam = 9.4 m • Draught = 2.61 m MV LINGA • Loa = 36.21m • Beam = 10.8m • Draught = 3.19m Capacity: • 95 passengers • 12PCU • 95 passengers •18PCU
1.2	RoRo Ferry Berth	• Inner side of a concrete jetty. • 27m of available berthing length
1.3	Linkspan	Large 9.3m wide x 20.47 m long
1.4	Lay-by berth	for Whalsay day vessel
1.5	Lay-by berth	for Skerries ferry
1.6	Parking/waiting area	125 lane meters
1.7	Facilities	Toilets & waiting room



Approx. scale 1:2000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3284 MOUL OF ESWICK LUNNA HOLM INCLUDING OUT SKERRIES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Dury Voe	2.1	1.6	0.9	0.3

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

0 25 50 75 100 125
1:2500 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

2) LIKE FOR LIKE OPTION
No Terminal upgrades

2.1	Vessel	**TYPE 1**
See note 7.		

3) LARGER VESSEL
Terminal upgrades

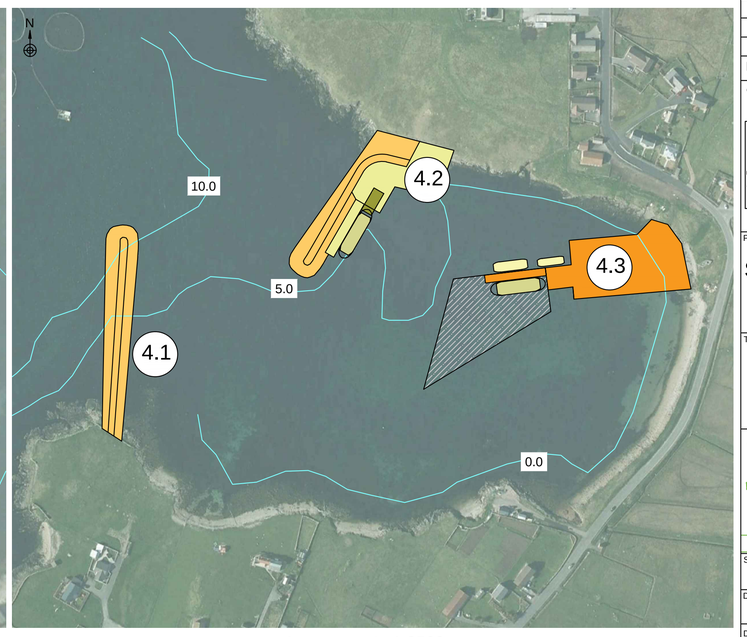
3.1	Vessel	**TYPE 2**
3.2	RoRo Ferry Berth	• Recommended to extend berthing platform aligned to vessel or improve mooring arrangement. See notes 7 & 8.

4) NEW HARBOUR AT WHALSAY (NORTH VOE)
Indicative layout

4.1	Breakwater	350m approx. to create circa 9 ha of protected waters. Breakwater layout is indicative.
4.2	RoRo Ferry Berth (op 1)	Jetty located inner side the breakwater to avoid dredging. This location will require construction of road access and dedicated parking/waiting area.
4.3	RoRo Ferry Berth & 2 lay-by berths (op 2)	This location will provide significant area for all the facilities that may be required. Dredging will need to be undertaken.

Approx. scale 1:1000

Approx. scale 1:1000



Approx. scale 1:2500

Rev	Date	Details
C	18/07/16	SIC comments
B	15/06/16	PBA comments
A	25/04/16	Minor corrections

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WHALSAY
SYMBISTER
OPTIONEERING

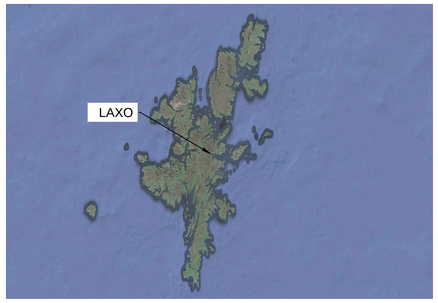
BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS

www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN
Drawn: DP / Checked: GR	Date: 07/03/16
Drawing Number: 1537-01-701	Revision: C

T:\2015\1537 - Shetland Inter-Island Transport Study - Brent Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-701 REV C



NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV HENDRA • Loa = 33.6 m • Beam = 9.4 m • Draught = 2.61 m MV LINGA • Loa = 36.21m • Beam = 10.8m • Draught = 3.19m Capacity: • 95 passengers • 12 PCU • 95 passengers • 18 PCU
1.2	Breakwater	Rubble mound 125m long
1.3	RoRo Ferry Berth	• 5 timber dolphins alongside a rubble mound supported by a series of timber struts. • 38m long mooring/berthing platform. • Vertical rubber D fenders.
1.4	Linkspan	Small 4.5m wide x 13.915 m long
1.5	Parking/waiting area	No dedicated parking
1.6	Facilities	Waiting room & toilets

Approx. scale 1:2000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3284 MOUL OF ESWICK LUNNA HOLM INCLUDING OUT SKERRIES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Dury Voe	2.1	1.6	0.9	0.3

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

2) LIKE FOR LIKE OPTION
Terminal upgrades

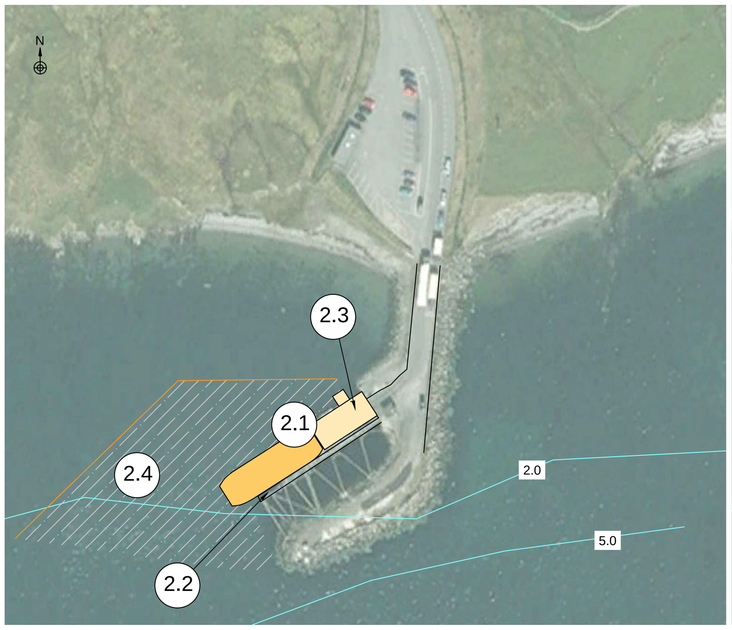
2.1	Vessel	**TYPE 1**
2.2	RoRo Ferry Berth	• Vessel slightly overhangs from berth if upgraded linkspan. • If used for overnight berthing it is recommended to extend the berth circa 10m. See note 7.
2.3	Linkspan	Upgrade to Large Linkspan (9.3m wide X 20.47m long) see note 9.
2.4	Dredging	Dredge pocket and maneuvering area to be dredged -3.5mCD

3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**TYPE 2**
3.2	Linkspan	Upgrade to Large Linkspan (9.3m wide X 20.47m long) see note 9.
3.3	RoRo Ferry Berth	• Extension of RoRo berth circa 20m (see note 7). • Installation new bollards and fenders along the structure (see note 8).
3.4	Dredging	Dredge pocket and maneuvering area to be dredged -3.5mCD.

4) OVERNIGHT BERTH
Proposed upgrades

4.1	• Extension of breakwater approximately 40m to provide additional shelter to berth position.
4.2	• Depending on main vessel, extension of the RoRo ferry berth may be required.



Approx. scale 1:1000

Approx. scale 1:1000

Approx. scale 1:1000

Rev	Date	Details
C	18/07/16	SIC comments
B	15/06/16	PBA comments
A	25/04/16	Overnight berth included

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WHALSAY - LAXO OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

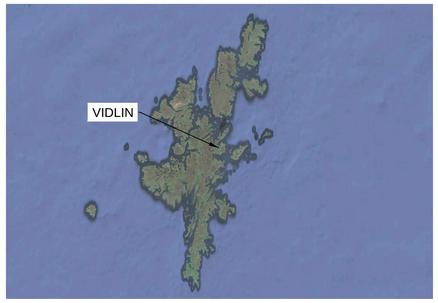
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	18/03/16

Drawing Number:	Revision:
1537-01-703	C

T:\2015\1537 - Shetland Inter-Island Transport Study - Bent Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-703 REV C

