

Bluemull Sound
Final STAG Report

ZetTrans
September 2008

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1. Introduction

1 Introduction

1.1 Introduction

Zetland Transport Partnership (ZetTrans) has commissioned Faber Maunsell to undertake a Scottish Transport Appraisal Guidance (STAG)¹ assessment to examine options for the future transport links across Bluemull Sound, connecting the North Isles of Unst, Fetlar and Yell. These links have been faced with a number of issues, the central focus of which concerns the ageing infrastructure and the potential inoperability of the transport link in the medium- and long-term. This study follows the STAG Part 1 study which was completed in June 2008.

The study aims *'To identify means of providing sustainable efficient transport links across Bluemull Sound for the long-term and identify the most appropriate actions to carry forward to implementation for the benefit of Shetland as a whole.'*²

This report examines the transport options identified for further analysis in the STAG Part 1 report³ and outlines the steps and analysis taken within the entire STAG process in order to reach a preferred option to be considered for funding.

1.2 STAG Appraisal

STAG is the official appraisal framework adopted by the Scottish Government to aid transport planners and decision-makers in the development of transport policies, plans, programmes and projects in Scotland. It is a requirement that all transport projects for which Scottish Government support or approval is required, are appraised in accordance with STAG.

STAG has three parts:

- Pre-Appraisal: project objectives are established with key stakeholders; an analysis of present and future problems, constraints and opportunities; and option generation sifting and development;
- Part 1 report: initial appraisal and broad assessment of impacts, designed to decide whether a proposal should proceed, subject to meeting the planning objectives and fitting with relevant policies; and
- Part 2 report: detailed appraisal of the options taken forward from the Part 1 appraisal with specific consideration to the Government's objectives, cost to government and risk and uncertainty.

1.3 Structure of Report

This report provides details of the STAG process undertaken to assess the future transport links across Bluemull Sound. This is set out within the following Chapters:

- Chapter 2 – Background and Study Context;
- Chapter 3 – Statutory Context;
- Chapter 4 – Analysis of Existing and Potential Problems and Opportunities;
- Chapter 5 – Objectives;
- Chapter 6 – Option Generation and Sifting;
- Chapter 7 – STAG Part 1 Appraisal;

¹ Transport Scotland, *Scottish Transport Appraisal Guidance*, May 2008

² The study aim was agreed by the Bluemull Sound STAG Group. Appendix A provides an overview of the role of this group in the study

³ Chapter 7 provides a summary of the STAG 1 Appraisal undertaken for this study

- Chapter 8 – Option Development;
- Chapter 9 – Environment;
- Chapter 10 – Safety;
- Chapter 11 – Economy;
- Chapter 12 – Accessibility and Social Inclusion;
- Chapter 13 – Integration;
- Chapter 14 – Costs and Deliverability;
- Chapter 15 – Risk and Uncertainty;
- Chapter 16 – Monitoring and Evaluation; and
- Chapter 17 – Conclusions and Recommendations.

This Final STAG Report is supported by an accompanying appendices report, which contains the following:

- Appendix A – Summary of Consultation Activity;
- Appendix B – Ferry Users Survey;
- Appendix C – Sample Timetables;
- Appendix D – Terminal and Tunnel Designs;
- Appendix E – STAG Part 1 Appraisal Summary Tables;
- Appendix F – STAG Part 2 Appraisal Summary Tables;
- Appendix G – Environmental Appraisal; and
- Appendix H – Assumptions and Calculations.

2. Background and Study Context

2 Background and Study Context

2.1 Introduction

The following chapter provides an overview of the study area, in the context of Shetland. It details the existing transport connections related to the North Isles, prior to examining the population and economic context of the three islands.

2.2 Shetland

The Shetland Islands are located 240 km north east of the Scottish Mainland. There is over 1440 km of coastline covered over 100 islands. The main town in the Shetland Islands is Lerwick, which is located on Shetland Mainland. Lerwick is the main focus for commercial, administrative and servicing activity on the island, and is where the largest concentration of population exists. External air links to and from Shetland are provided from Sumburgh Airport, whilst ferry links to and from Shetland (principal destination is Aberdeen via Kirkwall) are provided from Lerwick.

2.3 Bluemull Sound and the North Isles

The focus of the study is Bluemull Sound, a relatively narrow stretch of water which effectively divides the North Isles of Unst, Fetlar and Yell. The largest of these islands, Yell, is located three km north of Shetland Mainland, a 20 minute ferry crossing. Unst is located to the north-east of Yell, whilst Fetlar is located to the east of Yell, and the south of Unst. At its narrowest point, Bluemull Sound is approximately 1 km wide. The ferry route between Gutcher (Yell) and Belmont (Unst) is some two km in length (just over 1 nautical mile), and takes ten minutes. The crossing is relatively sheltered.



Photo 2.1 – Gutcher ferry terminal, Bluemull Sound

The ferry route to Hamars Ness (Fetlar) is around 6 km (3.2 nautical miles) in length, and from either Gutcher or Belmont the crossing takes around 25 minutes. This crossing is more exposed.



Photo 2.2 – Fetlar crossing, Bluemull Sound

The North Isles are characterised by cliffs, beaches, peat bog, farmland, heathery hills, and moorlands. Fetlar is also a Site of a Special Scientific Interest (SSSI), and other localised SSSI's / designated sites are present in the vicinity of Bluemull Sound.

The North Isles support a number of settlements. On Unst, these include Baltasound, Uyeasound and Haroldswick. Fetlar supports a relatively dispersed population with the main centre of population being Houbie. The main settlements on Yell are Burravoe, Aywick, Mid Yell, and Cullivoe.

2.4

Shetland's Internal Ferry Services

Shetland Islands Council operates a fleet of 12 ferries providing lifeline services between Shetland Mainland and the islands. The services run from 15 terminals serving eight islands with a total population of just under 3,500 people. Figure 2.1 shows the existing ferry services that operate throughout the islands.

The most important ferry services in terms of utilisation are Yell (Toft-Ulsta), Bressay (Lerwick-Bressay), Whalsay (Laxo/Vidlin-Symbister), Unst (Gutcher-Belmont) and Fetlar (Gutcher/Belmont-Hamars Ness). Table 2.1 shows recent carryings on these five key routes.

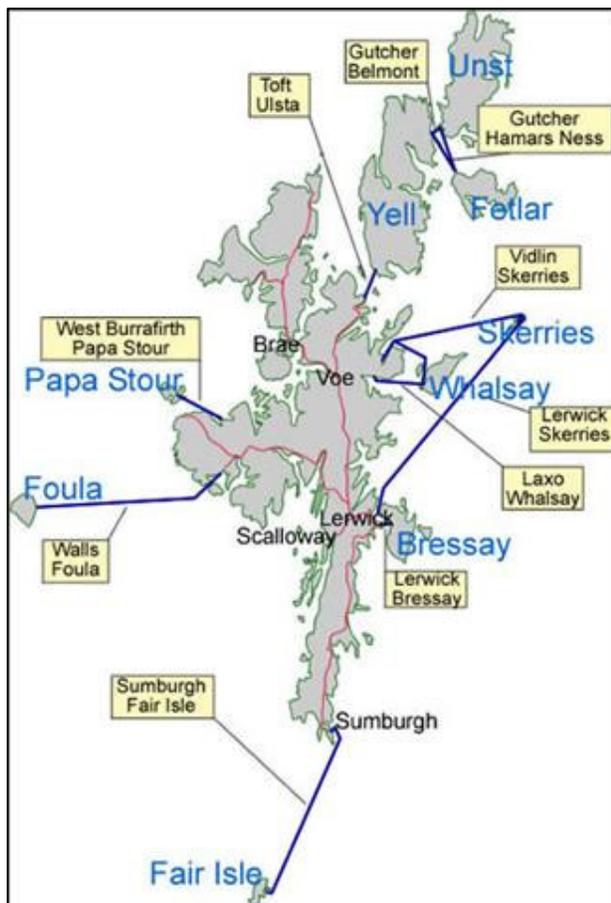
Table 2.1 – Recent carryings on selected routes

Island	Route	2006 Passengers (000s)	2006 Cars (000s)
Bressay	Lerwick-Bressay	207.9	65.5
Fetlar	Bluemull Sound	20.5	9.9
Unst	Bluemull Sound	117.9	56.4
Whalsay	Laxo/Vidlin-Symbister	169.2	73.2
Yell	Toft-Ulsta	245.0	115.4

Source: Scottish Transport Statistics 26, 2007 Edition

While the figures presented above underline the importance of the Toft-Ulsta route, they also highlight that the Gutcher-Belmont route is the fourth busiest. However, there is an important relationship between the Bluemull Sound services and the Yell Sound service, as the Toft-Ulsta service carries not only Yell passengers and vehicles, but also many of those passengers and vehicles using the Bluemull Sound services. Two new vessels were introduced onto the Yell Sound route in the summer of 2004 and this route has also benefited from terminal upgrades.

Figure 2.1 – Map of Shetland Inter-Island Ferry Services



2.5

Bluemull Sound Ferry Service

The Bluemull Sound ferry link has a timetabled journey time of 10 minutes (Gutcher-Belmont) and 25 minutes (Gutcher/Belmont-Hamars Ness), which extends to 35 minutes when the ferry travels to Fetlar via Yell/Unst.

There are typically between five and nine sailings per day from Hamars Ness, depending on the day of the week and season. Some of these sailings call at Belmont (Unst) prior to a departure to Yell.

In periods of strong winds and swell, the ferry can experience difficulties berthing at Hamars Ness because there is not a breakwater. Furthermore, due to the lack of a breakwater at Hamars Ness, the ferry is unable to berth overnight on Fetlar in inclement weather.

The ferry service between Gutcher and Belmont is more frequent than the Gutcher-Hamars Ness service. This runs approximately half-hourly during peak travel periods, and nearly hourly during off-peak periods.

In addition, with no fares on the current Bluemull Sound service, an additional morning departure from Fetlar (to Yell) is enabled under the summer timetable between Tuesday and Saturday. This is conditional on clement weather conditions (in the absence of a breakwater at the Hamars Ness terminal), to allow the Day Vessel to berth overnight on Fetlar.

However, a single vessel service operates for a period on Mondays, when both the Shift Vessel and the Day Vessel undergo maintenance at Cullivoe Harbour in Yell. A single vessel service also operates all day on Sundays during the summer.

With regard to the winter timetable, a single vessel service operates for the whole of the weekend. The additional morning departure from Fetlar to Yell (available in the summer) is not part of this timetable, as frequent inclement weather prohibits the vessel from berthing overnight at Hamars Ness during the winter months.

There is thus a general reduction in service levels under the winter timetable, compared with the summer timetable.

2.5.2

Vessels

As stated above, the Bluemull Sound ferry service is currently typically operated by two vessels. These are the Shift Vessel *MV Bigga* (16 vehicle capacity) and the Day Vessel *MV Geira* (11 vehicle capacity). Relief vessels on the route are typically *MV Fivla*, *MV Thora* and *MV Hendra*. A profile of these vessels is provided within Table 2.2 below.

Table 2.2 – Vessel Profiles

Vessel	Current Vehicle Capacity (PCUs)	Maximum Passenger Capacity (Gutcher-Belmont route)	Maximum Passenger Capacity (Fetlar route)	Year of Construction
<i>MV Bigga</i>	16	96 (year round)	96 (summer) 50 (winter)	1991
<i>MV Geira</i>	11	96 (summer) 92 (winter)	87 (summer) 50 (winter)	1988
<i>MV Fivla</i>	11	95 (summer) 92 (winter)	75 (summer) 50 (winter)	1985
<i>MV Thora</i>	6	93 (year round)	93 (summer) 50 (winter)	1975
<i>MV Hendra</i>	14	95		1982

Photos of *MV Bigga* and *MV Geira* are provided below.



Photo 2.3 – *MV Bigga* at Belmont, Unst



Photo 2.4 – *MV Geira* on Bluemull Sound

2.5.3

Terminals

Three ferry terminals are utilised by the Bluemull Sound service: Gutcher (Yell), Belmont (Unst) and Hamars Ness (Fetlar).

Facilities at these terminals include electronic variable message signs (to inform passengers of ferry information), waiting areas, parking facilities and toilets. There is also a privately run café near the ferry terminal at Gutcher. The Gutcher and Belmont terminals opened in the 1970s and were designed for the first generation of ferries. The original ferry terminal on Fetlar was at Oddsta but this was relocated to a new terminal at Hamars Ness in 2004.

2.5.4 *Road Access*

Access to the ferry terminal at Gutcher is via the main A968 spine route, which runs the length of the islands. Similarly, access to Belmont is formed by the continuation of the A968. Access to the Hamars Ness terminal is formed by a minor road (2km in length) which links to the B9088. The terminal is some 7 km from the settlement of Houbie.

2.5.5 *Public Transport*

Bus services in the North Isles are provided by ZetTrans and operated by a number of local bus service operators. The Integrated Bus/Ferry Service (No.24) to/from Unst, Fetlar and Yell and Lerwick operates once per day Monday-Saturday, with an arrival in Lerwick mid morning, and a departure from Lerwick mid-afternoon. A single fare from Belmont, Hamars Ness, Cullivoe or Gutcher to Lerwick is £4.20. Additional services are also available which enable connections with the ferry services outwith the designated timetable for Service 24.⁵ These provide a morning departure from Lerwick.

Within the North Isles, public transport is available primarily on Yell though there are also some services on Unst.

Public transport provision on Fetlar was previously limited to a Post Car operated by the Royal Mail, which seats were available on, subject to availability. The Post Car could not deviate from the defined set route. However, a Dial-a-Ride service has recently been introduced on Fetlar and this gives residents on the island greater travel flexibility. This service provides connections to the southbound Integrated Bus/Ferry Service to Lerwick and is also available to collect passengers at the Hamars Ness ferry terminal upon their return to Fetlar.

An overview of public transport services to and from the North Isles, and a detailed assessment of bus service connections with the Bluemull Sound and Yell Sound ferry services is provided in Chapter 12.

2.6

Carryings Analysis

Analysis of route characteristics was undertaken to ascertain the extent of vehicular and passenger demand for the service. Table 2.3 below presents historic trends on the route.

Table 2.3 – Bluemull Sound Service: Historic Trends (1999-2006)⁶

Year	Number of sailings	Passenger carryings	Passenger capacity utilisation	Passenger Car Equivalent Units	Vehicle Deck Utilisation
1999	21637	123,634	6%	68,259	29%
2000	18806	134,596	6%	79,045	32%
2001	21226	128,569	7%	77,547	34%
2002	20979	141,222	7%	79,889	35%
2003	20606	145,583	8%	85,947	39%
2004	20738	145,324	8%	86,712	38%
2005	20003	138,584	8%	83,261	36%
2006	19690	141,875	8%	89,743	36%

⁵ See Chapter 12, Tables 12.2 and 12.3

⁶ BM Consulting, Analysis of Carryings and Performance data on Inter-Island Ferry Services 1998 to 2006

In addition, Figure 2.3 presents PCUs (Passenger Car equivalent Units)⁷ on the route for every month throughout 2006.

Figure 2.3 – Bluemull Sound Monthly PCUs, 2006

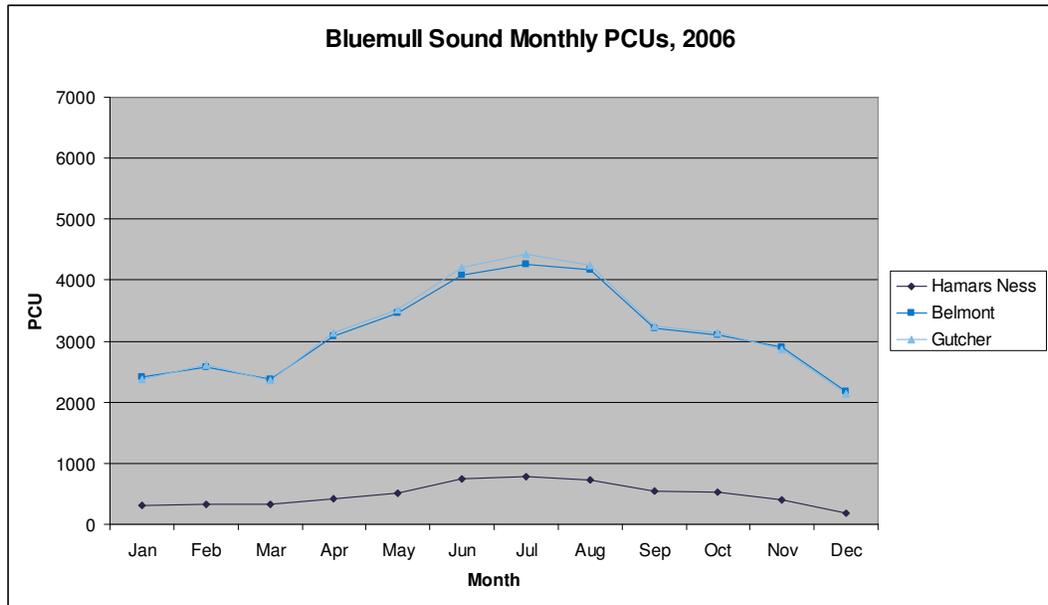
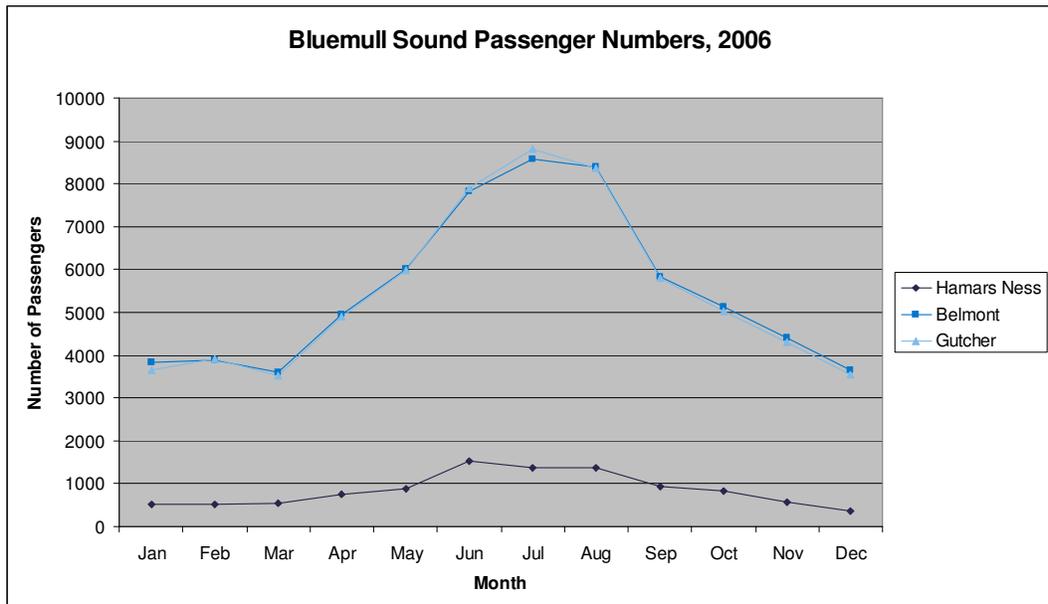


Figure 2.3 indicates that vehicular demand is seasonal, with the number of vehicles on the route peaking in the summer months. Passenger demand is also seasonal, although the summer peak in passenger numbers is more pronounced than that for vehicular demand, as evidenced by Figure 2.4 below.

Figure 2.4 – Bluemull Sound Passenger Numbers, 2006

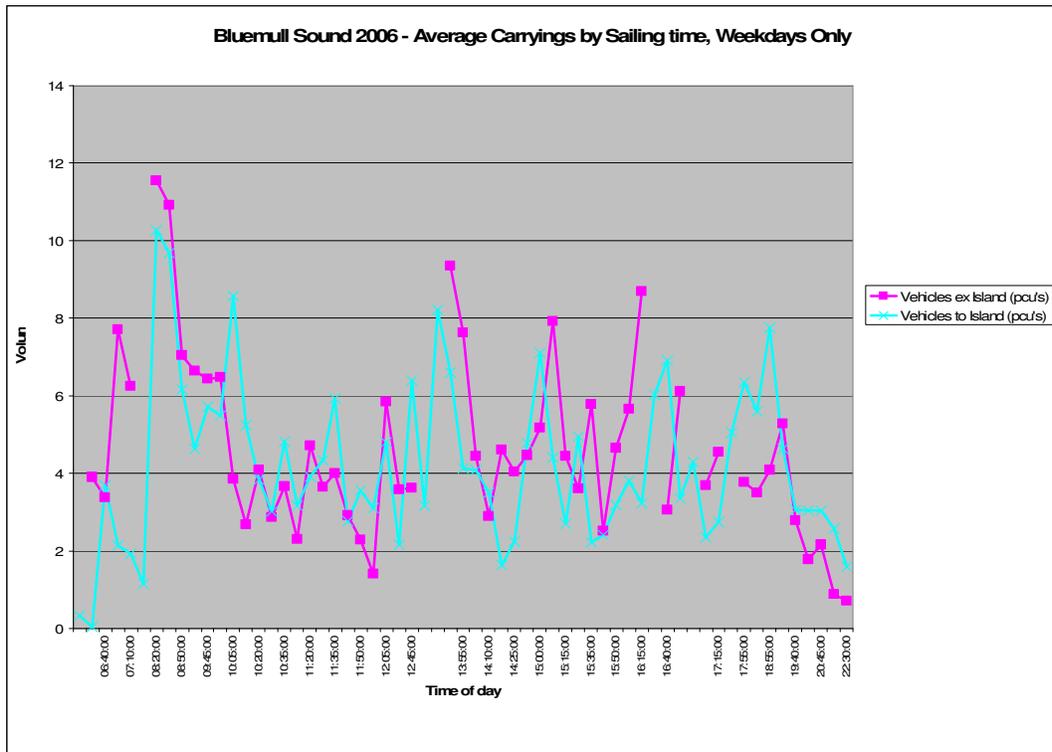


Carriings on the Bluemull Service (ex all islands) has all been assessed across the average 2006 weekday (see Figure 2.5). This analysis shows that the peaks occur on the morning

⁷ PCUs are used to convert the varying range and size of vehicles typically carried on the ferry network into a consistent and uniform basis. See ⁶ for conversion factors used.

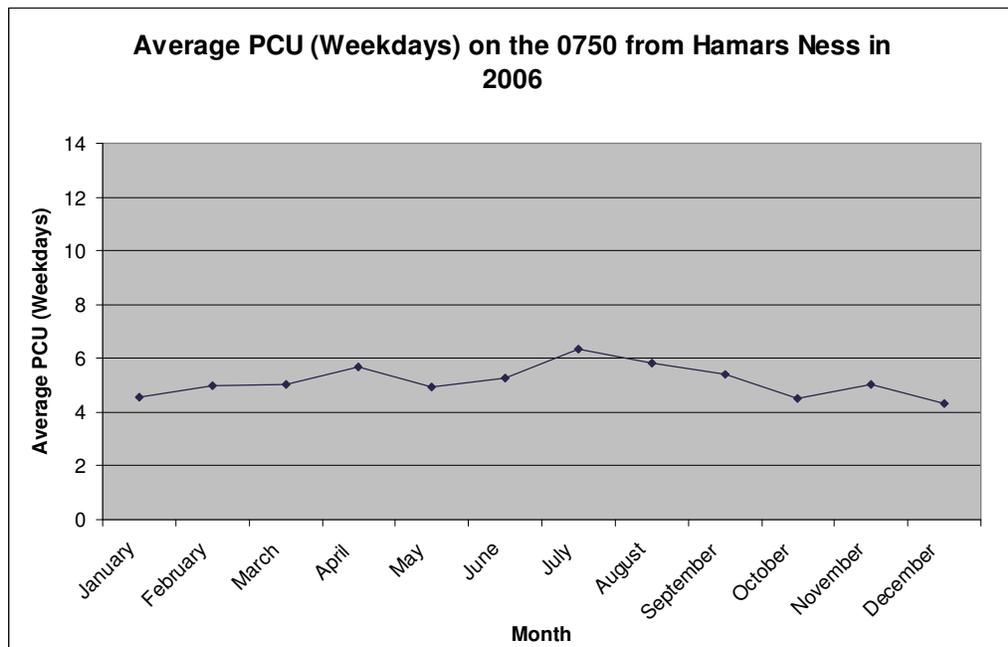
departures, and after the lunch break. Demand during the afternoon and evening peaks appears more evenly spread.

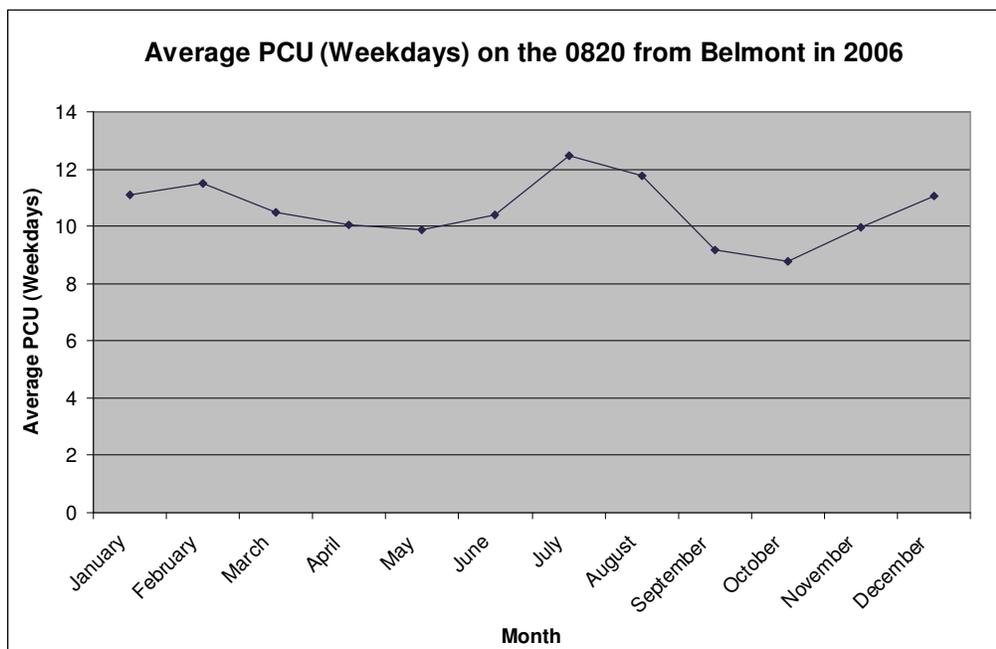
Figure 2.5 – Average Carryings by Sailing time (Weekdays)



Further analysis has also been undertaken on the key morning peak sailings on the route. These are the 0750 departure from Hamars Ness and the 0820 departure from Belmont. Figure 2.6 presents average PCU on weekdays for each of these two sailings throughout 2006.

Figure 2.6 – Average PCU (Weekdays) on the 0750 (Hamars Ness) and 0820 (Belmont) in 2006



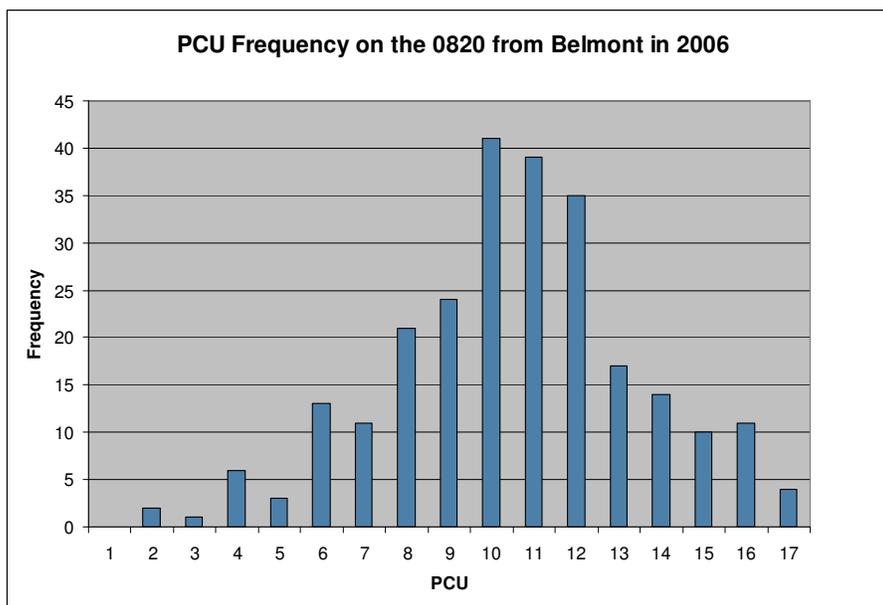


Carrying capacity on the 0820 departure is exacerbated as this is the vessel which departs from Hamars Ness at 0750 via Belmont to Gutcher, and so prior to departure from Unst, it already has a complement of vehicles from Fetlar on board.

In addition, it can be seen that average PCU peaks on both sailings in the month of July. This analysis is consistent with comments raised during consultation which stated that the service can experience capacity constraints at peak times and in the summer months. *MV Bigga* typically operates on the Bressay route in June and July to relieve *MV Leirna* during her annual overhaul.⁸

The extent of carrying capacity constraints on the 0820 departure from Belmont is examined further in Figure 2.7.

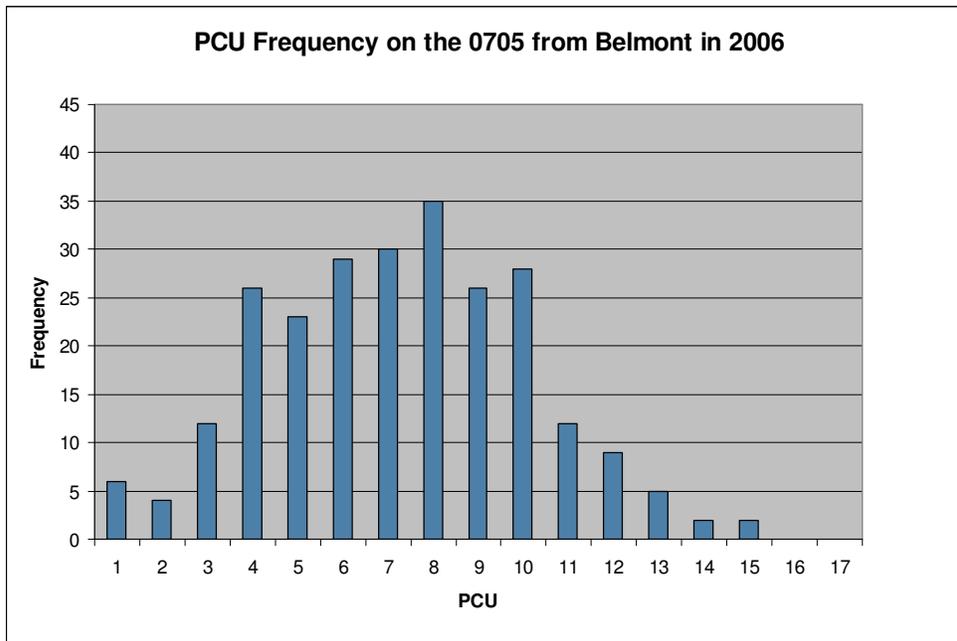
Figure 2.7 – PCU Frequency on the 0820 from Belmont in 2006



⁸ See Chapter 4 (Section 4.8) for further information

Figure 2.7 highlights that over the course of 2006, a high frequency of sailings departing Belmont at 0820 had a PCU of between 10 and 12. Figure 2.8 presents PCU frequency on the earlier sailing from Belmont at 0705.

Figure 2.8 – PCU Frequency on the 0705 from Belmont in 2006



Analysis of the 0705 departure confirms the 0820 departure as the critical peak sailing, as Figure 2.8 indicates that there is a more evenly distributed PCU frequency on the 0705 sailing.

Furthermore, of the 19,690 sailings made in 2006, 44% (8,654) were on *MV Bigga*, which has a PCU of 16. This means that the remaining 56% of sailings were on either *MV Geira* or *MV Fivla*, which only have PCUs of 11.

Capacity issues have also been examined through a review of short-shipped traffic reported on the Bluemull Sound service (that is traffic left at the terminal when the ferry departs), as shown in Table 2.4.

Table 2.4 – Bluemull Sound Service: Short-Shipped Traffic Levels (2001-2006)⁹

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2001							22	99	59	70	47	33	330
2002	N/A												
2003	N/A												
2004	25	39	36	13	50	96	100	57	29	33	17	13	508
2005	11	34	43	22	41	147	47	33	75	34	11	6	504
2006	7	34	20	13	12	18	48	47	11	5	4		219

While it is relatively difficult to make any firm conclusions from the limited data available on short-shipped traffic, it is apparent that levels of short-shipped traffic tend to be highest during

⁹ BM Consulting, Analysis of Carrying and Performance data on Inter-Island Ferry Services 1998 to 2006

the summer months (June, July and August). This provides further evidence that vehicular demand on the route, like passenger demand, is seasonal, and concentrated in the summer.

In reviewing short-shipped traffic, consideration was also given to the results of a ferry user survey undertaken as part of this study. Surveyors recorded three sailings between their survey period (06.30 to 14.00) when the ferry departed with vehicles left at the terminal. These sailings were the 10.05 from Yell to Unst (1 vehicle was left at the terminal), the 11.20 from Yell to Unst, (although it was not noted how many vehicles remained at the terminal), and the 14.00 from Unst to Yell (3 vehicles were left at the terminal).

Overall, this analysis of carryings on the Bluemull Sound route has shown that there are capacity constraints on peak services such as the 0820 service from Unst to Yell. It has also been shown that vehicular and passenger demand on the route is seasonal, with vehicle and passenger numbers peaking in the summer months.

2.7

Socio-Economic Analysis

The total population of Shetland was 21,988 at the 2001 census, and 18,606 (85%) are resident on Shetland Mainland. The remaining 3,382 residents are based on the nine islands detailed in Table 2.5. This also shows the resident population levels at the 1981, 1991 and 2001 censuses.

Table 2.5 – Island Population Trends, 1981-2001

Island	1981 Census	1991 Census	2001 Census	20 Year % Population Change
Bressay	334	352	384	+15.0%
Fair Isle	69	67	69	0.0%
Fetlar	101	90	86	-14.9%
Foula	45	42	32	-28.9%
Papa Stour	35	35	24	-31.4%
Skerries	88	87	76	-13.6%
Unst	1,140	1,055	720	-36.8%
Whalsay	1,025	1,041	1,034	+0.9%
Yell	1,191	1,075	957	-19.6%

Source: Shetland in Statistics (2007)

It can be seen that Yell and Unst are the second and third most populated islands respectively (after Whalsay). However, it is noticeable that both Yell and Unst (and Fetlar) have experienced population decline over the last twenty years. Population in Unst has been additionally affected by staged reductions in levels of personnel at of RAF Saxa Vord which has been reducing in size from the early 1990s, through to its eventual closure in March 2006.¹⁰

2.7.1

Population Trends in the North Isles

As highlighted previously, there has been a general trend of depopulation on each of the three North Isles, with the most dramatic decrease in population on Unst due to the progressive closure of RAF Saxa Vord in March 2006.

The population in the North Isles is also ageing. While the median age in Scotland is 38 years, the median ages of Unst, Fetlar and Yell are 41, 46 and 45 respectively.¹¹ The age structure of Unst, Fetlar and Yell at the 2001 census is provided in Table 2.6.

¹⁰ Reference Economics (Nov 2005), "Assessing the Impact of Saxa Vord Job Losses", Report for Shetland Enterprise

¹¹ 2001 Census

Table 2.6 – North Isles Age Structure

Age Category	Percentage of Population at 2001 Census			
	Unst	Fetlar	Yell	Scotland
0-9	13.3%	5.8%	11.4%	11.5%
10-19	9.4%	13.9%	9.9%	12.7%
20-29	9.3%	2.3%	7.7%	12.5%
30-44	23.9%	20.9%	20.8%	23.0%
45-59	23.3%	29.1%	22.2%	19.3%
60-64	5.8%	3.5%	7.4%	5.2%
65-74	7.1%	15.1%	11.3%	8.8%
75-84	5.4%	9.3%	7.1%	5.3%
85-89	1.8%	0%	1.6%	1.2%
90 and over	0.6%	0%	0.6%	0.6%

Source: 2001 Census

Table 2.6 indicates that around 20% of Unst's population is 60 or over, and around 28% of the population of both Fetlar and Yell is over 60. Approximately a fifth of the population on each island is aged under 20.

More recent population figures based on Doctor Registration Areas (2007) indicate that the Unst population stands at 598 with Yell (including Fetlar, where residents of the island are registered) standing at 1,023.¹² However, it is recognised that this is not necessarily a true reflection of the population of each of the islands because residents in the North Isles may be registered with another doctor (e.g. Lerwick), and not in Unst or Yell. Therefore, they would not be included in population figures based on Doctor Registration Areas.

Comparing the population age structure of the North Isles against national levels also provides support for the contention that the North Isles has an ageing population. As Table 2.6 shows, for example, the number of residents aged between 45 and 59 is considerably higher in each of the North Isles than in Scotland as whole. The same also generally applies for the other 'older' age rang' categories e.g. 65-76, 75-84 and 85-89.

Further evidence of an ageing population structure, in Unst specifically, was also highlighted in a report 'Assessing the Impact of RAF Saxa Vord Job Losses'¹³. Comparison of Unst's age structure in 1991 and 2001, as shown in Table 2.7, reveals that the proportion of the island's population aged from 45-64 and 65+ has increased between 1991 and 2001. It is also noticeable that the proportion of residents aged between 16 and 29 substantially decreased between 1991 and 2001, which further suggests Unst has an ageing population and has struggled to retain younger members of society on the island.

Table 2.7 – Comparison of Unst's Population Structure, 1991–2001

Unst Population Composition: 1991 & 2001			
Age Group	Structure		Absolute Change
	2001	1991	
0-4	6%	8%	-45
5-15	15%	15%	-49
16-29	11%	25%	-184
30-44	24%	22%	-64
45-64	29%	18%	15
65+	15%	11%	-10
Total	100%	100%	-337

Source: Assessing the Impacts of RAF Saxa Vord Job Losses, November 2005

¹² Shetland in Statistics (2007)

¹³ Reference Economics (Nov 2005), "Assessing the Impact of Saxa Vord Job Losses", Report for Shetland Enterprise

A comparison of census statistics between 1991 and 2001 for the North Isles also provides evidence that the North Isles population structure is ageing. For example, the proportion of residents of retirement age and over on Unst and Yell increased by 5.4% and 4.7% respectively (against a national increase of 0.4%). Corresponding to the trends of an ageing population, the proportion of residents on Unst, Yell and Fetlar aged under 16 decreased between 1991 and 2001, with Unst recording a decrease of 2.2%, Fetlar a decrease of 7.8% and Yell a decrease of 1%. Scotland as a whole recorded an average decrease of 1% of residents aged under 16 over the same period.

