



Shetland Inter-Island Transport Study – Fair Isle Outline Business Case

Summary Options Appraisal Report

On behalf of **ZetTrans**



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1 Introduction

1.1 Overview

1.1.1 Question 4.3d of the Levelling-Up Fund application requests the provision of an Option Assessment Report for transport bids.

1.1.2 The preferred option for the Fair Isle Ferry Investment Project was established through an iterative appraisal process, as follows:

- The Shetland Inter-Island Transport Study (2016) provided the **Strategic Outline Business Case** for the project. This piece of work considered all nine islands in the Shetland archipelago served by Council operated / funded ferry and air services. The work was undertaken in accordance with the Scottish Transport Appraisal Guidance (STAG). Following the identification of transport problems, issues opportunities and constraints and the setting of Transport Planning Objectives (TPOs), a long-list of options for each island was developed and appraised against the TPOs and STAG criteria to establish an options shortlist to be progressed to OBC.
- The SOBC identified the future transport needs of the islands of Fair Isle and Whalsay as being in the most urgent need of attention. Therefore, specific **Outline Business Cases** were commissioned for those two islands. For Fair Isle, this involved further appraisal to reduce the shortlist of three options to a single preferred option.

1.1.3 For ease of reference – i.e. to prevent UK Government having to review several large documents and piece together the chain of events – this paper collates the two components of the Fair Isle options appraisal into a single summary document.

1.1.4 The Fair Isle Outline Business Case is provided as Appendix B to the LUF application. All material relating to the SOBC, including baselining papers and appraisal summary tables for all options can be found at the link below:

<https://www.shetland.gov.uk/downloads/download/340/shetland-inter-isle-transport-study-2016>

1.1.5 The Council and / or our supporting consultancy team would be happy to answer any questions on the options appraisal process.

2 SOBC Options Appraisal

2.1 Overview

2.1.1 This chapter summarises the options appraisal chapter of the SOBC.

2.2 Capital Investment Timeframe

- The current Fair Isle vessel, the MV *Good Shepherd IV* is 30 years old [in 2016] 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.

2.2.1 The ASTs, harbour investment drawings and environmental constraints maps for this route can be found at:

<https://www.shetland.gov.uk/downloads/download/340/shetland-inter-isle-transport-study-2016>

2.2.2 It should be noted that the option development and costing at SOBC was very high level.

2.3 Identified Problems

2.3.1 A range of 18 potential transport problems was considered for each island served by Council funded ferry and air services. The table below shows the subset of problems which were identified together with a rating of the severity of the problem (x, xx or xxx). 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.

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

Table 2.1: Fair Isle Transport Problems

	Service Characteristics	Severity Rating	Why is this a problem or not?
1	Overall journey time to Lerwick	x	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. ¹ 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. <i>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.</i>
2	First sailing / flight	*	The issue for Fair Isle is related more to time on mainland / Lerwick / island.

¹ SIITS Ferry Service Provision (Peter Brett Associates, 2015), Fair Isle – Lerwick – Travel Time & Cost Page.

	Service Characteristics	Severity Rating	Why is this a problem or not?
			<i>The community consultation response noted that the time of the first sailing / flight has an impact on onward travel.</i>
3	Last sailing / flight ²	*	The issue for Fair Isle is related more to time on mainland / Lerwick / island. <i>The community consultation response noted that the time of the last sailing / flight has an impact on onward travel.</i>
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. ³ 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 <i>The community consultation response noted that the time on the island varies greatly due to the timetable.</i>
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. <i>The community consultation suggested that this should be cited as a minor negative as the actual operation is harder for the community to manage.</i>
8	Capacity	***	The MV <i>Good Shepherd IV</i> 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. ⁴ 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 <i>Good Shepherd IV</i> 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 event 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.

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

³ SIITS Air Service Provision (Peter Brett Associates, 2015), Time Ashore – Weekly.

⁴ SIITS Vessels Review (TMG, 2015), p. 9.

	Service Characteristics	Severity Rating	Why is this a problem or not?
11	Physical access	xx	As an older vessel operating out of a non Ro-Ro port, the MV <i>Good Shepherd IV</i> 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. <i>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 ease of access or comfort.</i>
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. <i>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.</i>
13	Integration with PT (strategic)	xx	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. <i>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.</i>
14	Crossing / flight times	x	The ferry crossing is very long as the vessel is very slow.
15	Onboard facilities	xx	As a small and relatively old vessel, the MV <i>Good Shepherd IV</i> 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 ⁵	xxx	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. ⁶ 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	xx	The ferry berth is constrained and exposed, with the vessel having to be hauled out of the water overnight. ⁷ 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	x	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.

2.4 Appraisal of Capital Options

Capital Options

2.4.1 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.

⁵ The "Weekday / Weekend Service Variation" picks up on the RSM metric of "Sailing Days".

⁶ SIITS Ferry Service Provision (Peter Brett Associates, 2015), Ferry Service Provision and SIITS Air Service Provision (Peter Brett Associates, 2015), Air Service Provision

⁷ SIITS Ports Review (TMG, 2015), p. 18.

2.4.2 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.

2.4.3 The following capital options were identified for Fair Isle:

- **Option Capital 1a⁸: 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 Passenger Car Unit (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**.⁹
- **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.¹⁰ A new fixed Ro-Ro ramp and minimal dredging would be required at Grutness, at a cost of around £950k.¹¹
 - 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.
 - 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.

⁸ The SOBC included both capital and revenue options, hence the differentiation here.

⁹ Derived by applying RPI growth to original Good Shepherd build cost of £250k in 1986.

¹⁰ See Fair Isle Harbour Drawing, Box 2, Ro-Ro Vessel Option.

¹¹ See Grutness Harbour Drawing, Box 2, Ro-Ro Option.

- 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.¹² 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 than 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.
 - 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

2.4.4 The following sections contain the appraisal of each capital option on the STAG seven point scale against the study objectives and the STAG criteria.

¹² See Grutness Harbour Drawing, Box 2, Overnight Berth Option

Appraisal against Objectives

Table 2.2: 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
<i>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.</i>	-	-	✓✓	✓✓	✓✓	✓✓✓	✓
<i>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.</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>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.</i>	-	✓	✓	-	✓	xxx	✓
<i>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.</i>	-	-	-	-	✓	-	-
<i>TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.</i>	-	-	-	-	-	-	-
<i>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.</i>	-	-	-	-	-	-	✓

2.4.5 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 2.3: 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	<i>There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like</i>	<i>There is an issue of design obsolescence surrounding the current vessel – it is unlikely that a like-for-like</i>	<i>A new fixed Ro-Ro ramp and slipway / hoist would be required at Fair Isle. A new fixed Ro-Ro ramp and minimal</i>	<i>The freight vessel could overnight at Scalloway, Walls or Grutness.</i>	<i>The freight vessel could overnight at Scalloway, Walls or Grutness. The passenger vessel would</i>	<i>A new overnight berth would be required at Grutness. Local feedback suggests developing a</i>	<i>No detailed surveying has been undertaken, whilst land ownership issues have not been</i>

	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
	would be a technically appropriate solution.	would be a technically appropriate solution. Achieving higher speeds with vessel design also challenging	dredging would be required at Grutness.		be based in Fair Isle.	berth at Grutness would be highly challenging. Tank testing on the proposed overnight berth would be required.	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 essential for the future of the island.	Some support for this proposal was found

2.4.6 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 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.

2.5 Rationale for Selection / Rejection

- 2.5.1 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 2.4: Outcome of Appraisal, Fair Isle

Capital & Revenue Options	Take Forward (✓) / Reject (✗)	Rationale for Selection / Rejection
Option C1a – Replace the MV <i>Good Shepherd IV</i> 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 <i>Good Shepherd IV</i> 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 <i>Good Shepherd IV</i> 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 <i>Good Shepherd IV</i> 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 <i>Good Shepherd IV</i> 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.

3 OBC Options Appraisal

3.1 Overview

3.1.1 This chapter summarises the options appraisal undertaken at OBC stage.

3.2 Review of SOBC Options

3.2.1 During the OBC process, the understanding, contribution and acceptability of the capital options has moved on from those presented in the SOBC (there was a 3-year gap between the studies), which are now considered outdated. The following comments present the updated position, with **Option CO1b** modified to align with current views:

Option CO1a: Replace the MV Good Shepherd IV with a like-for-like vessel

- This option would keep the vessel based in, and crewed from, Fair Isle.
- This option would provide a replacement vessel within the small workboat classification (<24m Length Overall (LOA)) and would be broadly compatible with current crew capability (subject to training to meet new regulations). However, the design and performance of the current vessel is obsolete and replacement with a like-for-like vessel would offer a poor-quality outcome.
- This option would require modest harbour works to refurbish / replace the cradle, winch, and slipway at Fair Isle.
- Option CO1b below would be preferable and thus Option CO1a remains excluded from further consideration.

Option CO1b: Replace the MV Good Shepherd IV with a like-for-like, but materially faster, vessel

- This option would keep the vessel based in, and crewed from, Fair Isle.
- It would also provide a replacement vessel within the small workboat classification (<24m LOA) and be compatible with current crew capability (subject to training to meet new regulations). The design and performance of the replacement vessel would not strictly be like-for-like as per Option CO1a, but would benefit from modern design, engine and hull efficiency.
- It is likely that the replacement vessel would have a different geometry than the current vessel (greater displacement, length, beam, and deeper drafted) and a different hull form and propulsion system.
- Assuming a like-for-like operation, this option would require harbour works to refurbish / replace the cradle, winch, and slipway, including onshore civil engineering work to enlarge the noust formed in the cliff.
- Dredging at Fair Isle and Grutness would also likely be required to accommodate a deeper drafted vessel without tidal constraints.
- Due to spatial constraints at both harbours, there are logistical challenges to undertaking the new harbour works whilst maintaining the service.
- The estimated cost of replacement in the SOBC appears low and does not include the necessary harbour works.