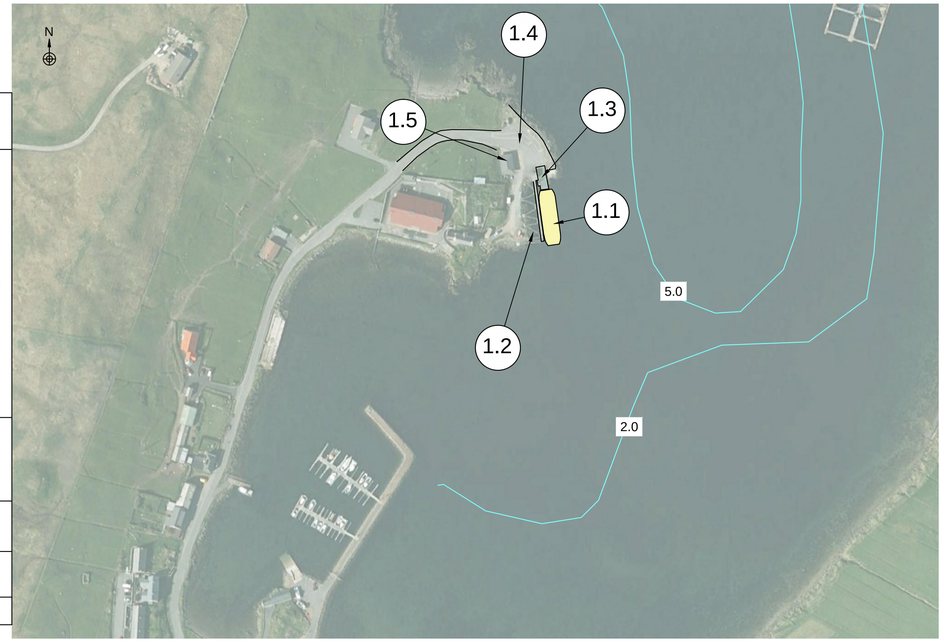


NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV HENDRA: • Loa = 33.6 m • Beam = 9.4 m • Draught = 2.61 m MV LINGA: • Loa = 36.21m • Beam = 10.8m • Draught = 3.19m MV FILA: • Loa = 35.5m • Beam = 9m • Draught = 3.05m Capacity: • 95 passengers • 12 PCU • 95 passengers • 18 PCU • 30 passengers • 8 PCU
1.2	RoRo Ferry Berth	• 4 dolphins alongside a rubble mound supported by a series of timber struts. • 33m long mooring/berthing platform. • Vertical rubber D fenders.
1.3	Linkspan	Small 4.5m wide x 13.915 m long
1.4	Parking/waiting area	No dedicated parking
1.5	Facilities	Toilets & waiting room



Approx. scale 1:2000

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3284 MOUL OF ESWICK LUNNA HOLM INCLUDING OUT SKERRIES.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

9. IF BERTH STRUCTURE IS TO BE REPLACED IT IS RECOMMENDED TO UPGRADE / REPLACE LINKSPAN.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Dury Voe	2.1	1.6	0.9	0.3

0 10 20 30 40 50
1:1000 m

0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

2) LIKE FOR LIKE OPTION
Terminal upgrades

2.1	Vessel	**TYPE 1**
2.2	Parking/waiting area	Recommended provision of dedicated parking/waiting area

See note 7.

Approx. scale 1:1000

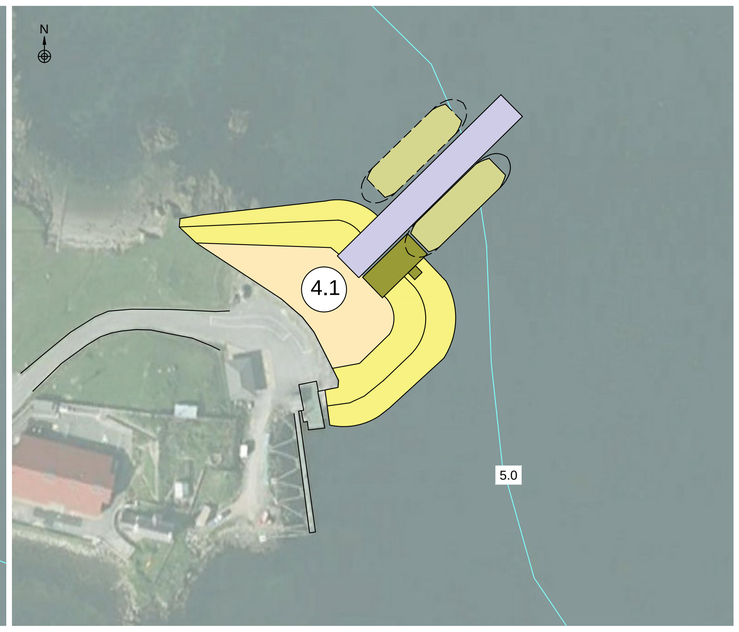
3) LARGER VESSEL
Terminal upgrades

3.1	Vessel	**TYPE 2**
3.2	Linkspan	Upgrade to Large Linkspan (9.3m wide x 20.47m long) see note 9.
3.3	RoRo Ferry Berth	• Additional dolphin required to extend mooring/berthing platform. • Installation of D fenders as per existing. See notes 7 & 8.
3.4	Parking/waiting area	Recommended provision of dedicated parking/waiting area.

Approx. scale 1:1000

4) OVERNIGHT BERTH AT VIDLIN
Proposed upgrade

4.1	• Construction of a 75m long jetty to provide ferry berth and overnight berth. If additional shelter is required a breakwater could be provided. • Provision of a Large Linkspan (9.3m wide x 20.47m long). • Land reclamation to provide approx. 0.12 ha of additional area. • Some minimum dredging may be required in the overnight berth to provide a suitable berth pocket.



Approx. scale 1:1000

Rev	Date	Details
B	21/07/16	SIC comments
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

WHALSAY - VIDLIN OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers

47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	18/03/16

Drawing Number:	Revision:
1537-01-702	B

T:\2015\1537 - Shetland Inter-Island Transport Study - Beet Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\001 Working Drawings\1537-01-702 REV B

Appendix J Yell (Appraisal Summary Tables, Environmental Constraints Map, Harbour Drawings)

Capital Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO1 (Do Minimum): Replace the MV *Dagalien* and MV *Daggri* on a like-for-like basis.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The new vessels would be TYPE 3. There would be no major harbour works (other than the replacement of life-expired assets) associated with this option. A small investment in improved parking / waiting facilities would be required.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £21.5 million. *Current revenue support* £2.27m (rounded) per annum. *Annual revenue support* £2.18m (rounded) per annum.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally.		

	Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on capacity.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Yell.

at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration as it offers the minimum required like-for-like replacement of the current assets.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	There are no operational feasibility issues with associated this option beyond training the crew on the new vessel.
Financial:	The capital cost would be £21.5 million, with annual revenue support estimated at £2.18m, a decrease of £90k per annum on the current day figure.
Public:	Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options. A fixed link is however identified as the preferred option of the community

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Daggri* and MV *Dagalien* at life expiry with more modern vessels gives rise to a potential reduction in emissions. There would be no other environmental issues associated with this option. **Environmental Constraints**

		The environmental constraints at the Yell Sound ports are provided below for information. Toft Constraints • Residential properties within 100m • Scheduled monuments within 500m • Coastal flooding risk • Good air quality Ulsta Constraints • Residential properties in close proximity to terminal • Yell Sound SAC and SSSI within 500m of terminal • Hamna Voe Shellfish Water Protected Area within 2km (east) • Listed buildings within 50m of harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety.
Economy:	Neutral	This option would have no impact in terms of economy, except in terms of the potential perception benefits from having new modern vessels.
Integration:	Neutral	This option would have no impact in terms of integration.
Accessibility and Social Inclusion:	Neutral	This option would have no impact in terms of accessibility and social inclusion.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO2 – Replace MV Dagalien and MV Daggri with two larger vessels</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">The working assumption with this option is that the MV Dagalien and MV Daggri would be replaced by two TYPE 4 vessels at life expiry.

However, differing vessel combinations could be considered and analysis of demand in the Final Business Case (FBC) would be used to determine this.

There remains an element of doubt as to whether a 75m vessel could access the lay-by berth at Ulsta. Ulsta Harbour Drawing (Box 3 – Larger Vessel) includes a manoeuvre path which Beckett Rankine believes is feasible and safe under reasonably calm conditions, although some dredging would be needed (costing around £300k). This manoeuvre does require the vessel to lean against the existing row of piles, so these would need to be checked and possibly new fenders will be required. If this manoeuvre path is</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£30.35 million.</td></tr>
<tr><td>Current revenue support
£2.27m (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
£2.22m (rounded) per annum.</td></tr>
</table>

	not feasible, a breakwater would be required at Toft so that the second vessel could lie there. The costs of the breakwater are outlined under Option CO3.		
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.		
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good		

	connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.
Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** The introduction of two larger vessels would significantly increase capacity across the Yell Sound – each individual sailing could accommodate nineteen additional cars over and above the current vessels. This would alleviate the relatively minor capacity peaks identified on this crossing (e.g. the 0915 and 1045 ex Toft and the 0715 ex Ulsta).
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the frequency of the service.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the timetable.
TPO5: Where practicable, islanders should	***Performance against Transport Planning Objective: Neutral***

be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	This option would have no impact on strategic connectivity.	
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. The case for two larger vessels would need to be revisited at the life expiry of the current Yell Sound vessels.	
Implementability Appraisal		
Technical:	There remains an element of doubt as to whether a 75m vessel could access the lay-by berth at Ulsta. Ulsta Harbour Drawing (Box 3 – Larger Vessel) includes a manoeuvre path which Beckett Rankine believes is feasible and safe under reasonably calm conditions, although some dredging would be needed (costing around £300k). This manoeuvre does require the vessel to lean against the existing row of piles, so these would need to be checked and possibly new fenders will be required. If this manoeuvre path is not feasible, a breakwater would be required at Toft so that the second vessel could lie there. The costs of the breakwater are outlined under Option CO3.	
Operational:	There are no operational feasibility issues with associated this option beyond training the crew on the new vessel.	
Financial:	The capital cost would be £30.35 million, with annual revenue support estimated at £2.22m, a decrease of £50k per annum on the current day figure. A further £6.6m of capital expenditure would be required if a breakwater is needed at Toft.	
Public:	Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options. A fixed link is however identified as the preferred option of the community	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✓	The replacement of the MV *Daggri* and MV *Dagalien* at life expiry with more modern vessels gives rise to a potential reduction in emissions, although these benefits may be offset by the use of larger tonnage. This minor benefit would be offset if a breakwater is required at Toft. The following impacts of the new breakwater at Toft have been identified in terms of environmental sub-criteria • Noise & vibration: Short term impacts at closest properties and on wildlife during construction.

		• Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction of breakwater at Toft. Indirect impacts on Hamna Voe Shellfish Water Protected Area considered unlikely due to distance (this would need to be confirmed in more detailed work). • Biodiversity & habitats: Potential for disturbance of qualifying features of Yell Sounds SAC during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing Toft harbour. • Landscape: Impacts on seascape from new breakwater but fitting in the marine working environment of the harbour. • Visual amenity: Short term impacts during construction. Permanent works could be significant particularly on completion of construction. • Cultural heritage: Works unlikely to significantly affect setting of scheduled monument. **Environmental Constraints** The environmental constraints at the Yell Sound ports are provided below for information. Toft Constraints • Residential properties within 100m • Scheduled monuments within 500m • Coastal flooding risk • Good air quality Ulsta Constraints • Residential properties in close proximity to terminal • Yell Sound SAC and SSSI within 500m of terminal • Hamna Voe Shellfish Water Protected Area within 2km (east) • Listed buildings within 50m of harbour • Coastal flooding risk • Good air quality
Safety:	Neutral	This option would have no impact in terms of safety.
Economy:	✓	The provision of two larger vessels would alleviate the relatively minor capacity issues identified on the Yell Sound route. This would give rise to minor TEE benefits, where residents can now travel on a ferry they could not previously travel on.

		Moreover, two large and modern vessels would improve the perception of Yell as a place to live work and do business.
Integration:	Neutral	This option would have no impact in terms of integration.
Accessibility and Social Inclusion:	✓	The provision of two larger ferries would improve community accessibility through reducing the minor capacity issues identified on the Yell Sound route.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option CO3: Replace the MV *Dagalien* and MV *Daggri* with three TYPE 3 vessels.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	The working assumption with this option is that the MV *Dagalien* and MV *Daggri* would be replaced by three TYPE 3 vessels. However, various vessel mixes could apply and the final decision should be informed by analysis of demand in the Final Business Case (FBC), which would be used to determine this. One of the three vessels would need to lie overnight at Toft. This would require the construction of a 210m detached breakwater to provide shelter from northerly or easterly waves allowing vessels to safely overnight. There would also need to be a small investment in improved parking / waiting facilities at Toft.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £38.8 million. *Current revenue support* £2.27m (rounded) per annum. *Annual revenue support* £3.49m (rounded) per annum, although it should be noted that frequency would be increased with this option.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west		

	coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Moderate Positive*** From a capacity perspective, when all three vessels are operating, the vessels would offer a capacity of 93 PCUs compared to the current 62. Perhaps more importantly, a three vessel solution would offer an almost turn-up-and-go frequency on Yell Sound, significantly reducing the scheduled time between connections. Finally, a third vessel would make a contribution to minimising timetable variation, providing flexibility and standing in during e.g. meal breaks, scheduled maintenance, drydock periods etc.

	This option would also have a benefit for Unst and Fetlar.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on connectivity.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The provision of a three vessel solution on Yell Sound would offer an almost 'turn-up-and-go' timetable. The current day boat on Yell Sound offers nine return sailings per day on a typical weekday, with the shift vessel offering up to sixteen return sailings. The third vessel would add a further 9-16 connections per day (or more if run more intensively) and would ensure at least the current Tuesday – Friday timetable is maintained during periods of refit, scheduled maintenance etc. This option would also have a benefit for Unst and Fetlar.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** A three vessel solution would provide sufficient flexibility to allow for the maintenance of a two vessel service during scheduled maintenance meal breaks, ensuring consistency across the working week. This option would also have a benefit for Unst and Fetlar.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity, although the service frequency would be higher for residents travelling to / from Sumburgh and Lerwick.

Rationale for Selection or Rejection of Proposal:	This option will not be retained for further consideration. The step-change in both capital and revenue costs, combined with the environmental impact, cannot be justified in the context of current and likely future demand. This option could be revisited in the Final Business Case if the demand for the Yell Sound service materially changed.	
Implementability Appraisal		
Technical:	At present, both the MV *Dagalien* and MV *Daggri* berth overnight at Ulsta on Yell, as there is no suitable overnight berth at Toft. A three vessel solution would require the construction of an overnight berth at Toft. This would take the form of an approximate 210 metre long detached breakwater to provide shelter from northerly and easterly waves allowing vessels to safely overnight. The breakwater would allow vessels to access the berth from both the north and south sides.	
Operational:	Additional crew would be required for the third vessel. The exact number of crew would be determined by the timetable which would be operated. However, as a minimum, it is assumed that a crewing numbers equivalent to the current 'day boat' would be required.	
Financial:	The capital cost would be £38.8 million, with annual revenue support estimated at £3.49m, an increase of £1.22m per annum on the current day figure, albeit with a higher service frequency offered.	
Public:	Given the relative youth of the current vessels and the fixed links issue, there was very little public engagement in the ferry based options. A fixed link is however identified as the preferred option of the community	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	××	The replacement of the MV *Daggri* and MV *Dagalien* at life expiry with more modern vessels gives rise to a potential reduction in emissions, although these benefits would be offset by the addition of a third vessel. The required harbour works at Toft would also have a negative impact. The following impacts of the new breakwater at Toft have been identified in terms of environmental sub-criteria • Noise & vibration: Short term impacts at closest properties and on wildlife during construction. • Local air quality: No significant effects predicted. • Water quality, drainage & flood defence: Some short term impacts on marine water quality during construction of breakwater at Toft. Indirect impacts on Hamna Voe Shellfish Water Protected Area considered unlikely due to distance (this would need to be confirmed in more

		detailed work). • Biodiversity & habitats: Potential for disturbance of qualifying features of Yell Sounds SAC during construction which could trigger HRA, consultation required. Short term impacts on otter and/or marine mammals etc but unlikely to be significant in context of disturbance in existing harbour. Impacts on marine habitats likely to be limited as new works in existing Toft harbour. • Landscape: Impacts on seascape from new breakwater but fitting in the marine working environment of the harbour. • Visual amenity: Short term impacts during construction. Permanent works could be significant particularly on completion of construction. • Cultural heritage: Works unlikely to significantly affect setting of scheduled monument. **Environmental Constraints** The environmental constraints at the Yell Sound ports are provided below for information. Toft Constraints • Residential properties within 100m • Scheduled monuments within 500m • Coastal flooding risk • Good air quality Ulsta Constraints • Residential properties in close proximity to terminal • Yell Sound SAC and SSSI within 500m of terminal • Hamna Voe Shellfish Water Protected Area within 2km (east) • Listed buildings within 50m of harbour • Coastal flooding risk • Good air quality
Safety:	✗	A three vessel solution could potentially have a marginally negative impact on safety. In previous examples where the service frequency has been increased, there has been an uplift in car carryings. Whilst increased car journeys are likely to increase with this option, any impact is likely to be marginal. Moving to a three vessel solution would statistically increase the possibility of marine accidents (due to more ferry journeys being undertaken), although the risks associated with this are extremely small. In addition, a new breakwater at Toft would make this berth more sheltered.

Economy:	✓✓	A three vessel solution would contribute positively to the STAG economy criterion. The frequency increase would offer minor TEE benefits. Perhaps more significantly, a three vessel service would offer moderate wider benefits, particularly if the third vessel was used to fill existing gaps in the timetable (e.g. Monday maintenance, lunch breaks, weekend connectivity etc). Benefits would accrue in terms of residents (particularly in terms of commuting), tourism and locally traded services. Given the prominence of the aquaculture sector on Yell, a higher frequency service would support the manufacturing & processing sector, and could encourage further inward investment into the island. This option would also have a benefit for Unst and Fetlar.
Integration:	✓	This option would improve public transport integration through offering a potentially increased service frequency. It would also support a wide range of policies targeted at sustaining and developing the islands. This option would also have a benefit for Unst and Fetlar.
Accessibility and Social Inclusion:	✓✓	The provision of a three vessel service would significantly enhance the community accessibility of Yell through potentially offering a higher frequency. The third vessel could fill gaps in the timetable and offer additional day, evening and / or weekend sailings on Yell Sound. From a comparative accessibility point of view, Yell would become one of the best connected islands in Scotland (albeit that link would be to the Shetland rather than the Scottish mainland). This option would also have a benefit for Unst and Fetlar.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option CO4 – Fixed link (tunnel) between Yell and Shetland mainland</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">There is at present uncertainty over the precise design and alignment of a fixed link to Yell. The most recent tunnel feasibility work was carried out in 2008 established the potential for a 3.5km dual lane tunnel, although very limited ground investigation has been undertaken. Options for a bridge were considered in 1999 at a conceptual level only. Our assumption is therefore that a fixed link would take the form of a tunnel.