Table 2.8 – Comparison of North Isles Population Structure, 1991–2001

	Percentage in age group			
	Under 16		Retirement age & over	
	2001	1991	2001	1991
Unst	21.1%	23.3%	17.9%	12.5%
Fetlar	14.0%	21.8%	26.7%	32.2%
Yell	18.7%	19.7%	24.3%	19.6%
Scotland	19.2%	20.2%	18.6%	18.2%

Source: Scotland's Census 2001: Statistics for Inhabited Islands, GROS Occasional Paper No.10, November 2003

2.7.2

Housing

In the North Isles in 2006, there was a total of 807 privately owned dwellings and 145 local authority or housing association dwellings.¹⁴ This makes up 10.1% and 6.6% respectively of the Shetland total. The North Isles comprises 7.9% of Shetland's total population, so it can be concluded that a higher proportion of people in the North Isles live in private dwellings than rented accommodation compared to Shetland as a whole. Table 2.9 below offers a breakdown in housing type for each of the North Isles.

Table 2.9 – Profile and Number of Dwellings in the North Isles

Island	Private dwellings	Rented dwellings	Total
Unst	349	66	415
Fetlar	40	14	54
Yell	418	65	483

Source: Shetland Islands Council, Local Housing Strategy 2006 Update

House sales in the North Isles are low. Sales in Unst have fluctuated, with 1 or 2 per year in recent years. Sales in Fetlar are very low, with one sale in 2000/2001. Sales in Yell have decreased with none sold in 2005/2006.¹⁵

An analysis of recent Housing Monitor Completion figures for 2007¹⁶ indicates that there have been no completions in Unst and Fetlar, while there have been two in Yell.

2.7.3

Education

"Shetland in Statistics" presents historic school roll data for secondary schools across Shetland. There are a number of schools in the North Isles. Table 2.10 shows the roll at primary and secondary schools in Unst, Fetlar and Yell.

¹⁴ Shetland Islands Council, Local Housing Strategy 2006 Update

¹⁵ Shetland Islands Council, Local Housing Strategy 2006 Update

¹⁶ Shetland Islands Council, Planning

Table 2.10 – North Isles School Rolls

School Roll	1976	1981	1986	1991	1996	2001	2004	2005	2006
Baltasound Junior High (secondary)	58	75	47	33	55	37	37	44	38
Mid Yell Junior High (secondary)	58	48	56	44	55	47	42	52	50
Baltasound Junior High (primary)	100	106	71	85	72	54	60	44	20
Burravoe Primary	31	36	29	32	26	19	14	7	8
Cullivoe Primary	23	24	24	18	15	12	12	15	15
Haroldswick Primary	33	21	30	25	14	-	-	-	-
Fetlar Primary	6	15	9	7	13	4	5	5	4
Mid Yell Junior High (primary)	76	65	53	48	47	49	48	50	47
Uyeasound Primary	27	16	8	9	21	17	10	7	8

Source: Shetland in Statistics (2007)

Table 2.10 shows that the school roll has generally fallen in the last two decades across schools the North Isles. Mid Yell Junior High School is an exception, where primary and secondary enrolment has remained fairly steady for the past 20 years. Baltasound Primary, Burravoe Primary and Uyeasound Primary have had notable decreases in numbers, and Fetlar Primary has been at an all time low of 4 or 5 pupils since 2001 and is due to close when these pupils reach secondary school level unless new families move to the island.

After primary school education, all Fetlar pupils attend Anderson High School in Lerwick as weekly boarders as the ferry timetable is not suited to pupils returning to Fetlar in the afternoon during the winter. All North Isles pupils undertake their Highers at Anderson High School and board there during the week.

2.7.4

Employment and Economic Activity

Of the 1,763 residents in the North Isles, 1,267 are aged between 16 and 74. Table 2.11 provides further detail of the status of these residents.

Table 2.11 – Economic Activity Status of the North Isles Population, Aged 16 to 74

Category	Unst	Fetlar	Yell
Part Time Employed	16.4%	15.2%	15.8%
Full Time Employed	44.1%	28.8%	36.9%
Self Employed	9.6%	16.7%	11.5%
Unemployed	3.7%	6.1%	2.8%
Full Time Students	0.6%	0%	0.4%
Retired	12.7%	19.7%	18.7%
Students	1.4%	0%	0.7%
Looking after home/family	5.7%	6.1%	4.8%
Permanently sick/disabled	3.1%	4.6%	5.2%
Other	2.7%	3%	3.2%
Total Population Aged 16-74	100%	100%	100%

Source: 2001 Census

Key industries in Unst and Yell include agriculture, fishing and aquaculture and there a number of salmon farms in the Bluemull Sound area. The Sellafirth Business Park – funded by Highlands and Islands Enterprise (HIE) and the European Regional Development Fund (ERDF)

– opened in Yell in 2005, with 4 business units. There are five units at the Hagdale Industrial Estate at Baltasound in Unst.

In 2006, the Ministry of Defence withdrew from RAF Saxa Vord, leading to depopulation and fears over the future of the island. In response, the Unst Response Team was set up to encourage economic development on the island, while fares were abolished on the Bluemull Sound ferry service.

There are a number of specialist industries on Unst, including a renewable energy initiative, a brewery and a chocolate factory and the Saxa Vord tourism resort is being developed near Haroldswick. There are a number of tourism opportunities on Unst including the Unst Boat Haven Museum, Unst Heritage Centre and other facilities such as a bistro at Haroldswick. This is in addition to the RSPB reserve at Hermaness, and the range of “Furthest North in the UK” sites.

Crofting is a key industry on Fetlar, while residents are also employed on the Bluemull Sound ferries. Fetlar is also popular with tourists and there is an Interpretative Centre at Houbie. Many also travel to Fetlar for its renowned ornithology. The RSPB have a reserve on the island, where a relatively rare bird species, the red-necked phalarope, can be found.

Table 2.12 provides an overview of employment by industry in the North Isles.

Table 2.12 – Employment by industry for North Isles residents

Sector		% of people aged 16-74 in employment residing in Unst, Fetlar and Yell (n=847)	% of people aged 16-74 in employment residing in Scotland (n=2,261,281)
Percentage of people aged 16 - 74 in employment working in	Agriculture, hunting and forestry	5.4%	2.1%
	Fishing	8.5%	0.3%
	Mining and quarrying	1.8%	1.2%
	Manufacturing	7.6%	13.2%
	Electricity, gas and water supply	1.2%	1.0%
	Construction	7.2%	7.5%
	Wholesale & retail trade, repairs	7.0%	14.4%
	Hotels and restaurants	4.0%	5.7%
	Transport, storage & communications	13.7%	6.7%
	Financial intermediaries	0%	4.6%
	Real estate, renting and business activities	5.9%	11.2%
	Public administration and defence, social security*	12.6%	7.0%
	Education	8.2%	7.3%
	Health and social work	10.6%	12.4%
Other	6.4%	5.3%	

Source: 2001 Census

* It is noted that the RAF base at Saxa Vord on Unst closed down after the 2001 census in March 2006 resulting in a loss of 119 jobs (or 105 full-time equivalent jobs).

It can be seen that residents in the North Isles have a higher than average proportion of the population in industries such as agriculture, fishing and transport, storage and communications, compared with the Scottish average.

2.8

Summary

This Chapter has provided background information on the study area and an overview of the main transport links within the study area. An overview of ferry operations on Bluemull Sound, and throughout the Shetland Islands as a whole, has been presented where it has been shown

that the Bluemull Sound service is a major route within Shetland's internal ferry network. An analysis of carryings on the Bluemull Sound route has also been undertaken and reveals that vehicular and passenger demand on the route is seasonal. It has also been shown that there are capacity constraints on peak commuter services such as the 0820 departure from Belmont. Focus has also centred on the vessels and terminals involved in sustaining these key ferry links between Unst, Fetlar and Yell.

This Chapter has also presented an overview of some of the main socio-economic trends in the North Isles, and has demonstrated that the populations of Unst, Fetlar and Yell are decreasing, with decline in Unst having been exacerbated by the closure of RAF Saxa Vord in 2006. Employment and economic activity in the North Isles has also been assessed where it has been shown that there are a variety of industries across the islands, with a number of specialist industries on Unst in particular providing new employment opportunities.

The following Chapter sets out the statutory context within which this study is being progressed.

3. Statutory Context

3 Statutory Context

3.1 Introduction

The aim of this Chapter is to set out the national and local planning policy context within which this study is set.

ZetTrans' Regional Transport Strategy establishes the regional and local transport policy context for this study.

At the national level, consideration has been taken of the National Transport Strategy published in 2006, as well as the national planning guidelines including Scottish Planning Policy¹⁷: Planning for Transport, and Scottish Planning Policy¹⁵, which focuses more specifically on measures to promote sustainable rural development.

At the local level, focus has centred on how this study fits with policies and principles adopted within the key Shetland specific policy documents such as the Council's Structure and Local Plans. The Economic Development Plan, 'Shetland 2012', and the Corporate Plan have also been reviewed in order to highlight the links between the objectives of the Bluemull Sound project and the wider objectives fostered by Shetland Islands Council and other Shetland bodies.

3.2 National Planning and Policy Framework

The national policy framework for transport is set out in the National Transport Strategy (2006).¹⁷ Relevant planning advice is contained in SPP 17: Planning for Transport¹⁸, and SPP 15: Planning for Rural Development.¹⁹

3.2.1 National Transport Strategy (2006)

In December 2006, the Scottish Executive²⁰ published Scotland's National Transport Strategy (NTS) outlining the long term vision for transport, together with its objectives, priorities and plans. The NTS focuses on three strategic outcomes which will set the context for transport policy making for the next twenty years:

- Improve journey times and connections between our cities and towns and our global markets to tackle congestion and provide access to key markets;
- Reduce emissions to tackle climate change; and
- Improve quality, accessibility and affordability of transport, to give people the choice of public transport and real alternatives to the car.

The following national transport objectives, published in the 2004 White Paper *Scotland's Transport Future*, have been retained in the NTS:

- To promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- To promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- To protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- To improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and

¹⁷ <http://www.scotland.gov.uk/Publications/2006/12/04104414/11>

¹⁸ <https://www.scotland.gov.uk/Publications/2005/08/16154406/44078>

¹⁹ <http://www.scotland.gov.uk/Publications/2005/02/20624/51511>

²⁰ Now Scottish Government

- To improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

Particular initiatives included in the National Transport Strategy relevant to Shetland are:

- a commitment to a national concessionary travel scheme for young people, and continuation of schemes for older and disabled people;
- support for lifeline airports and air services;
- a review of ferry services, with a view to developing a long-term strategy for lifeline services to 2025;
- review of the affordability of public transport in relation to ferry services;
- support for the Air Discount Scheme;
- expanded funding for Demand Responsive Transport services; and
- encouragement for more sustainable travel patterns.

3.2.2

National Performance Framework

Since publication of the NTS, the Scottish Government has set out five new Strategic Objectives²¹ that apply across all aspects of society, as well as transport. These objectives are that Scotland should be:

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

Fifteen new National Outcomes²² have also been set out by the Scottish Government.

As part of the Single Outcome Agreement (SOA) Settlement, the Scottish Government called on all Local Authorities to develop a list of Local Outcomes and Indicators to demonstrate how each Council will contribute to the delivery of the five new Strategic Objectives and fifteen National Outcomes. In April 2008, Shetland Islands Council approved its SOA, setting out its Local Outcomes and containing the list of Local Outcome Indicators which the Council will monitor to measure its progress in delivering these new Strategic Objectives and National Outcomes. Those Local Outcome Indicators that this Study has the potential to influence are as follows:

- LI 1: Increase the availability, accessibility and usage of internal public transport; and
- NI 36: Increase the proportion of journeys to work made by public or active transport.

3.2.3

Scottish Planning Policy SPP17: Planning for Transport

The aim of this planning guidance is to develop the integrated land use and transport planning elements proposed in the White Paper policy package.

As with all SPPs, SPP17 is underpinned by the sustainable development principles of economic competitiveness, social justice, environmental quality and design. Working towards this, SPP17 has the following objectives:

- to meet European and UK commitments and targets on greenhouse gas and local air quality;
- to maintain and enhance the natural and built environment, through avoiding or mitigating adverse environmental impacts, minimising environmental intrusion and retaining, improving and enhancing areas for biodiversity;

²¹ <http://www.scotland.gov.uk/About/purposestratobjis>

²² <http://www.scotland.gov.uk/Publications/2007/11/13092240/9>

- to maintain and enhance the quality of urban life, particularly the vitality and viability of urban centres;
- to reinforce the rural economy and way of life; and
- to ensure that the impact of development proposals on transport networks does not compromise their safety or efficiency.

In reference to rural, remote and island communities, one of the policy aims of SPP17 is “to have a prosperous rural economy, with a stable or increasing population where rural communities have reasonable access to good quality services.”

3.2.4

Scottish Planning Policy SPP15: Planning for Rural Development

This guideline states that the clear goal for Scotland’s rural areas, including islands, should be to maintain the viability of existing communities and bring new life into places which have seen years of decline.

SPP15 also recognises that Scotland’s rural areas are “unique resources” and future lifestyle changes and technological advancements could increase the demand for living and working in rural areas. Consequently, it is advised that planning authorities are proactive in releasing rural land for development.

This guideline also supports the main message put forward in ‘Rural Scotland – A New Approach’, which was published in 2000. The overarching aim of this strategy is “to have a prosperous rural economy, with a stable or increasing population that is more balanced in terms of age structure and where rural communities have reasonable access to good quality services”. It is recommended that the planning process supports this aim by allowing development where good infrastructure capacity and accessibility exists, or where it can be provided at reasonable cost or to meet justifiable social and economic costs.

SPP15 also highlights the importance of retaining younger community members in rural areas and suggests that planning should support economic opportunities, particularly those that seek environmental enhancement, such as the aquaculture industry. The important role that planning authorities can play in the development of the tourism industry in rural areas is also stressed within SPP15.

Finally, SPP15 highlights the importance of considering local circumstances and treating each development case individually according to its ‘appropriateness’ in terms of scale, location, design and transport provision.

3.3

Local Planning and Policy Context

This section examines the planning and policy framework for the study area in relation to transport, in the local context. The local context is set out within ZetTrans’ Regional Transport Strategy (RTS)²³ and the Shetland Islands Council’s Structure²⁴ and Local Plans.²⁵ Reference is also made to some of the key policies outlined in ‘Shetland 2012’²⁶, which details the economic development strategy for the islands, and the Corporate Plan.²⁷ A brief summary of the key objectives arising from these documents is provided below.

3.3.1

ZetTrans’ Regional Transport Strategy

ZetTrans finalised its RTS for submission to Scottish Ministers in March 2007. An updated RTS was resubmitted in May 2008, and was approved by the Minister in July 2008. The vision of the strategy is:

“To develop an effective, efficient, safe and reliable transport system for Shetland. The transport system will comprise an integrated network of accessible, and affordable internal, inter-island and external links, which will contribute to the development of a safe, healthy,

²³ <http://www.zetrans.org.uk/consultation/documents/ShetlandTransportStrategy050508.pdf>

²⁴ <http://www.shetland.gov.uk/developmentplans/ShetlandStructurePlan1.asp>

²⁵ <http://www.shetland.gov.uk/developmentplans/ShetlandLocalPlan.asp>

²⁶ <http://www.hie.co.uk/SHE-Shetland-LEF/SHE-lef-economic-strategy.pdf>

²⁷ <http://www.shetland.gov.uk/corporateplan/documents/corporateplan2008.pdf>

vibrant and inclusive society, a diverse, successful and self-sufficient economy, and enhanced environmental quality.”

Further to this overarching vision for Shetland, the RTS sets out objectives under the five headings of: Economy, Safety, Environment, Accessibility and Social Inclusion, and Integration.

These objectives align with and support the five national objectives for transport. Under these overarching objectives, the RTS outlines a series of sub-objectives in the context of Shetland. These objectives have provided the context within which our planning objectives have been developed.

Within the revised transport strategy, ZetTrans outline that it is committed to delivering a sustainable, long-term solution for the transport links across Bluemull Sound. A number of elements are relevant to this piece of work:

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

With specific reference to Unst, Fetlar and Yell, the RTS indicates that there is strong support for a fixed link from Unst to Yell. There was a strongly held belief that both Unst and Fetlar would benefit from dedicated ferry services. With regards to Fetlar: *“The development of the breakwater at Hamars Ness was seen as vital in facilitating improvements to the ferry service that the Fetlar community wish to see and could deliver a number of other improvements to the island. It was also stated that a dedicated ferry/crew and breakwater facility in Fetlar, tied in with other development opportunities, would have a significant impact on both Unst and Fetlar’s futures by allowing each island to have more influence in addressing their own particular needs.”*

The RTS also proposed a detailed investigation of the Bluemull Sound transport links alongside a separate but related study examining the potential for fixed links within Shetland. The principal links to be considered are between Lerwick and Bressay, Shetland Mainland and Yell, Shetland Mainland and Whalsay and also between Yell and Unst.

3.3.2

Structure Plan

The Shetland Islands Structure Plan (2000) focuses on shaping a more sustainable Shetland Islands and sets out a series of ‘top goals’ to help achieve this. With regards to the topic of transport, the Structure Plan states that its top goal is “to deliver an integrated transport system that meets the needs of Shetland people and seeks to minimise impact on the environment.”

With more specific reference to ports, harbours, ferry terminals and bridges, the Structure Plan states that these play a vital role in the economy of Shetland. For example, it is stated that ports and harbours offer opportunities for further growth and should be safeguarded against inappropriate development. At the same time, however, the Structure Plan recommends that ‘port related development should not be constrained by the inappropriate use of land immediately adjacent to port areas’.

Work to deliver new planning legislation through the Structure Plan is currently being undertaken.

3.3.3

Local Plan

According to Shetland’s Local Plan, it is important that the character of Shetland’s coast is protected from inappropriate development and that development which requires a coastal location is directed in the first instance to areas where development has taken place. Globally it is likely that sea levels will rise significantly over the next hundred years and that storms will become more severe. Around Shetland a sea level rise of 0.8 to 0.9 metres (3 feet) is predicted. This will have consequences for all existing and proposed coastal development. Great care will need to be taken to ensure development proposals will not increase the likelihood of erosion or tidal inundation. The aim of this policy is to protect the coastline from inappropriate development, balancing the needs of industry and the environment, while recognising the importance of the coast in the day-to-day life and economic prosperity of Shetland.

The Local Plan also notes that Shetland's traditional industries such as fishing, agriculture and knitwear are vulnerable to external influences such as the cost of fuel and transport, climate change, increasing regulation and the rapid development of the global economy. If Shetland's rural communities are to prosper then they must be able to develop, and attract and sustain new economic activities. The challenge lies in ensuring that these new activities do not destroy the environment on which they depend.

Generating and promoting new jobs in existing rural communities embraces the principles of sustainability, reducing the need to travel and maintaining the viability of local services and infrastructure. The policies in this chapter of the Local Plan hope to achieve this, by encouraging industry to locate in existing settlements where sufficient infrastructure is present, potential employees are nearby and the impact on the environment is minimised.

The main goal of the Local Plan in relation to Shetland's transport network is to deliver an integrated transport system that meets the needs of Shetland's people and seeks to minimise impact on the environment.

3.3.4 *Economic Development Strategy*

Shetland 2012 is the latest economic development strategy for the Shetland Islands and aims 'to ensure that Shetland has access to transport and communication links that are of a high quality and support economic and community development'.

The Strategy seeks to deliver this aim through a range of strategies that will attempt to improve the islands communication links with the outside world, including measures to improve external air and ferry links into the islands and through the implementation of high quality electronic communications links and IT, which will increase the connectivity of Shetland and improve its links to the global economy.

Shetland 2012 also adopts a local view and aims 'to foster sufficient economic activity in the remoter parts of Shetland to ensure that rural communities remain and/or become places where people can live and work with good career prospects'.

3.3.5 *Corporate Plan 2008 – 2011*

The vision for Shetland as described in the Corporate Plan is "We will seek to improve the quality of life in Shetland by promoting an economy where traditional industries thrive and innovate alongside newer, emerging industries. We will seek to focus economic development activity and investment on projects that will maximise income through the production of high quality produce aimed at discriminating consumers. For these ambitions to be sustainable, they must be achieved in ways that protect or enhance Shetland's environment and strengthen Shetland's society."

To achieve this vision, the Corporate Plan aims to:

- Link all economic development activity to market needs;
- Encourage enterprise and sustainable economic growth;
- Expand knowledge and build skills;
- Improve access and extend opportunities; and
- Focus on quality.

The Corporate Plan sets out a suite of long-term targets with regard to population, housing and employment opportunities, minimised environmental impacts and with regard to improving the quality of life for residents of Shetland.

The Corporate Plan recognises that because Shetland is geographically remote from its markets, it will be vital to improve Shetland's communication links to help competitiveness. In addition to the improvement of sea and air travel to assist in this aim, the plan also highlights the importance of ensuring that Shetland is connected to the UK by high quality electronic communications.

In addition to external links, the Council also discusses the importance of improving internal transport links within its Corporate Plan. For example, it is stated that Shetland is a scattered community and it is important to provide a sustainable and easy to use system for transporting freight and people. The Corporate Plan sets out an action plan in order to help "Develop an

environment in which the travel needs and priorities of Shetland's communities can be thoroughly researched and understood, enabling effective planning appraisal, prioritisation, integration and delivery of transport services and infrastructure.”

3.4

Summary

This Chapter has outlined the national and local planning policy context for the study area. The key points emerging from the policy review for the study are that national, local and transport policies all emphasise the importance of efforts to sustain island communities, and accept that local and central funding will be central to the sustaining of these, often isolated, populations. On a national level, there is a policy commitment to lifeline ferry links and to support the development of improved services and maintenance of affordable fares and introduction of new vessels and routes. Additionally, there is an overarching aim to have a prosperous rural economy with a stable or increasing population.

Local level policies recognise that frequent and affordable ferry links to Shetland Mainland are vital for the social and economic well-being of the community.

The following Chapter provides an analysis of the existing and potential problems and opportunities that should be considered in taking forward this study.

4. Analysis of Existing and Potential Problems and Opportunities

4 Analysis of Existing and Potential Problems and Opportunities

4.1 Introduction

The existing transport links across Bluemull Sound were analysed to uncover any existing and potential problems and opportunities. This Chapter provides a review of the key problems and opportunities related to the study, and were informed by the stakeholder and resident consultation,²⁸ as well as reviews of other available work.

4.2 Planning for the Replacement of Existing Vessels

Currently, two of the following three vessels are typically assigned to the route: *MV Bigga*, *MV Geira* and *MV Fivla*. *MV Thora* also provides relief on the route.

A profile of the vessels within the Shetland fleet, currently suitable for use on the Bluemull Sound routes is provided in Table 4.1 below. Other vessels in the fleet are either non roll-on roll-off, are specifically designed for the requirements of a particular route, or would require enlarged terminal and linkspans.

Table 4.1 – Current Vessels Suitable for Bluemull Sound routes

Vessel	Vehicle Capacity (PCUs)	Maximum Passenger Capacity	Year of Construction	Current Age
<i>MV Bigga</i>	16	96	1991	17
<i>MV Geira</i>	11	96	1988	20
<i>MV Fivla</i>	11	95	1985	23
<i>MV Thora</i>	6	93	1975	33
<i>MV Hendra</i>	14	95	1982	26

Nominal economic life expectancies for vessels are twenty years. It can be seen that *MV Bigga* and *MV Geira* will shortly reach or pass this milestone, *MV Fivla* and *MV Hendra* have passed this milestone and *MV Thora* is currently significantly beyond this age.

Options exist to secure modest life extensions to vessels in the fleet (at a cost of around £0.4m to £0.5m per vessel). It is noted that such a life extension was recently undertaken for *MV Hendra*. Whilst the re-engineering work was successful, such overhauls cannot in themselves guarantee a more reliable vessel. As an example, there is still the problem of the hull rusting and getting thinner over time, reducing the Scantlings, and this problem was apparent during *MV Hendra*'s latest overhaul. This demonstrates the difficulties, risk and potential inefficiencies of securing such refurbishments in the medium to long term.

Present EU Directives require that *MV Bigga*, and other similar aged vessels, be modified to match EU requirements by a certain date (July 2010 for *MV Hendra* and *MV Thora*, a year later for the others). At present there is a UK Merchant Shipping Notice (MSN) which indicates that the UK believes that existing regulations give "equivalent" safety to the EU Directive. However, this interpretation is unlikely to be accepted outwith the UK.

Modifications to *MV Bigga* etc are not practicable so Shetland Islands Council cannot adhere to the EU Directive. Therefore, the Council is reliant upon the UK MSN to allow the vessels to continue in service. This MSN is not backed by specific legislation and can, therefore, be withdrawn at any time. Clearly other operators are in a similar situation to us so there will be pressure to either retain the MSN or to give a long lead time before it is withdrawn. However there is no certainty such pleas would be listened to.

If the vessel fails, the relief vessel can be taken on the route but problems would be encountered if this vessel is being used elsewhere. Repair parts are also becoming harder to obtain for the older vessels. Difficulties resulting from vessel failure were evident in April 2008,

²⁸ Appendix A provides a summary of consultation activity undertaken for this study

when *MV Geira* grounded when departing from Gutcher, due to a mechanical failure. This meant that *MV Thora* – with its lower carrying capacity – had to be used to restore the two vessel service on Bluemull Sound with *MV Bigga*. In combination, a strategy of delaying replacement of the vessels increases the risk of higher levels of service unreliability and failure, and also increases the risk of legislative constraints severely restricting current operational patterns.

Accordingly, there is a relatively urgent requirement to plan for the replacement of those vessels that can be used on the route.

4.3 Changing Vessel Legislation

It is highlighted that a like-for-like replacement of existing vessels could not necessarily be achieved under current legislation. This is principally due to new safety features required by recent legislation²⁹, for example stability requirements, and the requirement for passenger accommodation to be above the vehicle deck. In combination, these factors result in a larger sized vessel just to carry a similar number of vehicles. This has implications for the future renewal and replacement of the ferry terminals

The vessels which are currently deployed on the Bluemull Sound service do not comply with stricter maritime legislation (MARPOL and SOLAS)³⁰ and they are non DDA compliant for foot passengers.

4.4 Renewal and Replacement of Gutcher and Belmont Ferry Terminals

The ferry terminals at Gutcher and Belmont were designed for the first generation of ferries and were constructed in the 1970s. They are now at the limits of their operation due to the increased size of vessels utilising them and consequential increased berthing pressures.

A survey conducted in 2005 into Shetland's ferry terminals³¹ stated that the Belmont and Gutcher terminals are steadily deteriorating and exhibit failure in several places. It was recommended that they need to be upgraded to cater for the large ferries using them. It was also stated that the structures are being asked to withstand over twice the 1970s design loadings.

The Belmont and Gutcher terminals have, in the recent past, been subject to expensive emergency maintenance costs. In 2006/2007, there was a need to address the deterioration of the foundations and steel sheet piling around the linkspan structure and berthing face of the Belmont terminal. At the same time, there was a requirement to address the progressive deterioration of the Gutcher ferry terminal.

Overall the maintenance during this period – in addition to normal maintenance – incurred costs of approximately of £636,000 for the Belmont terminal and £98,000 for the Gutcher terminal.³²

In addition, whilst the work at Gutcher was progressing, it was discovered that there was minor grounding on soft areas of the ferry berth. A survey identified the extent of emergency dredging to safeguard the terminal for the immediate future of the ferry service.

The ongoing availability of these terminals and linkspans is thus a critical issue in terms of service reliability.

If the linkspan at the Belmont terminal was to fail, Unst would essentially be cut off as there would be no means of transferring vehicles and freight to and from the island. If the linkspan at the Gutcher terminal was to fail, there could be the option of diverting the service to Ulsta on the South of Yell, meaning lengthy diversions, and significant service disruption and costs.

²⁹ Principally EU 2002/25/EC and EU 1998/18/EC (also known as L144) – Safety Rules and Standards for Passenger Ships (EU Class B domestic ferry)

³⁰ IMO Convention for the Prevention of Pollution from Ships (MARPOL: covers control of oil, sewage, garbage and air pollution), IMO Convention for the Safety of Life at Sea (SOLAS)

³¹ SIC Ferry/Transport Piers Survey (2005), R.G. Jamieson BSc(Hons), C.Eng., F.I.C.E. Consulting Engineers/Shetland Islands Council

³² Shetland Islands Council Ferry Services

4.5

Hamars Ness Ferry Terminal

The Fetlar ferry terminal at Hamars Ness is relatively new, opening in 2004, and consequently will not require renewing or replacing in the near future. Hamars Ness terminal lacks a breakwater which exposes the terminal to swell, posing difficulties when vessels try to berth during periods of adverse weather, and also limiting the viability of overnight berthing in inclement weather. As the vessel cannot be berthed overnight at Fetlar during the winter, this reduces opportunities for the introduction of a more island centred service for Fetlar.



Photo 4.1 – Hamars Ness Ferry Terminal, Fetlar

During an average year, the total number of hours of operational downtime at the Hamars Ness terminal, in the winter, is 35 hours. This consists of 20 hours of downtime from wind, 5 hours of downtime from wind and waves and swell, with 10 hours of downtime solely from waves or swell.³³ It should be noted, however, that not all of the 35 hours of operational downtime would affect ferry crossings, as the ferry service does not run for a full 24 hours.

The development of a breakwater and pier/berthing facility, with slipway, on Fetlar has been an aspiration of the Fetlar community for over 60 years. It is the only inhabited isle in Shetland without ready access to the sea. The development of a breakwater and small boat berthing facility was originally incorporated in the new terminal construction at Hamars Ness. However, for a number of reasons, it was unable to proceed at that time.

Consultation has revealed that, for the community of Fetlar, the ability to berth the ferry in Fetlar overnight throughout the year and the opportunities brought to them by having facilities to access the sea, remain the highest priority. It is the absence of these facilities that is believed to be contributing to a lack of economic opportunities and depopulation of the island.

Currently, in the morning, the Fetlar ferry crew has to catch the ferry across to Yell and drive to the pier at Cullivoe where the Fetlar vessel is berthed overnight. Once the crew reach Cullivoe this vessel then has to sail to either Belmont or Gutcher before it can then begin service. This process wastes time that could be used for an earlier first run from Fetlar.

³³ Shetland Islands Council (2005), Hamars Ness Wave Protection Options Report

ZetTrans have recently undertaken a study³⁴ examining the socio-economic benefits that a breakwater and small berth facility could provide to the island. This study identified that the provision of a breakwater could allow overnight berthing of the ferry all year round, subsequent service pattern enhancements for both Fetlar and Unst and greater reliability in poor weather conditions. In doing so, Fetlar residents would benefit from improved levels of accessibility to services off the island, with greater employment opportunities opened up through improved commuting opportunities. The provision of a breakwater at Fetlar would also benefit Unst by increasing peak period vehicle capacity. Service pattern enhancements on Fetlar could include the provision of an earlier morning sailing from the island, which in turn could help to reduce capacity constraints on the 0750 service from Hamars Ness – Gutcher (which travels via the 0820 departure from Belmont).

By basing the ferry in Fetlar all year round, the timetable could be arranged so that commuting from Fetlar to Yell and Unst is more viable. This assists not only the economy of Fetlar but also the North Isles as a whole. For example, one business on Yell is known to be struggling to recruit staff; opening up the employee base for Yell and the opportunities for employment for people based on Fetlar. There are many other synergies between the three North Isles that would benefit from improved accessibility between the isles. Basing the ferry on Fetlar all year round would also provide the ferry crew with a greater level of confidence regarding their job security. It is considered that these factors could all assist in halting depopulation on Fetlar.

The provision of a small berthing facility has also been a long term aspiration of the community and currently, Fetlar is the only inhabited island in Shetland that is not served by an adequate berthing facility for boats other than the ferry. Local residents believe that this has already had a detrimental effect on the economy and population of the island by preventing economic and leisure opportunities to be exploited. It is considered that the development of a small berthing facility could support opportunities for a fishing vessel, angling tours and other sea based tourist activities and that it would allow some business/industry to grow, such as aquaculture.

While it is recognised that transport infrastructure alone is unable to repopulate an island, evidence collected from the study has suggested that constructing a breakwater and small-berth facility could provide a catalyst to further social and economic development on the island.

4.6

Existing Timetable

There is variation in the timetable across the week, with five different variations across the seven days during the winter. This makes it difficult to use the service for island residents and visitors alike. This was reflected in the results of the consultation where the timetable was said to be “hard to understand” and “daunting” for those who do not know it.

There is also an uneven pattern of ferry departures, and significant gaps. For example:

1. At lunchtime, there are no departures from Belmont between 1205 and 1345 and this causes a subsequent surge in demand after the break.
2. When the single vessel operates and particularly when this vessel serves Fetlar, there is a break in the service between Unst and Yell. For example, on Monday mornings during vessel maintenance, there is no departure from Unst to Yell between 0945 and 1135 with the 1020 from Belmont going to Hamars Ness. Similarly, there is no service from Gutcher to Belmont on a Sunday between 1030 and 1220 because the single vessel departs Gutcher for Hamars Ness at 1100.

The effect of the single vessel operating on Bluemull Sound causes accessibility problems and capacity constraints during the summer tourist season, particularly at weekends.

3. The second vessel does not run during the AM peak and consequently this causes capacity constraints on busy sailings such as the 0820 from Belmont to Gutcher.

These timetable gaps result in extended waiting times and restrict freedom of movement.

³⁴ SIC CPRT Report, Breakwater and Small Berthing Facility at Hamars Ness, Fetlar (Jan 2008)

4.7 **Managing Vehicle Demand**

Analysis of vehicle deck utilisation levels confirms that there is a requirement to address high vehicle demand on commuter sailings, such as the 0750 morning service from Hamars Ness via Belmont to Gutcher. There is also a high level of demand for vehicle deck space during the tourist season in the summer, particularly during weekends.

The vessels operating on Yell Sound – *MV Daggri* and *MV Dagalien* – are large and have higher capacities than the Bluemull Sound vessels, carrying up to 31 cars and 4 trucks. A bottleneck at Gutcher often results as the Bluemull Sound vessels are too small to accommodate the higher number of vehicles transferred from the Yell Sound ferries.

On the Bluemull Sound service, vehicle demand showed an increase in the 5 years to 2004. Volumes fell back in 2005 with Fetlar traffic accounting for the bulk of this reduction. This was in part due to the additional traffic associated with construction of the ferry terminal at Hamars Ness, replacing the old terminal at Oddsta. Overall vehicle deck utilisation peaks in July with average monthly utilisation typically standing between 25% and 50%. There is evidence of severe vehicle constraints at peak times.

Vehicle and passenger demand is seasonal, with volumes conveyed in June, July and August more than double that of volumes in January.

A further pressure for vehicle deck space has arisen due to historical growth in the average vehicle mass (due for example to additional features to meet safety requirements), which, over time, tends to effectively reduce the average vehicle carrying capacity of a vessel.

4.8 **Wider Network Issues**

There are a number of wider network issues which affect the Bluemull Sound service.

In the past few years, there has been a requirement to take *MV Bigga* off the route to relieve the *MV Leirna* on the Bressay service whilst it is docked for overhaul. This effectively reduces capacity on the Bluemull Sound during the peak summer period in June and July.

With respect to ferries, greater operational reliability can be achieved through greater standardisation within the fleet and with terminals. This can allow a flexible deployment of vessels to cope during periods of planned vessel and linkspan maintenance, and facilitate efficient relief services during periods of unscheduled vessel or linkspan maintenance.

Accordingly, it is important to consider options which continue to facilitate this wider network compatibility, as far as is possible.

4.9 **Accessibility**

Consultation revealed that the service timetable poses problems for accessibility. The following sections provides some examples of the types of issues and problems experienced by residents in the North Isles in trying to access employment, health care and education, as well as the types of issues faced by businesses and tourists in trying to access the North Isles.

Many of the accessibility issues listed below cause problems for residents of Fetlar and Unst, and are important to capture. However, it must also be recognised that the physical constraints to movement imposed by living on an island cannot always be readily or economically be overcome. There is therefore a requirement to make best use of the resources that can be made available, in order to meet the needs of each island's community.

4.9.1 *Access to employment and off island opportunities*

With regards to Fetlar, jobs off the island are difficult to access because the first ferry departure of the day from Hamars Ness is not until 0750, and does not arrive at Gutcher until 0830 after going via the 0820 from Belmont.

This means the earliest start for employment in Mid Yell would be around 0845 and following the crossing from Ulsta-Toft, not until after 0930 for jobs on Shetland Mainland e.g. at Sullom Voe or Brae. The summer timetable, which allows arrival in Gutcher at 0820, provides a degree of improvement, but only in conditions of clement weather.

The existing timetable prevents Unst and Fetlar residents from catching the first flight from Sumburgh in the morning because the first sailing from Belmont is not until 0635, with the first flight departing Sumburgh for Edinburgh at 0730. It is also difficult to attend evening events in Lerwick and elsewhere in Shetland Mainland, because the last ferry departure from Gutcher to Belmont is at 2250 (Monday-Saturday) and a booking is required for this service which means a degree of forward planning is required.

4.9.2

Access to health care

Accessing health care in Yell can entail a lengthy trip due to the current timetable. If Fetlar residents have a routine appointment in Yell during the week for example, they will typically catch the 1050 service to Gutcher (the next earliest departure is at 0750). They cannot then get back to Fetlar until the 1415 crossing. Therefore it could be around 1500 before the resident returns to their home – a trip of 4.5 hours, door to door. However, health care can be accessed in Fetlar when the doctor does a fortnightly surgery on the island.

Consultation revealed that a number of Fetlar residents also have friends and relatives in the care centre in Yell as in-home care cannot be provided on the island as easily as elsewhere in Shetland. Fetlar residents visiting friends and relatives in Yell at weekends cannot get back to Fetlar until the afternoon if they have travelled in the morning. As a result, they tend to go across to Yell on a later sailing instead which incurs less waiting time to travel back to Fetlar in the evening.

Unst residents benefit from having a health care centre in Baltasound. However, with two ferry crossings, face issues with accessing health care in Lerwick, or on the Scottish Mainland.

4.9.3

Access to education

In terms of access to education, Fetlar secondary pupils do not attend school in either of the nearest schools (Baltasound or Mid Yell) due to the constraints imposed by the winter ferry timetable, which is in effect between October and April. Attending the nearest schools would entail a ferry departure at 0750 and a return to Fetlar at 1640. They therefore have to go to Anderson High School in Lerwick and board for the week.

There is also difficulty with inbound journeys for these pupils returning to the island on Friday evenings. Currently, the pupils are transported back to Gutcher from Lerwick. They then have a long wait until the next sailing for Fetlar, departing via Belmont at 1905, arriving at Fetlar at 1930.