Option CO2: Replace the MV Good Shepherd IV with a bespoke Ro-Ro vessel

- This option would keep the vessel based in, and crewed from, Fair Isle.

- The SOBC recommended the introduction of a catamaran on this route based on information and views available at that time. However, as the OBC offers a more detailed consideration of options, the choice between a monohull and catamaran will be more fully explored.
- A new slipway (or small linkspan) would be needed at both Fair Isle and Grutness along with an extended aligning structure at Grutness and modest dredging.
- Assuming it is necessary to bring the vessel ashore to overnight in poor weather at Fair Isle, this option would require harbour works to refurbish / replace the cradle, winch, and slipway including onshore civil engineering work to increase the size of the noust formed in the cliff.
- Dredging at Fair Isle and Grutness would also likely be required to accommodate a deeper drafted vessel without tidal constraints.
- Due to spatial constraints at both harbours, there are logistical challenges to undertaking the new harbour works whilst maintaining the service.
- The estimated cost of this option presented in the SOBC appears low.

Option CO3: Replace the MV *Good Shepherd IV* with a Lo-Lo freighter shared with Foula

- This option was rejected at SOBC stage because it would be highly detrimental to both the Fair Isle and Foula communities. In addition, designing a vessel which is inter-operable between the two islands would be challenging without significant harbour works.
- No additional evidence has emerged which suggests that this option should be considered, and it thus remains excluded from further consideration in the OBC.

Option CO4: Replace the MV *Good Shepherd IV* with a passenger vessel and a Lo-Lo freighter shared with Foula

- This option was retained at SOBC stage as it was considered that an on-island passenger vessel could mitigate the effects of delivering freight through a non-island based vessel. Whilst this would be unpopular with the community, it presented an opportunity for potentially deploying a larger freight vessel capable of carrying much higher loads than MV *Good Shepherd IV* (Fair Isle) and MV *New Advance* (Foula).
- However, carryings and survey work undertaken early in the OBC process clearly demonstrated that the primary function of the Fair Isle ferry is facilitating the island supply-chain. **This option would not meet this need and is thus excluded from further consideration at the outset of this OBC.**

Option CO5: Bespoke mainland-based Lo-Lo ferry service

- This option would involve relocating the ferry service to Shetland mainland. The vessel would lie overnight at Grutness (with harbour works) or Lerwick and would require a mainland-based crew.
- The SOBC acknowledged that this option would be highly unpopular locally, but it was retained as it provided an opportunity to address a number of the infrastructure constraints and operational challenges associated with the Fair Isle service.

3.2.2 From our review of the options considered in the SOBC, the following are recommended to be taken forward for further consideration as part of the OBC:

- **Option CO1b (hereafter referred to as Do Minimum):** Replace the MV *Good Shepherd IV* with a like-for-like, but materially faster, vessel.

- **Option CO2 (hereafter referred to as Option 1):** Replace the MV *Good Shepherd IV* with a bespoke Ro-Ro vessel.
- **Option CO5 (hereafter referred to as Option 2):** Bespoke mainland-based Lo-Lo ferry service.

3.2.3 Progressing the above shortlist to a preferred option requires resolution of the following questions:

- What **strategic approach** should be taken to future ferry service provision in Fair Isle?
 - What should the scale of the operation be?
 - Where should the crew and vessel be based?
- What is the most appropriate **vessel** option?
- Having defined the vessel, what is the most appropriate **ship-to-shore** interface?
- What are the options in relation to **overnight berthing**?

3.2.4 The remainder of this chapter takes each of these questions in turn, shaping the preferred option for Fair Isle. However, in advance of that, the 'case for change' is restated and the implications of a 'Do Nothing' summarised.

3.3 Case for Change

3.3.1 The 'case for change' can be summarised as:

- The current vessel is 35-years old, having entered service on the Fair Isle run in 1986 and does not meet current accessibility standards. It has circa five-years of remaining service life, although some expenditure will be required to achieve this.
- The service is **unreliable** and there are consequences of this in terms of:
 - **Supply-chain** – e.g. import of fresh produce, export of goods etc.
 - **Service provision** – e.g. providing health care and facilitating access to secondary school.
 - **Personal travel** – e.g. missed appointments and limited opportunities on the mainland for Fair Isle residents.
 - **Visitors and tourists** to Fair Isle, both in terms of the choice to visit the island and travel disruption *en-route* or on the return journey.
- In the 2019 Fair Isle household survey, 2/3 of respondents indicated that **aspects of the ferry service prevent travel to the mainland more often** – more than half of respondents cited comfort, crossing time and the **absence of Ro-Ro** as key barriers to travelling more by ferry.
- The current crane-based operation:
 - poses a potential medium-term **regulatory risk** to the continuation of the service;
 - places **limits on the weight / type of goods** carried; and
 - affects **vessel turnaround** times.
- There is a local **desire for improvements** as evidenced in the household survey:
 - 85% did not think the current air and ferry connections to the mainland are sufficient for their family's day-to-day needs, now and in future.
 - 2/3 thought that connections were not sufficient for tourism – 3/4 wanted to see tourism develop further.

- 1/4 felt current connections were not sufficient to ensure long-term sustainability of Fair Isle.
- 80% felt that better connections would make Fair Isle more attractive for in-migrants.

3.4 Do Nothing

- 3.4.1 In the context of Fair Isle, the 'Do Nothing' would involve continuation with the current vessel and infrastructure. Day-to-day maintenance would be undertaken but no major capital replacement work or refurbishment would be funded. The service would be discontinued at the point where the vessel or landside infrastructure required major capital investment. A charter vessel would be required to bring in freight on a Lo-Lo basis.
- 3.4.2 The 'Do Nothing' is clearly not a tenable option for Fair Isle. The ferry service is integral to the island supply-chain and also acts as a secondary mode for passenger travel. The 'Do Nothing' is therefore not considered further in this business case.

3.5 Strategic Approach

- 3.5.1 The current Fair Isle infrastructure and service represents a bespoke solution reflecting the needs of the island. The vessel and crew are island-based and the infrastructure designed around that solution. The strategic question therefore is whether that situation should be perpetuated for the next 30 or so years or whether Fair Isle should be migrated to similar operational practices as the rest of Shetland.
- 3.5.2 The most effective way to show the two strategic approaches is via a 'decision tree', which highlights the implications of each choice for different aspects of the service. This is shown below, with the preferred option shown in green (and explained forthwith):

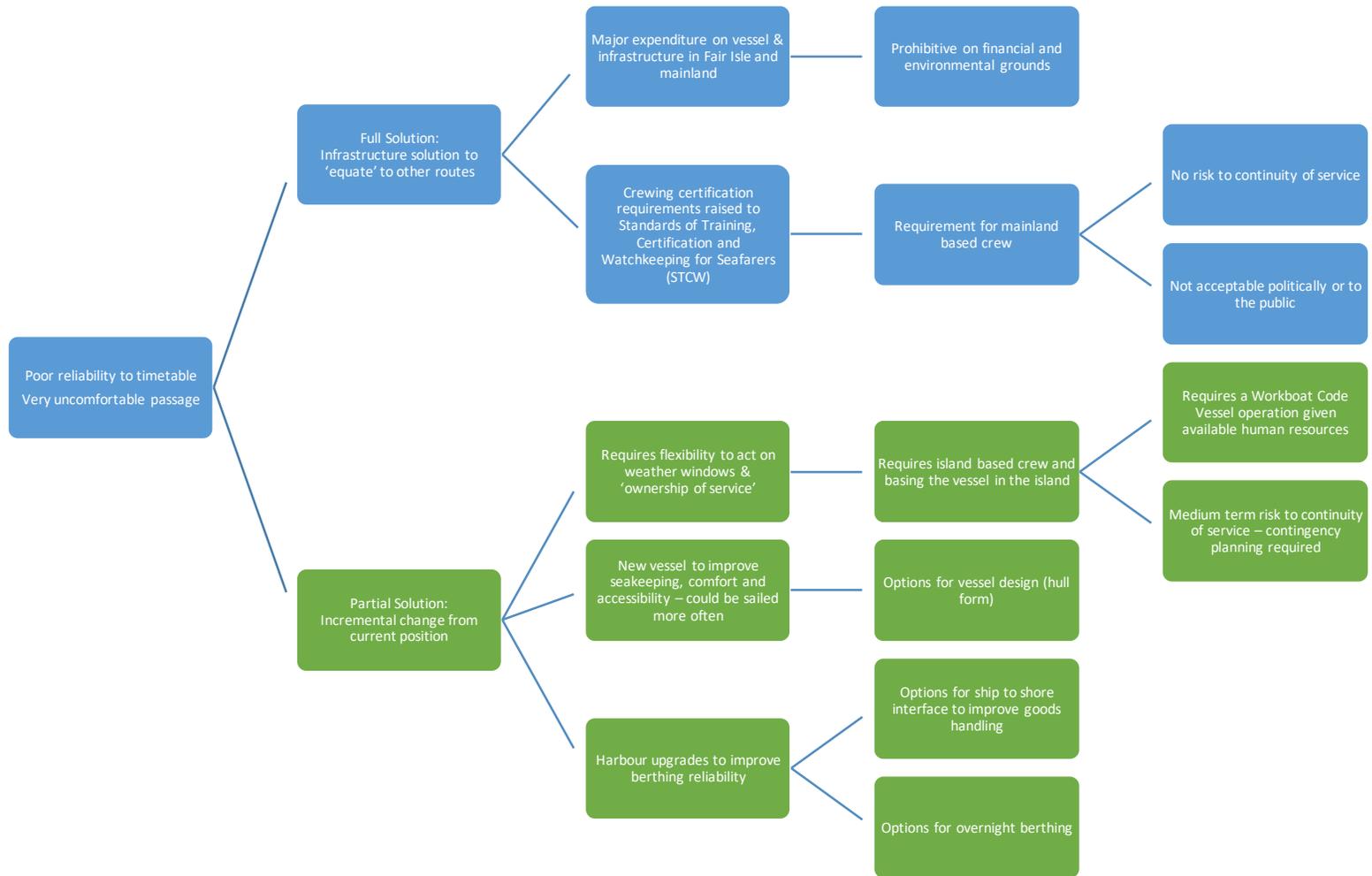


Figure 3.1: Fair Isle Strategic Approach – Preferred Approach

Full Solution

- 3.5.3 The so-called 'full solution' – equating the Fair Isle infrastructure and service to other routes in Shetland (with the exception of Foula) – would have a range of implications for both assets and human resource.