This option would permit the redeployment of the MV Dagalien and MV Daggri (and potentially the linkspans to another route.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant:
A range of capital costs have been provided for a fixed link, as set out in the main report:
Unlined UK: £95.6m (£177.9m including optimism bias & contingency)
Unlined Norwegian: £76.3m (£141.9m including optimism bias & contingency)
1/3 Lined UK: £101.8m (£189.4m including optimism bias & contingency)
1/3 Lined Norwegian: £80.5m (£149.8m including optimism bias & contingency)</td></tr>
<tr><td>Current revenue support: £0</td></tr>
<tr><td>Annual revenue support:
It is likely that a fixed link of this nature would require revenue support for ongoing maintenance. However, as this option is rejected from further consideration, an estimation of these costs and a determination of who would meet the costs has not been undertaken</td></tr>
</table>

Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.		
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.		
Planning Objectives			

Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link to Yell would remove all capacity related constraints associated with the current ferry service. There would also be integration benefits for Unst and Fetlar.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Performance against Transport Planning Objective: Moderate Positive*** The current Yell Sound service supports commuting to Sullom Voe and Lerwick. However, the provision of a fixed link would reduce commuter journey times, allow for 24 hour travel-to-work and offer a high-degree of reliability (i.e. a tunnel would not be negatively impacted by weather).
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This objective is not considered relevant for Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any frequency related considerations associated with the ferry. There would also be integration benefits for Unst and Fetlar.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** The provision of a fixed link would remove any timetable related variations associated with the current Yell Sound ferry service.
TPO5: Where practicable, islanders should be provided with links to strategic onward	***Performance against Transport Planning Objective: Major Positive***

transport connections without the need for an overnight stay on Shetland mainland.	The provision of a fixed link would allow twenty-four hour access to Lerwick and Sumburgh Airport. There would also be integration benefits for Unst and Fetlar.
Rationale for Selection or Rejection of Proposal:	This option is rejected from further consideration given the very high up-front capital costs. In addition, there are very high levels of technical and funding uncertainty, whilst the elapsed time before this option could be realised means that it will not be considered further in the appraisal. This elapsed time would also mean that if taken forward, this option would not be in place until the tail end of the strategy period, meaning that an interim ferry-based solution would be required, adding further to the cost. Should a nationally funded programme of fixed links emerge in future, the proposal could be revisited at this stage.
Implementability Appraisal	
Technical:	The ground investigation information is very limited and consists of the Caledonia Geotech report of 2002,which, inter alia, recommended as a pre-requisite for final route selection: • a more detailed geological mapping programme including stereo-oblique air photography, due to faulting within the tunnel corridor; • terrestrial geotechnical rotary drilling investigations to assess rock properties; • marine ground investigation of the central channels (though likely expensive due to sea current / weather etc.) or directional drilling from land to assess rock properties; The report also opined that 60m below CD may be suitable for tunnel construction from Shetland to Bigga, but a deeper profile is advisable between Bigga and Yell due to a prominent fault and potential for weak, brecciated rocks. The current lack of information (especially ground investigation) precludes robust optioneering.
Operational:	A proposal of this nature could not be funded independently by Shetland Islands Council and a bid for funding support would therefore have to be made to Transport Scotland. A scheme of this nature would be considered a nationally significant infrastructure project, similar in scale to e.g. the Airdrie – Bathgate Rail Link (£300 million) and Borders Rail (£353 million). To this end, the project would need to go through several steps to secure funding and it should be noted that it is not included as one of Transport Scotland's 29 strategic transport priorities through to 2032 (identified by the Strategic Transport Projects Review). The project is also not cited in the Infrastructure Investment Plan 2011.

	The lead time for a fixed link of this nature would also be considerable, with an elapsed time of several years from initial planning through to scheme opening. The combination of a lack of funding certainty, the absence of a supporting policy commitment and the long lead-times for such a scheme give rise to significant operational risks associated with an Unst – Yell fixed link. A basic ferry infrastructure would also need to be maintained to ensure continuity during times of tunnel closure / maintenance or where there is a catastrophic failure of the asset (akin to that experienced on the Forth Road Bridge in December 2015). The current ferries and linkspans on the Yell Sound route could be redeployed elsewhere on the network, offsetting capital expenditure (at least in the short-term) on other routes.
Financial:	A range of capital costs have been provided for a fixed link, as set out in the main report: • Unlined UK: £95.6m (£177.9m including optimism bias & contingency) • Unlined Norwegian: £76.3m (£141.9m including optimism bias & contingency) • 1/3 Lined UK: £101.8m (£189.4m including optimism bias & contingency) • 1/3 Lined Norwegian: £80.5m (£149.8m including optimism bias & contingency) Ongoing maintenance costs would be in addition to the up-front capital costs.
Public:	The consultation identified a fixed link as the only acceptable solution to the Yell community.

STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	×××	The provision of a fixed link is likely to have a minor negative impact through increasing vehicle kilometres, whilst there will also be potentially major environmental impacts associated with construction (further work on the alignment and design would be required to more accurately assess these impacts).
Safety:	×	The provision of a fixed link would lead to an increase in car trips to and from Yell, which would lead to a marginally higher accident rate. The removal of the ferry service would remove any potential for marine accidents.
Economy:	✓✓✓	The provision of a fixed link would be of a significant benefit to Yell. Firstly, there would be

		substantial TEE benefits, associated with the journey time savings associated with not having to wait for or travel on a ferry. In addition, Shetland mainland would be accessible 24 hours per day and there would be no frequency related issues associated with waiting for a ferry. The wider benefits to Yell would also be considerable. First and foremost, Yell would effectively become an 'extension' of Shetland mainland, more fully integrating the island's economy with the wider Shetland economy. This could create additional job opportunities for Yell and would encourage both inward investment and in-migration / population retention. A fixed link would also lead to cost reductions / productivity enhancements for Yell businesses, particularly the strategically important aquaculture sector. Other sectors which would benefit include tourism and locally traded services. The provision of a fixed link for Yell would also be of benefit to the neighbouring communities of Unst and Fetlar.
Integration:	✓✓	A fixed link would significantly enhance transport integration with the Shetland and indeed Scottish mainland. A fixed link could also promote land-use development in Yell (in the 'Area of Best Fit' in Mid-Yell), alleviating the current housing pressures on the island. There would also be integration benefits for Unst and Fetlar.
Accessibility and Social Inclusion:	✓✓✓	The provision of a fixed link would fundamentally transform the community accessibility of Yell, effectively making the island an extension of Shetland mainland. The impacts are likely to be similar in nature to that experienced by Skye when the bridge was opened, albeit the magnitude of those benefits are likely to be smaller given that a Yell fixed link would connect an island with an island rather than with the Scottish mainland. There would also be integration benefits for Unst and Fetlar.

Revenue Option(s) Appraisal Summary Table(s)

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO1: Offer an on-request early departure from Yell, Monday to Friday, which would allow connection with the first flights from Sumburgh.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	This option involves the operation of a 0500 request return crossing from Ulsta on Yell, thus allowing connection with the first morning flights from Sumburgh.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.27m (rounded) per annum. *Annual revenue support* £2.22m (rounded) per annum, based on new tonnage identified in Option CO1.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		

Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide a sailing a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on the ability to commute – the first ferry departs Ulsta 0615 on a weekday, which already facilitates commuting.

facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** An early morning on-request service would extend the length of the operating day by adding an additional morning connection into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation. .
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Major Positive*** This option of an early morning request sailing from Yell would contribute significantly to this objective. An 0500 departure from Ulsta would allow Yell residents to catch the first morning flights to Aberdeen, Edinburgh and Inverness. This in turn would allow the residents of Yell to make a day return trip to the Scottish mainland, removing the need for an off-island overnight stay.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration. The benefits of being able to make a day-return trip from Yell to the Scottish mainland would be of significant benefit to Yell residents, particularly when set against the relatively low costs of this option.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	There would be no operational issues associated with this option, although additional crew hours and fuel would be required.
Financial:	Minor reduction from the present day based on capital Option CO1.
Public:	No opposition to any of the revenue options was expressed during the public consultation.
STAG Criteria	

Criterion	Assessment Summary	Supporting Information
Environment:	✗	Whilst there would be additional sailing hours leading to a small increase in emissions, any such impact is likely to be extremely limited in the wider context of the Yell Sound route.
Safety:	✗	There would be a small negative safety impact associated with this option. Whilst this option would not necessarily generate additional road kilometres, it may displace trips to the early hours of the morning, which could be an issue in winter if people are travelling in the dark and / or before the roads are treated.
Economy:	✓	The principal economic benefit of this option is that it would allow Yell residents to make a day return trip to the Scottish mainland. This would potentially give rise to small economic benefits for Yell, although there would be a small loss for Shetland mainland hoteliers. There would be a direct financial benefit for the NHS. Yell patients would be able to make a day return to Aberdeen for hospital appointments, thus eliminating the overnight accommodation costs which the NHS currently has to fund (although the length of the day may be an issue for sick / elderly people travelling for hospital appointments).
Integration:	✓✓	This option would significantly enhance transport integration (see TPO5).
Accessibility and Social Inclusion:	✓	There would be a minor positive in terms of community accessibility, with Yell residents able to both access the Scottish mainland relatively early in the morning and make a day return trip.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO2: Offer additional request sailings on Friday and Saturday evenings (through to 0200).	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	Offer additional request sailings on Friday and Saturday evenings through to 0200.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.27m (rounded) per annum. *Annual revenue support* £2.20m (rounded) per annum, based on new tonnage identified in Option CO1.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		

Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Neutral*** This option would offer additional capacity in the sense that it would provide sailings at a time when there is currently not a connection. However, it would not address a specific capacity problem and thus the impact in terms of this objective is neutral.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably	***Performance against Transport Planning Objective: Neutral*** The late evening nature of this service means it would have no impact on commuting.

facilitate commuting	
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Minor Positive*** Late evening request sailings on a Friday and Saturday would extend the length of the operating day by adding additional evening connections into the timetable. However, the contribution to this objective would be very minor overall.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Neutral*** This option would have no positive impact on timetable variation.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Neutral*** This option would have no impact on strategic connectivity.
Rationale for Selection or Rejection of Proposal:	This option will be retained for further consideration as it is a relatively low cost option, offering an improvement in accessibility.
Implementability Appraisal	
Technical:	There are no technical feasibility issues associated with this option.
Operational:	There would be no operational issues associated with this option, although additional crew and fuel would be required (see below)
Financial:	Minor reduction from the present day based on capital Option CO1.
Public:	No opposition to any of the revenue options was expressed during the public consultation.