4.9.4

Access to the North Isles

Consultation suggested that there are problems in bringing in skilled tradesmen to carry out small jobs in Fetlar because of the length of time that is spent waiting for ferry connections. For example, if a contractor was to travel to Fetlar on a Monday on the 1230 from Gutcher, there is no return ferry from Fetlar until 1645. Therefore a quick job taking an hour would result in a long wait before the next ferry. As a result, it is either particularly difficult, or costly, for Fetlar residents to obtain services from off the island.

In terms of tourism, opportunities for visitors to make a day trip to Fetlar can be limited because of the gaps between departures from Hamars Ness. Despite accessibility constraints, a visitor survey undertaken by Fetlar Interpretative Centre and HIE between July and September 2007 indicated that the number of visitors to the island in the 2007 summer season was 1,029 – an increase from 1,006 in 2006.³⁵ It is particularly difficult to get to and from Fetlar on Sundays with the current timetable. For example, the first direct crossing from Unst to Fetlar on Sunday is not until 1905. Therefore a family staying in Unst (where the majority of tourist accommodation in the North Isles is located) wishing to visit Fetlar would have to first cross to Yell then take, for example, the 1100 to Hamars Ness. There is then just one departure from Fetlar for the rest of the day that goes directly to Unst, at 1600. This reduces flexibility and imposes restrictions on a day trip to Fetlar from Unst.

This would pose similar problems for families visiting Fetlar from elsewhere in Shetland, such as Lerwick. With a lack of accommodation on Fetlar, a day trip from elsewhere in Shetland on a Sunday is made difficult by this restrictive window for getting to and from the island on the same day.

³⁵ Fetlar Visitor Survey 2007 (Fetlar Interpretative Centre/HIE)

4.10 Affordability

A recurring theme for the supply of Shetland’s inter-island links is the relatively high cost of providing them, as well as the future prospect of revised fares structures.

4.10.1 Impact of Fuel Prices on the Inter-Island Ferry Service

As has been stated, a particular issue relates to the high operational and maintenance costs that are incurred in sustaining the current service³⁶. The increasing cost of petrol and diesel has also had a significant impact on the cost of running the ferry service. Table 4.2 provides an indication of the highest unit cost of fuel for vessels operating on Shetland’s inter-island ferry network in selected monthly periods between April 2006 and April 2008.

Table 4.2 – Unit Costs of Fuel for Shetland’s Ferries, 2006 – 2008

Month	Highest Unit Cost of Fuel in Month (£ per litre)
April 2006	0.3343
October 2006	0.2819
April 2007	0.2843
October 2007	0.3332
April 2008	0.4951

Source: Shetland Islands Council Ferry Services

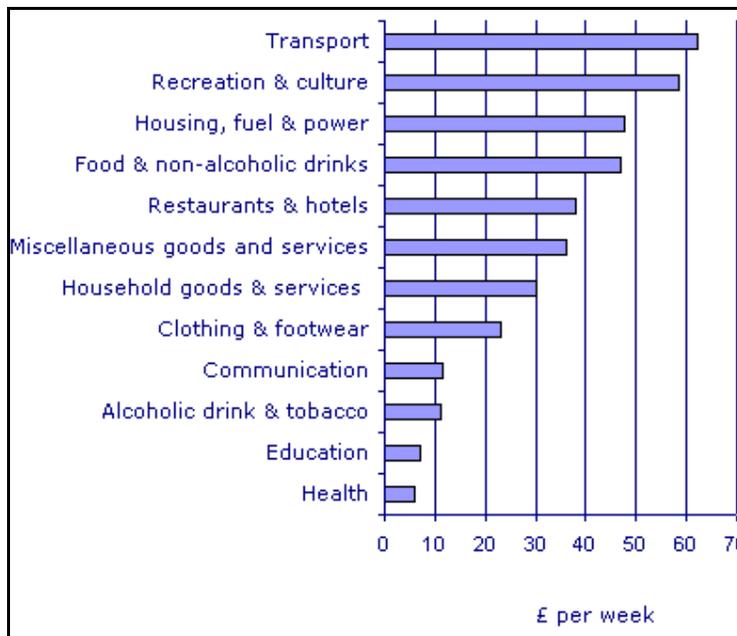
Table 4.2 indicates that the highest unit cost of fuel in the month in which the snapshot was taken has risen since October 2006. This general trend of increasing cost is reflected further in unit costs to date for the period 2008-2009, with the unit cost reaching 0.5311 pounds per litre in May 2008.

Affordability is thus an ongoing issue for Shetland Islands Council with regards to the provision of the inter-island ferry service.

4.10.2 Impact of Fuel Prices on Vehicle Users and Private Transport

This section considers the cost of transport for householders in UK terms, and then considers the impact on residents of the North Isles. On average, UK households spend £456 a week. Figure 4.1 below demonstrates how this money is distributed according to category.

Figure 4.1 – Average weekly expenditure by UK households, 2006



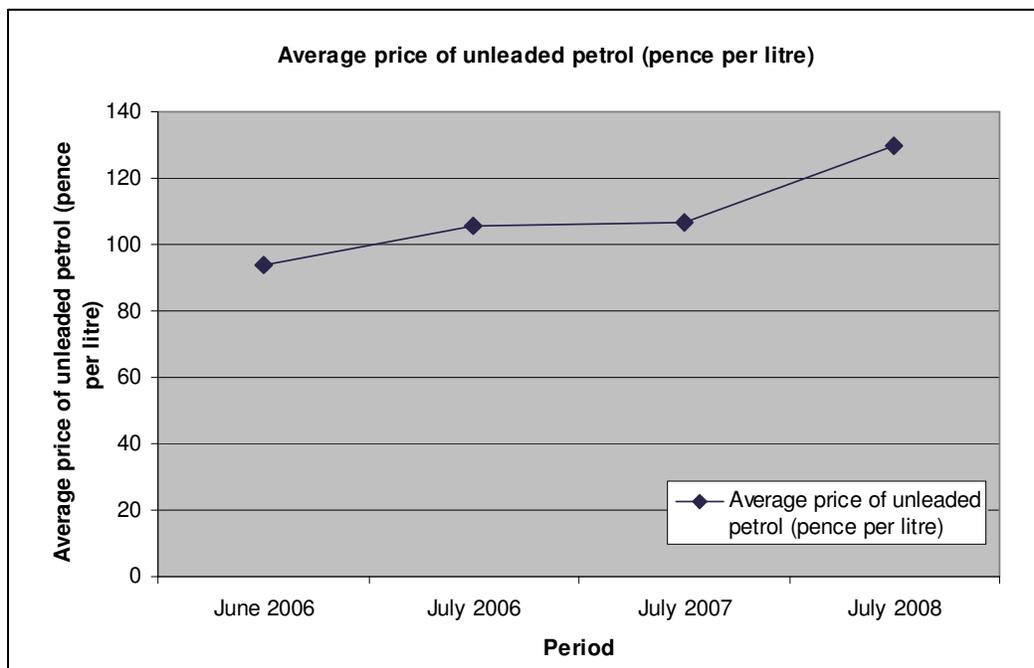
Source: <http://www.statistics.gov.uk/CCI/nugget.asp?ID=284>

³⁶ See Section 4.4

As Figure 4.1 demonstrates, UK household spending was highest in the transport category, where on average £62.00 of weekly expenditure was attributed to transport costs. Almost half of this was spent on operating personal transport (£28.60 per week), most of which was spent on fuel: petrol, diesel and other motor oils (£18.20 per week).³⁷

Since the 1950s, expenditure on transport *has increased consistently* and households in the UK now spend £1,538 million on transport every week.³⁸ In addition, households in rural areas spend 20% more per week on transport compared to those living in urban areas³⁹ and with regard to Shetland, the costs of private transport have also increased in recent years as evidenced in Figure 4.2 below.

Figure 4.2 – Average price of unleaded petrol in Shetland, June 2006-July 2008



Source: Shetland Islands Council / ZetTrans

Figure 4.2 demonstrates that the average price of unleaded petrol in Shetland in recent years has continually increased.

The impact of these rising fuel prices on the main settlements in the North Isles have been examined by considering the overall costs of specific trips in Shetland. Table 4.3, for example, sets out the cost of return travel by private transport from Baltasound, Houbie and Mid Yell to Lerwick. These costs have been calculated using AA averages for fuel consumption and average costs of fuel in Shetland. They include the cost of travelling on ferries with a vehicle, and the time period encompasses the removal of fares from the Bluemull Sound ferry service (2005).

³⁷

http://www.statistics.gov.uk/downloads/theme_social/Family_Spending_2006/FamilySpending2007_web.pdf

³⁸ <http://www.racfoundation.org/files/Costoftransportanditsimpact.pdf>

³⁹ <http://www.racfoundation.org/files/Costoftransportanditsimpact.pdf>

Table 4.3 – Journey Cost by Private Transport from settlements in the North Isles

Settlement/Year	Return Journey Cost			
	2005	2006	2007	2008
Baltasound (Unst)	£26.43	£20.97	£21.70	£24.99
Houbie (Fetlar)	£25.71	£20.16	£20.88	£23.99
Mid Yell (Yell)	£16.23	£17.38	£18.07	£20.57

Source: Shetland Islands Council / ZetTrans

Table 4.3 indicates a reduction in return journey costs from Baltasound and Houbie between 2005 and 2006. This can be attributed to the removal of fares from the Bluemull Sound ferry service in 2005. There has, however, been a notable increase in the cost of fuel in recent times, particularly between 2007 and 2008.

In addition to the residents being affected by increasing fuel costs, individuals and households are experiencing increases in the cost of household fuel, food and external travel. Thus the impact of increasing fuel prices is having a wider impact on those who travel by private transport.

4.10.3

Fares

The affordability of the ferry service to users is also an important issue and was highlighted during consultation. Although fares have been suspended on the Bluemull Sound service since September 2005, householder consultation revealed concern over the possible re-introduction of fares. It was also felt that the costs of the Yell Sound service are high and this is an important issue given the inter-relationship between the two ferry services.

ZetTrans have undertaken a study to evaluate the social and economic impacts of the removal of fares on the Bluemull Sound ferry services⁴⁰. This study was prompted by the proposed re-introduction of fares onto the route in April 2008. The key outcomes from this work are presented below:

The removal of ferry fares has not impacted equally on all residents and businesses of Unst and Fetlar. For many residents the benefits have been through cost savings rather than through generating new off-island trips. However, the research has shown that the fare changes have led to:

- *Increased trip-making and thus improved access to services and opportunities for employment and social activities*
- *Improved business performance*
- *Greater household income*
- *Improved quality of life and greater participation in wider Shetland life*
- *Improved confidence in the future prospects of Unst and Fetlar*
- *Potentially, a slower rate of population decline than would otherwise have occurred*

The fares removal has not led to radical changes in the economy or population of Unst and Fetlar. In part, this reflects the barriers to economic and social participation that stem from the financial costs, distance, time and travel issues involved in living on what are off-islands within an island group (i.e. Shetland); and ones with low populations and limited internal markets. Reducing the financial costs of accessing other places, while clearly welcomed, acts to remove/reduce only one of the barriers to wider participation.

Overall, there is a need for a cost effective solution for the long term sustainability of the transport link, balancing both the requirement for affordable travel, but also ensuring that the service can be financially sustained.

⁴⁰ Reference Economics (Dec 2007), *Evaluation of the Social and Economic Impact of the Removal of Fares on the Bluemull Sound Ferry Service*, prepared for Shetland Islands Council

4.11

Sustaining the Socio-Economic Prospects of the North Isles

Research has indicated the key role that frequent ferry services can have on the economic and social prospects for island communities.⁴¹ Economically, it is known that frequent and accessible ferry services can bring benefits to local producers and retailers, and local hauliers and transport providers. A good ferry service is also a prerequisite for any growth in tourism activity. However, there are wider social benefits. This can include community confidence, increased levels of social interaction between groups on and off the island, improved access to services including health and training, as well as changes in perception of inclusion. This is particularly significant for Fetlar.

With concern over the future vitality and viability of Unst, Fetlar and Yell due to the continuing depopulation of the islands, and ageing profile of residents, it should be highlighted that transport could help to release wider positive impacts for the North Isles, for example in terms of economic development and social integration, by improving access to jobs on and off the islands.

4.12

Other Operational Issues

Other problems have been raised during consultation.

- The timetable is difficult to understand.

The layout of the current timetable is not user friendly. The pupils at Fetlar Primary School have produced a version of the ferry timetable which is easier to understand and available to purchase at a small price at locations across the North Isles.

The Easy to Understand Unst Timetable		
SUMMER 2008		
All Ferries from Yell (Gutcher) to Unst (Belmont)		
MONDAY		
0620	1330	1740
0650	1400	1810
0835	1430	1850
0905	1500	2005
1005	1535	2105
1120	1630	2215
1150	1700	2250*
1220	1710	
TUESDAY TO SATURDAY		
0620	1120	1630
0650	1135	1700
0825	1150	1710
0835	1235	1740
0850	1345	1810
0905	1400	1850
0945	1450	2005
1005	1520	2105
1020	1535	2215
1050	1550	2250*
SUNDAY		
0620*	1220	1810

Photo 4.2 – The Easy to Understand Timetable

⁴¹ For example, Grangeston Economics, *Evaluation of the Social and Environmental Impact of the Sound of Harris Ferry Service*, 2003, prepared for Highlands and Islands Enterprise and Western Isles Enterprise

- The Voicebank service is not kept up to date.

Updating of the Voicebank can be difficult because of IT related problems.

- The electronic variable message signs at the terminals are not updated frequently enough.

This is due to difficulties in transmitting SMS messages due to problems with receiving mobile phone reception in some areas.

- Connections with the Yell Sound ferry service.

It was highlighted during consultation that timing can be tight when travelling through Yell to catch the ferry to either Toft or Belmont and can cause drivers to travel at high speeds. There are occasions where it can be difficult to catch the connecting ferry as outlined by examples in Tables 4.4 and 4.5 below although a wait of around five minutes to catch the next ferry is typical. Waiting times can extend to around ten or fifteen minutes. However, by contrast, some connections leave a twenty minute wait, on Sundays, for example.

Table 4.4 – Ulsta Terminal Connections

Belmont	16.15	16.45	17.55
Gutcher	16.25	16.55	18.05
Mid Yell	16.40	17.10	18.20
Arrive Ulsta:	16.50	17.20	18.30
Ulsta	16.55	17.25	18.30

Table 4.5 – Gutcher Terminal Connections

Toft	7.45	16.55	17.20
Ulsta	8.05	17.15	17.40
Mid Yell	8.15	17.25	17.50
Arrive Gutcher:	8.30	17.40	18.05
Gutcher	8.35	17.40	18.10

Delays to any leg of these journeys could make these connections difficult to make. Conversely, following the 2105 sailing from Toft-Ulsta, there is not another departure to Unst from Yell until 2215. However, it is highlighted that the current timetable is considered by many to be the best that can be achieved with current resources, bearing in mind the various inter-dependencies and constraints.

4.13

Opportunities

Based on analysis of the problems above, the following opportunities have emerged:

- Development of a breakwater at Hamars Ness;

The development of a breakwater at Hamars Ness would facilitate the delivery of socio-economic benefits for Fetlar and the island's residents would benefit from improved accessibility to services off the island. The breakwater could also help to address current timetabling and capacity constraints on the whole route.

- Public Sector service delivery efficiency;

There is the potential that public sector service delivery could be made more effective by implementing alternative transport arrangements across Bluemull Sound, such as the provision of health care, and the delivery of secondary education. For example, a teacher could teach a class in Yell in the morning and Unst in the afternoon.

- Greater coherence of service for visitors;

This would boost tourism by making the service more accessible and easier to use and understand.

- The promotion of wider opportunities for Unst, Fetlar and Yell.

Promoting wider opportunities for each of the North Isles would enhance their viability and attractiveness as places to live, work and visit.

4.14

Summary

In summary, this Chapter has analysed the range of problems and opportunities that this study will seek to address.

This has included consideration of the problems related to the Bluemull Sound ferry service timetable, capacity problems and issues with the vessels and terminals.

It has been shown that there is a relatively urgent requirement to plan for the replacement of those vessels which can be used on the Bluemull Sound, as these are approaching or have exceeded their life expectancies. In addition, a like-for-like replacement of existing vessels could not necessarily be achieved under current EU legislation. These issues increase the risk of service unreliability and failure.

Service reliability is also at risk due to the deteriorating nature of the ferry terminals and linkspans at Gutcher and Belmont. Failure of this infrastructure would result in significant disruption to the ferry service, and Unst would essentially be cut off from the other islands.

The provision of a breakwater and small berth facility on Fetlar could allow overnight berthing of the ferry overnight all year round, service pattern enhancements and greater reliability in poor weather. Wider social and economic benefits for Fetlar could also be promoted following the development of a breakwater and more island-centred ferry service.

It has also been shown that variations in the ferry timetable make the service difficult to use and gaps in the timetable result in extended waiting times and reduced freedom of movement. This poses problems for accessibility.

Issues of affordability to users have also been considered, with regard to rising fuel prices, and fares, while more generally it has also been shown that there is concern over the future vitality and viability of living and working in the North Isles.

Following an analysis of the problems, a number of opportunities have emerged. The development of a breakwater at Fetlar could release a number of socio-economic benefits and improve accessibility. There is a prospect that public sector service delivery could be made more effective with alternative transport arrangements. By making the service more accessible and easier to use, there would be a greater coherence of service for visitors, in turn boosting tourism.

The promotion of wider opportunities for each of the North Isles would also enhance their viability.

Having identified a number of problems and opportunities, the following Chapter presents the objectives that have been developed to address these issues within this study.

5. Objectives

5 Objectives

5.1 Introduction

This chapter presents the planning objectives that have been developed for the project, based upon the previous reviews of policy, problems and opportunities, and the consultation process.

5.2 Planning Objectives

The following ten planning objectives for the Bluemull Sound study are outlined below. Under each objective, further information is provided including information on the means by which delivery of the objective will be measured and by when.

Prior to setting out our objectives for this study, it should also be stated that these planning objectives sit within and are complimented by the wider objectives of Shetland's Regional Transport Strategy. It should also be stressed that the planning objectives below are not listed in any order of priority.

5.2.1 Objective 1

Provide a transport link which is economically efficient

Specific – we want a transport link which maximises the direct and indirect benefits to society, for a given sum of investment.

Measurable – this objective can be measured in terms of a cost-benefit analysis.

Time Based – Government advice requires cost benefit appraisals to be undertaken over a 60 year period.

5.2.2 Objective 2

Provide a transport link which is operationally reliable on a day to day basis

Specific – this objective addresses the requirement for the transport link to be as dependable as possible in the future, and as far as possible, free from disruptions to operation.

Measurable – current levels of service reliability (% of timetabled sailings operated) will be used as a benchmark for comparison of options.

Time Based – the baseline will be the three years prior to 2007. The aim will be for this baseline to be maintained, or improved, over the next 60 years.

5.2.3 Objective 3

Provide a transport link which is operationally sustainable in the long term

Specific – the preferred option must be able to be operated throughout the appraisal period, taking into account construction, scheduled and emergency maintenance, and manning of the transport link.

Measurable – the different elements of this objective cannot necessarily be measured.

Time Based – the principal focus will be on ensuring sustainable operations over the next 60 years.

5.2.4 Objective 4

Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland.

Specific – it is important that the transport link continues to provide linkages with the wider transport network – road network, walking and cycling opportunities, the bus network, appropriate linkage with the Yell Sound inter-island ferry service, and external links from Holmsgarth ferry terminal and Sumburgh Airport.

Measurable – it is possible to assess connectivity with existing public transport services, the level of integration with the Yell Sound inter-island ferry service, and also the opportunities for connections with external transport links.

Time Based – as public transport times and routes are liable to change, it is only possible to consider existing services, and other committed or known service changes, or recommend changes to public transport.

5.2.5

Objective 5

Provide a transport link which has a regular and easily understandable pattern of transport opportunities

Specific – this objective relates to the existing problem of the timetable varying across different days of the week, and also during different times of the day.

Measurable – this objective will be achieved if the pattern of transport opportunities is (at a minimum) consistent across the working week, with a regular and broadly predictable pattern of departures during each day.

Time based – it is important that the proposal would allow for such a pattern of timetable opportunities from the commencement of operations.

5.2.6

Objective 6

Provide a transport link which is considered to be affordable to users

Specific – this objective seeks to ensure that the cost to users of the transport link is considered to be affordable. Affordability is complex to define and measure – however, any proposals can be benchmarked against a) the existing situation b) other routes in Shetland c) other routes in Scotland.

Measurable – the fares to be levied (if changes are proposed) can be measured for passengers, car drivers and freight.

Time based – it is important that the cost of the transport link to users remains affordable throughout the whole of the appraisal period.

5.2.7

Objective 7

Provide a transport link which is considered to be affordable for funders and operators

Specific – it is necessary to develop an option which is considered to be affordable for funders relative to capital funding, and also for operators relative to revenue funding.

Measurable – the amount of capital funding required can be compared relative to existing published budgets. The amount of revenue funding can be assessed relative to current levels of expenditure.

Time Based – the affordability has to be considered for the whole of the appraisal period.

5.2.8

Objective 8

Provide a transport link which provides sufficient capacity for passengers and vehicles

Specific – it is necessary to ensure that the proposed transport link can provide sufficient capacity for vehicles and passengers across the appraisal period. The critical periods are during specific peak times. Account will be taken of historic trends, forecast changes in population, and issues such as the historic growth in size of vehicles.

Measurable – it is possible to measure how well a particular option can cater for current and forecast demands.

Time Based – forecasts will be prepared for a thirty year period.

5.2.9

Objective 9

Provide a transport link which provides island – focussed accessibility opportunities for Unst, Fetlar and Yell

Specific – the preferred option needs to facilitate key accessibility requirements which meet the needs of the islands of Unst, Yell and Fetlar. This includes opportunities to work on other islands / Shetland Mainland and opportunities to provide day trip opportunities on and off the

islands (for example, access to health, shopping, leisure, visiting local care homes and tourist trips).

Measurable – it is possible to measure the number of trip opportunities available for residents of each island.

Time Based – it is hoped that the proposal would allow for such a pattern of opportunities from the commencement of operations.

5.2.10

Objective 10

Provide a transport link which promotes wider socio-economic opportunities for North Isles communities.

Specific – transport is a necessary, but not sufficient, requirement for sustaining vibrant rural communities. The preferred option should not introduce additional barriers to supporting each community, and would ideally remove barriers. The preferred option should also be compatible with wider regeneration activities in the North Isles.

Measurable – a proxy would be the levels of transport movements taking place for each option over the appraisal period. This may also be accounted by an economic activity and locational impact assessment (EALI).

Time Based – this needs to consider short term impacts (5 years), as well as longer term impacts (60 years).

5.3

Constraints

STAG (paragraph 2.1.15) defines “Constraints” as the bounds in which the study is being undertaken, stating that these may include the statutory powers of an authority to promote change as well as Scottish, UK or European legislation.

This study is being promoted by Zetland Transport Partnership (ZetTrans). Together with Shetland Islands Council, the local ferry operator, they have the power to promote changes to the ferry network, and introduce terminal and vessel improvements, although these are subject to legislative constraints imposed by the MCA.

Information on potential constraints in the context of this study are set out below.

5.3.1

Funding

Funding of capital and revenue costs could be a key constraint. Capital costs relate to those costs required to improve infrastructure and in the case of Bluemull Sound, could include replacement of ferries, terminals or the construction of fixed link infrastructure. Revenue costs, on the other hand, refer to the ongoing operational costs required to maintain the Bluemull Sound link such as, for example, crewing costs.

Funding available to promote change could primarily be sourced from the following available bodies:

- Shetland Islands Council
- Scottish Government
- Other European sources

5.3.2

Physical Environment

The physical environment could also act as a constraint that will influence the appraisal process of the various options. Bluemull Sound can be subject to severe weather conditions that disrupt the ferry timetable. Other key physical constraints relate to depths of sea-water, and include wave and swell characteristics.

5.3.3

Wider Inter-Island Ferry Network

Another constraint imposed on this study is the relationship Bluemull Sound has with Yell Sound and the wider inter-island ferry network. This is because any options developed for Bluemull need to ensure it maintains the current service compatibility with Yell Sound, in particular in terms of timetabling.

5.3.4 *Operational and Legislative Requirements*

Finally, it is noted that each particular potential transport link option will be constrained by its particular operational requirements, and legislative requirements. For example, it is necessary that ferries operate within the legislative provisions of the MCA, the requirements of vessel maintenance and servicing, and safe operating procedures. Potential fixed link options are subject to legislative restrictions, as well as potential operational practices to facilitate maintenance and safe operation.

5.4 **Uncertainties**

The greatest uncertainties affecting the study relate to the future vitality and viability of Unst, Fetlar and Yell in the context of depopulation and socio-economic trends. This is dependent on many different factors and not only on the adequacy and attractiveness of the transport links.

There is also uncertainty over future fuel costs which would have a direct impact on the costs of the service but also wider impacts on costs of living and working in the North Isles, visiting the North Isles and the economic viability of Unst, Fetlar and Yell.

The lifespan of the existing ferry infrastructure is not known for certain, but it is likely to become increasingly unreliable, more costly and more difficult to maintain.

It is also important to consider the impacts of vessel crewing in relation to the population dynamics of the islands.

A more immediate uncertainty is the fares policy for Bluemull Sound, with fares having been suspended on the route since September 2005 to allow for economic regeneration in the wake of the RAF's decision to withdraw from Saxa Vord from March 2006. The approval for this suspension of fares was granted until the summer of 2008. An additional decision has since been made to suspend the fares until the end of the summer timetable in 2008.

5.5 **Summary**

This Chapter has set out key planning objectives for study development. The planning objectives have been developed following reviews of policy, problems and opportunities, and the consultation process. These objectives are accompanied by constraints and uncertainties.

Constraints imposed on the study include financial constraints, regarding the funding of capital and revenue costs. The physical characteristics of the study area also impose constraints to the operation of the ferry service, particular with regards to severe weather and the wave and swell characteristics of Bluemull Sound. Accordingly, any options developed for the study area will need to ensure compatibility with the Yell Sound ferry service is maintained. Operational and legislative requirements also impose constraints on the study.

Uncertainties relate to the future vitality and viability of the islands, future fuel costs and the lifespan of the existing ferry infrastructure. An immediate uncertainty is the fares policy for Bluemull Sound, with fares currently suspended.

6. Option Generation and Sifting

6 Option Generation and Sifting

6.1 Introduction

This Chapter describes option development and sifting process that has been undertaken as part of this study.

It discusses and defines the options generated and considered for the appraisal process and provides a summary of those options taken forward for further appraisal. The options were developed to provide a broad range of alternative ways to address the project aims and objectives. Options considered to be unfeasible are quickly sieved out.

6.2 Do Nothing

- This retains the existing vessels and terminals and contains only committed expenditure.

The 'Do Nothing' option is considered to be unacceptable because of the impacts and costs of doing nothing to improve the current transport link.

Under Do Nothing, there would be increased expenditure to maintain the ferry terminals and linkspans. Any maintenance would be difficult to undertake whilst simultaneously operating a ferry service and temporary suspensions of the service would become more probable. The vessels themselves would be subject to increase problems with scheduled and unscheduled maintenance. Maintaining the route would become increasingly costly. There is recent evidence available of the difficulty of undertaking emergency terminal maintenance, and also a recent series of reductions in service levels due to unscheduled vessel maintenance.

In parallel, it is likely that there would be an increased use of relief vessels, but it would be very likely that the service would be reduced to a single vessel service for lengthy periods. There is also the potential additional cost of some form of bare boat charter, if this were available. There is a long term risk of significant curtailment of operations due to the enforcement of legislation.

From a passenger perspective, there would be more disruptions and delays. There would be increased journey and wait times as passengers over-compensate for the risk of disruption. An increased likelihood of disruption and delay would suppress journeys to and from the North Isles as the service becomes more unreliable, and attracts a wider reputation for being unreliable.

The Do Nothing would have a wider impact on the economic viability of Unst and Fetlar, making the islands more difficult places to live and work. This would hasten population decline, reducing the prospect of people moving in and starting families. The feasibility of tourism would also be reduced. There would be increasing costs for deliveries and supplies and increased difficulties of getting services from Shetland Mainland, due to perceived transport difficulties.

Public sector service delivery would become increasingly costly and difficult, and it would be difficult to attract and retain staff. Inevitably, there is a risk of public sector facilities reducing the level of service that is offered.

Overall, in the long term, assuming the Do Nothing would have a significant reduction in the vitality and viability of Unst and Fetlar and a significant reduction in the feasibility and attractiveness of living on these islands, raising a family and undertaking any form of economic enterprise. It would be particularly difficult to maintain an adequate standard of service to these populations.

6.3 Do Minimum

- Replacement of vessels and terminals on a broadly like-for-like basis.

This option would involve providing two replacement Ro-Ro vessels which are compliant with legislation and able to cope with forecast vehicle and passenger demand over the appraisal period. This option would also include options for replacement terminals.

The Do Minimum acts as a viable option in its own right, and also as a benchmark for comparison against other options.

6.4

Vessels

A number of vessel options have been considered for the Bluemull Sound service. These options are summarised below.

- Single fast vessel.

A single fast vessel operating on Bluemull Sound would not have to reach high speeds on crossings between Unst and Yell, but could increase its speed on crossings to Fetlar to make up the time on the current 25 minute crossing to the island from Unst or Yell. Fast vessels are regularly used on longer crossings across the Irish Sea and English Channel.

While this option is to be considered further as a vessel option, it is to be highlighted that the operation of such a vessel is untried in Shetland and as such would contain an element of risk. It is unknown how the vessel would cope in rougher weather, and how the service would be affected as a result of such difficulties.

This option has been retained for further consideration

- An additional Ro-Ro vessel.

This option has not been considered further because there is not a requirement to bring an additional vessel into service. Problems experienced on the route are related to issues over the utilisation of the second vessel, which is inactive for some or all of the weekends, early morning and evenings.

This option has not been considered further

- An additional passenger vessel.

An additional passenger vessel could be used to provide a service from, for example, Houbie in Fetlar to Mid Yell without significant infrastructure costs. This service would be more difficult to provide on Unst and Yell because the terminals are far from the main settlements, particularly in terms of walking distance. This option has been retained, but the reliability and attractiveness of such an option requires further consideration.

This option has been retained for further consideration

- Inter-island (*Earl of Zetland*) passenger service.

The *MV Earl of Zetland* was a passenger ferry which operated between Shetland's isles until the mid 1970s before the introduction of Ro-Ro ferries. The introduction of such a vessel again could be beneficial for tourists visiting Unst, Fetlar and Yell, but would be unlikely to be frequently used by commuters and businesses based in the North Isles because of the longer journey times between the different ports on Shetland's transport network.

This option has not been considered further

- Two Stand-Alone Vessels for Unst and Fetlar.

The current service operates with two vessels that are inter-compatible with each other. However, it is conceivable that one vessel could be commissioned on the service that operated only between Unst and Yell (due to the lower maritime rating of this stretch of water), and a second vessel (similar to current vessels) operating the service between Yell and Fetlar. Despite apparent benefits of providing specific island focussed services, with existing crewing patterns, this proposal would significantly reduce levels of service to Fetlar, and significantly reduce operational flexibility.

This option has not been considered further

6.5

Terminals

A number of terminal options have been considered for the Bluemull Sound service. These options are summarised below.

- Breakwater at Fetlar.

There has been considerable work into the potential benefits of providing a breakwater at Hamars Ness, Fetlar. A breakwater for Fetlar would allow the ferry to dock at Hamars Ness in adverse weather and be based on the island overnight.

This option has been retained for further consideration

- Overnight (off-linkspan) berthing facility at Belmont.

This option involves providing overnight berthing facilities at Unst (off linkspan), opening up future opportunities for the vessel to be crewed from Unst.

This option has been retained for further consideration

- Off linkspan berthing facility at Gutcher.

Similarly, this option involves providing overnight berthing facilities at Gutcher (off linkspan).

This option has been retained for further consideration

- Improved facilities at terminals.

These improvements would be beneficial with any of the options taken forward by helping to make the terminals “gateways” to the isles.

This option has been retained for further consideration

- Establishing the ferry terminal at Toft as the hub for the inter-island ferry network.

Any benefits a “hub” for the inter-island ferry network would bring would be minimised in the North Isles because of the lengthy sea crossing and journey time that would have to be undertaken to reach Toft from Unst and Fetlar.

This option has not been considered further

6.6

Crewing

The following crewing options have been considered for the Bluemull Sound service.

- Additional full time crew.

This option has been retained for further consideration, but is inter-related with vessel and timetable options.

This option has been retained for further consideration

- Additional part time crew.

This option has been retained for further consideration. It is envisaged that a part time crew could help to improve service delivery at peak times, for example at the height of the tourist season.

This option has been retained for further consideration

6.7

Timetable

A number of timetable options that have been considered for the Bluemull Sound service and are summarised below. It is to be highlighted that a number of these options are inter-related.

- Early morning service from Fetlar.

An earlier sailing from Fetlar could help to reduce the level of Fetlar traffic travelling to Yell via the 0820 from Unst, thus alleviating congestion on this busy sailing. This option would have positive benefits for Fetlar residents wishing to access employment on Yell or Shetland Mainland.

This option has been retained for further consideration

- Regularised timetable during the week.

A more regularised timetable would help to make the service easier to understand by having a consistent timetable across the week.

This option has been retained for further consideration

- Reduce number of timetable gaps.

As stated previously, gaps in the timetable at lunch and during periods of ferry maintenance restricts movement between the isles. A service less punctured by gaps in the timetables would enable more flexible travel and be more coherent, potentially helping to even out demand during the day.

This option has been retained for further consideration

- More bookings only.

This option would entail that only those sailings that are booked, at all times of the day, would operate. Ensuring that vessels only run if there is a requirement (i.e. a booking) could help to improve efficiency and reduce operating costs.

This option has been retained for further consideration

- Fewer sailings during the day.

This option could be used to tailor the timetable so that the service is improved at key travel times – for example with more sailings around the morning and evening peaks, and the early afternoon peak – but reduced when there is lower demand.

This option has been retained for further consideration

- Fetlar and Unst running as separate ferry services.

This option could help to reduce the disproportionate impact on Unst caused when the single vessel service calls at Fetlar. It would also help to improve the service to and from Fetlar.

This option has been retained for further consideration**6.8****Fixed Link**

- Fetlar fixed link.

Given the small population that the ferry service to Fetlar currently serves, a fixed link to Fetlar would not be a viable or cost effective solution.

This option has not been considered further

- A bridge across Bluemull Sound between Unst and Yell.

This option would involve the construction of a bridge – broadly comparable in length with the Forth Road crossing – across Bluemull Sound between Unst and Yell. This option would be problematic as weather constraints that impose problems for the current ferry service would also affect the reliability of a bridge. A bridge would also have a more visual impact than a tunnel and could have negative impacts on sense of place factors (for example, reducing the perception of Unst and Yell as individual islands).

This option has not been considered further

- A barrage or causeway across Bluemull Sound between Unst and Yell.

This could also be used to generate power. However, with water depths greater than 30m and strong currents, construction of a suitable barrage/causeway would be particularly difficult, risky and costly despite the potential electricity generation benefits. Due to the complexity and scale of such a project, this option has not been taken forward.

This option has not been considered further

- A tunnel under Bluemull Sound between Unst and Yell.

A tunnel would have less visual impact than a bridge, and would remain open during periods of adverse weather.

This option has been retained for further consideration

- Fixed link between Yell and Shetland Mainland.

Although this option was raised during consultation, it is considered to fall outwith the scope of this study in that it would fail to address the future of Bluemull Sound. A Yell Sound fixed link could be an efficient way to bring travel time savings to all residents of all the North Isles, though it would not address the requirement to find a sustainable option for Bluemull Sound. A fixed link for this route was previously considered before the decision was made to introduce two new ferries, *MV Daggri* and *MV Dagalien*, onto the route in the summer of 2004.

This option has not been considered further within this study

Other options which could be related to the development of a fixed link between Unst and Yell are detailed below.

- Fetlar – Mid Yell ferry service.

If a fixed link was to be developed between Unst and Yell, Fetlar would still require a ferry service. It is considered that the use of a terminal at Mid Yell as the destination port for the Fetlar ferry service would not be viable due to the longer and rougher sea crossing that would have to be undertaken. Therefore the destination port for the Fetlar service would remain at one of the existing terminals at Gutcher or Belmont. Given the deteriorating condition of these terminals, the terminal selected as the destination port for the Fetlar service would require replacement.

This option has not been considered further

- Fetlar – Basta Voe ferry service.

If a fixed link was to be developed between Unst and Yell, there is another option of developing a terminal at Basta Voe. Whilst this may have the advantage of being slightly shorter in length than the current crossing, it would involve significant upgrading of road links, and also creation of new marshalling areas etc. It is considered that, in comparison, keeping the terminal at either Belmont or Gutcher would be a more efficient use of resources overall, as these would require only minimal redevelopment work in the event of a fixed link between Unst and Yell.

This option has not been considered further

The following options relate to the number of ferry crews that could operate a Fetlar ferry service in the event a fixed link is built between Unst and Yell.

- 1 x Fetlar ferry crew

One Fetlar crew could run a service operating for five days of the week, with an operating day of 8 hours.

- 2 x Fetlar ferry crew

Two Fetlar crews could run a seven day service, with an operating day of 8 hours.

- 3 x Fetlar ferry crew

Three Fetlar crews could carry out a full week's service equivalent to the current service.

These options have been retained for further consideration

6.9

Other Options

A number of other options have been considered during the option generation process, as set out below.

- Re-establishment of Unst and Fetlar air links.

Re-establishing air links to Unst and Fetlar could promote a number of wider benefits. Direct chartered air services could support the re-development of RAF Saxa Vord in Unst, whilst air links to Fetlar could help to improve the accessibility of the island to tourists and generate additional wider economic benefits. However it is to be highlighted that this option is outwith the scope of the study and the aim of the study, in the first instance, is to identify options for the long term sustainability of the Bluemull Sound transport link.

This option has not been considered further, but could be a worthy complement to the Bluemull Sound Service

- Bus service improvements.

It would be appropriate to review public transport arrangements with any of the options taken forward. Integrated links between the ferry service and buses would help to improve accessibility between the North Isles, and between the North Isles and Shetland Mainland.

This element would be a worthy complement to the Bluemull Sound Service when outcomes from the appraisal become clearer. The importance of complementary public transport services has been emphasised due to the high (and continually rising) price of petrol and diesel in Shetland.

6.10

Options Taken Forward to STAG Part 1 Appraisal

The different options highlighted above in relation to the vessels, terminals, crews, ferry timetable and fixed links have been combined to form a number of packages, which are outlined below.