Infrastructure

- 3.5.4 The infrastructure requirements of the 'full' solution at Fair Isle would be broadly as follows:
- Purchase of a new vessel at least equivalent in size to the Skerries ferry MV *Filla* to ensure improved seakeeping and reliability. The MV *Filla* is 35 metres long and an estimate at SOBC stage suggested that a new vessel of this type would cost circa £4.1m to build in a Polish yard. This cost has likely risen since then.
 - A vessel of this size and weight could not readily be taken out of the water at Fair Isle. There would therefore be a need for:
 - harbour upgrades at Fair Isle, including substantial new breakwaters, to provide sufficient shelter for the vessel to remain in the water overnight; **or**
 - a new overnight berth at Grutness, which again would require major investment to provide the necessary shelter in all weather; **or**
 - overnighing the vessel in Lerwick, significantly extending steaming times to Fair Isle and accruing commercial harbour charges from Lerwick Port Authority.
 - The landside infrastructure at both Fair Isle and Grutness would also need to be upgraded to include a linkspan, vehicle marshalling area and a terminal building, which would be both expensive and (particularly at Fair Isle) challenging to accommodate within the available space.
 - The impact of a larger vessel in North Haven should also be highlighted as it would occupy more quay space, impacting on use by visiting yachts in the summer. It should also be noted that vessels of the size of MV *Filla* can find manoeuvring in North Haven challenging when conditions are not favourable, which could further impact on service reliability.

Human Resource

- 3.5.5 The MV *Good Shepherd IV* operates under the 'workboat' code, which means that the crew require a lower level of certification / qualification than they would if they were operating a vessel equivalent to the MV *Filla*. A key benefit of this from a Fair Isle perspective is that it more easily facilitates an island-based crew and thus offers both the ownership and flexibility associated with this.
- 3.5.6 If the decision was taken to scale the service up to a vessel beyond the workboat code, a much more onerous set of qualifications would be required for the crew – this is known as the Standards of Training, Certification and Watchkeeping (STCW) for seafarers. An advantage of this arrangement would be the removal of the 12-passenger limit associated with the workboat code mode of operation.
- 3.5.7 For the current Master of the MV *Good Shepherd IV*, this step-up in qualifications would require attendance for 3 months at the North Atlantic Fisheries College in Scalloway, followed by one year at sea on a qualifying vessel before sitting a Master's Oral examination. This would represent a very significant commitment for the current Master, the implications of which include:
- There would be a requirement for the Master to leave Fair Isle for a minimum of 15-months, which is likely to be an unattractive prospect.

- The current Relief Master is retired – he would either have to come out of retirement for the period the primary Master is away from the island (which he is unlikely to want to do) or another Master(s) would need to be put into the island on a temporary / agency basis (which would again be challenging to deliver).
- An additional relief Master would need to be arranged.
- The Master currently fulfils a range of other roles on the island, including providing support at the airfield. Cover would also have to be provided for these roles.

3.5.8 Given the steps required to obtain STCW certification, particularly the required sea time, it is highly unlikely that any such vessel could be crewed from Fair Isle. Even if there was an undertaking made by a group of island residents to obtain the necessary certification, it would need them to leave the island for a prolonged period, which would impact on other on-island activities, fire cover at the airfield for example. Recruitment would be an option, but there is a global shortage of appropriately qualified seafarers, whilst attracting such individuals to live on Fair Isle would also be an issue (the Council has tried and failed in the past). The increased certification requirements would also impact on succession planning and the long-term ability to crew the vessel from Fair Isle, introducing a risk to the long-term sustainability of an island-based vessel.

3.5.9 It is therefore highly likely that a 'full solution' would require a mainland-based vessel and crew. Whilst there is no technical reason that this could not be done, a contracted mainland crew would be unlikely to offer the level of flexibility that a Fair Isle crew can. Whilst a larger vessel would improve seakeeping and possibly reliability (taking account of vessel manoeuvring in North Haven), the crossing to Fair Isle will always be long and weather-exposed and there will remain a practical requirement to work around weather windows. It is therefore likely that the already poor connectivity of the island would further diminish. Such a solution would not be acceptable to the Fair Isle community given their concerns with the current arrangements.

Partial Solution

3.5.10 The 'partial' solution would maintain a bespoke solution for Fair Isle, representing a compromise between a higher infrastructure specification and the need of the island for flexibility.

3.5.11 This approach would commit to the long-term retention of the vessel and crew in Fair Isle, allowing for the continuation of current flexible operational practices, most notably responding to weather windows. Whilst the evidence suggests that the infrastructure is not fully meeting the connectivity needs of the island, it is anticipated that a new, modern and faster vessel and improved landside infrastructure would provide at least some opportunity to operate some additional sailings. Whilst this approach is the preferred option of the Fair Isle community, there are two challenges / constraints which have to be acknowledged if it is selected as the way forward:

- Any new vessel would operate under the workboat code, limiting the number of passengers to 12. This places a long-term constraint on the use of the ferry as a passenger service, albeit an increase in capacity could be achieved through greater frequency of sailing.
- There would be a joint requirement within the Council and the Fair Isle community to ensure a clear succession plan for crewing the vessel, as well as appropriate contingency measures in the event that some of the existing crew were e.g. long-term sick. An outcome where a smaller vessel was progressed to meet the needs of Fair Isle but could then not be crewed would be the worst of both worlds.

Preferred Option

- 3.5.12 The **preferred option is to progress the partial solution** (the green shaded boxes in the decision tree). The infrastructure works required to scale-up to a 'full' solution, together with the loss of flexibility for Fair Isle make this highly unattractive and of disproportionate cost.
- 3.5.13 The partial solution is much more closely tailored to the needs of Fair Isle and is proportionate to the transport problems and opportunities which have been identified. Whilst it is acknowledged that it places a constraint on passenger numbers, the nature of the connection to Fair Isle suggests that passenger numbers will always be limited in any case, particularly when considered in the context of the expanded air service being implemented through the Air OBC.

Decision Point: For the reasons cited above, the preferred option is for the new Fair Isle vessel to be based on the island and operated under the workboat code. To this end, **Option 2 – bespoke mainland Lo-Lo ferry service – is excluded from further consideration.**

Crewing

- 3.5.14 To be coded as a workboat, any new vessel would be in the range of 150 gross tonnes (GT) – 500GT and less than 24m length overall. Current workboat legislation sets out the crewing and certification requirements. These requirements vary for vessels of less than 200GRT (those required for the MV *Good Shepherd IV*) and vessels over 200GRT (those which are anticipated to be required for any new vessel). It should be noted that there is emerging workboat legislation which would need to be adhered to for any new workboat compliant vessel operated on the Fair Isle route.
- 3.5.15 As the new vessel would undertake the same operation as the MV *Good Shepherd IV*, it is anticipated that the number of crew would remain the same. However, the new vessel would require the Engineer to possess a Marine Engineer Operating License (MEOL). This would entail a 30-hour course at the North Atlantic Fisheries College in Scalloway followed by an oral exam. It is understood that two of the current MV *Good Shepherd IV* crew have submitted funding applications to the Council to enable them to achieve the MEOL.
- 3.5.16 Six of the seven members of the current MV *Good Shepherd IV* crew are set to retire by 2032 or thereby. If a decision is taken to commit investment to retain the vessel on island, a long-term training and succession plan should be developed jointly by the community and the Council to de-risk the long-term sustainability of a Fair Isle based vessel. This would also align with the aspirations of the Fair Isle Development Plan to up-skill the island population and create well-paid and secure jobs which could assist in retaining population or attracting new families to the island.