STAG Criteria		
Criterion	**Assessment**	**Supporting Information**

	Summary	
Environment:	✗	Whilst there would be additional sailing hours leading to a small increase in emissions, any such impact is likely to be extremely limited in the wider context of the Yell Sound route.
Safety:	✗	There would be a very minor safety disbenefit associated with this option as it would likely encourage a very small number of additional road kilometres.
Economy:	✓	There would be minor benefits for residents. The late evening on request sailings on a Friday and Saturday would allow Yell residents to partake in evening social activities in Lerwick, potentially making the island a more attractive place to live.
Integration:	-	This option would have no impact in terms of integration.
Accessibility and Social Inclusion:	✓✓	This option would contribute towards improved community accessibility, allowing Yell residents to participate in evening social activities in Lerwick. It would also improve the comparative accessibility of the island, bringing it closer into line with communities on Shetland Mainland.

Part 1 Appraisal Summary Tables

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)		Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ	
Proposal Name:	Option RO3 – Operate standard weekday timetable seven days per week.	Name of Planner:	Stephen Canning, Peter Brett Associates
Proposal Description:	At present the Yell Sound route is operated by a 'day boat' and a 'shift boat' Monday – Friday. This provides 24 (plus 1 request) connection Tuesday – Friday (20+1 on a Monday due to scheduled maintenance & drills). The weekend service is only run by the shift vessel, reducing connections to 15(+1) on a Saturday and 14(+1) on a Sunday. This proposal would involve running the weekday timetable seven days per week.	Estimated Total Public Sector Funding Requirement:	*Capital costs/grant* £0.00 million. *Current revenue support* £2.27m (rounded) per annum. *Annual revenue support* £2.36m (rounded) per annum, based on new tonnage identified in Option CO1.
Funding Sought From: (if applicable)	Transport Scotland	Amount of Application:	*Present Value of Cost to Govt.* Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west		

	coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.

Planning Objectives	
Objective:	Performance against planning objective:
TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Performance against Transport Planning Objective: Minor Positive*** This option would enhance the available capacity on the Yell Sound route at the weekend. The carryings analysis identified minor capacity issues on Saturday and Sunday afternoons (summer and winter) which this option would alleviate. However, there were otherwise no capacity problems on this route. This option would also benefit Unst and Fetlar.
TPO2a: Where an island has a	***Performance against Transport Planning Objective: Neutral***

'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	This option would have no impact on the ability to commute on weekdays, although it would increase AM and PM frequency for weekend commuters.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Performance against Transport Planning Objective: Moderate Positive*** The option of running the weekday timetable seven days a week would make a moderate contribution to this objective by increasing the weekend service frequency to a level commensurate with weekdays. This option would also benefit Unst and Fetlar.
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Performance against Transport Planning Objective: Major Positive*** This option would equalise the level of connectivity across every day of the week, apart from Monday, providing consistency on Yell Sound services. This option would also benefit Unst and Fetlar.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Performance against Transport Planning Objective: Minor Positive*** This option would enhance the weekend service frequency, facilitating generally better connectivity with strategic transport connections. This option would also benefit Unst and Fetlar.
Rationale for Selection or Rejection of Proposal:	This option is retained for further consideration. The reduction in weekend services as part of the 2013 cuts was raised as a key issue in Yell, so a further review of options in this respect of this is necessary.

Implementability Appraisal		
Technical:	There are no technical feasibility issues associated with this option.	
Operational:	There would be no operational issues associated with this option, although additional crew and fuel would be required.	
Financial:	This option would cost increase operating costs to £2.36m per annum (based on Option CO1), an increase of £90k per annum on the current situation.	
Public:	No opposition to any of the revenue options was expressed during the public consultation.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	✗	There is likely to be a very minor negative impact associated with the increased emissions from operating extra sailings.
Safety:	✗	The increase in service frequency at weekends is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor.
Economy:	✓	There would be relatively minor benefits associated with this option. Whilst the length of the operating day would remain the same, the increased number of connections could have benefits for residents, tourists and locally traded services. A 7 day a week, (approximately) 17 hours operating day would also reduce the economic disadvantage of living on an island and could promote population retention and growth. This option would also benefit Unst and Fetlar.
Integration:	✓	The increased frequency at the weekend would support improved transport connectivity through offering improved connections throughout the day. This option would also deliver the RSM model service for Yell and would support a range of other policies intended to support the economic development of the islands. This option would also benefit Unst and Fetlar.
Accessibility and Social Inclusion:	✓✓	The operation of the weekday timetable at the weekend would significantly enhance community accessibility, providing nine additional connections to Shetland mainland on a Saturday and ten additional connections on a Sunday.

		This option would also benefit Unst and Fetlar.

Part 1 Appraisal Summary Tables

<table>
<tr><th colspan="4">Proposal Details</th></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal:

(Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Mr Michael Craigie, 01595 744 160, michael.craigie@shetland.gov.uk

Shetland Islands Council, Development Service, Transport Planning Service, 6 North Ness, Lerwick, Shetland, ZE1 0LZ</td></tr>
<tr><td>Proposal Name:</td><td>Option RO4a – Run both vessels for the full operating day, seven days a week.

Option RO4b – Run both vessels for the full operating day, five days a week.</td><td>Name of Planner:</td><td>Stephen Canning, Peter Brett Associates</td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">At present the Yell Sound route is operated by a ‘day boat’ and a ‘shift boat’ Monday – Friday. This provides 24 (plus 1 request) connection Tuesday – Friday (20+1 on a Monday due to scheduled maintenance).

Option RO4a would involve running both vessels for the full operating day. This would increase total connections to 31 per day, seven days a week.

Option RO4b is a variation on the above, offering 31connections per day Monday – Friday (potentially less on a Monday due to maintenance) and the current weekend timetable.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant
£0.00 million.</td></tr>
<tr><td>Current revenue support
£2.27m (rounded) per annum.</td></tr>
<tr><td>Annual revenue support
RO4a: £2.81m (rounded) per annum.
RO4b: £2.51m (rounded) per annum.</td></tr>
<tr><td>Funding Sought From:</td><td>Transport Scotland</td><td>Amount of Application:</td><td>Present Value of Cost to Govt.</td></tr>
</table>

(if applicable)			Costs in this study are all reported in 2016 prices only. The costs would reflect those set out above.
Background Information			
Geographic Context:	The island of Yell is situated between the north of Shetland mainland and the islands of Unst and Fetlar. The island is separated from Shetland Mainland by a narrow strait of water known as Yell Sound. The majority of the settlements on Yell are in the north and east the island. The ferry from the island to Shetland mainland operates from Ulsta (to Toft), a very small settlement on the south-west coast of the island. The larger settlements on Yell, such as Mid Yell and Cullivoe tend to be located in the east and north of the island, meaning that an onward car or public transport connection is typically required from Ulsta.		
Social Context:	Yell is the second most populous of the isles, with a population of around 1,000. The island has a relatively stable population, supported by good access to job opportunities and local services. However, forecasts suggest that the population will decline in the years ahead. In addition, whilst Yell has a stable population, it is also an ageing one, which is reflected in the proportionally lower economic activity rate and higher number of retirees relative to the Shetland Islands generally. Health provision on the island is of a high quality, whilst there are stable rolls at the island nursery, the two primary schools and the Junior High. The island also has a high level of community cohesion, with a very active third sector on the island.		
Economic Context:	The Yell economy is relatively healthy, with a number of indigenous businesses in the valuable aquaculture sector, good commuting opportunities and a strong public sector presence (in terms of both direct jobs and as a facilitator of other opportunities). Yell has very high levels of household car ownership and a significant proportion of its residents travel in a car to work. This reflects the importance of commuting to the island, particularly to Sullom Voe and Lerwick. The amount of people working from home has increased in recent years. The availability of housing on Yell and the North Isles generally is seen to constrain the growth of the community. Overall, Yell is in a relatively favourable position overall, with a stable population, reasonable industrial mix and good connectivity. Maintaining and potentially improving this level of connectivity in years to come will be of importance to the island.		
Planning Objectives			
Objective:	Performance against planning objective:		