The packages are predominantly defined by the infrastructure required to provide the link. It is as a consequence of this that operational issues such as timetabling are not fully captured at this stage. It is envisaged that the detail of the operational aspects, and some items of design detail (such as terminal facilities) can be addressed when there is a clearer picture emerging of the most appropriate option for the nature of the proposed transport link.

- **Option 1 – Do Minimum – Replacement of Gutcher and Belmont terminals and *MV Bigga* and *MV Geira***

This option would involve providing two replacement Ro-Ro vessels which are compliant with legislation and able to cope with forecast vehicle and passenger demand over the appraisal period. This option could also include options for alternative off linkspan berthing at the new terminals.

The Do Minimum acts as a viable option in its own right, and also as a benchmark for comparison against other options.

- **Option 2 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + development of Fetlar breakwater**

This option is similar to option 1, but also includes the development of a breakwater at Fetlar.

- **Option 3 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of a passenger only service**

This option is similar to option 1, but also includes the introduction of a third, passenger only, ferry service.

- **Option 4 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of an additional crew (1 x FT)**

This option is similar to option 1, but also includes the introduction of one additional full-time crew, providing a more frequent service.

- **Option 5 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of an additional crew (1 x PT)**

This option is similar to option 1, but also includes the introduction of one additional part-time crew, providing a more frequent service.

- **Option 6 – Single Fast Vessel**

This option involves the introduction a single fast vessel, instead of the existing two vessels that operate on the route.

- **Option 7 – Unst-Yell Tunnel with 1 x Fetlar crew**

This option involves the development of a fixed link tunnel between Unst and Yell, in addition to the operation of dedicated Fetlar ferry service, operated by one crew running from Fetlar to either an upgraded terminal at Belmont or Gutcher. This option also assumes the development of a breakwater at Fetlar.

- **Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew**

This option involves the development of a fixed link tunnel between Unst and Yell, in addition to the operation of a dedicated Fetlar ferry service, operated by two crews running from Fetlar to either an upgraded terminal at Belmont or Gutcher. This option also assumes the development of a breakwater at Fetlar.

- **Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew**

This option involves the development of a fixed link tunnel between Unst and Yell, in addition to the operation of dedicated Fetlar ferry service, operated by three crews running from Fetlar to either an upgraded terminal at Belmont or Gutcher. This option also assumes the development of a breakwater at Fetlar.

6.11

Summary

This chapter has presented information on the option generation and sifting process that has been undertaken in order to arrive at a package of options which it is considered are worthy of further consideration as part of a STAG Part 1 appraisal.

The results from this appraisal are discussed in the following chapter.

7. STAG Part 1 Appraisal

7 STAG Part 1 Appraisal

7.1

Introduction

This Chapter provides an overview of the results of the STAG 1 appraisal. The appraisal is broken down into three main categories:

- Performance against planning objectives;
- Implementability; and
- Performance against Government objectives.

Consideration is given to how well each option responds to the planning objectives, as set out in Chapter 5. It then continues to consider the performance of the options against four specific “implementability” criteria:

- Technical feasibility;
- Operational feasibility;
- Affordability; and
- Public acceptability.

Finally, the options have been broadly assessed in relation to the five key Government transport appraisal criteria based on the Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion.

Appraisal Summary Tables (ASTs) for the STAG Part 1 Appraisal are presented in Appendix E of the Appendices report.

7.2

Performance Against Planning Objectives

The performance of each of the nine options against each of the objectives is summarised below.

7.2.1

Objective 1: Provide a transport link which is economically efficient.

Do Minimum secures the link at the status quo, but would involve capital costs incurred by replacing the vessels and terminals. The introduction of new infrastructure would however reduce the existing high maintenance liabilities.

Options to enhance the current ferry service (Options 2, 3, 4, 5 and 6) typically incur increased operational or capital costs. For instance, operating costs would be increased with the introduction of a third (passenger only) ferry service (Option 3) and it is considered that the benefits delivered by the purchase of such a vessel could be more efficiently delivered through improvements to existing services, such as for example revenue support for an additional crew, which would facilitate an improved service timetable.

Option 6 could increase economic efficiency through the operation of one vessel rather than two vessels, as currently operated on the route.

The overall economic efficiency of options related to the implementation of tunnel infrastructure between Unst and Yell (Options 7, 8 and 9) is a critical element to this study, and will be determined during the STAG 2 appraisal.

The development of a fixed link, however, would not remove the requirement for a ferry service to Fetlar, and thus investment in ferry infrastructure replacement as well as ferry operating costs, in addition to tunnel construction costs, would continue under these options. The introduction of three Fetlar ferry crews (Option 9) would be more costly than one or two crews

(Options 7 and 8) but has the potential to slightly enhance current service levels. The operation of a service operated by one or two Fetlar ferry crews would either broadly retain, or reduce the current level of service.

7.2.2

Objective 2: Provide a transport link which is operationally reliable on a day to day basis.

Replacement infrastructure under the Do Minimum option would enhance operational reliability by reducing the need for frequent and expensive maintenance of the vessels and terminals.

Options to enhance the current ferry service (Options 2, 3, 4, 5 and 6) generally perform well against this objective. Option 2 in particular would address this objective through the provision of a breakwater on Fetlar, which would allow the ferry to berth overnight throughout the year as well as in periods of adverse weather. With regards to Option 3 (passenger only ferry), it could be anticipated that the operation of a smaller, passenger only ferry could be more prone to disruptions during adverse weather.

The provision of a single fast vessel (Option 6), would present an operational risk as it is untried in Shetland, and it is unknown how such a vessel would cope in rougher weather, and how the service would be affected as a result of any difficulties. For example, unreliability could be increased due to operation of a single vessel service, leaving the islands isolated during sudden vessel breakdown.

Tunnelling options (Option 7, 8 and 9) would perform well against this objective, as the provision of a tunnel would remove weather related constraints that affect the current ferry service. These options also assume the development of the Fetlar breakwater, allowing the vessel to berth at Hamars Ness in periods of adverse weather.

7.2.3

Objective 3: Provide a transport link which is operationally sustainable in the long term.

Replacement infrastructure under the Do Minimum option would deliver an operationally sustainable transport link in the long term, by providing infrastructure which would operate for the duration of the appraisal period.

Options to enhance the current ferry service (Options 2, 3, 4, 5, and 6) generally perform well against this objective by replacing the existing ageing infrastructure, thus enhancing service reliability and facilitating the provision of a link which is operationally sustainable for the lifetime of the infrastructure.

The effect of providing a single fast ferry (Option 6) on service reliability is generally unknown, though it is considered that the provision of replacement vessels during periods of maintenance etc. could be problematic. Two vessels may be required to replace the single vessel.

Tunnelling options (Option 7, 8 and 9) provide a long term solution to providing a sustainable transport link between Unst and Yell and therefore perform well against this objective. The provision of a Fetlar breakwater and dedicated ferry for the island could also support the long term sustainability of Fetlar, but this is dependent upon the levels of service that are provided.

7.2.4

Objective 4: Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland.

The Do Minimum option is only concerned with the replacement of physical infrastructure. This option would not facilitate greater sailing frequency nor timetable changes. Consultation revealed constraints with the current timetable which limits connectivity with the Yell Sound ferry service, public transport and Shetland's wider transport network such as Sumburgh Airport. Therefore, the Do Minimum option performed poorly against this objective.

In contrast, replacement of vessel and terminal infrastructure, plus the provision of a Fetlar breakwater (Option 2) could provide integration improvements as this option would allow a vessel to berth overnight on Fetlar, allowing an additional commuter sailing, thus potentially providing improved integration opportunities between the transport networks of Unst, Fetlar, Yell, and Shetland Mainland.

The provision of a third, passenger only, service could also increase transport integration opportunities. However, this would be dependent upon how it operated. A Gutcher/Belmont link would require additional public transport links as all the terminals are remote from nearby settlements. In contrast, a Houbie (Fetlar) to Mid Yell link could potentially operate without supporting public transport links, although opportunities to link with the main North /South public transport connection would be lost.

Option 4, which involves the provision of a more frequent service, enabled by the introduction of an additional full-time crew, performs well against this objective. The main impact of this option is to regularise the timetable, allowing easier journey plans and a more consistent pattern of opportunities across the week. Option 5, which involves the introduction of an additional part-time crew, also performs well against this objective, albeit to a lesser extent than Option 4.

The operation of one single fast vessel (Option 6) would be designed to broadly replace the existing service pattern, so the impact would be reasonably negligible when operating normally.

Tunnelling options (Options 7, 8 and 9) would perform well against this objective by providing 24 hour access to Unst from Yell. The introduction of three Fetlar crews (Option 9) would enhance existing levels of accessibility to and from the island and in turn provide potentially improved levels of integration with the wider transport network. Option 7 (one crew) and Option 8 (two crews) would result in either a broadly equivalent, or a less frequent ferry service for the island and either equivalent, or poorer levels of transport integration.

7.2.5

Objective 5: Provide a transport link which has a regular and easily understandable pattern of transport opportunities.

The Do Minimum option performs poorly against this objective. Consultation revealed that the current timetable is irregular and difficult to understand, particularly for visitors.

While Option 2 only assumes infrastructure improvements, the development of the Fetlar breakwater and overnight berthing of a vessel on Fetlar could have a slight positive impact against this objective through the provision of more frequent morning sailings, depending on the timetable that is put in place.

Option 3, which includes the introduction of an additional passenger only service, could have positive impacts on this objective through the provision of more frequent sailings for foot passengers. However, for the Ro-Ro services, similar to 2, this option only assumes infrastructure improvements and would therefore not facilitate changes in service frequency.

Options 4 and 5 perform well against this objective, because they contain measures which would increase the number of sailings or regularise the timetable through the provision of additional crews, thus making the timetable easier to understand overall.

The introduction of a single fast vessel (Option 6) would generally be designed to broadly replace the existing service pattern. While it is considered that the operation of one vessel instead of two could make the service more understandable, this option would have no impact on service frequency.

Tunnelling options (Option 7, 8 and 9) would perform well against this objective by providing 24 hour access to Unst from Yell. Levels of service frequency for Fetlar would be slightly improved, relative to those currently provided with a three crew option, but there would be a reduced pattern of sailings to the island under Options 7 with only one crew operating the Fetlar ferry service. A two crew service would be broadly negligible.

7.2.6

Objective 6: Provide a transport link which is considered to be affordable to users.

The Do Minimum and Options 2, 3, 4, 5 and 6 are currently considered to have a negligible impact on this objective with fares currently suspended on Bluemull Sound routes to support economic regeneration in the North Isles following the closure of RAF Saxa Vord. A decision on the possible re-instatement of fares is anticipated in early October 2008.

With regards to Options 7, 8 and 9, the impact of tunnels on user affordability is unknown at present, as the cost to users would depend on whether tolls would be included. It is noted that it is current Scottish Government policy to remove fares on tolled crossings.

7.2.7

Objective 7: Provide a transport link which is considered to be affordable for funders and operators.

The Do Minimum and Options 2, 3, 4, 5 and 6 would incur high capital costs associated with new infrastructure though in the longer term would minimise high operating costs incurred by frequent maintenance of the existing, ageing ferry infrastructure.

Option 6 (single fast vessel) is considered affordable for funders and operators as costs could be saved through the operation of one vessel rather than two.

Options 7, 8 and 9 (tunnelling) involve high capital costs but lower operating costs. The use of three Fetlar ferry crews (Option 9) is similar to the four crew service currently provided across the route, while Options 7 (one Fetlar crew) and Option 8 (two Fetlar crews) involve a reduction in crew numbers and would thus be considered more affordable for funders.

7.2.8

Objective 8: Provide a transport link which provides sufficient capacity for passengers and vehicles.

The Do Minimum and Options 2, 3, 4 and 5 perform well against this objective because they include the provision of two replacement Ro-Ro vessels which are able to cope with forecast vehicle capacity demand over the appraisal period. Option 3 also performs well against this objective, with the provision of the passenger only service providing additional passenger capacity on the route. However, this is dependent upon the service being utilised by passengers.

A single fast vessel (Option 6) could help to relieve existing capacity problems and it is considered that this vessel would be built with appropriate capacity for passengers and vehicles.

Tunnelling Options 7, 8 and 9 would provide unrestricted capacity for vehicles and passengers travelling between Unst and Yell. It is envisaged that a dedicated Fetlar ferry would be designed to provide sufficient capacity for passengers and vehicles at peak times across all options. Over the day, Options 7 (one crew) and 8 (two crews) would provide less capacity than Option 9 (three crews).

7.2.9

Objective 9: Provide a transport link which provides island – focussed accessibility opportunities for Unst, Fetlar and Yell.

The Do Minimum option could have minor positive benefits for island accessibility through the provision of new infrastructure that could increase service reliability. However, opportunities for increased access to services etc. would be negligible because this option is focussed on infrastructure improvements rather than service enhancements.

The provision of a breakwater for Fetlar (Option 2) would improve access to and from the island. Option 3 performs well against this objective as it could also help to improve accessibility to and from Fetlar, if the service can be designed to be attractive to users. Options 4 and 5 generally perform well against this objective, because they contain measures which would increase the number of sailings or regularise the timetable, providing some additional sailings.

The provision of one single fast vessel (Option 6) instead of two could lead to a perceived reduction in opportunities to access the islands, although overall the service would be designed to broadly replace the existing service pattern and thus this option would have a negligible impact on accessibility.

Tunnelling options 7, 8 and 9 would provide high levels of accessibility to/from Unst and Yell. Access problems to/from Fetlar could remain due to operation of a one or two crew service. The operation of a three crew, dedicated ferry service would increase the accessibility of the island.

7.2.10

Objective 10: Provide a transport link which promotes wider socio-economic opportunities for North Isles communities.

The Do Minimum option would enhance service reliability. However, this option would require additional complimentary measures in order to promote wider socio-economic opportunities for the islands.

Option 2 would enhance service reliability whilst the provision of a Fetlar breakwater would enable an additional commuter sailing which would improve accessibility. The breakwater could further support wider socio-economic opportunities if supported by small boat berthing facilities.

A passenger only service (Option 3) could generate a greater number of day tripping tourists in the summer months which could promote wider benefits for the islands, although this would require to be matched by associated improvements in public transport.

Option 4 could provide wider socio-economic opportunities by providing greater opportunity for travel to and from the isles, particularly tourist travel during peak times, and would enable businesses/residents greater freedom of movement to carry out jobs elsewhere within the North

Isles, and other parts of Shetland. There would be improved access to services. Option 5 would also have a positive effect on the delivery of this objective.

Option 6 (single fast vessel) would have a minor positive impact on the socio-economic development of the North Isles by providing a service which helps to relieve capacity constraints.

A tunnel (Options 7, 8 and 9) between Unst and Yell could encourage wider socio-economic benefits by improving the potential for inward investment and stimulating population growth, which in turn would support local economic growth. Wider impacts on Fetlar would be limited with the operation of a one or two crew ferry service, but could be increased with a three crew service with additional sailings being provided.

7.3 **Implementability**

Some of the options are considered to be more technically and operationally feasible than others, as discussed below.

7.3.1 *Technical Appraisal*

The Do Minimum and Options 2, 3, 4 and 5 are considered to be technically feasible.

There would be questions over the technical feasibility of Option 6 (single fast vessel) as such an option is untried in the Shetland context.

The development of a tunnel between Unst and Yell (Options 7, 8 and 9) would be technically feasible, although work is required to continue to refine design options and costs, and manage technical risk. In the UK, there is no experience of tunnels constructed for low-volume island links.

The provision of a dedicated Fetlar ferry (as assumed under Options 7, 8 and 9) is considered to be technically feasible.

7.3.2 *Operational Appraisal*

The replacement of vessels and terminals (included in the Do Minimum and Options 2, 3, 4, 5 and 6) is considered to be operationally feasible, but operational difficulties related to higher demands for vehicle deck space may apply at the end of the appraisal period should levels of car ownership and use continue to increase. It is noted that current rises in fuel prices, if sustained, may result in people buying smaller, more fuel efficient cars and rationalising their trip making behaviour, which could help to ease this pressure. Demands for vehicle deck space could be partially eased by the operation of a more frequent service which reduces demand at peak times (Options 4 and 5, additional full-time/part-time crew).

It is operationally feasible to provide a passenger only service (Option 3) from, for example, Houbie in Fetlar to Mid Yell. This service would be more difficult to provide on Unst and Yell because the terminals are far from the main settlements, particularly in terms of walking distance.

Option 6 (single fast vessel) would present operational risks. It is unknown how the vessel would cope in rougher weather, and how the service would be affected as a result of such difficulties. Provision of replacement vessels during periods of maintenance could also be problematic.

With regards to tunnelling Options 7, 8 and 9, systems would be required to manage operational risks.

7.3.3 *Financial Appraisal*

Each of the nine options has been appraised relative to current costs.

The Do Minimum and Option 2 would incur high capital costs with similar operating costs.

Options 4 and 5 would incur higher operating costs, and crewing costs, as they include the provision of an additional full-time or part-time crew.

Option 6 would incur lower capital and operating costs as a single (fast) vessel would replace the two existing vessels currently operating on the route.

The provision of tunnel infrastructure (Options 7, 8 and 9) would require significant capital investment though would reduce current ferry service operational costs. However, the impact on operating costs would be dependent on the level of service to Fetlar, provided by either one, two or three ferry crews.

It is considered that the benefits delivered by Option 3 (passenger only service) and Option 6 (single fast vessel) could be achieved at a lesser cost by providing improvements to the existing service, for example by funding an additional crew to facilitate more sailings.

7.3.4

Public Acceptability Appraisal

Consultation highlighted that there is a strong aspiration for improvements to the current situation.

Stakeholder consultation revealed support for the replacement of the vessels and terminals (the Do Minimum and Options 2, 3, 4, 5 and 6). However, the Do Minimum would not facilitate changes to service frequency or the timetable. Support for the development of a breakwater at Fetlar (Option 2) was unanimous among residents of Fetlar, and no objections were raised among residents of Unst and Yell.

The attractiveness of Option 3 (passenger only vessel) could be questioned given the distance between the main settlements in Unst and Yell from the respective ferry terminals, and the longer sea crossing from Fetlar (Houbie to Mid Yell).

Consultation also revealed a need to reduce the gaps in the service and improve the ferry timetable. The introduction of an additional full-time crew (Option 4) would facilitate this and could provide employment opportunities for residents of the North Isles. The introduction of an additional part-time crew (Option 5) could provide a more intensive service during the summer peak period, and also provide employment opportunities.

The introduction of one single fast vessel (Option 6) instead of two could lead to a perceived reduction in accessibility levels, and could also be perceived as a risky option to take forward due to the service disruption that could occur during periods of service maintenance or breakdown.

With regards to the tunnel options, consultation revealed a majority of residents on Unst supported the development of a tunnel between Unst and Yell, although it is worth noting that consultation revealed some anxiety that a tunnel could reduce the perception of Unst and Yell as unique, individual islands and lead to a rationalisation of services between Unst and Yell. Fetlar residents generally support the development of a tunnel as this would provide the opportunity for the island to have a dedicated ferry service with the ferry based on the island.

However, Fetlar residents expressed concerns that the provision of a fixed link between Unst and Yell could lead to the provision of a 'watered-down' ferry service, as could be anticipated with the provision of a one crew service. The provision of a dedicated Fetlar ferry service, operated by three crews (Option 9) could support increased accessibility to the island.

7.4

Performance Against Government Objectives

This section summarises the appraisal of each of the options against the Government's five key objectives for transport: Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion.

7.4.1

Environment

The development of new infrastructure, as proposed by the Do Minimum and Options 2, 3, 4, 5 and 6 could lead to some adverse environmental impact, particularly during construction. There is a geological SSSI on both sides of the Gutcher terminal. The provision of the Fetlar breakwater (Options 2, 7, 8 and 9) would also have potential environmental impacts during construction.

Options 7, 8 and 9 involve the construction of a tunnel between Unst and Yell and this could lead to some impacts during construction (on land uses; generation of waste from tunnelling, noise and vibration etc.). Once operational, a tunnel would remove the requirement for emissions related to the operation of ferries across Bluemull Sound, although the development of a tunnel would lead to increased levels of private vehicle emissions.

7.4.2

Safety

Replacement vessels (the Do Minimum and Options 2, 3, 4, 5, 6, 7, 8 and 9) would comply with maritime legislation (SOLAS).

Whilst the removal of a ferry link removes one set of safety consideration (maritime legislative requirements), Options 7, 8 and 9 would introduce road safety risk, which would require to be managed through the introduction of tunnel operational procedures.

7.4.3

Economy

Increased service reliability and user confidence due to improved quality of infrastructure (the Do Minimum and Options 2, 3, 4 and 5) could have a minor positive impact for economic development.

Wider economic benefits could be brought to Fetlar through the development of the breakwater (Option 2) and to the North Isles as a whole due to regularisation of the timetable (Options 4 and 5). Wider economic benefits could also be delivered through the provision of more opportunities to access the islands, as facilitated by provision of the passenger only service (Option 3).

Option 6 could have negative economic impacts as service breakdowns could have wider economic costs due to the requirement to replace the single fast vessel, with two conventional vessels (two of which may not necessarily be available).

A tunnel could provide the opportunity to improve business performance, and potentially widen the job search market for North Isles residents. Reduced accessibility, associated with the operation of a single crew service (Options 7), would have a detrimental impact to the Fetlar economy e.g. reduced opportunities for tourists to visit the island and locals to work off the island. There would be a loss of ferry jobs across the North Isles associated with the introduction of a single vessel serving Fetlar. The potential to deliver positive wider economic impacts on Fetlar would be increased with a three crew option, with a dedicated ferry service serving the island (Option 9).

7.4.4

Integration

The Do Minimum and Options 2 and 3 would not significantly promote or enhance integration with other transport modes and Shetland's wider transport network, as these are focussed primarily on infrastructure enhancements as opposed to service timetabling improvements.

The introduction of a more regular ferry service (Options 4 and 5) could provide better opportunities to improve integration with the wider transport network in the North Isles and Shetland Mainland.

The operation of one single fast vessel (Option 6) would be designed to broadly replace the existing service pattern, and hence the impact would be reasonably negligible when operating normally.

In terms of transport integration, a tunnel (Options 7, 8 and 9), would enable the provision of a continuous bus service from Unst as far as Ulsta in Yell and provide opportunities for Unst residents to catch the earlier departures from Sumburgh Airport in the morning. With regards to the dedicated Fetlar service, the provision of a single crew service (Options 7) would have negative impacts on transport integration opportunities, due to the operation of a reduced service frequency. The provision of a dedicated Fetlar service, operated by three crews (Option 9), would on the other hand have a positive impact on transport integration opportunities.

7.4.5

Accessibility and Social Inclusion

The Do Minimum option would have a minor positive impact on accessibility due to the provision of a more reliable service. However, concerns related to the existing problems that residents face in terms of accessing jobs on and off the islands, shops, services and other facilities would remain because these opportunities are restricted by the current timetable and this option entails only infrastructure rather than service level improvements. This option would have a negligible impact on Fetlar residents because the same problem of access to and from the island would remain.

The development of the breakwater at Fetlar (Option 2) would improve accessibility to and from the island as well as promoting a number of wider social and economic benefits for the local community by enabling the ferry to berth on the island overnight. This increases the potential to

introduce commuter sailings from the island in the morning, allowing Fetlar residents to access jobs off the island.

A passenger only service (Option 3) from Fetlar-Mid Yell could enhance opportunities for Fetlar residents to access key services in Mid Yell. The provision of this service could also improve access to the island, enabling tourists to make day trips to Fetlar in the summer months, which in turn could promote wider benefits for the local community. This is dependent on service levels.

Provision of a more frequent service through the introduction of an additional full-time crew (Option 4) would increase the accessibility of the North Isles and its residents, allowing increased opportunity to access services off the isles. The introduction of a part-time crew (Option 5) would provide a reasonably frequent service.

Provision of one vessel instead of two could have a slight negative impact on accessibility through a perceived reduction in opportunities to access the islands, although overall the service would be designed to broadly replace the existing service pattern and thus this option would have a negligible impact on accessibility.

The provision of a tunnel (Options 7, 8 and 9) would provide quick and easy access from Yell to Unst, which in turn should increase the social and economic opportunities available to residents. Opportunities generated for Fetlar would be limited in scope, as inflexibility would remain with regards to travel to and from the island with only one/two crews operating the service. A three crew, dedicated Fetlar ferry service would deliver a number of wider benefits to the island through increased accessibility levels, depending on the level of service that could be provided.

7.5

Outcome of Appraisal

The results of the STAG Part 1 appraisal led to the recommendation that the following options are not taken forward:

- **Option 3 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of a passenger only service**

It is considered that it is unlikely to be cost effective to introduce a third vessel onto the route, and it could be poorly utilised. It may be considered more efficient to use investment to increase the frequency of existing services rather than introduce a new service.

- **Option 6 – Single Fast Vessel**

A single fast vessel would have operational risks, and has not been taken forward to STAG 2 Appraisal.

- **Option 7 – Unst-Yell Tunnel with 1 x Fetlar crew**

This option has not been taken forward because a single Fetlar crew would result in a significant reduction in the levels of service for Fetlar.

7.6

Summary

The appraisal found that the following options are potentially suitable and are to be considered further as part of a STAG Part 2 Report:

- **Option 1 – Do Minimum – Replacement of Gutcher and Belmont terminals and *MV Bigga* and *MV Geira***
- **Option 2– Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + development of Fetlar breakwater**
- **Option 4 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of an additional crew (1 x FT)**
- **Option 5 – Replacement of Gutcher and Belmont terminals, *MV Bigga* and *MV Geira* + introduction of an additional crew (1 x PT)**
- **Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew**

- **Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew**

8. Option Development

8 Option Development

8.1 Introduction

The outcomes of the STAG 1 appraisal have been used to focus on the following areas of option development.

- Confirmation of patterns of ferry use;
- Vessel replacement;
- Working up of sample ferry timetables for each option;
- Outline designs for replacement/renewed ferry terminals;
- Further work on the costs and feasibility of a fixed link; and
- Discussions with service providers regarding the impact of a possible fixed link.

8.2 Confirming Patterns of Use

Two key sources of information have been used within this study to help confirm patterns of ferry use – analysis of data from the ferry log books (presented in section 2), and the outcomes from the residents survey undertaken in February 2008.

To fully capture travel patterns of those using the ferry service, an on-board ferry users survey was conducted on Wednesday 2nd July 2008. The survey covered 23 sailings, returning a total of 139 correctly completed surveys. Full details of this survey can be found in Appendix B. The survey typically captured the outward element of the journey, and not the return element of the journey, as it was undertaken between 06.30 and 14.00.

8.2.1 *Travel Mode*

The majority of those surveyed on Yell sailings were sole occupants of a car. For Unst trips, there was generally an even split between sole occupant car drivers and car drivers with passengers. The majority of those surveyed on Fetlar sailings were car drivers with passengers.

No respondents walked or cycled either to, or from any of the Bluemull Sound ferry terminals.

Of respondents who offered a reason for not taking a car that was available to them, they indicated that the car was too expensive, too inconvenient, their vehicle was being repaired or that they were participating in car sharing.

With respect to vehicle utilisation on the ferry, 4 vehicles were left behind in the queue at the ferry terminal. None of the sailings were diverted, and all sailings departed at their scheduled times.

8.2.2 *Profile of Ferry Users*

Taking the available evidence from the initial household survey, the on-board ferry user surveys and anecdotal information, a profile of the different users of the Bluemull Ferry Service has been developed, as illustrated in tables 8.1 and 8.2 below.

The user profiles summarised in Table 8.1 have been based on analysis of the on-board ferry user surveys undertaken in July 2008, whilst Table 8.2 presents the results based on analysis of the initial Residents Questionnaires issued in January 2008.

Table 8.1 – Typical User Profiles aboard the Bluemull Ferries based on Analysis of the Ferry Users Survey (July 2008)

Group	Typical User Profiles aboard the Bluemull Ferries
Travellers from Yell to Unst	<ol style="list-style-type: none"> 1. There are a number of Yell residents who travel to Unst for work purposes. Generally travelling weekdays / 2-3 times per week. 2. A considerable number of people travelling on the service to Unst are coming from Shetland Mainland for work purposes. Rather than commuters, as would be the case with many of those travelling from Yell, these service users are more likely to be involved in supplier services / deliveries to Unst. 3. Some ferry users use the service to return to Unst after visiting Shetland Mainland for education purposes e.g. Shetland College. 4. Other ferry users use the service to return to Unst having been shopping, and involved in personal business in Lerwick. 5. There are a considerable number of tourists using the service to travel to Unst as part of their holiday e.g. for leisure / entertainment purposes. Some of these tourists will travel onwards to Fetlar.
Travellers from Unst to Yell	<ol style="list-style-type: none"> 1. Of the Unst residents using the service, the vast majority are continuing onto Shetland Mainland. Personal business trips (i.e. medical appointments) and shopping were also common trip purposes for users of this service. It is evident that residents will often use their trips to the mainland for multi-purposes. 2. A number of Unst residents also used the ferry service to travel to education in Lerwick.
Travellers from Yell to Fetlar	<ol style="list-style-type: none"> 1. Trips from Yell to Fetlar are dominated by people travelling home after being involved in work/personal business on Shetland Mainland. 2. The remainder are travelling to Fetlar to work on the island.
Travellers from Unst to Fetlar	<ol style="list-style-type: none"> 1. Of those people travelling from Unst to Fetlar, all were on holiday in Unst and visiting Fetlar for the purposes of leisure / entertainment.
Travellers from Fetlar to Unst	<ol style="list-style-type: none"> 1. Of those few trips made from Fetlar to Unst, there is a mixed pattern of service use. Trip purposes include education (i.e. the school children at Fetlar going for their weekly specialist classes in Unst), shopping and work.
Travellers from Fetlar to Yell	<ol style="list-style-type: none"> 1. Again, of those few trips made from Fetlar to Yell, there is a mixed pattern of service use. Trip purposes include travel from home to work and also from home to medical appointments.

Table 8.2 – Typical User Profiles aboard the Bluemull Ferries based on Residents' Survey (February 2008) and Anecdotal Evidence

Group	Typical User Profile(s) aboard the Bluemull Ferries	Supporting Evidence
Unst Residents	<ol style="list-style-type: none"> Typically Unst residents are using the ferry on a weekly basis largely for the purposes of shopping, visiting friends and relatives (VFR) and accessing health care in Yell and Shetland Mainland. There is a small amount of daily commuting. Pupils travelling on a weekly basis to Anderson High School. 	<ul style="list-style-type: none"> Residents Survey revealed the majority of Unst residents travelled weekly (39%) on the service. 22% travelled monthly; while much less travelled frequently i.e. only 5% travelled more than once a day; 6% daily; and 13% 2/3 times per week. In terms of trip purpose, the Resident's Survey revealed the following trip purposes of Unst residents: Shopping – 29%; VFR – 23%; Health Care – 17%; business meetings – 8%; Sports and Leisure, and Commuting – 7%; and Education – 5%.
Fetlar Residents	<ol style="list-style-type: none"> Fetlar residents are using the ferry on a weekly basis, typically for the purposes of VFR, shopping and accessing health care. There is a small amount of commuting. Pupils travelling on a weekly basis to Anderson High School. 	<ul style="list-style-type: none"> Resident's Survey revealed the majority of Fetlar residents travelled 2-3 times per week / weekly (26% each). 28% travelled daily. In terms of trip purpose, the Resident's Survey revealed the following trip purposes of Fetlar residents: VFR – 25%; Shopping – 22%; Health Care – 15%; business meetings – 11%; Sports and Leisure, Education, and Commuting – 8%.
Yell Residents	<ol style="list-style-type: none"> Yell residents tend to use the Bluemull ferry only occasionally typically for the purposes of VFR. A number of Yell residents also use the service to commute to jobs. 	<ul style="list-style-type: none"> Resident's Survey revealed the majority of Yell residents travelled occasionally (44%), weekly (22%) or monthly (17%). 12% use it 2/3 times per week, with 5% using it more than once a day. In terms of trip purpose, the Resident's Survey revealed the following trip purposes of Yell residents: VFR – 32%; Commuting – 16%; business meetings – 13%.
Local Businesses	<ol style="list-style-type: none"> Service industries (e.g. Hotels, B&Bs) use the ferry to make trips to the mainland for supplies on a relatively frequent basis (e.g. weekly, twice weekly). 	
Suppliers/Services from Shetland Mainland	<ol style="list-style-type: none"> Ferry User Survey revealed a total of 5 HGVs and 17 vans travelling to the North Isles. The majority of these travelled on the Yell to Unst leg, with only a few movements between Unst and Yell. The majority of this traffic came from the Mainland (Lerwick). 	
Tourists	<ol style="list-style-type: none"> Short stay visitors, largely visiting for wildlife, walks, scenery (and general interest i.e. island community), as well as to visit friends and relatives and SOLI (on Fetlar). Mainly during summer season. Majority of visitors are travelling direct to Unst. Some then make their way to Fetlar. 	<ul style="list-style-type: none"> Fetlar Visitor Survey - 34% of visitors stayed ½ day; 25% stayed 1 day; 12% stayed 2 days; 17% stays 2+ days; only 2% stayed a week; 10% stayed for an other length of time.

8.3 Vessel Replacement

Current vessels on the Bluemull Sound route have vehicle carrying capacities varying from 16 PCU to 11 PCU.

No specific work has been undertaken with respect to developing vessel specifications. However work undertaken to inform the parallel appraisal of the Whalsay service has been utilised, in addition to other information available to SIC / ZetTrans.

For options which assume ongoing ferry provision, the appraisal has been undertaken on the basis that two twin Ro-Ro vessels would be procured, with nominal capacities of 20 PCU, of length of 42m. A double ended vessel design would be considered most suitable, based on the positive experiences of the Yell Sound vessels. The anticipated cost (2008) of such a vessel has been estimated to be £7.88m.

For options which assume a fixed link, a vessel with 14 PCU capacity has been assumed. The anticipated cost (2008) of such a vessel has been assumed to be £6.56m.

8.4 Sample Ferry Timetables

Work has been undertaken considering the differing levels of service that could be possible with the alternative options that remain within the appraisal. These sample timetables, and the levels of service that they afford (in terms of the number of sailings enabled on each route) are presented within Appendix C. Operational costs associated with each option are detailed in Appendix H.

8.4.1 *Do Minimum*

This option assumes the continuation of the current summer and winter timetables, but without the current summer arrangement which allows overnight berthing at Fetlar in clement weather.

8.4.2 *Option 2 – Fetlar Breakwater*

This option assumes the continuation of the current summer and winter timetables, but with the current summer arrangement allowing berthing overnight in Fetlar continued throughout the year.

Over and above this, it is recognised that within this option there are opportunities for variants, which could be implemented either separately, or in combination. Variants include:

a) the current 0720 ex Gutcher / 0750 ex Hamars Ness / 0820 ex Belmont service could be replaced by two Gutcher – Belmont – Gutcher services, assuming that sufficient crew were available to man the 0755 ex Hamars Ness.

b) it would be possible for a 0645 ex Hamars Ness service to be introduced, enabling a connection with the 0745 ex Ulsta. This could be achieved at additional cost (by extending crewing hours) or by bringing forward the last service operated by the Day Vessel.

8.4.3 *Option 4 – Additional Full Time Crew*

The timetable assumes the provision of an additional full time crew on the route and provides significant improvements to the current timetable, broadly matching the levels of service (length of operating day across the week) achieved by the two Whalsay vessels.

8.4.4 *Option 5 – Additional Part Time Crew*

The timetable assumes the provision of an additional part time crew on the route and provides improvements to the weekend timetable.

8.4.5 *Option 8 – Tunnel + 2 Shift Fetlar Service*

In discussion with the Fetlar community, a timetable has been developed for this option, with an early 0645 departure, a break during the middle of the day, and a resumption of service late afternoon. The vessel would be based on Fetlar. It is noted that this timetable is designed to efficiently provide for the requirements of the Fetlar community, although is associated with a number of implementation risks and assumptions.

The proposal as developed assumes that there would be two crews of four (Master, Mate, Engineer, Deckhand) plus one member on permanent holiday cover. The crew would require to be qualified and competent to a level where they would be able to cover each other's holidays. It would be necessary for current crew, and future crews, to be willing to operate a split shift

system as proposed, and there would also be a requirement for community support for flexibility in the application of the timetable.

Service delivery risks arise if all the crew now or in the future could not (or would not) be based permanently on Fetlar. There are also potential manning implications if the vessel required a crew of five (potentially due to the resumption of fares on Bluemull Sound). Overall, however, it is considered that given sufficient planning time, such risks could be managed and mitigated, but it must also be realised that this particular proposal does rely on a number of specific assumptions.

8.4.6 *Option 9 – Tunnel + 3 Shift Fetlar Service*

This option would broadly provide the same levels of service (length of operating day) as achieved by the current Shift Vessel operating on Bluemull Sound, as applied to Fetlar, but with an early 0645 departure afforded by the provision of the breakwater at Hamars Ness, which is assumed under both tunnel options. This option is considered more robust and sustainable than option 8 in relation to Fetlar, but comes at higher costs.

8.5 **Ferry Terminal Replacement**

Outline design work was commissioned following the outcome of the STAG 1 appraisal to determine the feasibility and cost of replacement ferry terminals for options 1, 2, 4 and 5, and also renewal of either of Gutcher or Belmont for options 8 and 9. Outline designs are provided in Appendix D. Costs are confirmed in Appendix H.

The berthing structures have been optimised for use by a 42m ferry, and would be developed to cater for occasional use by a B600 size ferry, similar to the capabilities of the Fetlar terminal.

The designers found that finding a workable solution at Gutcher was not necessarily straight forward, due to restricted water depth and space inside the existing breakwater. Available survey information suggests that water depths increase quite rapidly once outside the existing breakwater. Also, once outside the existing breakwater, there is exposure to weather from both northerly and southerly directions, possibly necessitating the construction of more than one breakwater. The designers have accordingly considered a new berthing structure inside the existing breakwater, but this is further complicated by the presence of the old ferry pier and the burn outlet from Gutcher loch. The construction work would be in close proximity to the current ferry service, but it is envisaged that this could be managed in a similar manner to that of the recently constructed Ulsta ferry terminal. Whilst the outline design is sufficient for the purposes of the appraisal, it has been noted that if the preferred solution required a replacement terminal at Gutcher, further work and survey information would be required in order to find the optimal terminal layout. Costs for an off-line design at Gutcher (exclusive of contingencies, 2008 prices) was £5.8m.

Belmont, by comparison, was found to be more straight forward. The preliminary layout shows a new berthing structure constructed to the north of the existing linkspan. An extension is provided to the existing breakwater and a relatively small amount of dredging is required to achieve the required water depth. There is, however, quite a lot of crushed rock infill required for the breakwater extension and land reclamation. Costs for an off-line design at Belmont (exclusive of contingencies, 2008 prices) was £5.2m.