3.6 Vessels

- 3.6.1 Based on the information available at the time, the SOBC concluded that a catamaran would be the most appropriate vessel for Fair Isle. However, in keeping with the business case guidance, critical decision points of this nature are more fully reviewed at OBC stage. Again, the most appropriate way to show the implications of prospective vessel choices is via a logic tree:

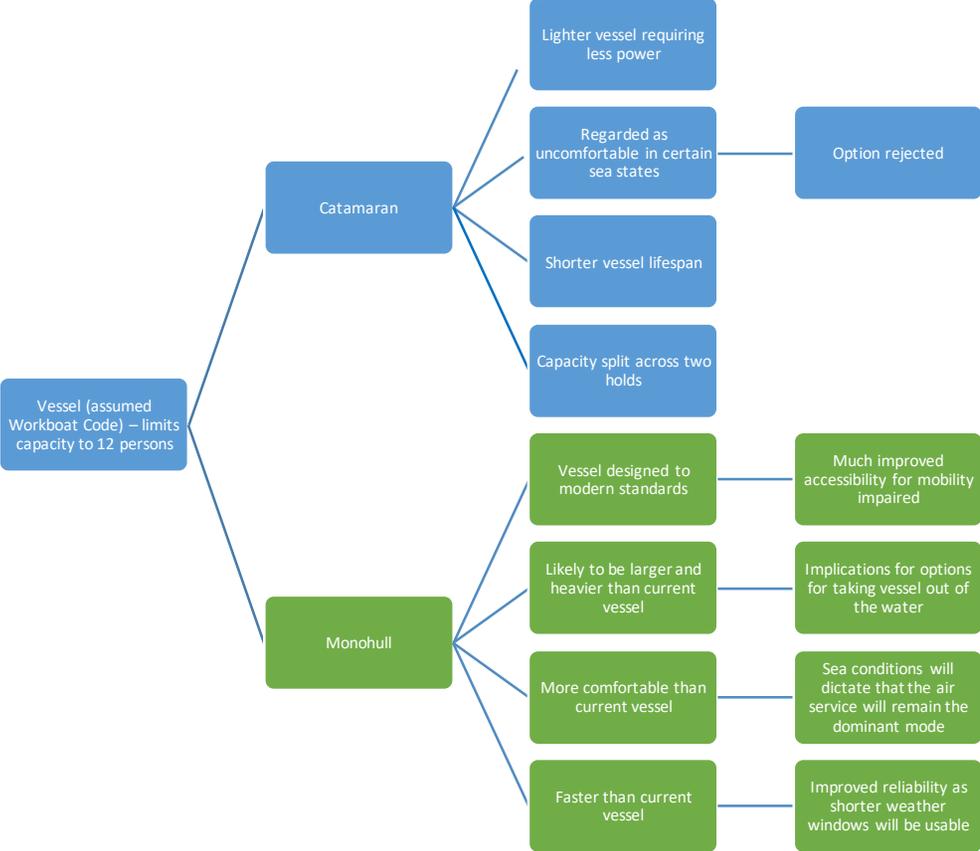


Figure 3.2: Fair Isle Vessel Options – Logic Tree

- 3.6.2 There are two main vessel choices for Fair Isle, a catamaran or a conventional monohull. Other hull forms such as a SWATH were considered at SOBC stage and ruled out – a brief review at OBC suggests that this conclusion remains appropriate. This section therefore considers the comparative merits of a catamaran and a monohull.

Catamaran

- 3.6.3 A medium speed catamaran was identified as the preferred option at SOBC stage because it was considered that it could make the best use of weather windows and would require less power when compared to a conventional monohull. However, on further consideration at OBC stage, a catamaran is excluded from further consideration because:
- The sea conditions between Fair Isle and Shetland mainland are such that it is considered unlikely that it could operate at its maximum speed much of the time, detracting from the benefit identified at SOBC stage. It could also be uncomfortable for passengers and make the service less reliable overall.
 - A catamaran would have a larger beam than an equivalent monohull of the same capacity, requiring more extensive landside work, particularly at Fair Isle where the vessel is taken out of the water (this point was acknowledged at SOBC stage but, at that point, the option of basing the vessel on the mainland remained in-play).
 - Catamarans are also generally of lighter construction (aluminium) and thus have a shorter service life than steel-built monohull vessels. From a present value of costs perspective, a replacement catamaran may have to be planned for within the life of the appraisal, which would not be the case for a monohull.
 - Whilst the hold capacity of a catamaran may be equal to or greater than a monohull, it would be split over two separate compartments, thus imposing size restrictions on the goods which can be carried, a key issue for Fair Isle currently.

Monohull

- 3.6.4 The **preferred option** for Fair Isle is therefore a new monohull vessel: The new vessel would be:
- A maximum of 24 metres length overall, so as to remain within the workboat code:
 - It is highly likely that any new vessel would be longer, beamier and heavier than the *MV Good Shepherd IV*, which will have implications for landside infrastructure.
 - For these waters, the new vessel would need to have an appropriate bow form, bulbous bow and most likely a stern ramp. It is likely that the replacement vessel will have a different geometry than the current vessel (greater displacement, length, beam, and deeper drafted).
 - Built to modern design standards, particularly in terms of facilitating step free access from the quayside to the passenger lounge(s).
 - Faster, allowing the vessel to take greater advantage of weather windows (albeit acknowledging that the maximum speed will not be deliverable in all sea states).
 - Offer greater flexibility in the sizing and handling of cargo due to the larger single hold.
- 3.6.5 The OBC does not typically establish the exact vessel to be used on the route. Whilst referenced in the Commercial Case of the OBC (which lays out procurement options), it is not further developed until the detailed design and Final Business Case stages, the point at which the project is moving towards procurement. The Commercial Case will generally set out the extent to which the buying party wishes to specify all elements of the vessel or provide an output-based specification against which shipyards can design and tender.

3.6.6 Whilst a preferred vessel is not specified, it is necessary at this stage of the OBC to provide a high level of design vessel as the basis for scoping out necessary infrastructure works. Shetland Islands Council, together with the crew of MV *Good Shepherd IV*, has been exploring prospective vessels for the route. One option identified is a Norwegian designed and built vessel known as the MD240, a picture of which is shown below:



Figure 3.3: Proposed Design Vessel – MD240

3.6.7 The MD240 is an appropriate high-level design vessel for this stage of the OBC process. It has the following characteristics:

Table 3.1: Proposed Design Vessel – Key Particulars

Parameter	Value
Length Overall	23.98m
Beam	11.20m
Laden Draught	3.50m
Gross Tonnage	250 tonnes (approximate)
Approx. car carrying capacity	4

3.6.8 For the purposes of harbour general arrangement drawings, the MD240 is used as the design vessel.

Decision Point: The preferred vessel is a monohull less than 24m length overall. The vessel will be coded as a workboat.

3.7 Ship-to-Shore Interface

- 3.7.1 Having defined the strategic approach and preferred vessel type, the next consideration is the ship-to-shore interface. The options are again summarised in a decision tree.