TPO1: The capacity of the services should not act as a constraint to regular and essential personal, vehicular and freight travel between the island(s) and Shetland Mainland	***Option RO4a: Performance against Transport Planning Objective: Minor Positive*** This option would enhance the available capacity on the Yell Sound route at the weekend. The carryings analysis identified minor capacity issues on Saturday and Sunday afternoons (summer and winter) which this option would alleviate. However, there were otherwise no capacity problems on this route. This option would also benefit Unst and Fetlar. ***Option RO4b: Performance against Transport Planning Objective: Neutral*** This option would have no impact on this objective. Whilst it would increase the number of connections over the day, it would not address any specific capacity problems.
TPO2a: Where an island has a 'commutable' combined ferry or drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably facilitate commuting	***Option RO4a: Performance against Transport Planning Objective: Minor Positive*** This option would have a minor benefit for shift workers finishing or starting work during the evening. ***Option RO4b: Performance against Transport Planning Objective: Minor Positive*** This option would have a minor benefit for shift workers finishing or starting work during the evening.
TPO2b: Where an island does not have a 'commutable' combined ferry or air / drive / public transport / walk time to a main employment centre (e.g. 80 minutes), the connections provided should reliably permit at least a half day (e.g. 4 hours) in Lerwick 7 days a week, all year round.	***Option RO4a: Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Yell. ***Option RO4b: Performance against Transport Planning Objective: Neutral*** This option is not considered applicable to Yell.
TPO3: The scheduled time between connections should be minimised to increase flexibility for passengers and freight by maximising the number of island connections across the operating day.	***Option RO4a: Performance against Transport Planning Objective: Major Positive*** The option of running both vessels for the full operating day seven days a week would make a major contribution to this objective by significantly increasing the overall level of service (up to 31 return crossings per day). This compares to the current 24(+1) on a typical weekday, 15(+1) on a Saturday and 14(+1) on a Sunday. This option would also benefit Unst and Fetlar. ***Option RO4b: Performance against Transport Planning Objective: Moderate Positive*** The option of running both vessels for the full operating day five days a week would make a moderate contribution to this objective by significantly increasing the overall level of service (up to 31 return crossings per day). This compares to the current 24(+1) on a typical weekday, 20(+1) on a Monday. This option would also benefit Unst and Fetlar.

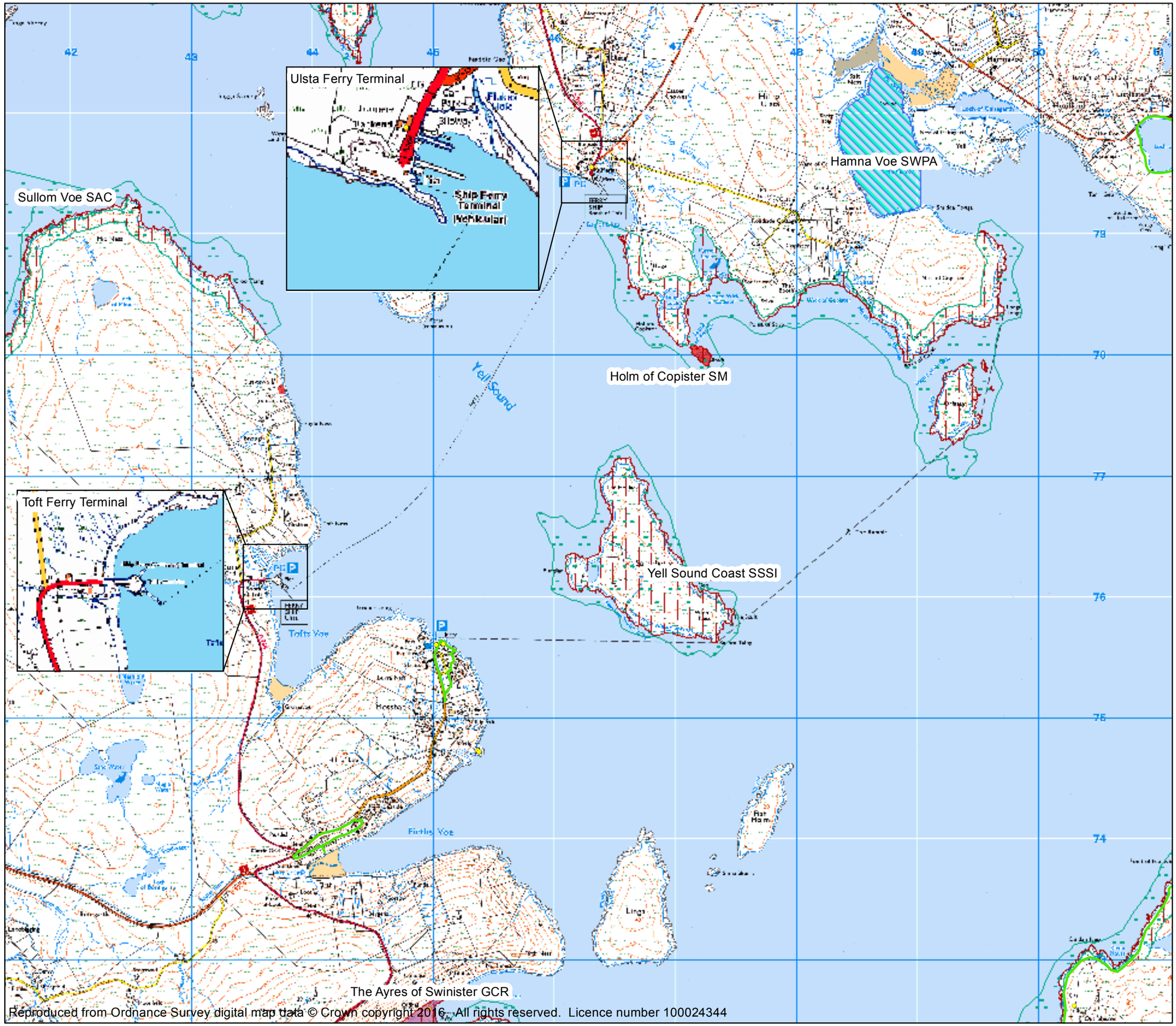
TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.	***Option RO4a: Performance against Transport Planning Objective: Major Positive*** This option would equalise the level of connectivity across every day of the week apart from Monday, providing consistency on Yell Sound services. This option would also benefit Unst and Fetlar. ***Option RO4b: Performance against Transport Planning Objective: Neutral*** This option would not have any impact on this objective.
TPO5: Where practicable, islanders should be provided with links to strategic onward transport connections without the need for an overnight stay on Shetland mainland.	***Option RO4a: Performance against Transport Planning Objective: Minor Positive*** This option would enhance the overall service frequency, facilitating generally better connectivity with strategic transport connections. This option would also benefit Unst and Fetlar. ***Option RO4b: Performance against Transport Planning Objective: Minor Positive*** This option would enhance the overall service frequency, facilitating generally better connectivity with strategic transport connections.
Rationale for Selection or Rejection of Proposal:	**Option RO4a** This option **will not** be retained for further consideration. The step-change in cost is likely to be disproportionate with the demand for the service. **Option RO4b** This option **will** be retained for further consideration. This option would provide a step change in frequency on weekdays and therefore merits further consideration.
Implementability Appraisal	
Technical:	There are no technical feasibility issues with either Option RO4a or RO4b.
Operational:	There would be no operational issues associated with either Option RO4a or RO4b, although additional crew and fuel would be required, particularly for Option RO4a, which represents a significant step change to the current level of service.

Financial:	Option RO4a - £545k increase on current costs of £2.3m assuming the CO1 new vessels scenario. Option RO4b – £238k increase on current costs of £2.3m assuming the CO1 new vessels scenario.	
Public:	No opposition to any of the revenue options was expressed during the public consultation. The increase in frequency offered by these options is likely to be widely welcomed.	
STAG Criteria		
Criterion	**Assessment Summary**	**Supporting Information**
Environment:	**Option RO4a -** ✗ **Option RO4b -** ✗	**Option RO4a** This option would lead to a significant increase in vessel running hours and hence emissions. **Option RO4b** This option would lead to a significant increase in vessel running hours and hence emissions.
Safety:	**Option RO4a -** ✗ **Option RO4b -** ✗	**Option RO4a** The increase in service frequency is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor. **Option RO4b** The increase in service frequency is likely to generate additional vehicle kilometres, which would have a negative safety impact. However, any impact would be very minor.
Economy:	**Option RO4a -** ✓✓✓ **Option RO4b -** ✓✓	**Option RO4a** There would be relatively major economic benefits associated with this option. Whilst the overall length of the operating day would remain the same, the number of connections over the length of that day would increase significantly. This would give rise to significant benefits for residents, tourists and locally traded services. A high frequency 7-day a week, (approximately) 17 hours operating day would also reduce the economic disadvantage of living on an island and could promote population retention and growth. The increased ferry frequency would also give rise to significant TEE benefit through doubling the frequency of the service at times when the ‘day boat’ does not currently operate.

		This option would also benefit Unst and Fetlar. **Option RO4b** The nature of the benefits of this option to the Economy criterion would be the same as for Option RO4a, although of a slightly lesser magnitude given the five day as opposed to seven day nature of this option. This option would also benefit Unst and Fetlar.
Integration:	**Option RO4a -** ✓✓ **Option RO4b -** ✓✓	**Option RO4a** The increased frequency at the weekend would support improved transport connectivity through offering improved connections in the early morning and evening and over the weekend. This option would also deliver the RSM model service for Yell and would support a range of other policies intended to support the economic development of the islands. This option would also benefit Unst and Fetlar. **Option RO4b** The increased frequency during the week would support improved transport connectivity through offering improved connections in the early morning and evening Monday to Friday. This option would also support a range of other policies intended to support the economic development of the islands. This option would also benefit Unst and Fetlar.
Accessibility and Social Inclusion:	**Option RO4a -** ✓✓✓ **Option RO4b -** ✓✓	**Option RO4a** The operation of the two vessels for the full operating day, seven days a week, would significantly enhance community accessibility, providing numerous additional connections to Shetland mainland over the week. This option would also benefit Unst and Fetlar. **Option RO4b** The nature of the benefits of this option to the Accessibility & Social Inclusion criterion would be the same as for Option RO4a, although of a slightly lesser magnitude given the five day as opposed to seven day nature of this option.