Costs have also been developed for an 'on-line' construction at Belmont (for the tunnel scenario where a single terminal is required on either Yell or Unst). For this layout the existing breakwater is extended and a solid berthing face is provided on the inside. It is envisaged that the level of the linkspan will need to be raised to cater for the larger ferries so an allowance has been made to partially regrade and resurface the existing marshalling area. Costs for an on-line design at Belmont (exclusive of contingencies, 2008 prices) was £4.3m.

Although estimated costs have not been developed, a similar scheme would be possible at Gutcher but may cost perhaps £0.5m more due to the requirement for more extensive dredging and more material in the breakwater extension.

For the purposes of the STAG 2 appraisal, it has been assumed that Belmont would be the terminal for the Fetlar service. This is because a terminal at this location would be easier and

cheaper to construct, but also because maintaining a terminal on linkspan provides the prospect of ensuring vehicular access to Unst in the event of tunnel non-availability. However, it is recognised that this decision will have to be verified by further design and consultation work.

An amount of feasibility and design work has previously been undertaken to consider options for the construction of a breakwater at Fetlar, as either a stand-alone element, or as part of a wider scheme to introduce a small craft berthing facility. Costs for a standalone breakwater have been estimated at £2.1m. It will be necessary to ensure that the designs for this breakwater are compatible with future vessels to be used on the route, and also the terminal design adopted for Belmont / Gutcher.

8.6 Fixed Link

As part of a parallel commission, fixed link feasibility studies have been commissioned covering links between Shetland Mainland and Whalsay, Shetland Mainland and Yell, and between Yell and Unst. Building upon earlier work, these studies have considered engineering feasibility and costs, as well as a particularly detailed analysis of tunnel operational risks. The work has also benefited from the work that has been undertaken to inform the appraisal of options for the Bressay link.

8.6.1 *Engineering Feasibility and Costs*

During the engineering study, existing alignments for the Yell – Unst crossing was reviewed and revised. The revised alignment reflects a consistent approach to managing design and construction risk. The construction technique that has been assumed uses drill and blast mining with a target cover depth from the tunnel crown to the sea bed of 50m. An integrated digital map with broad coverage was used to combine topographic and bathymetric survey data giving a more accurate understanding of landing sites and subsea rock cover.

An alignment and cross sections are indicated in Appendix D. Cost estimates have been produced for the tunnels based on costs derived from completed projects of a similar type. This has determined that a cost of the Yell – Unst tunnel should be taken as £63million. With these costs based on a conservative review of out-turn costs from other tunnels constructed world-wide, at this stage it should be assumed that these are accurate to +/- 35 per cent, and inclusive of contingency allowances.

8.6.2 *Risk Assessment*

The tunnel risk assessment has shown that there is a valid case for tunnels to provide fixed links between some of Shetland's islands. Furthermore, the work has demonstrated that the UK codes allow for the use of these single bore tunnels, as their configuration is not precluded, provided it can be justified by risk assessment.

In this case, using very conservative assumptions, the risk for the Yell – Unst tunnel has been demonstrated to be at or less than that which is experienced in the UK road system generally and, therefore, they can be considered practicable designs.

However, the implication of UK safety legislation is that achieving a comparable risk level to that which exists at present is not sufficient, if there are practicable measures to reduce the risk further.

Therefore, if additional safety systems are proposed which do not significantly reduce the economic case, they must be considered practicable. A qualitative review of the alternative systems suggests that provision of tunnel suppression could be practicable and would allow the design and approvals process to be efficient, and provide considerable operational continuity benefits.

8.7 Impacts on Local Service Delivery

Discussions have been undertaken with key stakeholders to determine likely impacts for service delivery under the key scenarios being considered within this appraisal (Do Minimum, Enhanced Ferry Service, and Fixed Link). These discussions have included SIC's Heads of Service, as well as the North Isles Service Delivery Group.

8.7.1 *Ferry Replacement / Improved Ferry*

Overall, the discussions concluded both ferry based scenarios would really have few significant impacts on the existing situation, relative to the status quo. Police and doctors would require duplication on both Yell and Unst. The key concern was the impact of increasing fuel prices, and the ability of the Council to maintain present levels of service on the route. Concern was also expressed regarding the future potential re-introduction of fares onto the route.

8.7.2 *Fixed Link*

It was only with the fixed link option that a noticeable “step change” in terms of service delivery could be envisaged. This would primarily be around delivering better services, and getting more out of existing resources, rather than any rationalisation of services. Examples of impacts are highlighted below.

- A greater pool of resources, which may overcome some of the staff shortages in community care at the moment (e.g. Cullivoe and Fetlar) and also in relation to child care and child care facilities. It could also address housing shortages (in Yell) and surpluses (in Unst) taking a whole North Isles approach;
- More joined-up emergency care and support;
- Specialists, such as chiropodists, would be able to make more efficient use of time – coming once a week to Unst and Yell, for example, rather than to each island separately;
- Easier access to first flights leaving Sumburgh;
- For schools, shared headship may be a possibility, but unlikely to be an improvement – this could also apply to care centres;
- More opportunities for socialising between the isles (the free ferry fares on Bluemull has assisted with this) and access to leisure activities; and
- Road safety improvement, as less perceived need to speed to ferries.

It was noted that the groups were unable to specifically commit to more radical proposals in relation to the future delivery of services. However, some form of rationalisation could not be ruled out to take account of changing patterns of land use, population and movement precipitated by a fixed link. It was a recommendation of the groups that any future proposals would require to be planned in a co-ordinated and managed way, to ensure the ongoing viability of Unst, Yell and Fetlar.

8.8 **STAG Part 2 Appraisal**

The areas of option development discussed above have been used to inform the STAG Part 2 Appraisal of the options taken forward.

The following chapters consider each of the options and how they perform against the following criteria:

- Environment;
- Safety;
- Economy;
- Accessibility and Social Inclusion;
- Integration; and
- Costs, Technical Considerations and Risk.

The assessment has been carried out in line with the STAG procedures. Part 2 Appraisal Summary Tables have been completed for the STAG Part 2 assessment and are provided in Appendix F of the Appendices report.

9. Environment

9 Environment

9.1 Introduction

This chapter presents the findings of the Environmental Appraisal undertaken as part of the STAG Part 2 Appraisal process.

The following sections describe the likely environmental effects of each option in relation to the nine environmental sub-criteria identified in the STAG methodology prepared by Transport Scotland.

A full description of the environmental appraisal is set out in Appendix G, which sets out the methodologies employed, the baseline situation, mitigation and the predicted environmental effects.

9.2 Environment Sub-Criteria

Within the STAG Part 2 Appraisal, all of the options are assessed against a number of environmental sub-criteria. Due to the nature of the options under consideration, the sub-criteria have been adapted and refined from those set out in the published guidance. The following have been considered within this appraisal:

- Biodiversity and Habitats;
- Landscape;
- Visual Amenity;
- Cultural Heritage;
- Water Quality, Drainage and Flood Defence;
- Geology;
- Agriculture and Soils;
- Noise and Vibration; and
- Air Quality.

To some extent, all of the options involve coastal development and could impact on coastal processes. Accordingly, the appraisal also considers coastal processes such as sediment transportation or coastal erosion. Impacts on coastal processes could lead to secondary or indirect effects on water quality and biodiversity. Such impacts are addressed under the relevant environmental sub-criterion in order to maintain consistency with the guidance.

9.3 Infrastructure Elements

Within this study, a number of different options, comprising varying combinations of infrastructure, have been developed as a means to improve the transport links across Bluemull Sound. The Environmental Appraisal considers the effects of the different infrastructure elements. Although preliminary designs have been prepared, it is important to note that specific locations for the infrastructure components of each of the options have yet to be confirmed. The infrastructure components of each of the options considered in the assessment are illustrated in Appendix D and described below:

Element A; a replacement terminal at Gutchter (Yell) which would be located either immediately to the north of the existing terminal (referred to as Option A(i)), or up to 300m south of the existing terminal (referred to as Option A(ii)).

Element B; a replacement terminal at Belmont (Unst) which would be located a maximum of 300m either to the north (Option B(i)) or south of the existing terminal (Option B(ii)).

Element C; a new breakwater at Hamars Ness (Fetlar), adjacent to the existing ferry terminal.

Element D; a bored (drill and blast) tunnel linking Yell and Unst. This Option includes the potential for new and upgraded roads linking the existing road networks of Yell and Unst to the tunnel portals.

Element E; upgrades to the existing terminals at either Gutcher (Yell) or Belmont (Unst).

Table 9.1 illustrates the infrastructure assumptions under each of the options which have been taken forward for more detailed appraisal.

Table 9.1 – Comparison of Appraisal Options and Infrastructure Elements

Appraisal Option	A Replacement Terminal at Gutcher	B Replacement Terminal at Belmont	C Breakwater at Hamars Ness	D Tunnel and Access Roads linking Yell and Unst	E Upgrade to existing terminal at Gutcher or Belmont
Option 1 – Do Minimum	✓	✓			
Option 2 – Fetlar Breakwater	✓	✓	✓		
Option 4 – Do Minimum + FT crew	✓	✓			
Option 5 – Do Minimum + PT Crew	✓	✓			
Option 8 – Tunnel + 2x Fetlar			✓	✓	✓
Option 9 – Tunnel + 3x Fetlar			✓	✓	✓

9.4

Methodology

9.4.1

Overview

Environmental appraisals have been carried out in accordance with STAG guidelines published by Transport Scotland. The key aim of the appraisal is to identify where the construction and operation of the infrastructure options may result in significant impacts on the environment. The level of significance is based on a seven-point scale:

- Minor Adverse;
- Moderate Adverse;
- Major Adverse;
- Neutral;

- Minor Positive;
- Moderate Positive; and
- Major Positive.

The appraisal of the environmental sub-criteria within subsequent sections takes into account mitigation based on best practice, established standards and sensitive design. Assumptions regarding mitigation are set out at the outset of each appraisal and the effects presented are therefore residual; i.e. the impacts remaining taking into account the mitigation measures that would be adopted through construction and operation. Impacts identified as neutral or minor adverse are considered environmentally acceptable, however, residual impacts assessed as moderate or higher are considered to be significant.

9.5

Assumptions and Limitations

The environmental appraisal has been undertaken based on the outline engineering designs contained within Appendix D. As highlighted above the specific locations of particular infrastructure options are yet to be confirmed; the appraisal has been undertaken on the assumption that, for the Yell and Unst options, infrastructure may be constructed in a number of locations.

The level of detail considered in the appraisal of each of the environmental sub-criteria varies as particular criteria are considered more susceptible to significant impacts than others. Biodiversity, landscape, visual amenity and cultural heritage have all been identified as key issues and as such have been considered in greater detail. This has included undertaking of site surveys to establish baseline conditions. For the remaining environmental sub-criteria sufficient baseline information to allow for a preliminary desk-based assessment of the options has been collated. As the individual infrastructure elements are further developed and taken forward additional site surveys would be undertaken.

9.6

Summary

This section summarises the significant environmental effects of the infrastructure options under consideration i.e. where residual impacts taking into account mitigation are identified as moderate or major.

9.6.1

Element A

The construction of a new terminal at Gutcher is predicted to have a number of significant environmental effects.

Moderate adverse effects on biodiversity are predicted to result from construction including impacts on designated sites, birds, otters, marine mammals and horse mussels.

Siting the terminal to the south of the existing facility is predicted to result in long term moderate adverse effects on landscape character with short term moderate to major adverse effects predicted to result from construction. In the short term, construction activities would impact on landscape character. In the long term, a new terminal would extend from a relatively linear, rocky and undeveloped section of coastline of open, unspoilt character.

Views from a number of locations will be affected by the proposals however resulting in a range of impacts on visual amenity. The most significant effects are predicted on those receptors located in closest proximity to the development.

Should the terminal be located south of the existing facility, in the proximity of the chapel and graveyard, moderate adverse effects are predicted to result on cultural heritage.

The Gutcher SSSI, designated for its geology, could be impacted should the redeveloped terminal be located to the south of the existing facility. It may impact on the current geological strata and features exposed at the coast and result in a moderate adverse to major adverse impact dependant on the specific exposures affected.

Due to the proximity of the potential development sites to residential properties, construction activities could result in significant adverse noise and vibration effects.

9.6.2

Element B

Construction of a replacement terminal at Belmont, Unst, is predicted to result in temporary disturbance to otters, breeding and wintering birds and marine mammals. These impacts are considered to be moderate adverse, however, in the long term effects are considered neutral.

Impacts on landscape character have the potential to be greater if a new terminal is constructed away from the existing breakwater as it will require development of new supporting infrastructure. It could affect the setting of the Belmont House GDL (Garden and Designated Landscape) and accordingly, long term moderate adverse effects are predicted. In the short term, construction will result in moderate to major adverse effects due to concentration of large plant and machinery.

Impacts on visual amenity range from neutral to major adverse in the short and long term. Due to the number of receptors potentially affected and the range of views afforded of the option the significance of effects is variable.

Should the development affect the existing small quarry behind the marshalling area or adjacent roadside rock exposures, either for cutting or as a source of aggregate, major adverse effects could result. However, if the quarry is unaffected impacts will not be significant.

Construction of a new facility in the southern location could result in minor to moderate adverse effects on a nearby aquaculture development through the disturbance of fine materials and the loss of fluids.

9.6.3

Element C

Significant adverse effects on landscape character and visual amenity (particularly for users of the Urie Ness walking path) are predicted during construction of the Fetlar breakwater. However, these will be short term. In the long term no significant effects are predicted as the breakwater will be viewed in the context of the existing working ferry terminal.

No other significant effects are likely to occur with implementation of mitigation.

9.6.4

Element D

Construction and operation of a bored tunnel linking Yell and Unst is predicted to cause detrimental effects on several environmental factors.

Due to the potential impacts on breeding and wintering birds, otters, cetaceans, and sensitive vegetative habitats, construction impacts can be predicted as being moderate to major adverse. Potential long term impacts on biodiversity can be predicted as being minor to moderate adverse.

Temporary major adverse impacts on landscape character during construction are predicted due to two large construction compounds containing temporary buildings, plant and excavated materials in addition to many HGV movements over an extended period. Long term impacts are likely to result in moderate to major adverse impacts on landscape character due to the introduction on new man-made features in a currently undeveloped landscape.

Short and long term impacts on visual amenity vary considerably, with many properties experiencing no adverse impacts on visual amenity but road and ferry users having views substantially compromised. Permanent impacts would therefore range from neutral to major adverse.

The proposed tunnel option between Yell and Unst has the potential to cause moderate adverse direct impacts upon sites of cultural heritage as well as cause visual impacts upon sites in the area from the portals and access roads.

During construction, in particular earthworks, the potential exists for excavated spoil and other pollutants to enter the loch and drains leading to reductions in water quality. Overall construction effects on Yell and Unst are considered to be minor to moderate adverse.

The construction phase has the potential for greater impacts on agriculture on Unst, due to the requirement for a large construction compound. This could be located on good quality land, disturbing agricultural activities. Depending on its location, temporary impacts could be

moderate adverse. Depending on the location and scale of a tunnel portal and access road on Unst, this option has the potential to result in minor to moderate adverse permanent impacts.

9.6.5

Element E

Upgrades to the existing terminals at either Gutcher (Yell) or Belmont (Unst) are predicted to cause temporary minor – moderate adverse disturbance to otters, breeding and wintering birds, horse mussels and marine mammals.

Temporary moderate to major adverse impacts are likely on landscape character during the construction phase due to the presence of construction equipment and materials and volume of HGV movements.

Construction activities would result in temporary impacts on visual amenity for a number of properties having immediate foreground views of the compound for the duration of the construction phase. Impacts on visual amenity would be temporary neutral to major adverse.

Major adverse effects are predicted on the upgrade of Belmont terminal if cutting or masking on the small quarry or adjacent roadside rock exposures is to be considered during construction.



10. Safety

10 Safety

10.1 Introduction

The safety objective in STAG is principally concerned with the potential impacts on the number and severity of transport-related accidents. Transport-related accidents in the context of this study refer to both maritime-based and road-based accidents.

The safety objective is also concerned with any potential changes in security. Security refers to the subjective experience of the user and their perception of personal safety and security.

The following sections discuss the impacts of the proposals on the two safety sub-objectives: Accidents and Security.

10.2 Accidents

Accidents on the Bluemull Sound transport links are considered in two parts: road accidents and marine accidents.

10.2.1 Road Accidents

Changes in the number of road accidents have been calculated considering the average rate for accidents per veh/km driven, and the changes in vehicle kilometres which occur with each of the options. Options 1, 2, 4, and 5 are associated with increases in vehicle kilometres due to an uplift in demand. Options 8 and 9 are associated with both increases in traffic volume, as well as increases in distance travelled.

Table 10.1 – Summary of Accident Costs (2002 prices, 2002 values)

Option	Accidents summed over 60 years	Change in Accidents, Relative to Do Minimum	Accident Costs (discounted over 60 years), Relative to Do Minimum
Option 1: Do Minimum	43.2	0	£0
Option 2: Do Minimum + Fetlar Breakwater	43.7	0.5	-£26,227
Option 4: Do Minimum + Full Time Crew	46.0	2.8	-£154,382
Option 5: Do Minimum + Part Time Crew	45.4	2.2	-£120,679
Option 8: Tunnel + 2 crew Fetlar Service	81.0	37.8	-£1,582,342
Option 9: Tunnel + 3 crew Fetlar Service	82.6	39.4	-£1,649,193

While it is acknowledged that the introduction of a fixed link will have the impact of reducing the speeding that is associated with drivers to catch a specific ferry departure, overall the calculations presented in Table 10.1 confirm that owing to the significant anticipated levels of traffic increases and distances travelled following the introduction of an Unst-Yell tunnel, options 8 and 9 could result in accident levels approximately double that of the existing situation.

10.2.2

Marine Incidents

Marine incidents include accidents on the ferry vessels themselves (including mishaps between vehicles), accident or conflict between the ferry vessel and other marine traffic and/or the pier, as well as 'near miss' incidents.

Accident data from 2001 and 2005 indicate a total of 96 incidents with Shetland Island Council ferries. These include incidents where there was a 'potential conflict' with another marine vessel. With a total of approximately 69,000 sailings every year, this represents an incident rate of approximately 19 per year or about one incident for every 3,632 sailings. Figure 10.1 shows the total number of marine incidents involving SIC ferries from 2001-2005.

Figure 10.1 – Total Number of Incidents involving SIC ferries (2001-2005)

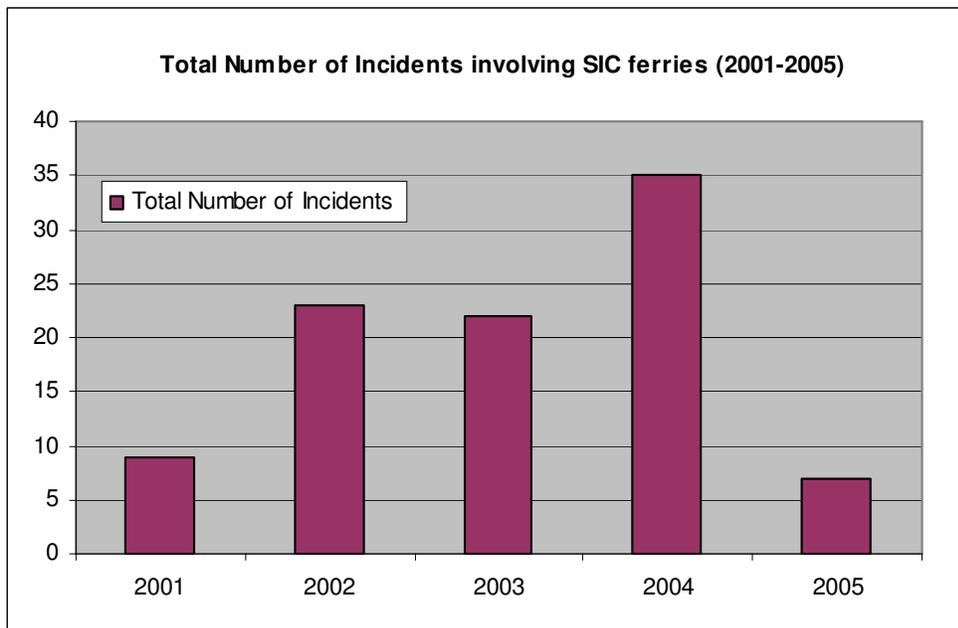


Table 10.2 below indicates the number of additional ferry sailings and maritime incidents that are anticipated under each of the Bluemull Sound options relative to the Do Minimum.

Table 10.2 – Number of Sailings and Maritime Incidents per Year by Option

	Option 1	Option 2	Option 4	Option 5	Option 8	Option 9
Total Sailings Per Year	22,802	23,374	24,648	23,764	5,616	8,840
Change from Do Minimum	0	572	1,846	962	-17,186	-13,962
Incidents per year	0	0.16	0.50	0.26	-4.73	-3.84

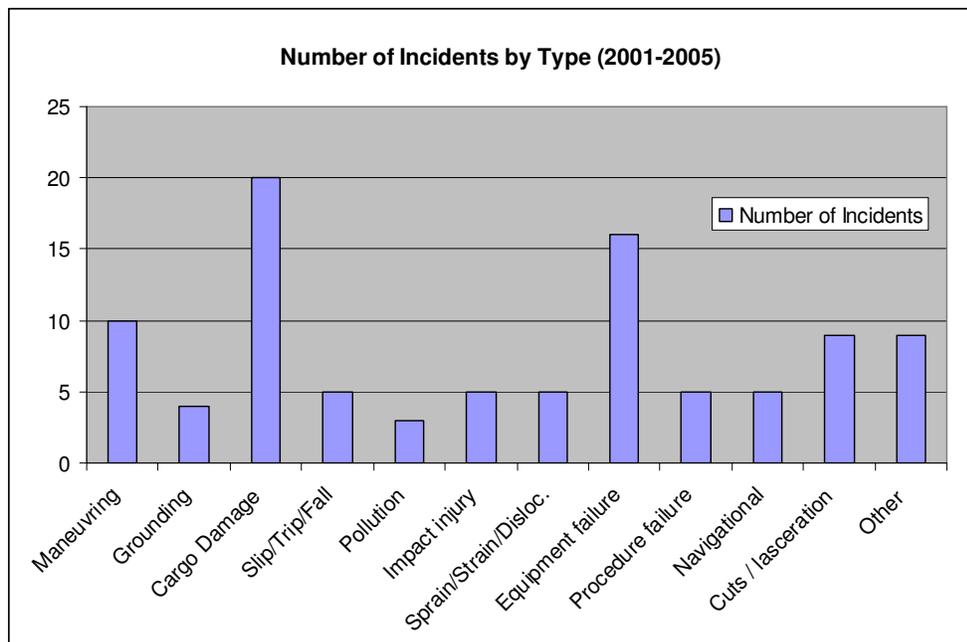
While it is anticipated that options 2, 4 and 5 will result in an increase in yearly sailings, Table 10.2 shows that only a marginal impact on the risk of maritime incidents is anticipated.

It is anticipated that the provision of tunnel infrastructure between Unst and Yell (options 8 and 9) will result in a meaningful reduction in the number of maritime incidents relative to the Do Minimum due to the reduction in ferry sailings associated with these options.

Figure 10.2 shows the breakdown of incidents by type. Most of these incidents relate to damage to cargo on the ferry, for example a vehicle colliding with a ramp. The other major

cause of incidents related to equipment failure. Approximately 10% of incidents between 2001 and 2005 (a total of 10 incidents) were attributed to manoeuvring issues and 5% were attributed to navigational issues.

Figure 10.2 – Number of Incidents by Type (2001-2005)



10.3

Tunnel Risk Assessment

The fixed link risk assessment has shown that there is a valid case for tunnels to provide fixed links within Shetland concluding that “*In this case, using very conservative assumptions, the risk for [the Yell-Unst] tunnel has been demonstrated to be at or less than that which is experienced in the UK road system generally and, therefore, they can be considered practicable designs.*”

The work confirmed that road tunnels in Norway and the Faroe Islands have very low accident rates and an argument can be made for an Unst-Yell tunnel to be constructed to a similar design as those in the Faroe Islands, on the basis of safety risk acceptability for tunnel users.⁴²

10.4

Security

Security is a required consideration of a STAG appraisal and involves an assessment of the impacts of a proposal on pedestrians, cyclists, public transport users, car users and, in this case as well, ferry users. Appraising security is largely a qualitative process and subject to user perceptions. Therefore, an appraisal must consider not only potential changes in *actual* security, but changes in *perceived* security as well.

Aspects or elements that might impact on security would include those related to changes in lighting, CCTV cameras, manning of facilities, presence of other travellers, as well as the perceived safety of the transport link (e.g. ferry vessels and terminals). These are just a few examples.

Using the Do Minimum option as a base case scenario, none of the ferry options are expected to generate any significant changes in security.

Similarly, the fixed link options are not expected to generate any significant changes in security. Security has not been identified as an issue on Unst, Fetlar or Yell and the impact of a fixed link on crime levels is unlikely to be significant. Unst would still be “an island” even with a

⁴² Tunnels Study (Faber Maunsell for ZetTrans)

connecting tunnel to Yell, as a ferry crossing (across Yell Sound) would still be required to reach Unst from elsewhere in Shetland.

Thus it is considered that the fixed link options will not generate any significant changes in security.

10.5

Summary

Following assessment of the various options against the security objective outlined in STAG, it is concluded that there will be change in the number of road accidents, relative to the Do Minimum. The most significant impact will be an increase in road accidents following completion of a Yell-Unst tunnel, due to the increased vehicle-kilometres driven under this option.

However, in terms of maritime accidents, options 8 and 9 potentially provide reductions in the numbers of maritime incidents, by virtue of the net reductions in ferry sailings.

A tunnel risk assessment has been undertaken, and has concluded that the level of risk *“to be at or less than that which is experienced in the UK road system generally.”*

No significant wider security issues were identified.

11. Economy

11 Economy

11.1 Introduction

This chapter provides the outcomes of the appraisal considering the STAG criteria for the economy. Following the revised STAG guidance, it considers Transport Economic Efficiency (TEE), Wider Economic Benefits (WEBS), and Economic Activity and Location Impacts (EALIs).

11.2 Transport Economic Efficiency

11.2.1

Introduction

The focus of the TEE appraisal is consideration of how each of the options contributes to social economic welfare, through an assessment of the costs and benefits incurred by users and private sector operators of the transport network. A consistent methodology has been used across each of the options, in line with established national guidance set out in STAG.

Key appraisal parameters for the TEE appraisal are:

- Options appraisal over a sixty year period;
- Standard price base is 2002 – all costs are converted from 2008 to 2002 price base using appropriate inflation indices; and
- Discount rates of 3.5% used for years 1 to 30, and 3% for years 31 to 60.

Other core assumptions are outlined in Appendix H.

The TEE appraisal considers the total discounted costs and benefits associated with the various options, as experienced by users and private sector operators of the transport network. Public sector costs, and assessment of net present value and value for money has been captured in Chapter 14.

Benefits of the options are from savings in accidents (detailed in Chapter 10), journey time savings experienced by users of the transport system, and changes in vehicle operating costs. Central to the generation of user benefits are estimates of changes in levels of demand.

11.2.2

Demand Forecasting

Analysis has been undertaken of the changing levels of patronage on the Bluemull Sound ferry services, presented in Table 11.1. It can be seen that growth in vehicle carryings typically outstrip growth in passenger carryings.

Table 11.1 - Historical Patronage Trends on Bluemull Sound

Year	PCUs	Growth	Passengers	Growth
1998	43,589	-	117,566	-
1999	68,259	57%	123,634	5%
2000	79,045	16%	134,596	9%
2001	77,547	-2%	128,569	-4%
2002	79,889	3%	141,222	10%
2003	85,947	8%	145,583	3%
2004	86,712	1%	145,324	0%
2005	83,261	-4%	138,584	-5%
2006	89,743	8%	141,875	2%

Average since 1999/2000	PCU 4%	Passengers 2%
Average since 2000/2001	PCU 2%	Passengers 1%

Option 1 – Do Minimum

The appraisal assumes continued growth at the low growth rate. A limit of PCU growth has been established at 75% of total vehicle carrying capacity. We have assumed continued growth up to this ceiling value, after which 0% growth is assumed. Given that there is a necessity for each PCU to be accompanied by one passenger, the number of PCUs carried cannot exceed the number of passengers carried. Where this point is reached, PCU growth is constrained to the level of passenger growth.

Figures are factored up until this maximum is reached at which point 0% growth is assumed.

If PCU figures reach the Pax figures, the growth rate is dropped to that of the Pax figures.

Option 2 – Breakwater at Fetlar

This option would allow the summer berthing that currently occurs at Hamars Ness to continue throughout the winter and regardless of the weather. Demand forecasting assumptions reflect those used for the Do Minimum option, although are increased in proportion to the small increases in sailings offered by this option.

Option 4 – Additional Full Time Crew

Demand forecasting assumptions used for this option match those used for the Do Minimum. Demand is also increased in proportion to the increase in sailings offered by this option.

Option 5 – Additional Part Time crew

Demand forecasting assumptions used for this option match those used for the Do Minimum. Demand is also increased in proportion to the increase in sailings offered by this option.

Option 8 – Unst to Yell tunnel; 2 crew Fetlar service

The Bressay STAG appraisal applied the following to demand for the tunnel / bridge options.

“Work undertaken by SIC has forecast that an increase of daily car trips by around 100% would be a conservative estimate of the number of new trips made as a result of the introduction of a fixed link.”

We believe that this is also an appropriate forecast for the Bluemull Sound appraisal, particularly as growth will be limited by the capacity of the Yell Sound ferry service. Therefore the Yell – Unst element of the current demand is assumed to double in year 1 of the tunnel opening and then revert back to 2% per annum growth. The Fetlar element of the service increases in line with underlying growth, and in proportion to the change in level of service provided by the dedicated service.

Option 9 – Unst to Yell tunnel; 3 crew Fetlar service

The demand forecasting assumptions used for option 9 match those used for option 8.

11.2.3*Journey Time*

The various options will have impacts on the amount of time taken to complete the trip across Bluemull Sound, relative to the current situation.

The ferry journey time from Unst to Yell (and vice versa) is assumed to be 5 minutes wait time at the ferry terminal; 10 minute crossing time; and 2 minutes unloading time. STAG recommends that time spent waiting for transport services is valued at twice the disutility as ‘in vehicle time’ (IVT), as users prefer travelling to waiting for services, so this is equivalent to 24 minutes IVT. To allow for a direct comparison of journey time with the tunnel option (which has tunnel portals further inland than the ferry terminals) an additional 3.01 minutes of travel time has been allocated to the current journey time.

The journey time through the tunnel, and back onto the existing road network, assuming an average speed of 50mph has been calculated as 4.7 minutes. This provides an average journey time saving of 22.31 minutes per crossing. This journey time saving can be applied to options 8 and 9 for the Yell and Unst components of demand.

For options featuring the Fetlar breakwater (options 2, 8 and 9) there is a journey time saving provided to Fetlar residents, due to the direct sailing to 0755 Fetlar to Yell service, as opposed to the 0750 Fetlar to Yell via Unst service. This provides a 10 minute saving per trip. There is no equivalent time saving in the evening period, as both the current and proposed timetables provide direct return services.

Options to improve the existing ferry service in terms of frequency do not generate journey time savings, despite users benefiting from a more convenient range of departure times.

The identified journey time savings can be assigned a value, as detailed in national economic appraisal guidance. From the on-board ferry surveys undertaken, we can determine the following breakdown of trip type.

- Travelling whilst in Work - 18%
- Commuting - 35%
- Other trip purposes - 47%

The following values of time can be applied to these trips types.

- Travelling whilst in Work - £26.73
- Commuting - £5.04
- Other trip purposes - £4.46

This provides a value of time of **£8.67** per hour on the Bluemull Sound crossing. According to established guidance on the evaluation of economic benefits, this full journey time saving has been applied to existing users. However, the half of this journey time saving has been applied to users additional to the Do Minimum (The Rule of Half⁴³).

Values of journey time savings, relative to the Do Minimum, are presented in Table 11.2.

Table 11.2 – Journey Time Savings

Option	Description	Journey Time Savings (mins)	Journey Time Savings (£)
Option 1	Do Minimum	0	£0
Option 2	Fetlar Breakwater	10	£494,853
Option 4	Full Time Crew	0	£0
Option 5	Part Time Crew	0	£0
Option 8	Tunnel + 2 x Fetlar Crew	22.31	£19,874,543
Option 9	Tunnel + 3 x Fetlar Crew	22.31	£19,937,727

Table 11.2 highlights that the provision of the fixed link options offer the potential for significant journey time savings in the region of £20m over the appraisal period. The construction of the Fetlar breakwater and the time savings that can be delivered through the introduction of a direct Fetlar to Yell morning sailing would also generate savings in the region of £0.5m over the appraisal period.

11.2.4

Vehicle Operating Costs

For the Yell-Unst tunnel options, users drive an additional 4.75km on the road network compared to the ferry based options. This incurs additional costs to the users, in terms of additional fuel costs, and additional wear and tear on the vehicle. Full costs of this are applied to existing users; half costs to additional users. Vehicle operating costs are also applied for new trips generated by the options. From analysis of the ferry survey, we have assumed an average additional trip of 67km induced by the options. Results are presented in Table 11.3.

⁴³ http://www.webtag.org.uk/webdocuments/3_Expert/5_Economy_Objective/3.5.3.htm

Table 11.3 – Vehicle Operating Costs

Option	Description	Vehicle Operating Costs (£)
Option 1	Do Minimum	£0
Option 2	Fetlar Breakwater	-£51,833
Option 4	Full Time Crew	-£299,870
Option 5	Part Time Crew	-£235,432
Option 8	Tunnel + 2 x Fetlar Crew	-£4,324,448
Option 9	Tunnel + 3 x Fetlar Crew	-£4,489,902

11.2.5*Fares Impacts*

Currently, no fares are levied on the ferry crossings, and the appraisal has been undertaken assuming that this policy is continued. In line with current national policy, the appraisal has also assumed that no tolls would be levied on the tunnel options. The application of fares has been considered as a sensitivity test.

11.2.6*Journey Quality and Reliability Impacts*

STAG confirms that journey quality and reliability impacts require to be assessed qualitatively.

Journey quality will improve on all options due either to the provision of replacement vessels, or the construction of a tunnel which removes the requirement for a ferry crossing between Yell and Unst. It can be argued that journey quality will also be improved by those options which reduce the existing schedule constraint imposed by the current ferry timetable. This will be particularly prominent factor in options 4 and 5.

Journey reliability will be improved across all options due to the planned replacement of terminals and vessels, or the construction of a tunnel linking Yell to Unst.

11.3**Wider Economic Benefits****11.3.1***Introduction*

The second element of the economy criteria concerns Wider Economic Benefits. This is a new area of appraisal, and there is currently limited experience in its application to remote rural projects, such as Bluemull Sound.

It is accepted that the costs and benefits captured by the TEE analysis provide an acceptable approximation of the full economic impacts of a project, expressed in terms of economic welfare. However, further research has indicated that further economic impacts may be derived from a project, in terms of the impact of transport upon agglomeration, and the impacts of agglomeration upon productivity. Four elements have been identified:

- Agglomeration Economies – productivity benefits arising from companies being located close to other firms. This can facilitate knowledge sharing, or access to more suppliers and larger labour markets.
- Increased competition as a result of better transport – Scottish Government guidance suggests that there is currently a lack of evidence in regard to this element.
- Increased output in imperfectly competitive markets – STAG states that “where there is imperfect competition in a market, we’ve seen that the value placed on additional production, the price, is normally higher than production costs. Firms and consumers would be better off if firms were to increase production. If better transport induces firms to increase production there are precisely such benefits... the value attached to time savings would underestimate the true benefits.”
- Wider benefits arising from improved labour supply – this could arise because more people work because of commuter time or cost savings, some people work longer hours because commuting time decreases, and the potential relocation of jobs to higher-productive areas (because better transport makes the area more attractive to firms and workers).

Each element is briefly discussed below in relation to the Bluemull Sound appraisal. The focus of this element of the appraisal is upon the economy of Unst (there being very limited economic activity on Fetlar) and the impact of a tunnel as compared to a ferry link.

11.3.2

Agglomeration Economies

There are unlikely to be any quantifiable agglomeration impacts arising from any of the options being considered.

Reduced travel time, and the improved travel reliability and confidence would facilitate some additional networking opportunities, but not to the extent that productivity would be noticeably increased. On Shetland, there is a finite number of suppliers for the tourist and aquaculture industries, and it is unlikely that a tunnel would meaningfully increase the number of suppliers available, and thus reduce costs. However, it is noted that it is possible that a tunnel could increase the available labour market, although this is captured under the EALI and Accessibility criteria.

11.3.3

Increased Competition as a Result of Improved Transport

Some key economic sectors would benefit from improved transport, by virtue of improved accessibility. Tourist initiatives in Unst would be likely to benefit, as more visitors are likely to make the trip north, and stay for longer. However, other sectors in Unst could lose out due to accessibility from Shetland Mainland being improved. This is discussed further with respect to EALIs.

11.3.4

Increased Output in Imperfectly Competitive Markets

This sub-criterion is concerned with the additional benefits of additional production. However, with respect to the Unst economy, it is difficult to identify where improved transport could induce increased production.

11.3.5

Wider benefits arising from improved labour supply

It is anticipated that a fixed link could reduce any current barriers to employment between Yell and Unst, particularly for employment which is outwith normal working hours. However, within the North Isles, there are other more significant labour supply issues than the difficulty of crossing Bluemull Sound. There is the possibility that some people will work longer hours due to reduced time spent commuting across Bluemull Sound. It is unlikely that any of the options will engender a relocation of jobs to higher-productive areas.

11.3.6

WEBs Summary

Overall, it is considered that there is the possibility of a tunnel option delivering some Wider Economic Benefits. However, it is most likely that the WEB benefits are consequences of benefits captured within the EALI assessment, or accessibility improvements.

11.4

Economic and Activity Location Impacts

11.4.1

Introduction

This section presents the findings from the Economic and Activity Location Impacts (EALI) assessment of the Bluemull Sound options taken forward to the STAG Part 2 appraisal.

Guidance prepared by the Scottish Government on undertaking an EALI assessment recommends considering the economic impact that may accrue from a transport project in both employment and GDP terms. It states that in assessing the impacts of the various options on the economy, it is necessary to assess these at both the Scotland and the regional or sub-regional level. However, due to the geography of Bluemull Sound, it is anticipated that the options being considered to improve transport links between Unst, Yell and Fetlar will generate very localised and distributional impacts only, and that wider benefits would only be attainable if there is a significant constraint on economic activity in Shetland that improved access to the North Isles could relieve.

The key points or questions that have been considered in assessing each of the options under the EALI guidance are as follows:

- What will the transport option achieve in terms of transport benefits and costs; for example, what will the options achieve in terms of time savings, accessibility, journey quality etc?