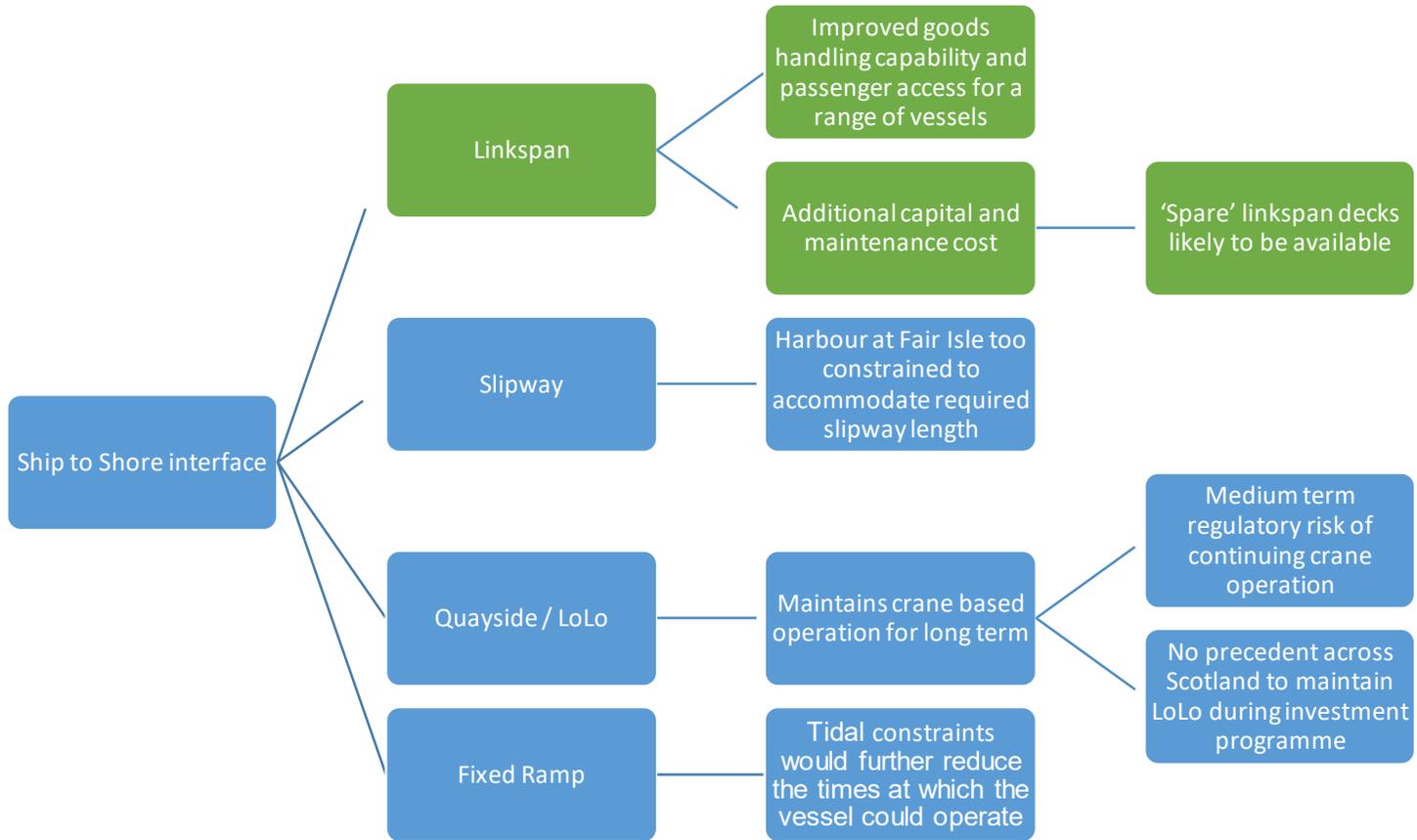


Figure 3.4: Fair Isle Ship-to-Shore Interface Options

Quayside Lo-Lo

- 3.7.2 A quayside Lo-Lo would represent a continuation of the current operational practice. Whilst this has been effective over many years, it is not without its limitations. These include the constraints imposed by the lifting capacity of a vessel-based crane, the safety parameters within which craning can be undertaken at an exposed berth and the impact on turnaround times.
- 3.7.3 It is important to note that there is no precedent anywhere in Scotland where life-expired lifeline Lo-Lo infrastructure has been replaced on a like-for-like basis. The most obvious comparator is that of the Small Isles, where a Ro-Ro conversion was undertaken for Canna, Eigg, Muck and Rhum in the early 2000s, replacing the previous Lo-Lo / flit-boat arrangement.
- 3.7.4 There is also a concern amongst communities still operating Lo-Lo services that, over time, increasingly onerous health and safety requirements (either as a result of evolution or a crane-based incident in Fair Isle or elsewhere) could restrict the windows within which crane-based operations could take place, for example lowering the thresholds for vessel motion or wind speed etc. It is important to note that there is no imminent threat in this respect, rather it is a potential longer-term risk which would need to be managed. If any such restrictions did emerge, these would further impact on the supply-chain, increasing the number of service outages.
- 3.7.5 The retention of Lo-Lo is the 'do minimum' for Fair Isle, but it would lock in the transport and supply-chain problems of the island for several decades to come and, for this reason, is excluded from further consideration. It should be noted that the primary purpose of moving to Ro-Ro is to facilitate the handling of goods – the intention is not to encourage regular car travel, and car-based tourism, and indeed a 'permit' system could be considered analogous to that operating for Iona and the Small Isles.

Decision Point: The restrictions posed by Lo-Lo operations on Fair Isle, together with the lack of precedent for replacing a life-expired Lo-Lo operation on a like-for-like basis, means that the **Do Minimum option – Replace the MV Good Shepherd IV with a like-for-like, but materially faster vessel - is eliminated from further consideration.**

By extension, the **preferred option is therefore Option 1 – Replace the MV Good Shepherd IV with a bespoke Ro-Ro vessel.** The subsequent analysis in this report is focused on that option.

Fixed Ramp

- 3.7.6 A 'fixed ramp' would accommodate a vessel's vehicle ramp over a restricted tidal window. Whilst this is an effective means of ship-to-shore interface for Ro-Ro vessels at some ports, the resulting tidal constraints would further reduce the times at which the vessel could operate at both Fair Isle and Grutness, creating a tidal timetable and impacting on flexibility with regard to weather windows i.e. weather windows would need to coincide with appropriate tidal windows, likely reducing service levels. This would be unacceptable to the community and would likely worsen the current level of service.
- 3.7.7 It is important that the solutions for Fair Isle and Grutness maintain the maximum level of flexibility for this route. Having the shoreside infrastructure place further restrictions on the service is unacceptable and, for this reason, **a fixed ramp solution is excluded from further consideration.**

Slipway

- 3.7.8 A slipway would provide a more flexible ship-to-shore interface option for Ro-Ro vessels, compared to a fixed ramp. Using the typical slipway gradient of 1 in 8, the slipway at Fair Isle would need to be approximately 80m in length.
- 3.7.9 The existing harbour infrastructure at Fair Isle is spatially constrained. Our research suggests that the construction of a slipway of the required length is not feasible within North Haven due to the aforementioned spatial constraints, the requirement for protection within the harbour provided by the breakwater and the available water depths within the harbour at Fair Isle. For these reasons, a slipway solution is **excluded from further consideration**.
- 3.7.10 The provision of a suitable slipway at Grutness would require significant lengthening of the existing quay structure and is also **excluded from further consideration**.

Linkspan

- 3.7.11 Introduction of Ro-Ro capabilities to the Fair Isle route would increase the resilience of the service and improve safety in terms of passenger access and goods handling. Operating from linkspans would allow the service to remain flexible as it would not be restricted by the tidal state, as would be the case with a fixed ramp.
- 3.7.12 The provision of a linkspan would significantly improve the Fair Isle supply-chain through simplifying goods handling and removing the current crane capacity restrictions. In particular, the use of linkspans would reduce vessel turnaround times, with reduced time taken to load / unload goods from the vessel (thus reducing the overall weather window required and potentially increasing reliability). Palletised goods could be dropped on the deck by the forklifts currently used to manoeuvre pallets for craning on and off of the vessel.
- 3.7.13 The introduction of a new vessel and linkspan interface would also provide a major improvement in terms of passenger access and egress allowing those with impaired mobility to board via the linkspan.
- 3.7.14 In terms of the operational safety of a linkspan / vessel interface, there is a requirement to ensure suitable wave climate on the linkspan berth at both Fair Isle and Grutness. Provision of improved shelter is included for both locations.
- 3.7.15 There will be additional capital and maintenance costs associated with the provision of linkspans for this route when compared to the other ship-to-shore interface options. However, it should be noted that the capital cost associated with the supply of 2No. new linkspan decks may be reduced due to the potential availability of 2No. decks from the current Council Linkspan Life Extension Project. It is therefore anticipated that there will be 2No. 'Type A' linkspan decks available for use at Fair Isle and Grutness as a result of these other works across Shetland.

Preferred Option

- 3.7.16 **The preferred option is to provide a linkspan interface at both Fair Isle and Grutness** (the green boxes in the logic tree) for the following reasons:
- The perpetuation of a Lo-Lo operation locks in the existing transport and supply-chain process and may be subject to increased regulation in the future, potentially compromising service flexibility and resilience.
 - The concept of Ro-Ro as a whole could be transformative for Fair Isle:
 - It would remove the crane-based weight restrictions associated with Lo-Lo operations.

- Turnaround times would also be reduced, providing the ability to operate sailings within tighter weather windows (and potentially facilitating an increase in frequency).
 - Physical accessibility to the ferry would be significantly improved for passengers, a key issue given current access arrangements and the ageing population of the island.
 - A suitable slipway cannot be provided within North Haven and the loss of resilience and flexibility associated with a fixed ramp also rules out this option.
- 3.7.17 Implementation of a linkspan service would also improve the operational safety of the infrastructure provided at Fair Isle and Grutness. It will also be a step towards meeting the connectivity needs of the island. Improved turnaround times associated with a Ro-Ro service along with continuation of current practice through responding to weather windows and a faster vessel will provide the potential for operation of an increased number of sailings.
- 3.7.18 Provision will also assist with delivery of the Council's Critical Success Factors including the provision of improved resilience of their transport service to Fair Isle and compliance with legislative obligations in terms of passenger accessibility.
- 3.7.19 Finally, it should be noted that a frequent concern of islands migrating from Lo-Lo to Ro-Ro is an increase in tourist / visitor cars to the island. In reality, the proposed size of the vessel and frequency of sailings means that this would be highly unlikely. However, it may nonetheless be appropriate to introduce a vehicle permit system along the lines of that used on Iona and the Small Isles, where only resident registered vehicles are permitted carriage on the ferry.

Decision Point: The preferred option is to provide a linkspan interface at both Fair Isle and Grutness.

3.8 Overnight Berth

- 3.8.1 Having defined the strategic approach, preferred vessel type and ship-to-shore interface, the final consideration is the overnight berthing options for the new vessel at Fair Isle. The options are again summarised in a decision tree.