		This option would also benefit Unst and Fetlar.

Environmental Constraint Map(s)



Reproduced from Ordnance Survey digital map data © Crown copyright 2016. All rights reserved. Licence number 100024344

Legend

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Marine Protected Area (MPA)
- Ancient Woodland Inventory
- RSPB Reserve
- Shellfish Water Protected Area (SWPA)
- Local Nature Reserves (LNR)
- National Scenic Area (NSA)
- Geological Conservation Review Site (GCR)
- Scheduled Monument (SM)
- Listed Buildings:
  - Category A
  - Category B
  - Category C
- Garden and Designed Landscape (GDL)
- Conservation Area
- Core Path

Relevant Options:

Yell Options C2, C3 & C4

N

1:30,000 @ A3

0 0.25 0.5 1 km

DRAFT

Shetland Inter-Island Transport Study

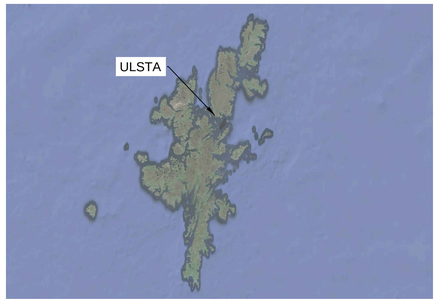
Environmental Appraisal

Drawn:	Revision:	Checked:	Date:
DM	0	HC	20/06/2016

Figure 9: Environmental Constraints Plan

Toft and Ulsta Ferry Terminals

Harbour Drawing(s)



NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV DAGGRI • Loa = 65.36 m • Beam = 13.8 m • Draught = 3.70 m MV DAGALIEN • Loa = 65.36m • Beam = 13.8m • Draught = 3.70 m Capacity: • 144 passengers • 31 PCU • 144 passengers • 31 PCU
1.2	Breakwater	Rubble mound 100 m long
1.3	RoRo Ferry Berth	• Piled jetty 90 m long. The berth extends 70 m from the end of the larger sized linkspan. • Jetty provided with supercone fenders
1.4	Linkspan	Large 9.3 m wide x 20.47 m long
1.5	Lay-by berth	Approx. 85m
1.6	Parking/waiting area	200 lane metres
1.7	Facilities	Toilets & booking office
1.8	Safety piles	Safety berthing piles provided with cone fenders

Scale approx. 1:2500

2) LIKE FOR LIKE OPTION

No Terminal upgrades

2.1	Vessel	**TYPE 3**

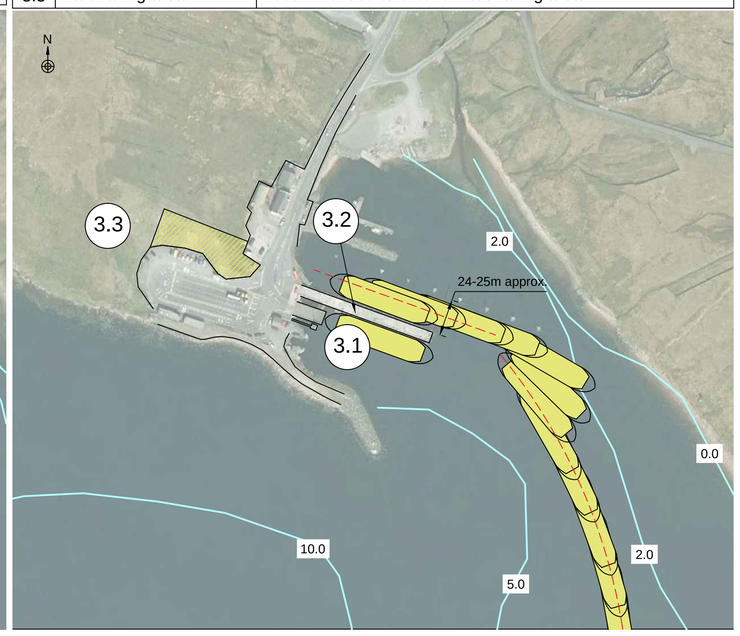
See note 7.

Scale approx. 1:1250

3) LARGER VESSEL

Terminal upgrades

3.1	Vessel	**TYPE 4**
3.2	RoRo Ferry Berth	• See notes 7 & 8. • When moored vessel slightly overhangs but is not considered an issue. • Lay-by berth could be used as overnight berth. Dredging to provide adequate berth pocket will be required. To facilitate access manoeuvring, some safety piles could be removed.
3.3	Marshalling area	Recommended to extend marshalling area.



Scale approx. 1:1250

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3298 YELL SOUND.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Burra Voe	2.3	1.8	0.9	0.4

0 25 50
1:1250 m

0 20 40 60 80 100
1:2000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

Rev	Date	Details
B	18/07/16	SIC comments
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

YELL - ULSTA OPTIONEERING

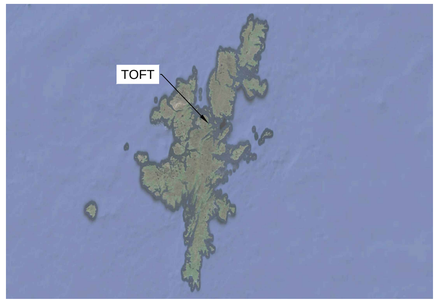
BECKETT RANKINE
Marine Consulting Engineers
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	24/03/16

Drawing Number:	Revision:
1537-01-802	B

T:\2015\1537 - Shetland inter-island Transport Study - Brett Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-802 REV B

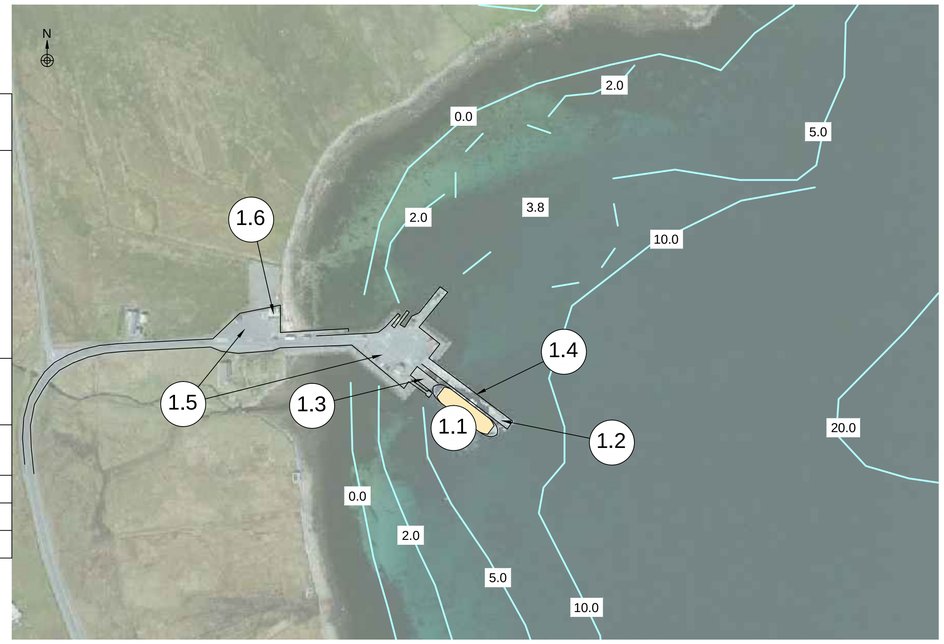


NTS

NTS

1) CURRENT CONDITION

1.1	Current Main Vessel	Size: MV DAGGRI • Loa = 65.36 m • Beam = 13.8 m • Draught = 3.70 m MV DAGALIEN • Loa = 65.36m • Beam = 13.8m • Draught = 3.70 m Capacity: • 144 passengers • 31 PCU • 144 passengers • 31 PCU
1.2	RoRo Ferry Berth	• Piled jetty of 83 m long. The berth extends 63 m from the end of the larger sized linkspan. • Jetty provided with supercone fenders
1.3	Linkspan	Large 9.3 m wide x 20.47 m long
1.4	Lay-by berth	Approx. 80m
1.5	Parking/waiting area	Limited area available
1.6	Facilities	Toilets & waiting room



Scale approx. 1:2500

NOTES:

1. COPYRIGHT BECKETT RANKINE, EXCEPT WHERE NOTED OTHERWISE. THIS DRAWING, DESIGN AND CONCEPT IS CONFIDENTIAL AND MAY NOT BE REPRODUCED, MANUFACTURED OR EXPLOITED IN WHOLE OR PART WITHOUT WRITTEN CONSENT.

2. THIS DRAWING IS FOR THE SOLE USE OF THE NAMED CLIENT FOR THE PURPOSE SHOWN.

3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.

4. OFFICIAL ISSUES OF THIS DRAWING ARE IN PAPER OR PDF FORMAT ONLY. DWG FORMAT FILES ARE FOR REFERENCE ONLY.

5. IMAGERY FROM GOOGLE EARTH.

6. BED LEVELS FROM ADMIRALTY CHART 3298 YELL SOUND.

7. BERTH STRUCTURE REQUIRES FURTHER ASSESSMENT TO ESTABLISH NECESSARY REPAIRS/STRENGTHEN WORKS OR COMPLETE REPLACEMENT TO COMPLY WITH A 30 YEARS SERVICE LIFE.