- Who will benefit from these impacts, and who, if anyone, will lose; where are the beneficiaries (and losers) located; what will be the impacts on particular areas / groups in society?
- Will there be any labour market effects / changes as a result of the different transport options?
- What are the likely responses of gainers and losers in terms of travel behaviour?
- What are the likely responses of gainers and losers in terms of economic behaviour?

Within this section, the differences in expected impact, both positive and negative, between the options are presented largely in a qualitative manner, and draw on the results from earlier consultation exercises as well as research from a number of wider socio-economic evaluations relevant to this study.

11.4.2

Review of Previous Work

As alluded to above, this EALI assessment has been informed from the results of previous consultation exercises and reviews of various relevant background reports, including:

- *Shetland Regional Transport Strategy and Bluemull STAG Consultation Reports, 2005/06 and 2008, Faber Maunsell*
- *The Fetlar Visitor Survey 2007*
- *Socio-Economic Impact of a Fixed Link between Yell and Unst, EKOS, 2001*
- *Assessing the Impacts of RAF Saxa Vord Job Losses, Reference Economic Consultants, 2005*
- *Evaluation of the Social and Economic Impacts of Removal of Fares on Bluemull Sound Ferry Services, Reference Economic Consultants / BM Consulting, 2007*
- *Evaluation of the Social and Economic Impacts of New Yell Sound Ferries, Reference Economic Consultants, 2006*
- *Evaluation of the Social and Economic Impacts of The Sound of Harris Ferry Service, Grangeston Economics, 2003*
- *An Evaluation of the Social and Economic Impacts of Fixed Links to the Islands of Scalpay and Berneray, SQW Limited, 2004*
- *Option Values, Business and Population Impacts in Transport Assessment, Institute for Transport Studies, 2004*

Wherever possible, information and results from these reports have been used to provide evidence and justification for assessments made as part of this EALI, discussed below.

11.4.3

Option Impacts

The link between transport investment and economic performance has been widely debated, and depends heavily upon local circumstances. Whilst there is a theoretical basis for assuming that transport improvements will lead to improved economic competitiveness, empirical evidence is less clear. At best, it appears that transport investment is one of a number of issues affecting economic performance, but is by no means the most important or critical factor. At worst, there is a risk that improved transport infrastructure may open up the local economy to more competition, and thus cause a net disbenefit to the local economy.

Within this section, the economic impacts of the various options are assessed against the EALI criteria discussed in 11.4.1, with results set out according to the various stakeholder groups and sectors likely to be affected by the transport options.

11.4.3.1

Residents

This sub-section briefly summarises the economic impacts of the various options for residents of the North Isles.

The Do Minimum (option 1) would have a minor positive impact in providing access to jobs for residents in the North Isles by providing a more reliable service. However, opportunities for increased access to employment would be negligible because this option is focussed on infrastructure improvements rather than service enhancements. It is to be pointed out that the

review carried out into the introduction of new ferries on the Yell Sound Service (Reference Economic Consultants, 2006) only found slight evidence of increased commuting activity.

Options 4 and 5 could increase sailing opportunities and in turn deliver greater commuting opportunities.

The provision of fixed link infrastructure (options 8 and 9) would increase access to employment for North Isles residents, making commuting to jobs on other North Isles and Shetland Mainland easier. It is also to be noted that, in population terms, previous research (EKOS, 2001) suggested that development of a fixed link would have a positive influence on a majority of residents' decision to continue to stay in Unst. For example, of those residents who said that they did not expect to still be on Unst 3 years from the time of the study (21%), 43% would be more likely to stay if a fixed link was introduced. Of those unsure whether they would still be on Unst 3 years from the time of the study, 63% would be more likely to stay if a fixed link was introduced. Therefore, it would appear that the provision of a fixed link would have a positive influence on a majority of residents' decision to continue to stay in Unst, and local population retention could have knock on benefits for local economic growth (i.e. spend in the local community). However, it is important to bear in mind that resident's views on the development of fixed link infrastructure also assumes that the link would generate a significant increase in economic prosperity which might not happen.

For residents of Fetlar, the development of a breakwater (option 2) and dedicated ferry service (options 8 and 9) would allow the timetable to be arranged so that commuting from Fetlar to Yell and Unst is more viable. As a previous report into the case for a Fetlar breakwater states, *"this would assist not only the economy of Fetlar but also the North Isles as a whole. For example, one business on Yell is known to be struggling to recruit staff; opening up the employee base for Yell and the opportunities for employment for people based on Fetlar."*⁴⁴ The provision of a dedicated Fetlar service would also provide the ferry crew with a greater level of confidence regarding their job security, which in turn could assist in halting the currently declining population and support local economic development.

Potentially, the main benefit stemming from a more accessible Bluemull Sound Link would be a better quality of life for residents, as the total number of hours working (and commuting) would be reduced with the provision of a more accessible link. This in turn could have knock on positive impacts, as alluded to earlier, for the local economy through increased time (and money) spent in the local community. The existing restrictions imposed by the Bluemull Sound timetable would also be lifted, improving quality of life.

11.4.3.2

Businesses

From the review of previous studies and consultations, it is evident that new transport infrastructure can deliver a wide range of economic impacts, many of which have been considered as part of this assessment, including:

- New business start-ups;
- Existing businesses seeing changes in sales and employment levels;
- Business saving money and/or time obtaining supplies;
- The ability for businesses to serve an expanded markets;
- Reduced freight costs;
- Increase in staff productivity; and
- Greater flexibility of businesses to respond to customer requirements.

The provision of new infrastructure and in turn delivery of a more reliable ferry service could deliver slight improvements in business efficiency and operational benefits which increase staff productivity, effecting some cost reduction for businesses. For example, it is anticipated that the delivery of a more reliable service would cut down on the amount of time wasted by staff at present during periods when the vessels are out of operation due to technical problems. This improvement would apply across each of the proposed options.

⁴⁴ SIC CPRT Report, Breakwater and Small Berthing Facility at Hamars Ness, Fetlar (Jan 2008)

Outwith the Do Minimum and option 2, the remaining options would all support increased accessibility through the provision of additional sailings, which could have wider economic benefits.

For example, the provision of additional sailing opportunities and a more accessible service could enable businesses/residents greater freedom of movement to carry out jobs elsewhere in Shetland and travel/move loads on services at times they require, which will have knock on benefits for economic development. This was a point noted from the evaluation of the New Yell Sound Ferries⁴⁵, which outlined numerous examples of how the introduction of the new ferries had removed constraints faced by businesses when the old ferries operated. For instance, in the context of the service sector, it would often be the case that if businesses from the North Isles were undertaking a job on the Mainland which ran later than planned, rather than stay on and complete the job, workers would often have to return home on the sailing on which they were booked before returning to complete the job on the following day, thus incurring additional costs.

Another problem faced by businesses during the operation of the old ferries was that if products were completed ahead of schedule and were being delivered to their premises earlier than expected, they were still unable to travel across Yell Sound until the sailing on which they were booked as no spaces were available on earlier crossings. This incurred driver down-time and thus costs as they waited until the sailing on which they were booked. It is considered that similar constraints could be relieved through the provision of a more accessible Bluemull Sound Link.

Options 4 and 5 also involve the introduction of an additional full-time and part-time crew respectively, which would deliver economic benefits through increased employment. In the case of option 4, the introduction of an additional full-time crew could create five or six FTE jobs. The impacts of introducing an additional part-time crew would be smaller, with two or three FTE jobs created.

With regards to the fixed link options (options 8 and 9), it is considered that for Unst in particular, the development of a fixed link could deliver a much greater range of positive economic impacts. For example, the development of a tunnel could influence business start-ups and support the expansion of services and businesses, by increasing the ability of businesses in Unst to serve an expanded market. Similarly, the provision of a tunnel and a more accessible link between Unst and Yell could enable greater commuting possibilities, which could allow Unst businesses to recruit staff from outside Unst, as has been suggested by businesses based on the island.

It is also considered that a tunnel could improve the efficiency of North Isles businesses through reducing costs associated with moving freight on the ferries. Staff productivity would also be increased through reduced time spent organising ferry bookings, as well as reduced time waiting on goods via the ferry etc. For example, at particularly busy times, owing to capacity limitations, there may be times when heavy and bulk loads being transported to and from the North Isles have to be split between sailings, incurring additional time and financial costs. The provision of fixed link infrastructure would relieve these types of business constraints, and in turn could help to improve business confidence by removing the unreliability of potential disruptions associated with vessel breakdown.

Previous research has also suggested that fixed links can result in the creation of a wider labour catchment area, which could actually lead to some Unst and Yell based businesses facing problems with recruitment due to competition from elsewhere in Shetland. Likewise, in contrast to the aforementioned argument that the provision of more accessible links could increase time and investment in the local community, potential negative impacts on local businesses in the North Isles could be anticipated through the development of more accessible links across Bluemull Sound into Yell and onto Shetland Mainland. It is interesting to note, for example, that surveys undertaken during the pre-appraisal Bluemull Sound STAG work established that shopping was the main purpose of trips on the Bluemull Sound ferry service. If under current conditions the majority of residents use the ferry for shopping purposes, it could

⁴⁵ Evaluation of the Social and Economic Impacts of New Yell Sound Ferries, Reference Economic Consultants, 2006

be anticipated that provision of more accessible links across Bluemull Sound to Yell would have an adverse impact on local shops, as local GDP could be spent elsewhere where there is greater choice e.g. Lerwick.

11.4.3.3

Ferry Service Related Employment

The development of tunnel infrastructure would also have some adverse impacts on economic development, primarily related to the loss of ferry jobs. Removal of an Unst to Yell ferry service could be anticipated to save some of the existing operational costs associated with Bluemull Sound, although it would also lead to a loss of jobs – between 12 (option 8) and 6 (option 9).

As reported in the EALI undertaken as part of the Bressay Link STAG (Anderson Solutions, 2008), SIC has a policy of relocating staff wherever possible and, in the case of the Bressay crew, it was stated that they could be relocated to other inter-island ferry services as a number of posts would become vacant prior to 2012 as a result of retirement of existing post holders. The report continued by stating that the ferry crew are skilled and in demand in the wider economy and it was anticipated that if a Bressay fixed link was constructed, some of the more mobile crew members would seek to leave the service rather than wait on relocation proposals.

The recruitment of skilled workers is difficult for almost a quarter of organisations in Shetland, the population is ageing; and there is very low unemployment. Therefore, similar to the Bressay case, it could be expected that if an individual did not wish to relocate within the ferry service, they could readily secure employment elsewhere – with prospects enhanced through the provision of a more accessible transport link. Finally, consultations undertaken as part of the Bressay STAG also revealed that vacancies in the ferry service are becoming increasingly difficult to fill, resulting in an increase in the use of agency staff and recruitment costs. Accordingly, it could be the case that contracting of the ferry service could relieve recruitment problems currently faced by the Council.

In sum, the Bressay EALI concluded that while the construction of a fixed link could have impacts at an individual level for ferry crew members in terms of change of occupation or relocation, owing to the factors discussed above, no net increase in unemployment at a Bressay or a Shetland level would be anticipated, and the savings from the removal of the ferry service would quickly benefit the public purse.

Similar impacts would be expected with the development of an Unst-Yell fixed link, although the more peripheral location of the North Isles and its more localised economy could suggest that the loss of ferry jobs on the Bluemull Sound service would have a greater impact than job losses associated with the Bressay service, which potentially could be more easily absorbed within the Lerwick/central economy. Furthermore, should the decision be taken to develop fixed links on both the Bressay and Bluemull Sounds, further consideration would require to be given to the potential cumulative impacts of this and whether both sets of crews could be relocated within the Council's ferry service.

11.4.3.4

Tourism

In terms of the impacts of the various options on the development of tourism in the North Isles, the provision of a more reliable ferry service, as would be facilitated by options which involve the provision of improved infrastructure alone (i.e. options 1 and 2) is only likely to deliver minor economic impacts through tourism. This is largely because increased inward investment from tourism requires wider improvements related to accommodation and service provision in the North Isles. This particular message emerged strongly from the 2007 Fetlar Visitor Survey, which confirmed that rather than transport provision, perhaps the main problems or issues related to the development of tourism on the island according to visitors was said to be the lack of accommodation and catering facilities.

This provides further support to the view that while transport improvements can help to *support* economic development, in reality a much greater range of factors and conditions are required to *deliver* economic development, as discussed earlier in this chapter.

Options which will increase service frequency as well as reliability of the Bluemull Sound ferry service (e.g. options 4 and 5) could be anticipated to support an increase in tourist numbers, particularly during peak times by easing any potential capacity constraints that exist at present. In turn, this could lead to greater inward investment and local economic development. However, again the aforementioned problems relating to a lack of wider facilities and services for tourists could hamper economic development through tourism.

With regards to the options involving the development of tunnel infrastructure between Unst and Yell (options 8 and 9), it is considered that this could promote increases in visitor numbers and extended stays on the island as visitors would not have to catch a ferry to reach the island. However, it has also been reported⁴⁶ that this could lead to the possibility of shorter stays with Unst perhaps being perceived as an extension of Yell. The provision of a 3 crew Fetlar service (option 9) as opposed to a 2 crew service (option 8) and in turn a more frequent service could also potentially encourage increases in tourist numbers to Fetlar, particularly during peak times, although again it is to be stated that increased inward investment requires wider improvements related to accommodation and service provision.

The potential wider impacts of developing a Fetlar breakwater on tourism have also been considered as part of a study⁴⁷ undertaken to inform a funding bid for a breakwater and small boat berthing facility on the island. This study established that the construction of a new pier facility could bring tourism-related economic benefits both through improving the quality of a trip to Fetlar for visitors already on the island and by encouraging new visitors to travel to Fetlar for a day trip or overnight stay. The provision of a small berthing facility could facilitate angling tours and would allow other sea based tourist activities to grow. Overall, therefore, it was concluded that the provision of a Fetlar breakwater and small boat berthing facility would have positive impacts on attracting more tourists to the island.

11.4.3.5

Quantification of Impacts

In an effort to broadly quantify the potential economic benefits of different options in terms of their effect of tourism numbers and in turn on gross economic impact and employment safeguarded, a number of assumptions and calculations have been carried out using methodologies applied in likeminded studies.⁴⁸

Firstly, to establish the base situation, an estimate was made relating to the number of visitors who travelled to Unst (both for the purposes of 'holiday' and 'visiting friends or relatives') in 2006 based on ferry patronage data and trip purpose information gathered through the ferry user survey undertaken in July 2008. This was validated against visitor numbers at attractions in Unst from the 2006 Shetland Visitor Survey. From this, it was estimated that of the 141,875 passenger carryings made on the service in 2006, 20,235 would have been made by tourists (10,382 for holiday purposes; 9,852 for visiting friends or relatives).

Using these figures and assumptions about the average length of stay of tourists (and breakdown), and average total spend per person per trip (based on findings from the 2006 Shetland Visitor Survey) as shown in Table 11.4, the direct expenditure of tourists under the Do Minimum situation has been calculated. The direct expenditure by visitors will obviously help to sustain existing jobs in accommodation and catering and other service sectors, and will have a multiplier effect. Using the assumption that an additional turnover of £35,000 in accommodation and catering is likely to sustain 1 FTE job, figures have also been developed for the total number of jobs likely to be safeguarded through the visitor expenditure. These figures along with direct expenditure levels are shown in Table 11.5.

Table 11.4 – Key assumptions and associated visitor and VFR numbers for the Do Minimum Option.

Key Assumptions	Visitors	VFR
Total Spend per person per trip	£295	£199
Average Stay	5.8	5.8
Spend per Day	£51	£34
Do Minimum		
Total No. Visitors	10,382	
Total No. VFR	9,853	
Assumed Length of Stay	75% - 1 day 0 night 15% - 3 days 2 nights 10% - 5 days 4 nights	

⁴⁶ Socio-Economic Impact of a Fixed Link between Yell and Unst, EKOS, 2001

⁴⁷ SIC CPRT Report, Breakwater and Small Berthing Facility at Hamars Ness, Fetlar (Jan 2008)

⁴⁸ Economic Impact of Smyril Line on Shetland (A B Associates Ltd, 2005)

Table 11.5 – Tourist expenditure and employment safeguarded by the Do Minimum Option.

		Indirect Multiplier (backward)	Indirect Impact	Indirect/Induced Multiplier (backward)	Gross Effect
Do Minimum					
Direct Expenditure	£1,024,259	1.331	£1,363,288	2.24	£2,294,340
Direct Employment	29 FTE	1.1	32 FTE	1.172	34 FTE

As a comparison to the Do Minimum, using the same approach as that described above, the economic impacts of tourists travelling to Unst following the potential development of a fixed link has also been calculated. As it is uncertain as to the levels of passenger increases that could be anticipated following the provision of a more accessible link to the island, figures have been calculated based on tourist number increases of both 60% and 100%. These are shown in Table 11.6 and Table 11.7 below.

Table 11.6 – Key assumptions and associated visitor and VFR numbers for the Fixed Link Options

Key Assumptions	Visitors	VFR
Total Spend per person per trip	£295	£199
Average Stay	5.8	5.8
Spend per Day	£51	£34
Tunnel (assuming 60% passenger increase)		
Total No. Visitors	16,612	
Total No. VFR	15,766	
Assumed Length of Stay	80% - 1 day 0 night 10% - 3 days 2 nights 10% - 5 days 4 nights	
Tunnel (assuming 100% passenger increase)		
Total No. Visitors	20,765	
Total No. VFR	19,707	
Assumed Length of Stay	80% - 1 day 0 night 10% - 3 days 2 nights 10% - 5 days 4 nights	

Table 11.7 – Tourist expenditure and employment safeguarded under the Fixed Link Option.

		Indirect Multiplier (backward)	Indirect Impact	Indirect/Induced Multiplier (backward)	Gross Effect
Tunnel (assuming 60% passenger increase)					
Direct Expenditure	£1,385,310	1.331	£1,843,848	2.24	£3,103,095
Direct Employment	40 FTE	1.1	44 FTE	1.172	46 FTES
Tunnel (assuming 100% passenger increase)					
Direct Expenditure	£2,058,718	1.331	£2,740,154	2.24	£4,611,529
Direct Employment	59 FTE	1.1	65 FTE	1.172	69 FTE

As shown in the tables above, the Do Minimum option (which it should be noted does assume an increase in visitor numbers on the back of the delivery of a more reliable service) is estimated to result in a gross effect on the economy of £2.3m and 34 FTE jobs being safeguarded. The impacts of a fixed link, based on the assumptions that this will result in a 60% passenger increase, are more pronounced. Under this option, it is assumed that there will be a gross expenditure injection of £3.1m per annum while 46 FTE jobs will be safeguarded. Finally, the fixed link option, based on the assumption that this could generate 100% passenger increases, delivers significant additional benefits in the region of an annual £4.6m injection to the local economy and 69 FTE jobs being safeguarded.

While the estimated economic benefits generated by increased tourist numbers following development of a fixed link suggest that Unst would be significantly positively affected, it is important to bear in mind that this option could have negative impacts elsewhere.

For example, the loss of ferry jobs assumed under the fixed link options (option 8 would see a loss of 12 jobs; option 9 would see a loss of 6 jobs) would have a negative impact on Yell. It is also worth noting that a proportion of the positive impacts on Unst would come from displacement or transferral of activity from elsewhere in Shetland, most likely on Shetland Mainland. Nevertheless, the combination of improved accessibility, facilitated by a tunnel, plus the development of improved tourist facilities on the island (e.g. the Saxa Vord resort), will inevitably help to generate additional expenditure, rather than simply displacement.

11.4.3.6

Construction Impacts

As reported in the EALI assessment for ZetTrans STAG Part 2 Appraisal of the Bressay Link Project, the construction of a tunnel is not particularly labour intensive (the Bressay Link Report suggested that the option of a tunnel between Shetland Mainland and Bressay would have a construction period of 22 months, during which 15 full-time equivalent posts would be required along with a further 10 full-time posts for 18 of the 22 months). While design work on the construction of a Bluemull tunnel has not been taken to the same level of detail as the Bressay tunnel, similar assumptions over construction periods and jobs created could be inferred for the development of a tunnel across Bluemull Sound. The skills that would be required for the majority of these posts are highly specialised and as a result approximately 90% of the posts would be expected to be filled by individuals from outwith Shetland. Therefore leakage from the local economy of the potential benefits of the income earned during construction is expected to be high.

In addition to the direct construction impacts associated with the development of a fixed link, there could be associated construction work stemming from the development of a fixed link which could have positive impacts for local contractors, such as those involved in road building / improvement works.

Multiplier benefits could also be experienced through the construction works associated with the development of a fixed link. For example, those involved in the construction of a fixed link may have to be based on the island, staying in local hotels/B&Bs, spending money in local cafés, shops etc.

This section has focussed on the construction impacts and knock on benefits associated with the development of a fixed link, but it should also be borne in mind that, in the case of other options, the development of new terminals could also have minor benefits for local companies contracted for this work.

11.4.4

EALI Summary

In summary, as established from the review of previous related studies, there are a range of potential economic impacts that could occur following implementation of the various options for improving the Bluemull Sound Link. However, a common finding from the review was that new transport infrastructure only provides the opportunity for economic growth and that maximising the opportunities from improved transport provision requires a much wider range of improvements.

12. Accessibility and Social Inclusion

12 Accessibility and Social Inclusion

12.1

Introduction

The Accessibility and Social Inclusion objective is principally concerned with *community accessibility*, which includes access to local services, and *comparative accessibility* which considers the distribution of transport access benefits by people, group and by location.

This chapter provides an overview of social inclusion with regard to the North Isles and provides an appraisal of each of the options against the two sub-criteria, *community accessibility* and *comparative accessibility*.

12.2

Social Inclusion

12.2.1

Analysis of SIMD Data

It has been known for some time that there is a relationship between transport and social inclusion.⁴⁹ The Scottish Indices of Multiple Deprivation (SIMD) provide an overview of aspects of social inclusion or deprivation. SIMD measures levels of deprivation through five key indicators of deprivation: access, education, employment, health and income.

Table 12.1 details the ranking of Unst/Fetlar and Yell with regard to various measures of deprivation.

Table 12.1 – SIMD Rank 2006

SIMD Domain	Unst and Island of Fetlar		Yell	
	SIMD Rank (out of 6,505)	Quintile (1 = Most Deprived, 5 = Least Deprived)	SIMD Rank (out of 6,505)	Quintile (1 = Most Deprived, 5 = Least Deprived)
Overall SIMD Rank	3,244	3	3,020	3
Income Domain Rank	3,496	3	3,341	3
Employment Domain Rank	4,692	4	4,165	4
Health Domain Rank	4,957	4	4,365	4
Education Rank	4,832	4	4,664	4
Geographic Access Rank	11	1	21	1
Crime Rank	6,411	5	6,089	5

Source: Scottish Executive SIMD 2006

With regard to deprivation indicators for employment, health, education and crime, the North Isles rank relatively highly within the 6,505 datazones for Scotland as a whole. However, with regard to geographic access, the North Isles (Unst, Fetlar and Yell) all rank very poorly relative to the rest of Scotland. For example, out of the 6,505 data zones, Unst and Fetlar rank as the

⁴⁹ "Running on Empty: Transport, social exclusion and environmental justice", Dr. Karen Lukas, Policy Press, 2004.

11th most deprived area with regard to geographic access, while Yell ranks 21st. It is anticipated that the North Isles will benefit from the transport options proposed, particularly through those options which promote an enhanced service pattern and/or increase levels of accessibility relative to the Do Minimum.

12.2.2

Shetland Specific Research on Social Exclusion

In 2006, work was undertaken examining deprivation and social exclusion in the Shetland context.⁵⁰ This work stated that the spatial scale of datazones used by the SIMD is too blunt and indicators chosen to make up the index are less sensitive to the characteristics of deprivation and social exclusion found in Shetland. In rural areas such as Shetland, social exclusion can be traced more so to an individual's characteristics than the area in which they live. It is important to bear these points in mind when carrying out the Accessibility and Social Inclusion appraisal for the Bluemull Sound options.

Some key findings from this research were that:

It is individuals and households rather than communities who face deprivation and social exclusion in Shetland, making it difficult to determine how much deprivation there is. And it can affect anyone, at any point in his or her lifecycle. Individuals in Shetland particularly prone and vulnerable to deprivation and social exclusion are:

- *young people whose parents are not able to ensure they are able to access opportunities and grow up feeling a part of the community within which they live;*
- *adults of any age who have low self-esteem and/or poor mental health, often due to situations which have developed as a result of negative experiences in the past and can result in homelessness and substance misuse. This is particularly acute if their situation is not understood by the community within which they live;*
- *those who are physically disabled or with a long-term illness and their carers, when they do not receive adequate support and understanding;*
- *those looking after a young family without access to their own transport, particularly those living in remote areas of Shetland;*
- *older people unable to access opportunities that would enable them to feel a part of the community.*

In particular, some examples of the specific issues for the socially excluded in Shetland relating to transport and access were detailed in the research, as follows:

- *If people are unable to run a private vehicle, most opportunities available to them are severely restricted: employment, services, social opportunities, learning and leisure activities, such as swimming, for example. Weekly bus services are available, but it is difficult to get fresh food items and carry home a weekly shop;*
- *Many people rely on others for transport. This is humiliating and hinders independence;*
- *Households are not able to afford to use the bus, go to youth club or swimming.*
- *Access is also restricted by a lack of services close by, including childcare and for some, by illness and disability.*
- *Those living in communities within which they were brought up are usually able to rely on local networks of family and friends in times of need. This safety net is less readily available for incomers;*
- *The relatively high cost of living for essential items, such as food and fuel means that nationally decided benefit levels do not buy so much. Unplanned expenditure, such as an emergency admission to hospital on the mainland can push a household into debt, which they can be paying off for years;*
- *Employment can be difficult to access out-with central areas, particularly for those without private transport. The regular commute to Lerwick for those able to afford transport and for whom employment is 9-5 leaves behind others in the community without the same opportunities;*
- *Meanwhile the opportunity cost of participating in low skilled, low paid jobs is higher when the cost of private transport to access are included, but are a necessary requirement to access shift work in central areas.*
- *There is a desire to learn, but barriers to do so are often insurmountable for people: such as cost, transport and childcare, as well as people not having the motivation or time.*

⁵⁰ Perring, E (2006) Deprivation and Social Exclusion in Shetland. Shetland Islands Council

All the research points to ensure that the assessment of accessibility pays particular regard to changes in accessibility afforded to non-car owners, or those without regular access to a car. With increasing costs of fuel, it is anticipated that fuel poverty will extend to an increasing proportion of residents of the North Isles.

12.3 Community Accessibility

Community accessibility is considered to increase where there is an increase in the public transport network and/or an increase in local accessibility through improved walking and cycling opportunities. Conversely, community accessibility is considered to decrease where there is a reduction in the public transport network coverage and/or there are any barriers introduced that would hinder walking and cycling opportunities.

12.3.1 Public Transport Network Coverage

Bus services in the North Isles are provided by ZetTrans and operated by a number of local bus service operators. Those bus services which offer connections with ferry services are presented in Figure 12.1 below. Tables 12.2 and 12.3 provide a more detailed overview of the timetables for southbound services from Yell, Unst and Fetlar and northbound services to the North Isles.

Figure 12.1 – Bus services in the North Isles connecting with ferry services

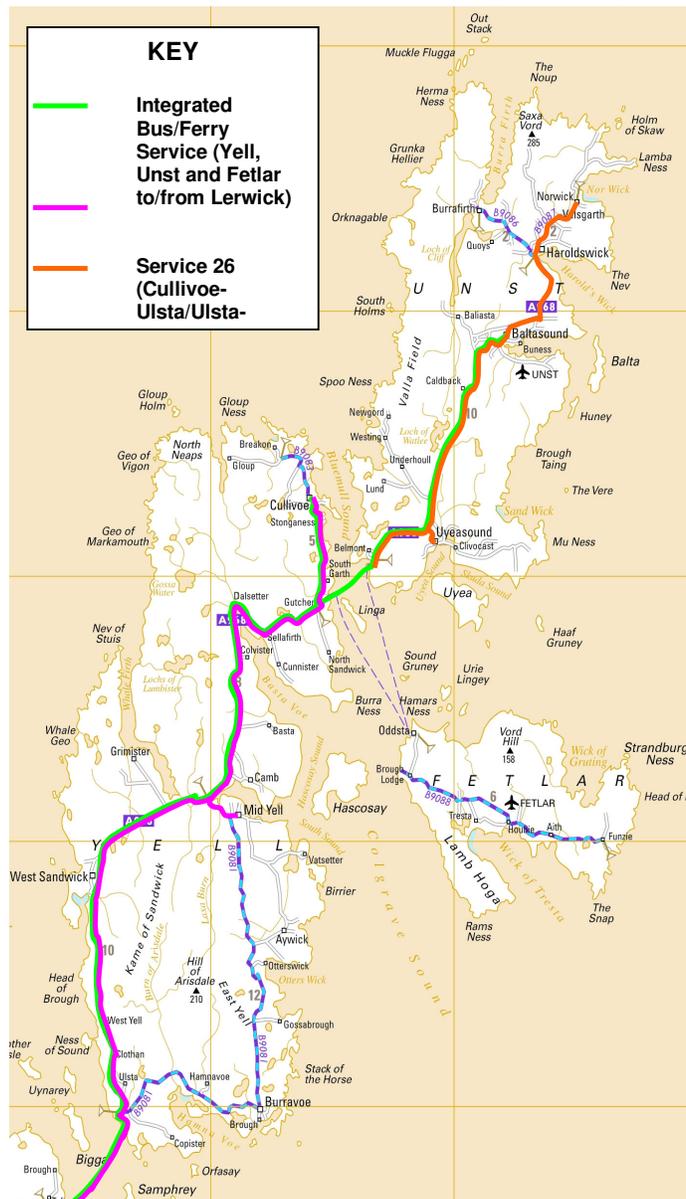


Table 12.2 – Southbound Services from Yell, Unst and Fetlar

Service/ Departing from	Integrated Bus/Ferry Service		Other Connecting Services		26 (Cullivoe-Ulsta)						28 (Haroldswick – Baltasound – Belmont)						
	Monday – Saturday		Monday – Saturday		Monday – Saturday			Sunday			Monday – Saturday						
					A	B	D		D	C	H	I		D			E
Fetlar	Fetlar Dial-A-Ride Connection	✓	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Hamars Ness	0750	1505	1545	---	---	---	---	---	---	---	---	---	---	---	---	---
Unst	Baltasound	0735	1615*	1615*	---	---	---	---	---	---	0735	0850	1000	1035	1615	1735	1755
	Haroldswick	---	---	---	---	---	---	---	---	---	0740	0900	---	1045	1610	---	---
	Saxa Vord	---	---	---	---	---	---	---	---	---	0745	0910	---	1050	---	---	---
	Norwick	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Baltasound Junior High	---	---	---	---	---	---	---	---	---	---	0920	---	---	---	---	---
	Uyeasound	---	---	---	---	---	---	---	---	---	0755	---	---	---	U	---	---
	Belmont	0820	1645	1645	---	---	---	---	---	---	0820	---	1015	---	1635	1750	1820
Yell	Cullivoe	0815	1645	1645	0820	0815	1510	1645	1630	1955	---	---	---	---	---	---	---
	Gutcher	0830	1655	1655	0830	0830	1515	1655	1640	2005	0830	---	---	---	---	---	---
	Sellafirth	0833	---	---	0835	0833	1520	1658	1643	2008	---	---	---	---	---	---	---
	Camb	0838	---	---	0840	0838	---	1703	1648	2013	---	---	---	---	---	---	---
	Mid Yell Junction	0840	---	---	---	0840	---	1705	1650	2015	---	---	---	---	---	---	---
	Mid Yell School	---	---	---	0850	---	1530	---	---	---	---	---	---	---	---	---	---
	West Sandwick	0845	---	---	---	0845	---	1710	1655	2020	---	---	---	---	---	---	---
	Ulsta	0910	1715	1715	---	0910	---	1715	1703	2028	---	---	---	---	---	---	---
Shetland Mainland	Toft	0930	1745	1745	---	---	---	---	---	---	---	---	---	---	---	---	---
	Lerwick	1010	1830	1830	---	1010	---	---	---	---	---	---	---	---	---	---	---

A – April to September only, not on Thursday, B – April to September only, Thursday only, C – April to September, D – Monday to Friday, School term only, E – April to September Dial-A-Ride, Bookings Required, F – Thursday/Friday only – Dial-A-Ride, Bookings Required, G – Saturday only April to September, H – October to March, School term only, I – April to September, School term only, U - Goes via Uyeasound on demand, * = Dial-A-Ride Bus Service from Baltasound, Booking Required

Table 12.3 – Northbound Services to Yell, Unst and Fetlar																			
Service/ Departing from	<i>Integrated Bus/Ferry Service</i>		<i>Other Connecting Services</i>				<i>26 (Ulsta-Cullivoe)</i>						<i>28 (Haroldswick – Baltasound – Belmont)</i>						
	Monday – Saturday		Monday – Saturday				Monday – Saturday			Sunday			Monday – Saturday						
				A	B		C		C	D		E	F	G		G		H	I
Shetland Mainland	Lerwick	1430	0755	1545	---	1710	---	---	---	---	---	---	---	---	---	---	---	---	---
	Toft	1525	0910	1655	---	1750	---	---	---	---	---	---	---	---	---	---	---	---	---
Yell	Ulsta	1545	0930	---	1715	1820	---	0930	---	1715	1820	1710	2035	---	---	---	---	---	---
	West Sandwick	---	0938	---	1718	---	---	0938	---	1718	1828	1718	2043	---	---	---	---	---	---
	Mid Yell Junction	---	0943	---	1723	---	---	0943	---	1723	1833	1723	2048	---	---	---	---	---	---
	Mid Yell School	---	---	---	---	---	0855	---	1537	---	---	---	---	---	---	---	---	---	---
	Camb	---	0945	---	1725	---	---	0945	1543	1725	1835	1725	2050	---	---	---	---	---	---
	Sellafirth	---	0950	---	1730	---	0905	0950	1555	1730	1840	1730	2055	---	---	---	---	---	---
	Gutcher	1615	0953	---	1733	---	0910	0953	1600	1733	1843	1740	2105	---	---	---	---	---	---
	Cullivoe	1630 J	1010	---	1748	1858	0915	1010	1607	1748	1858	1745	2110	---	---	---	---	---	---
	Gutcher (Ferry to Fetlar)	1615 K	1005	---	1850	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Gutcher (Ferry to Unst)	1630	1005	---	1740	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Unst	Belmont	1640	1015	---	1750 *	---	---	---	---	---	---	---	---	---	1015	---	1640	1750	1820
	Uyeasound	---	1025	---	---	---	---	---	---	---	---	---	---	0900	1025	---	U	1755	1825
	Baltasound JHS	---	---	---	---	---	---	---	---	---	---	---	---	0925	---	1545	---	---	---
	Baltasound	1655	1035	---	1805	---	---	---	---	---	---	---	---	0930	1035	1550	1655	1805	1845
	Haroldswick	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1600	---	---	---
	Saxa Vord	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1605	---	---	---
	Norwick	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1610	---	---	---
Uyeasound	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1615	---	---	---	
Fetlar	Ferry Arrives at HN	1640	1045	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Fetlar Dial-A-Ride Connection	✓ L	✓	---	✓	---	---	---	---	---	---	---	---	---	---	---	---	---	---

A – Monday to Friday only, B – Thursday and Friday only, C – Monday to Friday, School term only, D – Thursday and Friday only, E – October to March, School term only, F – April to September, School term only, G – Monday to Friday, School term only, H – Thursday/Friday only – Dial-A-Ride, Bookings Required, I – Saturday only April to September, J – 1620 on Saturday, K – 1850 on Saturday, L – Connection is at 1645 Monday – Friday and 1850 on Saturdays, U – Goes via Uyeasound on demand, * = Dial-A-Ride Service

12.3.2

Analysis of Public Transport Access to Employment Opportunities

Each of the options considered as part of the study are aimed to secure and improve access across Bluemull Sound. For Unst and Yell residents, many key elements of access are contained within each island. However, there is evidence that there is significant potential to improve access to employment opportunities by improving access between Fetlar, Unst and Yell.

With regards to public transport network coverage, existing public transport provision takes bus passengers from Unst (and those from Fetlar who have crossed to Unst on the ferry) as far as Gutcher by 0830 in the morning. Mid Yell can be reached on public transport before 0900 through Service 26 which departs Gutcher at 0830. However, current provision does not enable bus passengers from Unst and Fetlar to reach Shetland Mainland before 0930. This means that Lerwick cannot be reached by public transport from Unst and Fetlar before 1000. Given that jobs typically involve a 9am-5pm working day, it is not possible for Unst and Fetlar residents to work on Shetland Mainland should they require to commute (via Yell) using public transport.

In addition, Yell residents cannot travel to Unst using public transport before 1005 (on the 0755 bus service from Lerwick). Yell residents thus cannot arrive in Uyeasound before 1025 or Baltasound before 1035 in the morning using public transport. Again, it is not possible for Yell residents to have a 9am-5pm job in Unst, if they are travelling north using public transport.

Connecting northbound services currently do not enable passengers travelling from Lerwick and elsewhere in Shetland Mainland to arrive in Yell before 0930, Unst before 1015 and Fetlar before 1045.

An analysis has been undertaken of how the different options could assist public transport users. Replacing the Gutcher and/or Belmont terminals would have no impact on the coverage of public transport.

Under those options which would regularise the timetable (options 4 and 5), public transport access would only be enhanced with matching enhancements to the existing public transport services.

Similarly, the Fetlar Dial-A-Ride service would require amendment to connect with an earlier first ferry departure under options 2, 8 and 9.

The utility and convenience of public transport could be enhanced between Unst and Yell under tunnelling options 8 and 9, which could facilitate the provision of a continuous and uninterrupted bus service from Unst as far as Ulsta in Yell, given the Bluemull Sound ferry interchange would be removed. However, without public timetable improvements, the options do not necessarily facilitate any improvement in public transport accessibility.

12.3.3

Analysis of Public Transport Access to Other Opportunities

The focus of this analysis is the island of Fetlar, as this has no access to a secondary school, health centre or leisure centre on the island.

The introduction of a Fetlar Dial-A-Ride service has improved public transport accessibility and connections with the Fetlar ferry terminal. However, none of the options necessarily improve through access onto services (typically located in Mid Yell). Mid Yell can only be accessed on public transport from Unst or Fetlar through Service 26 in Yell departing from Gutcher at 0830 and arriving at Mid Yell School at 0850. However, in the afternoon, the bus departs Gutcher at 1515, arriving at Mid Yell School at 1530 (See Table 12.2). The 1505 Hamars Ness-Gutcher ferry crossing does not connect with this service, as this ferry does not arrive at Gutcher until 1530, when the bus has already departed for Mid Yell. There is thus inflexibility in journey planning for residents in Fetlar who require public transport to access opportunities in Mid Yell.