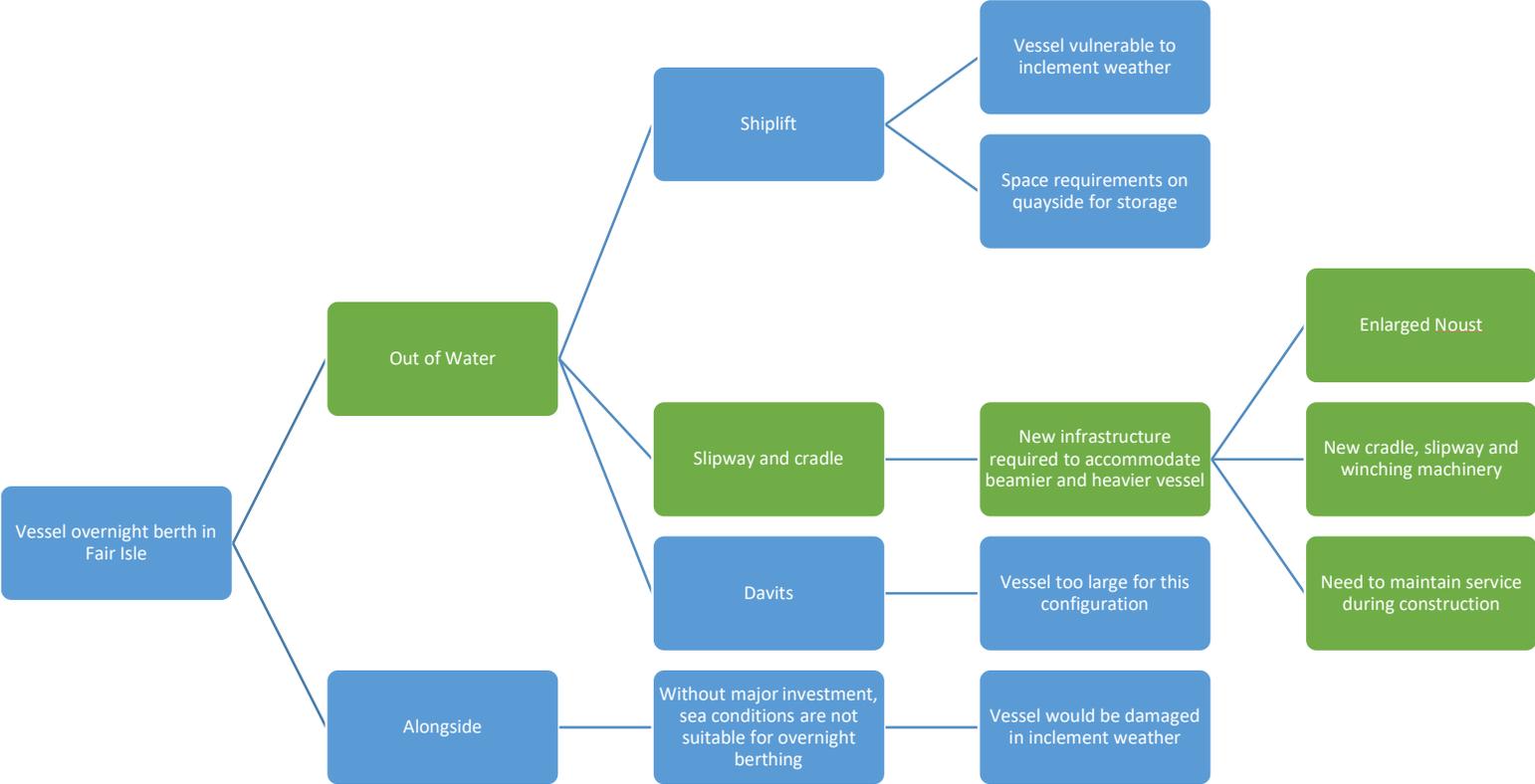


Figure 3.5: Fair Isle Overnight Berthing Options

Alongside

- 3.8.2 Currently, the MV *Good Shepherd IV* overnights at North Haven, Fair Isle. In fair weather during the summer, she berths alongside the quay and during winter, or on forecast of inclement weather / sea state, she is brought ashore using the cradle and slipway.
- 3.8.3 Without major investment to provide suitable shelter and berthing / mooring arrangements at Fair Isle, the conditions within the existing harbour are not suitable for reliable year-round overnight berthing. This is best shown in a photograph (below), where the waves can be seen overtopping the quayside:



Figure 3.6: North Haven in inclement weather

- 3.8.4 The required investment to provide a secure, in-water, year-round overnight berth would likely include construction of an overlapping breakwater to the north-west of the approach to North Haven as well as significant improvements to the existing solid quay including an appropriate fendering system, quay furniture and dredging.
- 3.8.5 Without the investment indicated above, if any new vessel was to berth alongside the solid quay overnight or in inclement weather, both the vessel and marine infrastructure would sustain significant and potentially irreparable damage. For this reason, overnight berthing alongside the solid quay is excluded from further consideration and options for getting the vessel out of the water are discussed below.

Shiplift

- 3.8.6 An alternative option would be the use of a shiplift or boat hoist. A shiplift is often used in boatyards etc. to lift vessels out of the water and consists of two piers, one either side of a

suspended deck. The deck is generally suspended by either pier mounted winches and wire ropes or hydraulic cylinders. The deck generally has rails on it and a suitable vessel cradle riding on the rails. The deck complete with cradle is lowered into the water and the vessel manoeuvres into the cradle prior to the winches or cylinders lifting the suspended deck and vessel out of the water. Once out of the water, the cradle would be winched along rails to the noust.

- 3.8.7 The difficulty with this solution is: (i) The depth of water required to allow the vessel onto the cradle at all states of the tide pushing the shiplift out to a location similar to the end of the current finger pier (or a dredged pocket requiring maintenance dredging); (ii) generally, the suspended deck, and the rails on it, need to be level / horizontal leading to difficult gradient transitions to be accommodated by the cradle as it is winched. Further, such a system introduces added complexity and maintenance over the existing arrangements.
- 3.8.8 A boat hoist also requires finger piers extending out into deep enough water to allow the vessel to manoeuvre over slings suspended from the hoist. Once the vessel is positioned, the hoist raises the slings and lifts the vessel out of the water prior to travelling shoreward. Typically, these boat hoists need large areas to manoeuvre and can only accommodate shallow gradients. North Haven is already spatially constrained and could not accommodate this; in addition, the existing gradient into the noust would likely be too steep for such a boat lift. Furthermore, the vessel could not be left suspended in the hoist, it needs to be positioned into a cradle in a sheltered location, e.g. the noust. The boat hoist itself also needs to be parked in a sheltered location, adding to spatial requirements.
- 3.8.9 Such a system adds complexity and maintenance burden over the existing which cannot be justified.

Davits

- 3.8.10 Lifting davits or large cranes can be fixed to quay wall structures to raise and lower vessels from / into the water. However, the preferred vessel is too large for this configuration (the davits for the much smaller Foula ferry are believed to be amongst the largest in existence) and transfer to an enlarged noust would be technically difficult and would require a complex cradle and rail arrangement including some form of side transfer. For this reason, use of davits is excluded from further consideration.

Slipway and Cradle

- 3.8.11 The MV *Good Shepherd IV* is currently brought ashore using a steel cradle that rides on the slipway rails and is drawn up and down by an onshore winch. The slipway rails extend into a 'noust' which provides shelter to the vessel when it is out of the water. The noust is approximately 30m long, 10m wide and is formed in a cliff to the south-east of the existing harbour.
- 3.8.12 In order to accommodate the proposed new vessel, which will be longer, heavier and beamier than the MV *Good Shepherd IV*, the noust would require to be enlarged along with upgrade of the winch house and provision of a larger cradle. The existing finger pier would require to be demolished and replaced. The alignment of the slipway and rails would be confirmed at detailed design stage to minimise the period of outage during construction.

Preferred Option

- 3.8.13 The existing slipway and cradle arrangement work well for Fair Isle. In the absence of appropriate infrastructure to support berthing at the quayside, replacement of the current slipway and cradle arrangement is the preferred option for overnight berthing at Fair Isle.

Decision Point: Replacement of the current slipway and cradle arrangement is the preferred option for overnight berthing at Fair Isle.

3.9 Preferred Option – Summary

- 3.9.1 Through the analysis undertaken in this chapter, it has been determined that the preferred option for the replacement of the Fair Isle ferry is **Option 1 – Replace the MV Good Shepherd IV with a bespoke Ro-Ro vessel**. In reality, since the vessel is to be a Ro-Ro capable workboat, this is a hybrid of the Do Minimum workboat option and the bespoke Ro-Ro option. A summary of the key particulars is provided below.

Strategic Approach

- 3.9.2 The preferred option is to progress with a bespoke solution for Fair Isle with the **retention of an island-based vessel and crew**. To de-risk the adoption of an island-based option, contingency and long-term crewing arrangements must be developed between the Council and the Fair Isle community to ensure a clear succession plan for crewing the vessel.