8. FENDERS AND BOLLARDS FOR OVERNIGHT MOORING REQUIRE FURTHER ASSESSMENT TO ESTABLISH THEIR ADEQUACY FOR LARGER VESSELS.

SHETLAND TIDAL LEVELS

LOCATION	MHWS	MHWN	MLWN	MLWS
Burra Voe	2.3	1.8	0.9	0.4

0 25 50 75 100 125
1:2,500 m

0 10 20 30 40 50
1:1000 m

ORIGINAL DIMENSION 90mm

Reference Drawings:

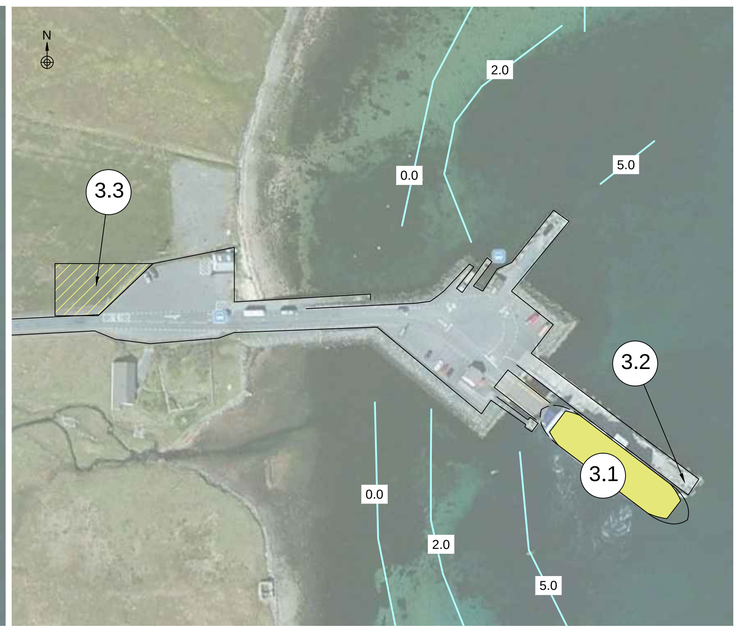
2) LIKE FOR LIKE OPTION
Terminal upgrades

2.1	Vessel	**TYPE 3**
2.2	Paking/waiting area	Additional parking area for busy periods.
See note 7.		

Scale approx. 1:1000

3) LARGER VESSEL
Terminal upgrades

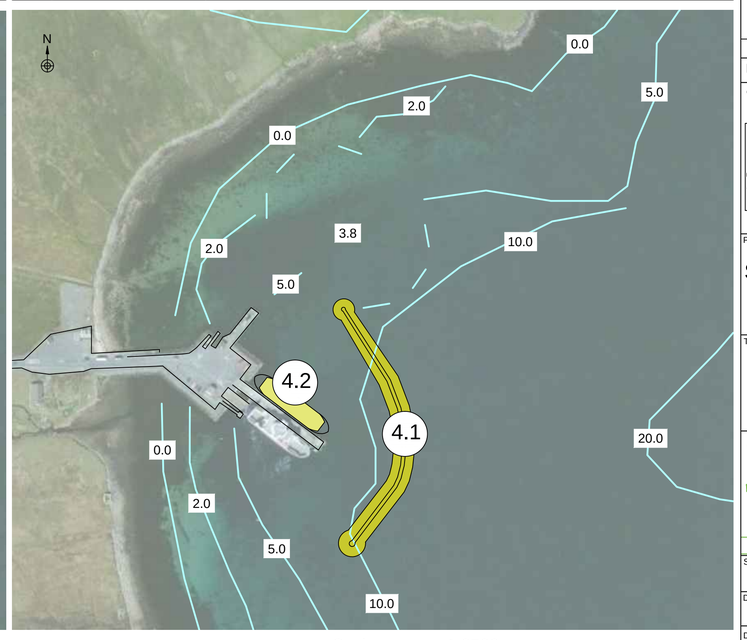
3.1	Vessel	**TYPE 4**
3.2	RoRo Ferry Berth	Vessel slightly overhangs but is not considered an issue (see notes 7 & 8).
3.3	Parking/waiting area	Additional parking area for busy periods.



Scale approx. 1:1000

4) BREAKWATER AT TOFT
Indicative layout

4.1	Detached breakwater	• Approx. 210m long detached breakwater to provide shelter for northerly and easterly waves allowing vessels to safely overnight. • Allows vessels to access from north and south sides. • Breakwater could be extended to land (north side) to increase sheltered area but providing access only from south side.
4.2	Overnight position	• Possible overnight berth to avoid larger vessel overhanging. • Access to the berth from north side entrance.



Scale approx. 1:2500

Rev	Date	Details
A	15/06/16	PBA comments

Client:

Shetland Islands Council

Project:

SHETLAND INTER-ISLAND TRANSPORT STUDY

Title:

YELL - TOFT OPTIONEERING

BECKETT RANKINE
Marine Consulting Engineers
47 Gillingham Street
Westminster, London SW1V 1HS
www.beckettrankine.com

Status:	Scale at A1 Original:
FOR DISCUSSION	AS SHOWN

Drawn:	Checked:	Date:
DP	GR	24/03/16

Drawing Number:	Revision:
1537-01-801	A

T:\2015\1537 - Shetland Inter-Island Transport Study - Bertt Consulting\01 - Shetland Inter-Island Transport Study\01 Drawings\01 Working Drawings\1537-01-801 REV A

Appendix K Harbour Costings

INDICATIVE COSTS[1,2 and 3]								
	Like for Like option		**Larger Vessel**		**Overnight Berth**		**New Harbour / Terminal**	
BRESSAY *See drwg. 1537-01-101*		-	▪ Dredging ▪ Refendering	£800k		-		-
LERWICK *See drwg. 1537-01-102*		-	▪ New berthing dolphin ▪ Refendering	£750k	▪ Refendering	<£150k		-
FAIR ISLE *See drwg. 1537-01-201*	▪ Hard ramp ▪ Provision of new slipway/hoist	£1.6M/£1.8M		-		-		-
GRUTNESS *See drwg. 1537-01-202*	▪ Hard ramp ▪ Minimum dredging	£950k	▪ Hard ramp ▪ Extension of breakwater	£2.4M		-		-
GUTCHER *See drwg. 1537-01-301*	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan	£3.5M	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan ▪ Dredging	£4.7M		-	▪ New breakwater ▪ New piled jetty ▪ Land reclamation ▪ New linkspan	£6.8M
BELMONT *See drwg. 1537-01-302*	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan	£3.4M	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan ▪ Dredging	£4.2M		-		-
HAMARS NESS *See drwg. 1537-01-303*		-	▪ Provision of a dedicated parking/waiting area ▪ Refendering	<£250k				-
FOULA *See drwg. 1537-01-401*		-		-		-	▪ New breakwater ▪ Demolition of existing jetty ▪ Provision of new jetty/RoRo ramp ▪ Dredging	£14.1M
WALLS *See drwg. 1537-01-402*		-	▪ Hard ramp ▪ Provision of two safety piles ▪ Relocation of existing parking area	£1.0M		-		-
PAPA STOUR *See drwg. 1537-01-501*		-		-		-		-
WEST BURRAFIRTH *See drwg. 1537-01-502*	▪ Refendering ▪ Minimum dredging	<£250k	▪ Refendering ▪ Minimum dredging ▪ Provision of dedicated parking/waiting area	<£350k		-		-
SKERRIES *See drwg. 1537-01-601*	▪ Extension of berthing platform (additional dolphin) ▪ Refendering	£650k		-	▪ Refendering ▪ Provision of a wave screen	£1.3M		-
SYMBISTER *See drwg 1537-01-701*		-		-		-	▪ New breakwater ▪ New piled jetty ▪ Land reclamation (1) / (2) ▪ New linkspan	£14M/£15.5
VIDLIN *See drwg. 1537-01-702*	▪ Refendering ▪ Provision of dedicated parking/waiting area	<£130k	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan ▪ Provision of dedicated parking/waiting area	£3.8M	▪ New piled jetty ▪ New linkspan ▪ Land reclamation	£5.7M		-
LAXO *See drwg. 1537-01-703*	▪ Assuming replacement of berthing structure ▪ Replacement of linkspan	£4.5M	▪ New piled jetty ▪ Replacement of linkspan ▪ Dredging ▪ Minimum breakwater extension	£5.4M	▪ New piled jetty ▪ Replacement of linkspan ▪ Dredging ▪ Breakwater extension	£6.4M		-
TOFT *See drwg. 1637-01-801*	▪ Extension of existing parking/waiting area	<£100k	▪ Extension of existing parking/waiting area ▪ Refendering	<£260k		-	▪ New breakwater ▪ Refendering	£6.6M
ULSTA *See drwg. 1637-01-802*		-	▪ Provision of dedicated parking/waiting area	<£100k	▪ Dredging	£500k		-

Note:

[1] Budget costings have not been fully considered at this stage. The above indicative costs (order of magnitude based on the listed assumptions) have been obtained using approximate rates based on BR's experience and information available from similar developments on the area. These magnitudes could be used to assist with consideration of the preferred option.

[2] Fees related to design consultancy, surveys and possible required consents/licences have been included as a 15% of the total construction costs.

[3] Global colour scale included to help costs range.