Returning to the island, Fetlar residents can catch the 1537 bus from Mid Yell School, which arrives in Gutcher at 1600 prior to the ferry crossing to Hamars Ness at 1615. This bus service is only available Monday to Friday during the school term. The Fetlar Dial-a-Ride connects with the ferry at Hamars Ness at 1645.

12.3.4

Local Accessibility – Walking and Cycling

The local accessibility criterion considers pedestrian and cycle access to local activity centres and to public transport.

In considering the impacts of the options on walking and cycling, consideration has been given to the potential impacts of tunnels on pedestrian and cycle access, and any barriers to pedestrians and cyclists as a result of the ferry options.

Typical distances from each of the ferry terminals in the North Isles to the main settlements are outlined below:

- On Unst, the Belmont ferry terminal is between 3.5km and 4.5km from Uyeasound. This is around an hour's walking time.
- On Yell, the Gutcher ferry terminal is around 5km from Cullivoe. This is around an hour and half's walking time.
- On Fetlar, the Hamars Ness ferry terminal is around 7km from Houbie. This is around a two hour walk.

These distances tend to practically preclude pedestrian activity related to the Bluemull Sound Services.

Similarly, the ferry user survey revealed that no respondents travelled on foot either from the trip origin to the ferry terminal or from the destination ferry terminal to the final destination. However, the distances from the ferry terminals to the main settlements listed above are reasonable for cyclists, and the National Cycle Route 1 crosses Bluemull Sound.

For all the options being considered, in terms of local walking accessibility, there is not considered to be any impact. It is noted that a tunnel between Unst and Yell (Options 8 and 9) would necessarily prohibit pedestrian access for safety reasons. However, the significance of this severance is limited as there is no current pedestrian activity.

For all the ferry-based options being considered, in terms of cycling accessibility, there are considered to be no significant impacts.

However, tunnel options (8 and 9) will necessarily sever unrestricted cyclist access between Yell and Unst, and sever the National Cycle Route 1. Whilst no cyclists were captured during the ferry user survey, discussions with stakeholders, and on-site observations confirmed that touring cyclists are frequent visitors to the North Isles.

It will be important to provide alternative access arrangements for cyclists through any tunnel. Possible solutions to this are detailed below.

One option could be the provision of Minibus/Trailer service – similar to the one shown in Photo 12.1. This could be a complement to existing public transport services, with the trailer attached only for the portion of travel through the tunnel.



Photo 12.1 – Minibus with bicycle trailer⁵¹

⁵¹ Information Sheets Cycles on Buses & Coaches (Transportation Management Solutions, Glasgow)

Bikes may also be carried on racks, or within the bus itself, as shown in Photos 12.2 and 12.3, although this requires re-configuration of buses, and dedicated buses.



Photo 12.2 – Rack Storage⁵²



Photo 12.3 – Internal Storage⁵³

These options represent possible solutions for cyclists, and provision for cyclists would have to be an integral part of the tunnel design going forward.

12.3.5

Changes in Accessibility for Car Users

Whilst not part of the formal STAG assessment, in the case of the Bluemull Sound, it is worth considering how accessibility will change for those able to access a car.

- Unst – accessibility will not change under the ferry options but a tunnel would provide 24 hour access to Yell and, with the current Yell Sound service, enables access to the first flights out of Sumburgh via the 0520 sailing between Ulsta and Toft.
- Yell – provides 24 hour access to and from Unst.
- Fetlar – for options 8 and 9, an earlier ferry sailing through the provision of a breakwater at Hamars Ness increases accessibility to Unst, Yell and Lerwick by enabling arrival in Yell (or Unst) by 0710. From Yell, this would permit connections with the 0745 Ulsta-Toft ferry crossing and enable those with access to a car to be in Lerwick by 0835, considerably

⁵² Information Sheets Cycles on Buses & Coaches (Transportation Management Solutions, Glasgow)

⁵³ Information Sheets Cycles on Buses & Coaches (Transportation Management Solutions, Glasgow)

earlier than the current timetable permits. There is also the potential to include this service in option 2, although at additional cost to the service provider.

12.4 Comparative Accessibility

12.4.1 *Distribution of Impacts by People Group*

With regard to potential accessibility impacts on groups such as women, black and ethnic minorities, the elderly, children, those with physical or sensory disabilities, faith groups and/or sexual orientation, none of the options generated are expected to precipitate any differential changes. Differences between the options relate to costs, service patterns and infrastructure and these would not differentially impact any of these groups.

With regard to disability access, all options offer improved accessibility through the introduction of Disability Discrimination Act (DDA) compliant replacement ferry vessels, with passenger accommodation situated above the vehicle deck.

It is expected that residents of Unst and Fetlar would benefit from improved access to and from the islands under options 4 and 5, which include the introduction of an additional full-time or part-time ferry crew. These options would regularise the ferry timetable and generate an enhanced service pattern. These options would also have a positive impact on tourists visiting the North Isles, with the enhanced service providing greater flexibility to explore Unst, Fetlar and Yell.

Tunnelling options 8 and 9 would enable unrestricted movement between Unst and Yell for all with access to a car or public transport, although would cause severance for those who walk and cycle.

Given the uncertainty over the future costs of fares on the Bluemull Sound ferry service, which are currently suspended, the impact of the ferry options on user affordability is currently unknown. It is also unknown at this stage whether tolls would be charged to travel through a tunnel connecting Unst with Yell, although the prevailing national policy is that tolls would not be levied.

12.4.2 *Distribution of Impacts by Location*

The accessibility impacts associated with the replacement of the Gutcher and Belmont terminals under the Do Minimum and options 2, 4 and 5 – and the replacement of one of these terminals in options 8 and 9 – are expected to be negligible as there are very few residents in the areas surrounding these existing terminals.

Both Unst and Fetlar residents would benefit from improved access through options 4 and 5, which would regularise the pattern of ferry services, and increase travel opportunities.

With regard to the tunnelling options, those on Unst relying on private vehicles would experience improvements in access, although vehicles would no longer be exempt from MOT certification. There may be deterioration in access, for example, to the Belmont ferry terminal for lower income families on Unst who can only currently afford to run a car on the island under this exemption. In addition, a number of older residents could stop using the car and become reliant travelling off the island by public transport or by lifts from friends and family. This could potentially lead to social exclusion for such people on Unst.

Option 8, which includes a two crew Fetlar ferry service, could potentially have negative accessibility impacts for residents living on the island, as this would signal a reduction in service levels compared with the Do Minimum. However, it is expected that this ferry service could be tailored to meet the needs of the local community.

Option 9 (three crew service) would have a negligible impact on access to/from Fetlar relative to the Do Minimum, since this option would be broadly equivalent to the existing level of service received by the island. However, option 9, along with option 2 could increase accessibility relative to the Do Minimum due to the provision of the breakwater at the Hamars Ness ferry terminal. This could help to improve access to employment elsewhere in the North Isles and Shetland Mainland.

12.4.3

Impact of the options on the number of ferry departures

Tables 12.4, 12.5 and 12.6 below provide an overview of the number of weekly ferry departures that could be enabled on each Bluemull Sound route under each of the ferry and tunnel options. These figures have been calculated from sample timetables derived for each option. These sample timetables are presented in Appendix C.

Table 12.4 – Total number of weekly trips by ferry option (Summer Timetable)

Summer Timetable				
Route/Number of trips by option	Option 1	Option 2	Option 4	Option 5
Gutcher-Belmont	190	190	200	193
Gutcher-Hamars Ness	21	21	19	19
Belmont-Gutcher	162	162	166	159
Belmont-Hamars Ness	31	37	35	34
Hamars Ness-Gutcher	43	49	47	46
Hamars Ness-Belmont	9	9	7	7
Total Trips	456	468	474	458

Table 12.5 – Total number of weekly trips by ferry option (Winter Timetable)

Winter Timetable				
Route/Number of trips by option	Option 1	Option 2	Option 4	Option 5
Gutcher-Belmont	172	172	200	190
Gutcher-Hamars Ness	19	19	19	21
Belmont-Gutcher	149	149	166	162
Belmont-Hamars Ness	31	36	35	31
Hamars Ness-Gutcher	41	46	47	43
Hamars Ness-Belmont	9	9	7	9
Total Trips	421	431	474	456

Table 12.6 – Total number of weekly trips by tunnel option (All Year Timetable)

All Year Timetable		
Route/Number of trips by option	Option 8	Option 9
Belmont-Hamars Ness	54	85
Hamars Ness-Belmont	54	85
Total Trips	108	170

Tables 12.4 and 12.5 indicate that for all ferry options, the number of sailings on each Bluemull Sound route increases relative to the Do Minimum.

Access to and from Fetlar is increased under option 2, which provide an increase in the number of sailings from Belmont-Hamars Ness and Hamars Ness-Gutcher. Options 4 and 5 increase the overall number of weekly sailings relative to the Do Minimum and therefore provide greater accessibility between the islands.

With regard to the tunnel options (Table 12.6), option 9 (3 Fetlar ferry crews) provides a greater level of accessibility to and from Fetlar compared to option 8 (2 Fetlar ferry crews) due to the increased number of sailings that could be provided by the operation of a 3 crew service.

12.5

Summary

None of the options present either significant benefits or obstacles in terms of comparative accessibility relative to the Do Minimum. Walking and cycling opportunities are not affected by the replacement of the ferry terminals at Gutcher and Belmont. Similarly, walking opportunities are not affected by a tunnel connecting Unst and Yell as the distances from each of the ferry terminals in the North Isles to the main settlements practically preclude pedestrian activity. However, a tunnel would necessarily sever unrestricted cyclist access between Yell and Unst, and sever the National Cycle Route 1. Therefore provision for cyclists would have to be an integral part of the tunnel design going forward.

None of the options are expected to have any impact, either negative or positive, on accessibility with regard to different groups of people (e.g. by gender, ethnicity etc.) Other groups such as tourists may benefit from improved access to, from and between the North Isles under the other options due to the provision of a more accessible link in the form of additional sailing opportunities (options 4 and 5) or a tunnel (options 8 and 9).

It will be necessary to re-configure the public transport services if accessibility benefits of improved ferry or fixed links are to be extended to non car users.

However, for car users, the fixed link options will bring significant impacts in terms of 24 hour unrestricted access between Unst and Yell.

13. Integration

13 Integration

13.1 Introduction

'Integration' in a transport sense encompasses the model of a seamless travel experience in a way that fits with local existing and planned land-use developments, structure plans and policies. A proposal that offers good integration will also fit with the interests of stakeholders.

In June 2004, the Transport White Paper "Scotland's Transport Future" set out the Government's transport policies. The White Paper seeks, among a number of overall aims, to *"improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport."*

The National Transport Strategy (NTS) further develops the then Scottish Executive's aims and objectives for transport⁵⁴, as set out within the White Paper. The NTS sets out three strategic outcomes, including to *"Improve journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on our high level objectives for economic growth, social inclusion, integration and safety."*

The integration objective comprises three sub-objectives: transport integration, transport and land-use integration and policy integration. The following sections set out how the options fit with these three sub-objectives.

13.2 Transport Integration

An integrated transport system must operate as a true network across all modes in order that passengers can move easily from one service to another in a comfortable environment. Integrated transport can tackle pollution; support a strong economy, a sustainable environment and a healthy and inclusive society. Consideration of integrated transport typically considers the integration of different elements of the public transport network (ticketing, interchanges, timetables, inter-modal opportunities), but extends to include opportunities such as park and share facilities.

13.2.1 Services and Ticketing

In the context of the transport links across Bluemull Sound, current integration with the public transport network is generally good. As such, there would be minimal improvement in integration with the public transport network under the Do Minimum since this option is focussed on infrastructure enhancements as opposed to any service or timetable improvements. Similarly, option 2 is focussed on infrastructure enhancements, but the provision of a breakwater at Fetlar may open up the potential for an earlier morning sailing from the island and an opportunity to connect with the wider transport network, for example with the Yell Sound ferry service.

Options 4 and 5 may present improved opportunities to integrate with the Yell Sound ferry service through a more regularised and more frequent ferry service. However, it is acknowledged that regularising the timetable will not improve integration unless public transport provision is also enhanced.

Transport integration can also be affected by the introduction or removal of interchanges. The ferry infrastructure would appear to present an 'extra' interchange to journeys between the North Isles and onto Shetland Mainland. Tunnels (options 8 and 9) would remove the Bluemull Sound ferry interchange and improve integration between Unst and Yell, thus promoting a seamless journey between the two islands for the movement of people and freight.

⁵⁴ The objectives set out in the NTS by the Scottish Executive in December 2006 have been retained for the time being by the Scottish Government as the overarching policy framework for Scotland

13.2.2

Infrastructure and Information

From a user perspective, the quality of transport infrastructure (including ferry terminals, pedestrian and cycling facilities, and so on) can impact on a journey. At worst, poor amenities and facilities can 'interrupt' a journey by deterring the user from particular aspects or elements of the journey. Quality can refer to waiting areas, amenities on site (e.g. toilets), but also the layout of the interchange (e.g. distances between boarding points, changes of level, barrier-free design and weather protection).

Generally, the quality of the transport infrastructure would be enhanced across all options. The provision of new vessels would enhance journey experience by providing more comfortable passenger accommodation, with a better view from the passenger deck.

The quality of waiting areas and toilets at the Gutcher and Belmont terminals could be improved during terminal redevelopment (included within all ferry and tunnel options). It is also considered that the presentation of information could be enhanced through the refreshing of display cases and the electronic variable message signs (VMS) providing ferry information.

Regularised service patterns assumed under options 4 and 5 would make the ferry timetable easier to understand and the Fetlar ferry timetable under options 8 and 9 would be easy to understand, since this would consist of a two island (Fetlar-Yell or Unst) service rather than the existing triangular service, which produces a more confusing timetable.⁵⁵

With regards to ticketing, there are no known barriers at present, given that fares are currently suspended on the Bluemull Sound ferry service. A ticket is only required to be purchased returning to the North Isles on the Yell Sound ferry service and not on the outbound journey from Unst and Fetlar southwards.

13.3

Transport and Land-Use Integration

Land-Use integration refers to the way in which a transport proposal fits with established land-use plans and land-use / transport planning guidance.

13.3.1

Ferry Options

New ferry terminals at Gutcher and Belmont are proposed as part of the Do Minimum and options 2, 4, and 5. One terminal (either Gutcher or Belmont) would be upgraded in the tunnelling options (Options 8 and 9). Planning permission would be required for the replacement of either of these terminals.

The existing Gutcher terminal is located within an area zoned where housing development is encouraged. No other immediate land-use development is proposed for this area and the area to the south of the terminal is an open landscape.

With regard to terminal relocation, any relocation would require adjustments to the safeguarding zone.

In addition, there is a locally designated historic site (a standing stone) situated around 300m south of the existing Gutcher terminal. Should a new Gutcher terminal be relocated 300m south of the existing terminal, there may be impacts on this site. This option for the Gutcher terminal would also require additional roads infrastructure that could have negative landscape impacts.

The area around the Belmont terminal is largely undeveloped. Replacing the terminal to the north would increase the impact of the terminal on the setting of Belmont House, which is a Category A listed building. This area also consists of the best quality agricultural land in Shetland.

A breakwater at the Hamars Ness terminal on Fetlar is included within options 2, 8 and 9. This development would be unlikely to pose any land-use and transport integration issues as no other upgrades to the terminal, which was opened in 2004, are required. Similarly, there would be no issues associated with the development of a berthing facility on Fetlar as this would sit within the Hamars Ness breakwater proposed as part of options 2, 8 and 9.

⁵⁵ The first stage of consultation highlighted difficulties in understanding the existing Bluemull Sound ferry timetable which was said to be poor at weekends and characterised by gaps and poor connections with other transport links

13.3.2

Tunnel Options

With regard to options 8 and 9, which involve the construction of a tunnel between Unst and Yell, there would be landscape impacts associated with the construction of the tunnel, the portal and supporting infrastructure (i.e. connecting roads) on both islands.

On the Unst side, the suggested route for the access road to the A968 is through the area of best quality agricultural land.

The standing stone south of Gutcher may also be impacted upon under the tunnelling options, both during construction and when the tunnel is operational.

Other elements of the six options would have no impact on land-use and transport integration since these are concerned with replacing the ferry vessels and/or crewing and service pattern options.

13.4

Policy Integration

The Policy Integration criterion examines whether the proposed scheme contributes to and is consistent with, other governmental policies and legislation beyond transport.

13.4.1

Integration with National Policies

The 2004 White Paper, Scotland's Transport Future, quotes economic growth, social inclusion, health and protection of the environment through a safe, integrated, effective and efficient transport system as key areas for consideration when planning transport, recognising that transport decisions have wide impacts upon communities.

Building on these key objectives, Scotland's NTS, which was published in 2006, identifies three key strategic outcomes in order to achieve the vision and objectives set out within Scotland's Transport Future: Improve journey times and connections; reduce emissions and improve quality and accessibility and tackle affordability.

In addition the NTS recognises the importance of lifeline links, and states:

"We are committed to sustaining the viability of remote and fragile communities through ensuring access to lifeline air and ferry services...We are committed to maintaining lifeline ferry services and to ensuring that wherever technically and financially possible, ferry services are developed to improve access to vulnerable island and peninsular communities."

The current (Do Nothing) situation with the Bluemull Sound transport link would have a negative impact with regards to policy integration. The Do Nothing would incur increased expenditure to maintain the ferry terminals, linkspans and vessels and service reliability would be affected. This could hinder the future growth of the economies of Unst, Fetlar and Yell and their future viability, making the islands more difficult places to live and work.

13.4.2

Rural Affairs

All options detailed in this report satisfy the national objective of 'sustaining the viability of remote and fragile communities'. The viability of Unst is promoted particularly in those options which enhance the existing ferry service (options 4 and 5) or through the provision of tunnel infrastructure in options 8 and 9. The viability of Fetlar is supported by an enhanced ferry service in options 4 and 5, and through the provision of a breakwater in options 2 and 8, as well as the provision of a breakwater and three crew ferry service within option 9.

13.4.3

Social Inclusion

None of the options specifically compromise existing social inclusion policies.

However, as previously discussed under consideration of accessibility, the various alternative options have little impact on accessibility if access to a car is not available. To ensure that the options under consideration can deliver improvements to social inclusion, it will be necessary to review the current provision of public transport.

The one key exception is options which provide for a revised ferry timetable from Fetlar featuring an early departure (options 8 and 9 could be developed with option 2). This has *the potential* to allow Fetlar residents the opportunity to access employment opportunities on both Yell and Unst, as well as Shetland Mainland.

13.4.4

Disability

All ferry options would comply with the Disability Discrimination Act (DDA) through the provision of new, fully accessible vessels with passenger accommodation situated above the vehicle deck.

13.4.5

Health

None of the options can be considered to have significant impacts on health.

Changes in vehicle or vessel emissions are not predicted to cause any impact on air quality.

None of the ferry based options are anticipated to have any impact on physical exercise, particularly walking or cycling.

Options 8 and 9 include the provision of a fixed link tunnel between Yell and Unst. This a) increases vehicle flows; and b) severs the existing walking or cycling link between Yell and Unst. Some form of mitigation would be required to ensure continued cycle access between Yell and Unst, probably in the form of "bikes on buses" or a "bike trailer" solution. The overall impact could be to reduce propensity for local walking or cycling trips under these options.

With regards to access to health care, Unst and Yell residents have local access on each island, and this would therefore be unaffected. For Fetlar residents, local health care is provided from the Mid Yell Surgery. Provided access to a car was available, each option would provide some improvement in terms of access. However, for patients without access to a car, there would be no noticeable change.

For trips to Lerwick, or the Scottish Mainland, provided users had access to private transport, each option would typically improve access to health care. If patients relied on public transport, there would be no significant impact, without adaptations to the local public transport timetables.

13.4.6

Integration with Local Policies

A review has been undertaken of the Community Council statements for Unst, Fetlar and Yell, as including Shetland's Local Plan, in order to consider the impacts of each of the options against each community's local planning objectives.

Planning objectives against which the various options would have a positive impact include:

Unst

- To seek ways to further diversify the economy of Unst; and
- To enhance transport links with the rest of Shetland.

Fetlar

- To seek ways to diversify the local economy;
- To counter de-population and encourage the growth of the community; and
- To develop further the tourism potential of the area.

Yell

- Seek ways to further diversify the economy of Yell;
- Maintain and enhance accessibility with the rest of Shetland; and
- Further develop tourist potential within the island.

13.4.7

Integration with Environmental Legislation

None of the options infringe on any Special Protection Areas (SPAs). However the replacement of the Gutcher terminal may infringe upon an SSSI which extends along the coast for about 500m north and 200m south of the Wick of Gutcher. Full details of the environmental appraisal are provided in Chapter 9 and Appendix G.

13.5**Summary**

Overall, transport integration is not considered to be significantly affected by any of the options, particularly in terms of land-use and policy integration.

With regard to the quality of travel, the ferry options would provide more comfortable travel accommodation for ferry passengers and improve the overall quality of the travel experience through the provision of new vessels. Enhanced service patterns (under options 4 and 5) would improve information by making the ferry timetable easier to understand. Easier to understand ferry timetables for Fetlar would also be generated by options 8 and 9. With regard to Unst and Yell, a fixed link (options 8 and 9) would promote a seamless travel experience by removing the Bluemull Sound ferry interchange and providing an uninterrupted journey for passengers between the two islands.

The appraisal also emphasises that to provide benefits to those without access to a car, it will be important to re-consider the current provision of public transport.

14. Costs and Deliverability

14 Costs and Deliverability

14.1 Introduction

This chapter details the relevant investment and operational costs associated with each of the appraisal options. The costs that STAG requires to be assessed are:

- Public sector investment costs;
- Public sector operating and maintenance costs;
- Grant/subsidy payments;
- Changes in revenue; and
- Changes in indirect taxation.

14.2 Public Sector Investment Costs

14.2.1

Capital Cost Estimates

Table 14.1 presents the estimated capital costs for each element of the options. In accordance with the Green Book Guidance issued by the Treasury, uplift factors have been applied to each of these options to account for potential costs associated with the risks highlighted in the previous section.

- Do Minimum assumes the immediate replacement of Gutcher and Belmont Ferry Terminals, plus the procurement of two new 20 PCU ferries. During the 60 year appraisal period, it is assumed that both Belmont and Gutcher would again require to be replaced (2041), whilst Hamars Ness would need replaced once (in 2037). Ferries would additionally need replaced in 2031 and 2051.
- Option 2 is similar to the Do Minimum, albeit with the addition of a breakwater at Hamars Ness.
- Options 4 and 5 match the investment costs of the Do Minimum.
- Options 8 and 9 require the construction of tunnel between Yell and Unst, plus access roads linking the tunnel portals to the road network. These options require the procurement of a 14 PCU ferry, which would have to be replaced two additional times during the appraisal period. Hamars Ness ferry terminal receives a new breakwater, with the whole terminal and breakwater being replaced once during the appraisal period. It has been assumed that the terminal for the Fetlar service will be at Belmont, which is refurbished on line prior to decommissioning of the Gutcher terminal. It is assumed that the Belmont Terminal would have to be replaced one further time during the appraisal period.

Table 14.1– Estimated Cost Summary of Options

	Cost Estimate (2008 prices)	Cost Estimate (2002 prices)	Design Life
Yell – Unst Tunnel	£63,000,000	£54,668,070	120 Years
Tunnel Access Roads	£3,300,000	£2,863,565	60 Years
Replacement Ferry Terminal – Gutcher	£5,797,678	£5,030,917	30 Years
Replacement Ferry Terminal – Belmont	£5,174,825	£4,490,438	30 Years
Refurbished Belmont Ferry Terminal	£4,297,636	£3,729,260	30 Years
Breakwater, Hamars Ness	£2,100,000	£1,822,269	30 Years
Replacement Ferry Terminal – Hamars Ness	£5,000,000	£4,338,785	30 Years
Replacement Ferry Terminal and Breakwater – Hamars Ness	£6,500,000	£5,640,335	30 Years

	Cost Estimate (2008 prices)	Cost Estimate (2002 prices)	Design Life
Procurement of Ferry Vessel – 20 PCU	£7,880,000	£6,837,846	20 Years
Procurement of Ferry Vessel – 14 PCU	£6,560,000	£5,692,420	20 Years

14.2.2 *Infrastructure Design Life*

Each element of infrastructure is associated with different design lives. A tunnel is associated with an assumed design life of 120 years; tunnel access roads 60 years; ferry terminal infrastructure 30 years; ferries 20 years.

14.2.3 *Construction Period*

The appraisal has assumed that different elements of infrastructure have varying spend profiles.

- The tunnel is associated with a five year spend profile (10%, 20%, 20, 25%, 25%).
- Replacement terminals have a three year spend profile (10%, 45%, 45%).
- The breakwater at Hamars Ness has a one year spend profile.
- All other elements are assumed to have a two year spend profile (50%, 50%).

14.2.4 *Contingency Allocations*

Additional contingency allocations have been calculated as follows. The tunnel price estimate has been developed on the basis of a top-down approach, based on outturn prices experienced on other worldwide tunnel projects. This price estimate is considered to already include a robust allowance for contingency, and so no further additional contingency has been allocated.

Cost estimates for tunnel access roads have been developed on the basis of comparison of rates from national sources. A 20% contingency allocation has been provided for this element of infrastructure.

Cost estimates for terminal infrastructure works have been provided from initial design and costing exercises undertaken by Shetland Islands Council's Capital Projects Team. A 10% contingency allowance has been provided for these elements of infrastructure.

No additional contingency factors have been provided with the ferry procurement. These are typically procured using fixed price tender costs, with a higher degree of confidence in the final cost.

14.2.5 *Optimism Bias Adjustment*

As discussed in chapter 15, appraisal guidance requires the allocation of optimism bias uplifts to take account of the tendency for insufficient contingency costs or programme time to be made during scheme appraisals, a phenomenon known as Optimism Bias. HM Treasury's Green Book has identified Optimism Bias as the systematic tendency for appraisers to be over-optimistic about key project parameters. Evidence from other major projects in the UK has confirmed this to be a major issue.

- Standard uplift values are imposed at the outset of a project, with the aim being to reduce these factors during the ongoing development of the project, as part of the risk management process.
- For the tunnel, the combination of the tunnel design being at a conceptual stage, and the dependence of the final costs on currently unknown ground conditions, require an uplift of 66% to be imposed.
- For the standard engineering works, (ferry terminal works, access roads) a lower uplift of 44% is recommended.
- Advice from the Scottish Government confirms that there is no specific requirement for optimism bias uplifts to be applied to ferry procurement costs.

14.2.6

Residual Values

The residual values of assets have been calculated for the purposes of the appraisal. All terminal infrastructure is assumed to be at the end of its economic life at the end of appraisal period. The tunnel is estimated to retain half its original value after 60 years. Vessels have been depreciated on the basis that they retain 20% of their original value after twenty years.

Based on the above, the estimated investment costs for each of the option packages is summarised in Table 14.2 following adjustment to 2002 prices, discounting over 60 years.

Table 14.2 – Total Sixty Year Option Investment Costs

Option	Appraisal Investment Cost
Option 1 – Do Minimum	-£34,752,934
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	-£37,423,824
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	-£34,752,934
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	-£34,752,934
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	-£80,355,511
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	-£80,355,511

Inclusive of contingency allowances, optimism bias adjustments, and residual values, discounted over 60 years, expressed in 2002 prices.

14.2.7

Infrastructure Maintenance Costs

Operating and maintenance costs have been considered for ongoing ferry operations, and also costs associated ferry terminal maintenance, and tunnel maintenance. They are detailed in Table 14.3 below, derived either from comparison with other projects or from existing ferry operational budgets. Higher terminal maintenance costs have been assumed for the options with a two vessel service, and for the options including a breakwater at Hamars Ness.

Table 14.3 – Annual Maintenance Costs

Infrastructure Element	2008 Prices	2002 Prices
Yell-Unst Tunnel	£200,000 pa	£173,549 pa
Gutcher Terminal (Options 1, 2, 4, 5)	£35,000 pa	£30,371 pa
Belmont Terminal (Options 1, 2, 4, 5)	£35,000 pa	£30,371 pa
Hamars Ness (Options 1, 4, 5)	£20,000 pa	£17,354 pa
Hamars Ness (Options 2, 8, 9)	£27,500 pa	£23,863 pa
Belmont Terminal (Option 8, 9)	£20,000 pa	£17,354 pa

14.2.8

Vessel Operational Costs

Existing operational budgets have been used to derive total vessel operational costs for the different options. These include all aspects of staffing, insurance, fuel, and associated route overheads.

The differing operational cost take account of additional fuel burn associated with increased / decreased sailing, and associated manning costs.

There is evidence from recent experience on Shetland that replacement vessels typically are associated with higher operational costs. Accordingly, allowance has been made for additional operational costs from the time that new vessels are introduced onto the route.

Operational costs are presented Table 14.4.

Table 14.4 – Vessel Operational Costs

Option		2008 Prices	2002 Prices
Option 1 – Do Minimum	Existing Fleet	£2,080,509.70 pa	£1,805,356.04 pa
	New Fleet	£2,422,798.50 pa	£2,102,376.12 pa
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	Existing Fleet	£2,080,509.70 pa	£1,805,356.04 pa
	New Fleet	£2,422,798.50 pa	£2,102,376.12 pa
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	Existing Fleet	£2,469,169.20 pa	£2,142,614.15 pa
	New Fleet	£2,897,030.20 pa	£2,513,889.25 pa
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	Existing Fleet	£2,274,839.45 pa	£1,973,985.10 pa
	New Fleet	£2,794,002.93 pa	£2,424,487.65 pa
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	Existing Fleet	£953,585.85 pa	£827,471.26 pa
	New Fleet	£1,121,585.85 pa	£973,252.75 pa
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	Existing Fleet	£1,452,599.85 pa	£1,260,489.15 pa
	New Fleet	£1,729,799.85 pa	£1,501,028.62 pa

14.2.9

Revenue Forecast

Fares are currently suspended on the Bluemull Sound route. The appraisal has assumed that this situation continues. The re-introduction of fares has been tested as a sensitivity to the main analysis.

14.2.10

Sixty Year Operational Costs

The total operational costs of each of the options, summed over the sixty year appraisal period, at 2002 prices, are presented in Table 14.5.

Table 14.5 – Total Sixty Year Option Operation and Maintenance Costs

Option	Appraisal Investment Cost
Option 1 – Do Minimum	£46,237,904
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	£46,358,525
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	£54,907,938
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	£52,729,453
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	£28,831,823
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	£37,878,016

14.3

Present value of Cost to Government

Table 14.6 presents the total costs to the public sector of each of the options.

Table 14.6 – Cost to Public Sector

	Investment Costs	Operational Costs	Grant / Subsidy Payments	Change in Indirect Taxation *	Total Public Sector Costs
Option 1 – Do Minimum	£34,752,934	£46,237,904	0	£0	£80,990,834
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	£37,423,824	£46,358,525	0	-£16,219	£83,766,130
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	£34,752,934	£54,907,938	0	-£93,836	£89,567,036
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	£34,752,934	£52,729,453	0	-£73,672	£87,408,715
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	£80,355,511	£28,831,823	0	-£1,353,216	£107,834,118
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	£80,355,511	£37,878,016	0	-£1,404,991	£116,828,536

* expressed as a public sector income, relative to the Do Minimum

The public sector investment costs are the capital costs that are spent to construct the infrastructure necessary to enable the services.

The public sector operating and maintenance costs are the ongoing burden imposed on the public purse by the service options and increased infrastructure. This is assumed to cover the running of the ferries, and the upkeep and maintenance of the infrastructure.

Grant/subsidy payments are fund transfers to the private sector to cover the ongoing costs of the service options and infrastructure. This is not applicable to the Bluemull ferry service and is therefore zero.

Indirect taxation revenues would change when a scheme shifts expenditure to or from fuel, which is heavily taxed. Results show small but increasing levels of indirect taxation due to the increased number of trips and hence use of vehicles generated by some of the options.

14.3.1

Monetised Summary

This section presents the benefits from the safety and TEE sections of the analysis and compares them with the Cost to Government shown above. This allows a judgement to be made as to the value for money of the service options. However, it should be emphasised that not all transport benefits are able to be expressed in money terms, and that there may be other benefits to society, not transport related, that could result from implementation of the options.

This is particularly true for a project such as this where the focus is on maintaining a transport link to outer islands, where there are high capital and operational costs relative to the magnitude of benefit that can be achieved by a relatively low number of users. In doing so, there are benefits for sustaining vibrant rural locations and safeguarding their future and many benefits related to accessibility and social inclusion.

Table 14.6 – Monetised Summary of Costs and Benefits

60 year appraisal period	PVB	PVC	NPV	BCR*
Option 1 – Do Minimum	£0	£0	£0	0.00
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	£416,793	-£2,732,064	-£2,315,270	0.15
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	-£454,252	-£8,325,773	-£8,780,025	-0.05
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	-£356,111	-£6,221,334	-£6,577,446	-0.06
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	£13,967,754	-£23,778,470	-£9,810,716	0.59
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	£13,798,631	-£32,638,344	-£18,839,713	0.42

*ratio, not monetary value

The Net Present Value (NPV) is calculated as the Present Value of Benefits (PVB) minus the Present Value of Costs (PVC). It therefore calculates the net benefit to society. In an ideal world, any scheme with a positive NPV would be implemented, as society gains. However, as funds are scarce, another indicator is required. The Benefit to Cost Ratio (BCR) is the Present Value of Benefits divided by the Present Value of Costs multiplied by negative one. This therefore presents the amount of benefit society gets from each pound spent on the project.

Relative to the Do Minimum option, the options all produce negative NPV and BCRs of less than 1. This is reflective of the rural nature of this project and as stated above many benefits which arise out of such a project can not be monetised.

- Option 2 is associated with a small amount of net user benefits, and the additional investment cost of the new breakwater at Fetlar. The net present value is -£2.3m.
- Options 4 and 5 are associated with additional user costs associated with vehicle costs and safety costs, but no journey time savings. The options also attract significantly increased operational costs relative to the Do Minimum. The net present value is £8.8m for option 4, and -£6.7m for option 5.

- Option 8 attracts significant benefits relative to the Do Minimum, driven by journey time savings. Despite lower operational costs, due to the capital costs associated with the tunnel, the present value of costs is some -£23.8m more than the Do Minimum. The overall net present value is -£9.8m.
- Option 9 presents a similar pattern to option 8, although with additional ferry operational costs increasing costs, and reducing the net present value to -£18.8m.

14.4

Deliverability and Public Acceptability

Deliverability has been a key consideration during the development of the Bluemull Link options. Clearly, any option which cannot be delivered could not be taken forward.

The implementation of the preferred package should involve minimum disruption to the transport network and the travelling public. It should also be compatible with potential long-term development strategies within the study area. Construction and operational risks associated with the implementation of the preferred option should be minimised.

It is considered that all of the proposed options could be delivered successfully. Although it is noted that work involving the existing terminals, particularly at Gutcher and Belmont will involve careful planning to minimise the disruption to the ferry service.

Public acceptability is also of key concern and consultation has been undertaken throughout the study with the community, through resident's surveys and meetings, as well as ongoing liaison with the Bluemull Sound STAG Group.

In terms of the ferry options, community consultation highlighted the strong aspiration for improvements to the current situation. Accordingly, stakeholder consultation revealed support for the replacement of the vessels and terminals as assumed under the Do Minimum and options 2, 4 and 5. However, the Do Minimum would not facilitate changes to the service frequency or timetable and thus there was a greater level of support for options 4 and 5 which would seek to improve the ferry timetable and access levels through the introduction of an additional full-time and part-time crew respectively.

Support for the development of a Fetlar breakwater was unanimous among Fetlar residents, and no objections were raised by Unst or Yell residents.

With regards to the fixed link option, generally amongst residents on Unst, consultation revealed that a majority supported the development of tunnel between Unst and Yell, although it is worth noting that consultation also revealed some anxiety that a fixed link could reduce the perception of Unst and Yell as unique, individual islands and lead to a rationalisation of services between the islands. Fetlar residents also generally supported the idea of developing a fixed link between Unst and Yell as this would provide the opportunity for the island to have a dedicated ferry service and ferry based on the island.

14.5

Summary

This chapter has presented the costs and figures for the maintenance and operation of the various options and provided the economic summary for NPV and BCR of each of the options.

The results of the TEE appraisal confirm that in economic terms, none of the alternative options out-perform the Do Minimum, with all options having a negative Net Present Value. This is due to the very high capital and operating costs of all the options, relative to the levels of use of the proposed infrastructure. Although the tunnel proposals replace the requirement to service link Unst and Yell, a significant amount of infrastructure is still required to service the link to Fetlar.

The following chapter considers the various project risks and technical considerations.

15. Risk and Uncertainty

15 Risk and Uncertainty

15.1

Introduction

All risks and uncertainties associated with an option need to be fully identified and accounted for in the appraisal process. As stated in the HM Treasury Green Book (2003), in appraisals it is always likely there is some difference between what is expected and what actually happens. This is the consequence of biases unwittingly inherent in the appraisal process, and risks and uncertainties that materialise. As a result, it is important to identify and mitigate risks, and make allowances for Optimism Bias

The risks to successful approval of the scheme come from many different sources, of which the technical risks and associated cost risks are only one. Similarly, following approval of the scheme there are many possible sources of risk prior to commencement of operations.

Risk management strategies should be adopted throughout the appraisal and implementation stages of proposals in order to ensure that steps have been taken to prevent and mitigate risks and uncertainties. Once reliable estimates of relevant costs are built up, risks are explicitly assessed and quantified, and work to minimise project-specific risks is undertaken, any optimism bias can be reduced.

Once risk factors have been explicitly quantified and valued, adjustment should be made to the costs and benefits in order to calculate risk-adjusted “expected values”. An expected value provides a single value for the expected impact of all risks. However, in general, even with a well-developed project, there will remain some risks which cannot be foreseen. In such cases it will not be possible to include these risks in the expected value, so instead a contingency figure should be added in order to take account of possible unanticipated risks.

This Chapter outlines the principles of Risk and Uncertainty from the work undertaken to date.

Ultimately, the purpose of the work being undertaken is to maintain or provide for the transport links across Bluemull Sound. Additionally, the potential for a project of this magnitude to impact on the delivery of projects elsewhere on Shetland must be considered in terms of the potential risks and associated costs.

15.2

Risk Assessment

15.2.1

Risk Identification

STAG guidance provides an illustration of the range of risks that can be encountered during project development and delivery. This is detailed in Table 15.1.

We have identified the likelihood of these individual risks occurring for the core ferry based options (Do Minimum, 2, 4, 5), the construction of the tunnel (8, 9) and the provision of the associated Fetlar ferry service (8, 9). Of particular note are the following risks.