Vessel

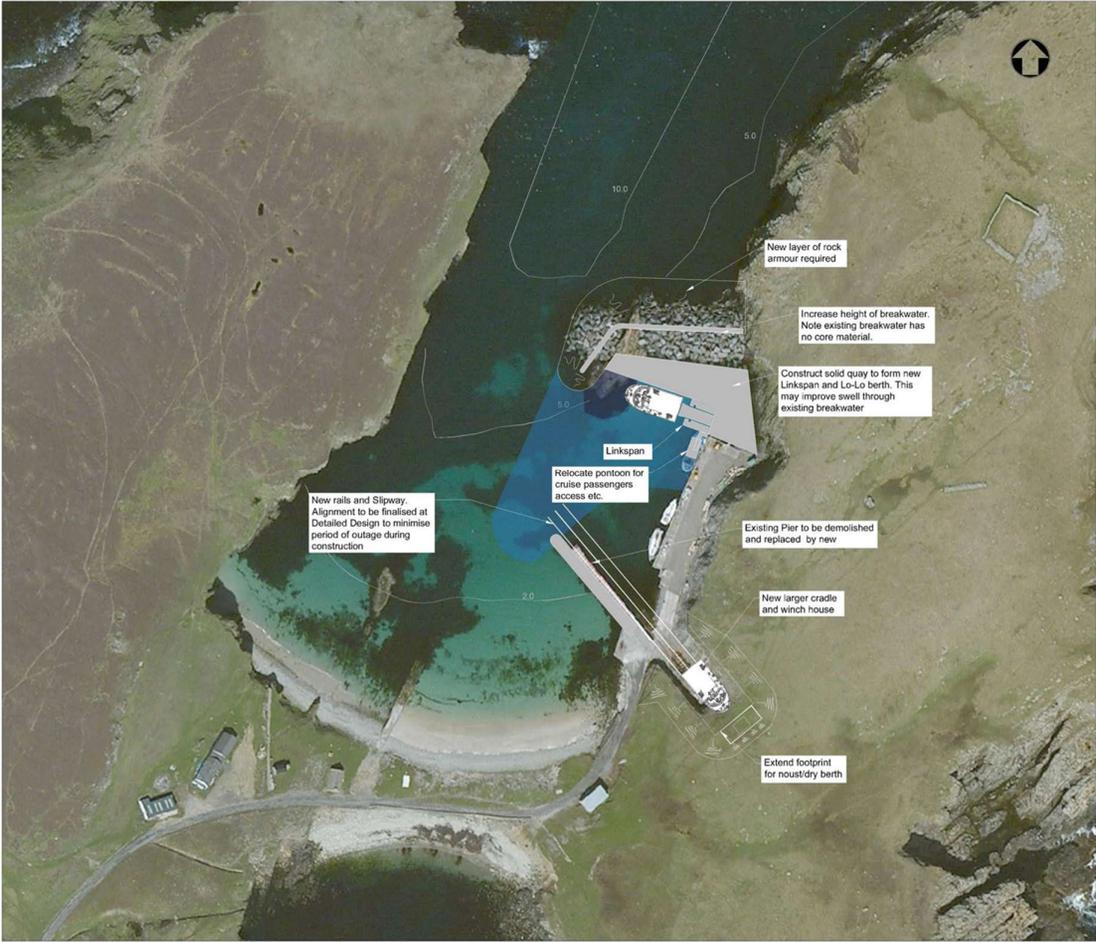
- 3.9.3 The preferred option for Fair Isle is a larger, faster monohull vessel built to modern standards. This new vessel is to be coded as a workboat, limiting the number of passengers to 12. The vessel design will be focused on providing improved passenger comfort and seakeeping, therefore improved reliability.
- 3.9.4 Whilst a preferred vessel is not specified in the business case process, it is necessary at this stage to provide a high-level design vessel as the basis for scoping out necessary infrastructure works. The Norwegian designed and built MD240 is an appropriate high-level design vessel for this stage of the OBC. This vessel is not normally configured as linkspan compatible but the shipyard has confirmed that such a configuration is possible. The vessel normally comes with two cranes - the intention would be to retain one crane for loading goods into the hold and building in flexibility of operation during any periods of linkspan maintenance etc.

Ship-to-Shore Interface

- 3.9.5 The preferred option is to provide a linkspan at both Fair Isle and Grutness. It is anticipated that there will be 2No. small 'Type A' linkspan decks available for use at Fair Isle and Grutness as a result of the Council's planned refurbishment project for 13No. linkspan decks across the wider Shetland network.

Fair Isle Linkspan and Supporting Infrastructure

- 3.9.6 The General Arrangement drawing below shows the proposed marine infrastructure work at Fair Isle.



**Shetland OBC
 Options Development
 Fair Isle
 Ro-Ro Linkspan**

- All levels are to Chart Datum
- Bathymetric information sourced from Beckett Rankine drawing no. 1537-01-201
- Tide Levels:
 - MHWS = 2.2m
 - MLWS = 0.6m
- LAT has been taken as Chart Datum
- Assumed vessel MD240 or similar with:
 - LOA = 23.98m
 - Beam = 11.20m
 - Service Draught = 2.8m
- Dredge level allows for 1m UKC

- Rock dredging to -4.0mCD
- Maintenance dredging to -4.0mCD



Location Plan

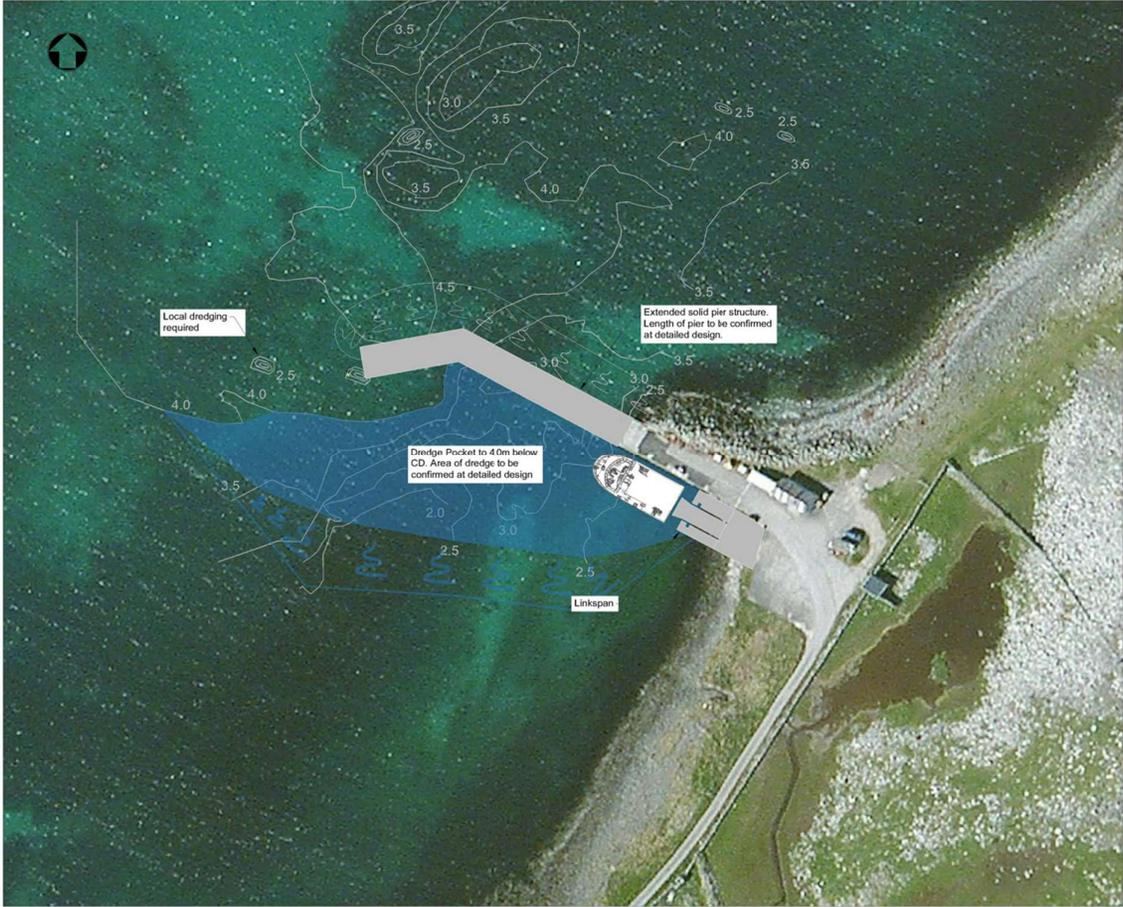


Figure 3.7: Fair Isle – Preferred Infrastructure Option

- 3.9.7 As can be seen from the above figure, it is proposed that the linkspan will be constructed to the north of the existing solid quay, in an east-west orientation. An extension to the north and west of the existing solid quay will provide the vehicular approach to the linkspan and Ro-Ro berth, ensuring appropriate space for vehicle manoeuvring. Due to the proximity of the linkspan to the existing breakwater and the lack of core material within it, the new solid quay structure may further improve conditions on the linkspan berth.
- 3.9.8 In ensuring the operational safety of a linkspan / vessel interface, there is a requirement to ensure suitable wave climate on the linkspan berth. At Fair Isle, it is anticipated that the height of the existing breakwater will require to be increased and an additional layer of rock armour provided on the north face to improve shelter at the new linkspan berth. Wave modelling will be undertaken at the detailed design stage to confirm suitability of the wave climate.
- 3.9.9 Dredging will be required to reduce the level of the rock outcrop located within the existing breakwater. This will allow for 1m under keel clearance for the design vessel.

Grutness Linkspan and Supporting Infrastructure

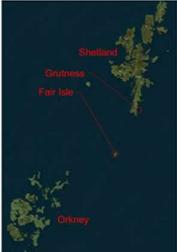
- 3.9.10 The General Arrangement drawing below shows the proposed marine infrastructure work at Grutness.



**Shetland OBC
 Options Development
 Grutness
 Ro-Ro Linkspan**

- All levels are to Chart Datum
- Bathymetric information sourced from Shetland Islands Council drawing no. SM6-1-100
- Tide Levels:
 - MHWS = 1.8m
 - MLWS = 0.4m
- LAT has been taken as Chart Datum
- Assumed vessel MD240 or similar with:
 - LOA = 23.98m
 - Beam = 11.20m
 - Service Draught = 2.8m
- Dredge level allows for 1m UKC, bed understood to be soft material therefore bed overdredged to minimise need for maintenance dredging

■ Dredging to -4.0mCD



Location Plan



Figure 3.8: Grutness – Preferred Infrastructure Option

- 3.9.11 At Grutness, it is proposed that the linkspan will be constructed to the south-east of the existing berth. An extension to the north-west of the existing solid quay and rock armour protection to the north will improve shelter on the linkspan berth. It is anticipated that general repairs and refurbishment will be required to the existing solid quay.
- 3.9.12 Dredging will be required along the existing and extended solid quay to provide 1m under keel clearance for the design vessel.

Overnight Berth

- 3.9.13 The preferred option is to upgrade the current overnight berthing arrangement at Fair Isle for the design vessel.
- 3.9.14 The noust will be extended and will be accompanied by the provision of a new winch, winch house and cradle. The alignment of the finger pier, slipway and rails will be confirmed at detailed design stage to minimise the period of outage during construction.

3.10 Options Appraisal

- 3.10.1 This section revisits the appraisal of options undertaken in the SOBC. As the study has arrived at a preferred option through a logic-based process of elimination, this element of the appraisal is largely a 'validation' exercise to ensure that the preferred option aligns with the TPOs, the STAG Criteria and is acceptable to the public.

Transport Planning Objectives

- 3.10.2 Table 3.4 reassesses the performance of each option against the TPOs. All options are compared against the present-day situation.

Table 3.2: Fair Isle Capital Options – Appraisal against Objectives

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for- like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
<i>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.</i>	○	✓✓	✓
<i>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.</i>	○	✓	✗
<i>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.</i>	✓	✓	✗
<i>TPO4: The level of connectivity provided should minimise the variation within and between weekdays, evenings, Saturdays and Sundays.</i>	○	○	○
<i>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.</i>	○	○	○

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

- The replacement of the MV *Good Shepherd IV* with a like-for-like Lo-Lo vessel (**Do Minimum**) would represent a continuation of the current day position, albeit the higher speed of the vessel may permit the service to work within tighter weather windows, thus increasing frequency.
- A Fair Isle based Ro-Ro (**Option 1**) would offer the most significant benefits in terms of the objectives. The primary benefit is the ability to convey wheeled freight, which would remove the dependence on a weight limited crane, thus offering a moderate capacity benefit. A modern and faster Ro-Ro vessel would also facilitate the operation of more connections through reducing both journey and turnaround times, allowing the service to operate within a tighter weather window.
- Finally, **Option 2** would offer a capacity benefit through removing the dependency on a weight limited crane. However, the loss of flexibility from having an island-based vessel would likely lead to a reduction in connections and would thus be highly negative for Fair Isle.

Key Point: An appraisal of the options against the TPOs suggest that the preferred option – a Fair Isle based Ro-Ro service – would contribute most significantly to the objectives. Combining this option with the proposed enhanced air services would significantly enhance the transport connectivity of Fair Isle

STAG Criteria

3.10.4 This section briefly revisits the appraisal of the options against the STAG criteria. In moving the appraisal beyond the SOBC stage, the sub-criteria under each heading will be considered here.

Environment

Table 3.3: Fair Isle Capital Options – Environment Sub-Criteria

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
Noise & Vibration	✘	✘✘	○
Global Air Quality	○	○	○
Local Air Quality	✘	✘	○
Water Quality, Drainage & Flood Defence	✘	✘✘	○
Geology	○	○	○
Biodiversity & Habitats	✘	✘✘	○
Landscape	○	○	○
Visual Amenity	○	○	○
Agriculture & Soils	○	○	○
Cultural Heritage	○	○	○
Overall Assessment	✘	✘	○

3.10.5 The key points from the above table are as follows:

- **Option 2** is predominantly a vessel-based solution with minimal harbour works beyond replacing life-expired infrastructure. It is therefore neutral from an environmental perspective.
- The **Do Minimum** and **Option 1** would have short-term negative environmental impacts associated with widening the noust (which would require blasting) and, for the latter options, further developing the breakwater in North Haven. Overall, however, these impacts are likely to be short-term only and will be managed through the consenting process.

Safety

Table 3.4: Fair Isle Capital Options – Safety Sub-Criteria

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
Accidents	✓	✓✓✓	✓
Security	○	○	○
Overall Assessment	✓	✓✓✓	✓

3.10.6 The key points from the above table are as follows:

- The **Do Minimum** and **Option 2** would offer a minor benefit in terms of the accidents sub-criterion. A new vessel would be built to modern standards and designed to meet the needs of the Fair Isle route.
- However, from a safety perspective, the deployment of a Ro-Ro vessel (**Option 1**) would be transformative for Fair Isle. As well as meeting all modern standards, the vessel would address the risks associated with crane-based operation, both in terms of vessel stability and the movement of goods from a moving vessel onto the quayside. Moreover, the risks associated with passenger access would be addressed through allowing step-free access via the linkspan.

Economy

Table 3.5: Fair Isle Capital Options – Economy Sub-Criteria

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
Transport Economic Efficiency (TEE)	✓	✓✓	✗
Wider-Economic Impacts	○	✓	✗
Overall Assessment	✓	✓✓	✗

3.10.7 The definition of ‘Economy’ benefits in the STAG guidance is not entirely relevant in the context of Fair Isle. TEE benefits typically generated through journey time savings and, in the context of public transport, a higher frequency service which offers journey time benefits through reducing wait times. Wider-economic impacts only tend to be manifested in the largest schemes and reflect improvements in productivity and labour market impacts as a result of transport investment bringing places ‘closer’ together. The above table does identify TEE and WEI benefits for the options, but these have to be considered in the context of Fair Isle only. The key points of note are as follows

- TEE benefits in this context would be derived through a faster vessel offering shorter sailing times and a more reliable vessel facilitating the operation of additional connections. The **Do Minimum** would record a minor benefit but **Option 1** would record a larger benefit because the reduction in turnaround times would allow the service to operate within tighter weather windows, thus offering greater scope for increasing frequency.
- Option 2** would record a minor negative in terms of the TEE sub-criterion. Whilst any new vessel would be faster, the withdrawal of the vessel from Fair Isle would significantly reduce operational flexibility and is likely to reduce the overall number of connections.
- The deployment of a Ro-Ro vessel (**Option 1**) would be beneficial for Fair Isle in terms of wider economic impacts. It would support the island supply-chain and facilitate greater use of the ferry by passengers travelling to and from Fair Isle. The opposite is true with a mainland-based vessel (**Option 2**), where the loss of flexibility would introduce additional uncertainty and also lead to the loss of critical island employment (which may in turn prompt out-migration from the island).

Integration

Table 3.6: Fair Isle Capital Options – Integration Sub-Criteria

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
Transport Integration	○	○	○
Transport & Land-Use Integration	○	✓	○
Policy Integration	✓	✓✓	✗
Overall Assessment	✓	✓✓	✗

3.10.8 The key points from the above table are as follows:

- Retaining any future vessel on-island (**Do Minimum and Option 1**) would record a positive in terms of policy integration. As well as supporting the Fair Isle Development Plan, an on-island vessel would support a wide range of other local and national objectives focused on sustaining and developing island communities. The Ro-Ro solution (**Option 1**) would record a moderate positive as it would provide a greater range of benefits for Fair Isle than the continuation of Lo-Lo. The withdrawal of the vessel from Fair Isle (**Option 2**) would be negative from a policy perspective, undermining the FIDP and threatening the sustainability of Fair Isle.
- A Ro-Ro solution (**Option 1**) would record a minor benefit in terms of transport and land-use integration. Fair Isle requires new housing and the refurbishment of existing crofts but the evidence suggests that the current vessel acts as a constraint in achieving this objective. A Ro-Ro vessel would address this challenge to some extent through allowing goods such as building materials to be driven onto the vessel rather than being craned on.

Accessibility and Social Inclusion

Table 3.7: Fair Isle Capital Options – Accessibility and Social Inclusion Sub-Criteria

	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
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	Do Minimum: Replace the MV <i>Good Shepherd IV</i> with a like-for-like, but materially faster vessel	Option 1: Replace the MV <i>Good Shepherd IV</i> with a bespoke Ro-Ro vessel	Option 2: Replace the MV <i>Good Shepherd IV</i> with a bespoke mainland based Lo-Lo service
Community Accessibility	O	O	O
Comparative Accessibility	✓	✓✓✓	✓
Overall Assessment	✓	✓✓✓	✓

3.10.9 In terms of accessibility, any new vessel would be built to modern design standards and thus access arrangements would be improved when compared to the MV *Good Shepherd IV*. However, a Ro-Ro vessel (**Option 1**) would be transformative in this respect, offering step free access to the vessel via the linkspan. This is a key issue given the ageing population on Fair Isle.

Key Point: A review of the options against the STAG criteria highlights that the preferred option – replacing the MV *Good Shepherd IV* with a Ro-Ro vessel – performs most favourably against the STAG criteria.

Public Acceptability

3.10.10 In order to gauge public opinion of the options developed, a public exhibition was held in Fair Isle on 29th May 2019. The study process and options, together with our recommendation on the preferred option, was presented on display boards. Members of the public were invited to view the material, discuss the options with the team and complete a short feedback form. Some 40 Fair Isle residents attended the consultation (almost the entire adult population of the island), of which 24 completed the feedback form.

3.10.11 Respondents to the feedback form were specifically asked whether they agreed with the preferred option. There was universal agreement with the proposed preferred option – of particular importance to residents are the proposals to: retain the vessel on-island; improve access to the vessel through boarding via the linkspan; and offer a faster and thus potentially more reliable crossing. There was a desire to ensure that vehicle access to the island by non-residents is controlled.

3.11 Summary

3.11.1 The Strategic and Socio-Economic Cases have confirmed the requirement for investment in a new vessel and supporting marine infrastructure for Fair Isle. The preferred option package can be summarised as follows:

- Procurement of a new and faster monohull Ro-Ro ferry, which will operate under the Workboat classification (i.e. less 24m length overall and a maximum of 12 passengers). The vessel will overnight in, and be crewed from, Fair Isle.
- The provision of crew training on the new vessel and joint development of a long-term crew Succession Plan by the Fair Isle community and the Council.
- Upgrading of the slipway and cradle and widening of the noust at Fair Isle, so as to provide a secure overnight berth for the ferry.
- Construction of a new solid quay to form a linkspan berth at Fair Isle. This will be accompanied by increasing the height of the current breakwater.
- At Grutness, an extended solid pier structure and installation of a linkspan.