- Legislative risk is particularly present for the tunnel option, as this would be a unique construction in the UK, although not in Scandinavia. Ferry operations are also highly legislated, and this means some risk for future ferry operations.
- There is significant construction risk associated with the tunnel, due to a lack of detailed information regarding ground conditions. There is planning risk associated with the tunnel, particularly related to the disposal of the spoil.
- We have identified a high operational risk related to the Fetlar based ferry option, particularly related to sustaining sufficient crew on Fetlar.
- Ongoing construction inflation will be a relevant risk, particularly in relation to the high capital costs associated with all options.

Table 15.1 – Risk Identification

Risk		Description	Options 1, 2, 4, 5	Option 8,9 Tunnel	Option 8,9 Ferry
Policy risk	Legislative risk	The risk that changes in legislation increase costs. This can be sub-divided into general risks such as changes in corporate tax rates and specific ones which may change the relative costs and benefits of different procurement routes.	✓✓	✓✓✓	✓✓
	Policy risk	The risk of changes of policy direction not involving legislation.	-	✓	-
Risk on delivering the asset	Construction risk	The risk that the construction of the physical assets is not completed on time, to budget and to specification. The risk of inflation differing from assumed inflation rates, particularly for any schemes where construction is not expected to start until some years in advance.	✓✓	✓✓✓	✓✓
	Planning risk	The risk that the implementation of a project fails to adhere to the terms of planning permission, or that detailed planning cannot be obtained, or, if obtained, can only be implemented at costs greater than in the original budget.	✓	✓✓✓	✓
	Residual value risk	The risk relating to the uncertainty of the value of physical assets at the end of the contract.	-	-	-
Risk on operating the asset	Operational risk	The risk that operating costs vary from budget, that performance standards slips or that the service cannot be provided.	✓✓	✓	✓✓✓
	Inflation risk	The risk that actual inflation differs from assumed inflation rates.	✓✓	✓✓✓	✓✓
	Maintenance risk	The risk that the costs of keeping the assets in good condition vary from budget.	✓	✓	✓
Risks on demand and revenue	Demand risk	The risk that demand for the service does not match the levels planned, projected or assumed. As the demand for a service may be (partially) controllable by the government, the risk to the public sector may be less than that perceived by the private sector.	✓	✓	✓
	Design risk	The risk that the design cannot deliver the services at the required performance or quality standards.	✓	✓✓	✓
	Availability risk	The risk that the quantum of the service provided is less than required under the contract.	✓	✓	✓
	Volume risk	The risk that actual usage of the service varies from the level forecast.	✓	✓	✓
	Technology risk	The risk that changes in technology result in services being provided using non optimal technology.	✓	✓	✓

Source: Department for Transport (Adapted from Technical Note No.5, Treasury Task Force 1999)

Key: - no risk; ✓ little risk, ✓✓ moderate risk, ✓✓✓ higher risk

15.2.2

Assessing Impacts of Risk

STAG recommends that once risks have been identified, the impact of these risks should be assessed in terms of cost outcomes. An assessment of the cost implications of the identified risks has been provided in Table 15.2.

Table 15.2 – Potential Cost Impacts of Risk

Risk		Description	Options 1, 2, 4, 5	Option 8,9 Tunnel	Option 8,9 Ferry
Policy risk	Legislative risk	The risk that changes in legislation increase costs. This can be sub-divided into general risks such as changes in corporate tax rates and specific ones which may change the relative costs and benefits of different procurement routes.	✓✓	✓✓✓	✓✓
	Policy risk	The risk of changes of policy direction not involving legislation.	-	✓	-
Risk on delivering the asset	Construction risk	The risk that the construction of the physical assets is not completed on time, to budget and to specification. The risk of inflation differing from assumed inflation rates, particularly for any schemes where construction is not expected to start until some years in advance.	✓✓	✓✓✓	✓✓
	Planning risk	The risk that the implementation of a project fails to adhere to the terms of planning permission, or that detailed planning cannot be obtained, or, if obtained, can only be implemented at costs greater than in the original budget.	✓	✓✓✓	✓
	Residual value risk	The risk relating to the uncertainty of the value of physical assets at the end of the contract.	-	-	-
Risk on operating the asset	Operational risk	The risk that operating costs vary from budget, that performance standards slips or that the service cannot be provided.	✓✓	✓	✓✓✓
	Inflation risk	The risk that actual inflation differs from assumed inflation rates.	✓✓	✓✓✓	✓✓
	Maintenance risk	The risk that the costs of keeping the assets in good condition vary from budget.	✓	✓	✓
Risks on demand and revenue	Demand risk	The risk that demand for the service does not match the levels planned, projected or assumed. As the demand for a service may be (partially) controllable by the government, the risk to the public sector may be less than that perceived by the private sector.	✓	✓	✓
	Design risk	The risk that the design cannot deliver the services at the required performance or quality standards.	✓	✓✓	✓
	Availability risk	The risk that the quantum of the service provided is less than required under the contract.	✓	✓	✓
	Volume risk	The risk that actual usage of the service varies from the level forecast.	✓	✓	✓
	Technology risk	The risk that changes in technology result in services being provided using non optimal technology.	✓	✓	✓

Source: Department for Transport (Adapted from Technical Note No.5, Treasury Task Force 1999)

Key: low cost medium cost high cost

We have identified that the most significant cost impacts of the identified risks are associated with inflation, construction risk, and planning risk for the tunnel. We also have identified that if the Fetlar based crew option cannot be sustained for option 8, there would be a potentially significant operational cost impact of providing an alternative solution.

15.2.3

Estimating Probability of Risks Occurring and Deriving Probability Distributions

The final two elements of the risk appraisal process can help derive specific risk indices and costs. For the current appraisal, it is sufficient to have identified those elements most at risk, and the potential relative cost implications of those risks being realised. These risks have been incorporated into the appraisal through the application of appropriate optimism bias uplift factors.

15.2.4

Preventing and Mitigating Risk

STAG confirms that following the identification and analysis of risks, practitioners are required to demonstrate that they have adopted a systematic approach to responding to risk, including strategies to prevent and mitigate risks and uncertainties. The following strategies may be adopted:

- **Consulting early** - Helps to identify relevant stakeholders and risk mitigation.

The study has been based on extensive consultation within Shetland and the North Isles. Discussions are currently being progressed with Transport Scotland in relation to the fixed link concept. Shetland Islands Council have significant experience in relation to the procurement and commissioning of ferries and terminals.

- **Avoiding irreversible decisions** - Through understanding causes of delay, and further investigation and improved reliability of project plan.

At this stage of the appraisal, no irreversible decisions have been committed to.

- **Carrying out pilot studies** - Acquire more information on risk affecting projects with many unknowns.

It is anticipated that further work would be required to assess the feasibility of fixed links. It is noted that the operation of a Fetlar based ferry and crew has been undertaken during the current and previous summers, during clement weather.

The following strategies are recommended for adoption during the design development process.

- **Building in flexibility from the start** - Designs adaptable to future changes are less adversely affected by risk than design only suited to one outcome.
- **Taking precautionary action** - Precautionary action required to mitigate severe risks.
- **Transferring risk through contractual arrangements** - Risk contractually transferred to other parties.
- **Developing less risky options** - Including making less use of leading edge technology.
- **Reinstating or developing different options** - Alternative options may be considered if current options are found to be more risky than initially perceived.
- **Abandoning options** - Option may be so risky that it is worth abandoning due to adverse risk.

15.2.5

Further Technical Considerations – Procurement of Vessels

The appraisal of options has assumed that it takes two years to construct any of the ferry vessels. However, it is acknowledged that there is a backlog of work currently being dealt with in shipyards which will add to this time as new orders will be placed on a waiting list. There are also lengthy lead times for supply of major engines and propulsion units: currently some 3 years. Typically a ferry can be delivered within 3 years of an order being placed but in some cases this can extend to 5 years. The appraisal of options has allowed for a four year lead in period. This would see the ferry available to coincide with the terminal upgrades being complete.

If the ferry vessels could not be delivered within four years, the cost implications associated with this relate to the requirement to extend the service lifespan of the existing ferry vessels. However, this is likely to be simple annual maintenance and repair of *MV Bigga* and *MV Geira*.

15.3 Optimism Bias

15.3.1

Process

Experience has demonstrated a tendency for insufficient contingency costs or programme time to be made; a phenomenon known as Optimism Bias. HM Treasury's Green Book has identified Optimism Bias as the systematic tendency for appraisers to be over-optimistic about key project parameters. Evidence from other major projects in the UK has confirmed this to be a major issue.

Optimism Bias provides a methodology to determine what level of additional cost and programme delay should be applied to a project given its particular stage of development. A project at the stage of developing a business case is inherently less certain, in terms of its cost envelope, than one which is close to contract signature. The Optimism Bias adjustment allows a factor to be applied to the capital costs of a project to reflect this and the costs involved in mitigating the impact of this. Standard factors are given dependent upon the nature of the project, based on analysis of previous schemes. This Optimism Bias adjustment sits as a percentage factor independent, but inclusive, of any specific contingencies identified for the particular scheme. It is therefore a predictor of where the costs might finally end up. No Optimism Bias adjustments exist at present to cover operating costs, lifecycle costs or revenue.

15.3.2

Benchmarking / Factors Adopted

In accordance with guidelines, cost estimates and anticipated construction programme durations developed for the scheme are subject to adjustment using Optimism Bias uplift factors. These are set out in the Mott MacDonald Report for HM Treasury: "Review of Large Public Procurement in the UK" dated July 2002.

The Bluemull transport link options are likely to be regarded as a 'Non-standard Civil Engineering' project for the construction of a tunnel. The starting values for optimism bias uplift calculations adopted are:

- 66% for capital costs.

These values are based upon an analysis by Mott MacDonald of a number of previous contracts, which examined the reasons for delay and increased costs and allocated a proportion of total increases to categories and sub-categories of risk. This allocation is utilised when estimating the reduction in Optimism Bias uplift arising from implementation of the mitigation strategies, as described below.

For the tunnel access roads, and ferry berthing structures terminals it is appropriate to apply lower optimism bias factors. The starting values of optimism bias for such schemes are

- 44% for capital costs.

These rates have been applied to the different elements of the scheme appraisal, and are detailed in Chapter 14.

15.4

Sensitivity Tests

A series of sensitivity tests have been undertaken, in addition to the core appraisal reported in Chapter 14. We have particularly focussed efforts on sensitivities related to:

- Option 1 – Do Minimum, as the best performing option within the economic appraisal;
- Option 2 – Do Minimum + Fetlar Breakwater, as an option that has the potential to secure significant accessibility opportunities for Fetlar; and
- Option 8 – Fixed Link + 2 x Fetlar Crew – Despite the high costs relative to other options, there is significant political and public interest in this option, and it delivers journey time and accessibility benefits. It has therefore been considered that sensitivity testing would be valuable to confirm the impact of key assumptions on its economic performance.

15.4.1

Fuel Prices and Fares

The first set of tests considered the potential impact of different fuel price assumptions and the impact of the re-application of fares onto the service.

Fares were previously applied on the Bluemull Sound with a reduced fare then paid for the Yell Sound for onward journeys. Fares were removed following the closure of RAF Saxa Vord on Unst. Studies were undertaken to assess the impact of the removal of these fares on demand for the service.

A sensitivity test has been undertaken to determine the likely impact of re-applying these fares. This scenario assumed that the fares were applied at their previous level and that the arrangement of a reduced fare for the Yell Sound for those travelling between Unst or Fetlar and the Mainland was also reinstated.

This would see a reduction in demand due to increased costs of travel but would introduce a revenue stream that would go some way to offset the operational costs.

Fuel prices have been the subject of much public concern of late and are increasing at a higher level than the standard appraisal increases. Transport Scotland are not proposing to revise the approach taken to fuel costs in the short term future however it was considered prudent for this assessment to consider this as a sensitivity. Fuel prices affect the Vehicle Operating Costs for drivers and in turn will affect demand for the service. Fuel prices also affect the operating costs for the ferries.

The fuel price sensitivity scenario has been run with a 10% per annum increase applied to fuel between 2008 and 2018 and then the increases revert to those in the standard appraisal guidance.

The Fares and Fuel Price Scenarios were run separately and then considered together.

The impact on the figures is shown in table 15.3 below. All figures are discounted over 60 years. Revenues are offset in the operating costs as it is the public sector body operating the service that also collect the fares. All costs are compared against the Do Minimum. It can be seen from the results below that the order of the options does not alter across the various scenarios.

Table 15.3: Fuel and Fare Sensitivity Comparisons

Original							
	Capital	Operating	Journey Time	VOC	Safety	NPV	BCR
Option 1	£0	£0	£0	£0	£0	£0	0.00
Option 2	-£2,670,890	-£120,622	£494,853	-£51,833	-£26,227	-£2,315,270	0.15
Option 8	-£45,602,577	£17,406,081	£19,874,543	-£4,324,448	-£1,582,342	-£9,810,716	0.59
Fuel sensitivity							
	Capital	Operating	Journey Time	VOC	Safety	NPV	BCR
Option 1	£0	£0	£0	£0	£0	£0	0.00
Option 2	-£2,844,324	-£120,622	£494,853	-£72,363	-£25,612	-£2,505,688	0.14
Option 8	-£43,786,654	£17,406,081	£17,334,441	-£4,748,966	-£1,082,002	-£11,861,716	0.49
Fares Sensitivity							
	Capital	Operating	Journey Time	VOC	Safety	NPV	BCR
Option 1	£0	£0	£0	£0	£0	£0	0.00
Option 2	-£2,844,324	-£55,553	£494,853	-£53,148	-£25,465	-£2,422,856	0.15
Option 8	-£43,786,654	£13,922,661	£19,071,752	-£4,234,554	-£1,429,041	-£12,506,556	0.52
Fares and Fuel sensitivity							
	Capital	Operating	Journey Time	VOC	Safety	NPV	BCR
Option 1	£0	£0	£0	£0	£0	£0	0.00
Option 2	-£2,844,324	-£55,553	£494,853	-£74,005	-£24,903	-£2,440,475	0.14
Option 8	-£43,786,654	£13,922,661	£17,334,441	-£5,435,984	-£1,211,891	-£15,885,107	0.40

15.4.2

Alternative Tunnel Configuration

Prompted by the high costs of the tunnel options relative to the other options, and given the strong political and public interest in the tunnel options, as well as the significant potential journey time and accessibility benefits that a tunnel could deliver, a further sensitivity test was undertaken for the option of a single bore, single lane tunnel (controlled by traffic lights).

Within this sensitivity test, a capital cost for a single bore, single lane tunnel was calculated by estimating how much rock volume would require to be removed if a single bore tunnel was to be constructed (relative to the volume of rock removed / costs assumed for the original, single bore two lane tunnel options). This suggested that the capital costs for a single bore, single lane tunnel would cost in the region of £35m, as opposed to the original capital costs which stood at approximately £63m for the single bore, two lane tunnel options assumed under options 8 and 9.

In terms of operational costs, while the tunnel operational costs assumed under options 8 and 9 were calculated at around £200k per annum, the sensitivity test has assumed more expensive costs for the operation of a single bore, single lane tunnel (approximately £300k) owing to the additional monitoring (e.g. traffic lights) that would need to be built into this option.

Using these revised capital and operational tunnelling costs, Table 15.4 below outlines the impact of a single bore, single lane tunnel on the Net Present Value (NPV) and Benefit to Cost (BCR) Ratio relative to the Do Minimum.

Table 15.4: Sensitivity Comparisons for a Single Bore Tunnel

Original						
	Capital	Operating	NPV	PVC	PVB	BCR
Option 1			£0	£0	£0	0.00
Option 8	£63,000,000	£200,000 pa	-£9,810,716	-£23,778,470	£13,967,754	0.59
Option 9	£63,000,000	£200,000 pa	-£18,839,713	-£32,638,344	£13,798,631	0.42
Single Bore, Single Lane Tunnel						
	Capital	Operating	NPV	PVC	PVB	BCR
Option 1			£0	£0	£0	0.00
Option 8	£35,000,000	£300,000 pa	£15,242,980	£1,275,226	£13,967,754	10.95
Option 9	£35,000,000	£300,000 pa	£6,213,982	-£7,584,649	£13,798,631	1.82

It can be seen from the results that, relative to the Do Minimum option, the single bore, single lane tunnel options produce a positive NPV of £15.2m (option 8) and £6.2m (option 9), indicating the Present Value of Benefits delivered by these options outweigh the Present Value of Costs.

Given the scale of benefits delivered by the single bore, single lane tunnel options, a further sensitivity test has been undertaken by increasing the assumed capital cost of this option to £40m, as shown in Table 15.5.

Table 15.5: Single Bore Tunnel Figures based on Higher Capital Cost

Single Bore Tunnel						
	Capital	Operating	NPV	PVC	PVB	BCR
Option 8	£40,000,000	£300,000 pa	£10,503,509	-£3,464,244	£13,967,754	4.03
Option 9	£40,000,000	£300,000 pa	£1,474,512	-£12,324,119	£13,798,631	1.12

Table 15.5 demonstrates that, even assuming a higher, more precautionary capital cost for the single bore, single lane tunnel, the options related to this still provide positive NPVs and BCRs relative to the Do Minimum.

In sum, though there is still uncertainty surrounding the capital costs of developing a single bore, single lane tunnel, even applying optimism bias at 66%, the figures above illustrate the significant economic benefits that this option could deliver relative to the Do Minimum. It is therefore concluded that this option warrants further investigation, as discussed further in Chapter 17.

15.5

Summary

This chapter has provided an overview of the potential risks related to the various options being considered as part of this study. The results of specific sensitivity tests undertaken on the various options have also been presented. While the sensitivity tests surrounding the potential impact of different fuel price assumptions and the impact of the re-application of fares onto the service suggested that these factors would not affect the order of the options, outcomes from an initial sensitivity testing of a single bore tunnel confirmed that this option has the potential to offer clear economic advantages relative to all others and thus warrants further attention.

The following chapter sets out the proposed approach to monitoring and evaluation of the future Bluemull Sound transport link.

16. Monitoring and Evaluation

16 Monitoring and Evaluation

16.1

Introduction

The Scottish Government requires monitoring and evaluation to be undertaken and documented for any proposal for which it provides funding or approval. STAG guidance requires that a new project or strategy be subject to planned evaluation and monitoring, in addition to regular revalidation throughout its development.

STAG defines Monitoring as an ongoing “*process of gathering and interpreting information on the performance of a project post-implementation*”. Evaluation is used for “*specific, post-implementation events, designed to identify whether or not a project is performing as originally intended, whether, and to what extent, it is contributing to established policy directives and whether the implemented project continues to represent value for money*”. Therefore, by gathering and interpreting information, monitoring and evaluation will demonstrate how the project or strategy performs against its objectives, identify any deficiencies and allow adjustments to be made.

Soon after implementation, the performance of the scheme should be assessed against the specified objectives. Recognising that certain projects require time before the full benefits can be realised, a further evaluation is required some time after implementation.

In addition, regular monitoring of the scheme is essential against specified Key Performance Indicators (KPIs) to assess the ongoing effectiveness of the overall strategy and individual schemes.

This chapter sets out the methods and indicators that may be put in place to meet the requirements of the STAG guidance with respect to monitoring and evaluation of the Bluemull Sound link options.

16.2

Base Case

In order to effectively monitor and evaluate a project or a programme of interventions, it is necessary to establish what would have happened in the absence of interventions. The base case scenario represents the absence of intervention. Monitoring projects against the base case scenario provides a means of gauging how well a project or programme of interventions meets the objectives set out when the project began.

It is important to note that just as objectives need to be achievable and relevant, so does the monitoring scheme. Most monitoring and evaluation schemes require the coordinated effort of several organisations. Data collected and used for monitoring needs to be affordable, achievable and relevant. Much of the data should already be available and much of it will have been collated as part of this process.

The collection of any outstanding data for the base case will likely be a joint effort between Shetland Islands Council, ZetTrans, and other agencies. It will be important for relevant organisations to discuss what information is available as part of their regular data gathering functions to avoid incurring additional cost and to limit the collection of new information to that which is strictly necessary to establish performance against scheme objectives.

Baseline data may include, but will not necessarily be limited to:

- Marine safety records;
- Road safety records;
- Passenger surveys;
- Incidence of delayed ferry trips;
- Journey time crossing;

- Passenger and vehicle carryings on all sailings;
- Passenger and vehicle deck utilisation rates for all sailings;
- Incidence of vehicles left behind (i.e. short-shipping);
- Service frequency levels and daily operation time-span; and
- Wider socio-economic trends related to resident population, age-profile, and tourist numbers.

16.3

Preferred Option

The STAG guidance states that a Monitoring Plan should be developed to monitor the impacts of the preferred scheme against the established transport planning objectives and STAG criteria.

An initial monitoring programme has been developed which would be implemented when the preferred option is taken forward to construction to ensure that the success of the project can be evaluated against its planning objectives. For each of the scheme's planning objectives, Key Performance Indicators (KPIs) have been identified, along with information on the source and timescale for monitoring. The proposed monitoring programme is outlined Table 16.1 below.

Table 16.1 – Proposed Monitoring Programme

Planning Objective	Indicator	Source of Indicator	Monitoring Method and frequency
Provide a transport link which is economically efficient	Operational and capital (construction) costs of running the Bluemull Sound ferry service / a tunnel between Unst and Yell.	Proportion of actual costs over budget	Budget and cost comparison – after implementation.
Provide a transport link which is operationally reliable on a day to day basis	% of timetable sailings operated to schedule.	SIC Ferry Log Books	Before and after surveys. Monitoring annually.
Provide a transport link which is operationally sustainable in the long term	- % of timetable sailings operated to schedule. - Number of vehicles or passengers left behind at ferry terminal.	- SIC Ferry Log Books - Short-shipping counts	- Before and after surveys. Monitored annually. - Logs retained for every sailing.
Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland	% of connections that can be made with Shetland's public transport network.	Timetable reviews	Review SIC bus and ferry timetables compared to current provision.
Provide a transport link which has a regular and easily understandable pattern of transport opportunities	User views on opportunities for travel, and understanding of timetable.	Ferry user interviews	Qualitative survey results by group – after implementation.
Provide a transport link which is considered to be affordable to users	Levels of ferry fares compared against inflation.	SIC Ferry Services	Review of fare levels.
Provide a transport link which is considered to be affordable for funders and operators	Operational and capital (construction) costs of running the Bluemull Sound ferry service / a tunnel between Unst and Yell.	Proportion of actual costs over budget	Budget and cost comparison – after implementation.
Provide a transport link which provides sufficient capacity for passengers and vehicles	- Vehicle deck capacity and passenger carrying data. - Number of vehicles or passengers left behind at ferry terminal.	- SIC Ferry Log Books - Short-shipping counts	- Before and after surveys. Monitoring annually. - Logs retained for every sailing.

Provide a transport link which provides island-focussed accessibility opportunities for Unst, Fetlar and Yell	- Number of trip opportunities available for residents of Unst, Fetlar and Yell. - User views on opportunities for travel.	- Stakeholder views. - Ferry User Survey	- Stakeholder interviews. Ferry timetable review, - Qualitative survey results by group – after implementation
Provide a transport link which promotes wider socio-economic opportunities for North Isles communities	- Resident population levels and age profiles for Unst, Fetlar and Yell. - North Isles visitor numbers.	- Census data / Residents Surveys - Visitors Survey	Before and after surveys.

It is important to state that the table above is only in draft outline stage because, as confirmed by the STAG guidance, the monitoring process is quite a fluid process and “will need to be reviewed over time and modified according to the extent to which it is achieving sound and cost effective results”. The guidance goes on to state that the monitoring plan, detailed performance indicators and targets may also need to be reviewed and updated to appropriately reflect any changes to established policy directives.

16.4 Project Development, Procurement and Construction

16.4.1 *Project Validation*

It is possible that circumstances may change within the time required for scheme development, approval and construction, which could affect the assumptions made regarding the proposals. During this time it will be necessary to keep under review the planning objectives, taking into account any changes in the underlying transport situation.

16.4.2 *Cost and Revenue and Programme Monitoring*

It is recommended that a management team comprising various advisors be appointed to manage the process of monitoring cost and revenue and programme issues throughout the development and construction of the preferred package. The team will thereby evaluate any potential for changes in project costs and associated risks.

16.5 Evaluation

16.5.1 *Process Evaluation*

Evaluations are specific post-implementation events designed to identify whether:

- A project has performed as intended (or under or beyond expectations);
- Established objectives have been achieved (fully or partially, and the reasons for any failures); and
- The project continues to represent value for money (also considering actual cost budget).

The Process Evaluation is conducted straight after the implementation. It will draw lessons for ongoing implementation and for the design, management and implementation of future projects.

For the reasons given above with respect to Base Case data and the proposed monitoring regime, it is not possible at this stage to be specific about the nature of the process evaluation. However, as this study is taken forward, similar to the development of a more detailed Monitoring Plan, an Evaluation Plan will be developed outlining the scope and timing of the evaluation to be undertaken together with an Evaluation Summary Table (EST), which will be used to report outturn performance and impacts following implementation.

17. Conclusions and Recommendations

17 Conclusions and Recommendations

17.1 Introduction

This chapter begins by summarising some of the key issues and findings that have emerged following the STAG appraisal of options for improving transport links across the Bluemull Sound.

The final section concludes by outlining the key recommendations that have emerged from this study.

17.2 The Necessity to Do Something

The results from the appraisal suggest that doing nothing is not feasible due to the impacts and costs of continuing to operate ageing ferry and terminal infrastructure beyond its lifespan. This represents a significant risk to service delivery, not only for the transport link, but also for the viability of the communities of Fetlar and Unst.

17.3 Key Findings Arising from the Appraisal

A summary of the key findings from the STAG appraisal is presented below according to each of the Government's transport appraisal criteria: Environment, Safety, Economy, Accessibility and Social Inclusion, and Integration. A summary of the performance of the options in terms of levels of risk and deliverability is also presented.

17.3.1 *Environment*

The environmental appraisal did not exclude any of the proposed options, although highlighted potential adverse impacts arising from the disposal of tunnel spoil, impacts on established SSSIs, and landscape impacts.

17.3.2 *Safety*

The appraisal of safety impacts did not identify specific issues with any of the options being considered. It was noted however that the development of a tunnel would be predicted to significantly increase vehicular travel from Unst, and onward to Yell and Shetland Mainland, which in turn would lead to an overall increase in road accidents. However, the construction of a tunnel would also remove some of the current hazard associated with drivers speeding to catch a specific ferry departure.

17.3.3 *Economy*

Two key elements were considered as part of the economic appraisal: Transport Economic Efficiency (TEE) and Economic and Activity Location Impacts (EALI).

The TEE appraisal considered the overall monetised costs and benefits of the different options, relative to the Do Minimum. The incremental benefits of the various options, relative to the Do Minimum are presented in Table 17.1. The main factors influencing the performance of the various options are the differences in capital investment, and the ongoing operational costs. Whilst various other benefits are associated with the different options (such as travel time savings) they were found not to significantly influence the appraisal outcome.

Table 17.1 – Summary of Benefits to Costs

60 year appraisal period	Net Present Value	Benefit to Cost Ratio
Option 1 – Do Minimum	£0	-
Option 2 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + development of Fetlar breakwater	-£2,315,270	0.15
Option 4 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x FT)	-£8,780,025	-0.05
Option 5 – Replacement of Gutcher and Belmont terminals, <i>MV Bigga</i> and <i>MV Geira</i> + introduction of an additional crew (1 x PT)	-£6,577,446	-0.06
Option 8 – Unst-Yell Tunnel with 2 x Fetlar crew	-£9,810,716	0.59
Option 9 – Unst-Yell Tunnel with 3 x Fetlar crew	-£18,839,713	0.42

The Net Present Value demonstrates that over 60 years, all options appraised perform less well than the Do Minimum option. Taking into account all capital and operational costs over 60 years, offset by benefits such as the value of journey time savings, all options are more costly than the Do Minimum option. The Benefit to Cost ratio indicates that for *all options*, each additional pound invested over and above the Do Minimum, returns a fractional amount of benefit, or merely increases costs.

The EALI appraisal considered the economic impacts that may accrue from the various transport options in both employment and GDP terms. For residents, it is considered that the ferry options could help to improve access to jobs in the North Isles through the provision of more reliable infrastructure and, under some of the options, a more accessible service. The tunnel options would increase access to employment for North Isles residents, making commuting to jobs on other North Isles and Shetland Mainland easier. For residents of Fetlar, the development of a breakwater and dedicated ferry service could allow the timetable to be arranged so that commuting from Fetlar to Yell and Unst is more viable. In combination with a small berth facility, this option could secure wider socio-economic benefits for Fetlar.

Businesses could also benefit from the provision of a more reliable and accessible link facilitated by improved ferry services or a tunnel. Potential impacts identified include new business start-ups, increased staff productivity and reduced freight costs. The main negative impact relates to the loss of ferry jobs associated with construction of a fixed link – although this option is also the most accessible and therefore offers the greatest potential economic benefits.

The potential impacts of the various options on the development of tourism in the North Isles have also been considered with results from appraisal suggesting that while each of the options could support increases in tourist numbers, a tunnel would deliver the greatest economic benefits in terms of gross effects on the economy and number of jobs safeguarded. It is important to highlight however that while Unst would be significantly positively affected by increases in tourism on the back of the development of a tunnel, this option could have negative impacts elsewhere in terms of a loss of ferry jobs and transferral of tourist activity from elsewhere in Shetland.

17.3.4

Accessibility and Social Inclusion

Appraisal has also considered the impacts of the different options on levels of accessibility and social inclusion. The provision of a Fetlar breakwater opens up accessibility to Unst, Yell and Lerwick by enabling an earlier morning ferry sailing from Hamars Ness. Under those options which would regularise the timetable, public transport access would only be enhanced with matching enhancements to the existing public transport services.

While the utility and convenience of public transport could be enhanced between Unst and Yell through the development of a tunnel, these options do not necessarily facilitate any improvement in public transport accessibility without timetable improvements. However, for those with access to a car, the tunnel options would provide 24 hour access to and from Unst. However a tunnel connecting Unst and Yell would prohibit pedestrian and cyclist access for

safety reasons. Access for these user groups would require more detailed consideration as part of the design process, should tunnelling options be pursued in the future.

Other groups, such as visitors to the North Isles, would benefit from improved accessibility through a regularised ferry timetable, or a tunnel between Unst and Yell.

17.3.5

Integration

The appraisal of integration impacts did not specifically highlight significant impacts. In terms of transport integration, the appraisal identified that the main positive impacts would result from the provision of a tunnel which could deliver "seamless" journeys between Unst and Yell.

17.3.6

Risk and Deliverability

The STAG appraisal has also considered issues of risk and deliverability. It is apparent, that for the communities of Unst and Fetlar, the biggest risk is the risk of continuing to adopt a "Do Nothing" approach. This risks a significant reduction in service levels, and increase in service unreliability, and the possibility of temporary arrangements to overcome vessel or terminal failure.

Of the options being considered, the principal risks are as follows:

- Option 1 – No significant operational risks. Some construction risk related to terminals.
- Option 2 – Some operational risk related to sustaining a Fetlar based crew. Some construction risk related to terminals.
- Option 4 – No significant operational risks. Some construction risk related to terminals.
- Option 5 – No significant operational risks. Some construction risk related to terminals.
- Option 8 – Some operational risk related to sustaining a Fetlar based crew, and split shift timetable. Higher levels of construction risk related to fixed link.
- Option 9 – No significant operational risks. Higher levels of construction risk related to fixed link.

In line with HM Treasury, and Scottish Government Guidance, account has been taken of the varying levels of risk associated with each option through the application of "Optimism Bias" uplifts, applied to the capital cost elements of each option. They range from 66% uplift for tunnelling work, through to 44% for access roads and terminal construction.

In respect of deliverability, the key constraints are related to affordability. Given that the tunnel options perform less well than the Do Minimum (in relation to Net Present Value), it will be particularly difficult to gain funding support from the Scottish Government for these options.

17.4

Sensitivity Testing

The robustness of the outcomes of the appraisal have been firstly tested through the application of higher fuel costs, the re-introduction of fares, and also fares and higher fuel costs in combination. These tests did not alter the outcomes of the appraisal.

Further sensitivity testing was also undertaken with respect to varying the alternative assumptions made with respect to the application of optimism bias, and contingency allowances. Whilst these changes did impact upon the relative magnitudes of the Net Present Values of each of the options, they did not alter the ranking of the options.

In recognition of the public and local political interest related to the provision of a fixed link between Yell and Unst, a further sensitivity test was undertaken to test the performance (in relation to the cost benefit analysis) of a conceptual single bore, single lane tunnel. This would provide 24 hour access between Yell and Unst, although would be subject to directional controls. It was found that in this instance, the lower capital costs that would be associated with such a proposal had the potential to significantly outperform other options included within the appraisal. However, it is noted that this sensitivity option has not been subject to community consultation, operational risk assessment, or specific engineering feasibility review.

17.5**Option Summary Tables**

In an effort to facilitate the clear presentation of information to decision makers, planners are required to produce Option Summary Tables (OSTs) as part of the refreshed STAG.

The following sections present OSTs for those options that, following the full STAG appraisal, are considered to be the most realistic in terms of costs and in terms of addressing the study objectives. These options are:

- Option 1 – Do Minimum
- Option 2 – Do Minimum + Fetlar Breakwater
- Option 8 – Unst-Yell Tunnel + 2 Fetlar Crew

The OSTs which follow have been completed making use of information that has been gathered to date as part of the STAG process. However, the primary reason behind the inclusion of OSTs as part of the refreshed guidance has been to ensure that decision makers are provided with a concise summary of each option with all relevant information presented in a clear and accessible manner. Further, more detailed, information on the pros and cons of each option, and their performance against the full range of STAG criteria has been provided throughout this report and has also been included in the Appraisal Summary Tables included within the Appendix Report.

<h2 style="margin: 0;">Option Summary Table</h2>	<i>Study Title: Bluemull STAG</i>	Option title: Option 1 – Do Minimum
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<p>Option description: Do Minimum. Replacement of Gutcher and Belmont terminals and MV Bigga and MV Geira. Option acts as a viable option in its own right, and also a benchmark for comparison against other options.</p>	<p><i>Capital Costs/Grant (2002 Prices - undiscounted)</i></p>	£72.7m
	<p><i>Annual Revenue Support (2002 Prices - undiscounted)</i></p>	£2.2m pa
	<p><i>Present Value (PV) of Cost to Government</i></p>	£75.7m

Summary of impact on the five STAG criteria	Impacts (Monetary and Non-Monetary)							Monetary only (£m)		Monetary impact ratio (if relevant)		
		---	--	-	0	+	++				+++	
	Environment											
	Safety											
	Economy											
	Integration											
Accessibility and Social Inclusion												
NPV:							£0	BCR:		0.00		
Including Wider Economic Benefits							-	BCR(WEB):		-		

Assessment against Transport Planning Objectives	TPO Target 1:	---	--	-	0	+	++	+++	TPO Target 6:	---	--	-	0	+	++	+++
	TPO Target 2:								TPO Target 7:							
	TPO Target 3:								TPO Target 8:							
	TPO Target 4:								TPO Target 9:							
	TPO Target 5:								TPO Target 10:							

Contribution toward the Government Purpose:
 The Do Minimum option generally supports delivery of the Government’s purpose in relation to transport. The reliability of ferry services across Bluemull Sound would be improved through the provision of new infrastructure to replace the existing ageing vessels and terminals. However, this option would not deliver any significant improvements in levels of accessibility as it entails infrastructure rather than service enhancements. This option would also specifically fail to address the problems with regards to accessibility to and from Fetlar.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
Safety	Replacement vessels would comply with maritime legislation (SOLAS). No increase in maritime or personal accidents expected.	Technical	This option is considered to be technically feasible.
Economy	Service reliability improvements could have a minor positive impact for economic development.	Operational	This option is considered to be operationally feasible.
Integration	Integration with other transport modes and Shetland's wider transport network would not be enhanced as this option does not facilitate greater service frequency nor timetable changes.	Financial	Replacement vessels and improved terminals would incur significant capital costs, and therefore require external funding support through the Scottish Government and/or European Grant Aid. However, high operating costs associated with the maintenance of ageing vessels and terminals would be alleviated through the replacement of existing infrastructure.
Accessibility & Social Inclusion	Accessibility would be slightly improved through the provision of a more reliable service though concerns related to the existing problems that residents face in terms of accessing jobs, services and amenities on and off the islands, would remain as this would require timetables alterations and changes in service frequency. Option would have a negligible impact on Fetlar residents.	Public Acceptability	Although existing problems relating to accessibility would remain, stakeholder consultation revealed support for the replacement of the vessels and terminals.
Environment	<i>This section identifies key impacts and tensions across the sub-criteria</i>		
	The development of new terminals has the potential to have adverse impacts on biodiversity in the short term, though in the long term effects would be considered to be neutral. New terminals could have an adverse impact on landscape character, due to new construction activity. The Gutcher SSSI, designated for its geology, could be impacted should the redeveloped terminal be located to the south of the existing facility.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
TPO 1:	Provide a transport link which is economically efficient.	TPO 6:	Provide a transport link which is considered to be affordable to users.
TPO 2:	Provide a transport link which is operationally reliable on a day to day basis.	TPO 7:	Provide a transport link which is considered to be affordable for funders and operators.
TPO 3:	Provide a transport link which is operationally sustainable in the long term.	TPO 8:	Provide a transport link which provides sufficient capacity for passengers and vehicles.
TPO 4:	Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland.	TPO 9:	Provide a transport link which provides island – focussed accessibility opportunities for Unst, Fetlar and Yell.
TPO 5:	Provide a transport link which has a regular and easily understandable pattern of transport opportunities.	TPO 10:	Provide a transport link which promotes wider socio-economic opportunities for North Isles communities.

Option Summary Table	Study Title: Bluemull STAG	Option title: Option 2 – Do Minimum + Fetlar Breakwater
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Option description: This option involves the replacement of Gutcher and Belmont terminals and <i>MV Bigga</i> and <i>MV Geira</i> , along with the development of a Fetlar breakwater.	Capital Costs/Grant (2002 Prices - undiscounted)	£77.5m
	Annual Revenue Support (2002 Prices - undiscounted)	£2.2m pa
	Present Value (PV) of Cost to Government	£78.4m

Summary of impact on the five STAG criteria	Impacts (Monetary and Non-Monetary)							Monetary only (£m)		Monetary impact ratio (if relevant)		
		---	--	-	0	+	++				+++	
	Environment											
	Safety											-0.01
	Economy										-£26,227	0.16
	Integration										£443,020	
Accessibility and Social Inclusion												
NPV: -£2,315,270							BCR: 0.15					
Including Wider Economic Benefits							NPV(WEB): -		BCR(WEB): -			

Assessment against Transport Planning Objectives		---	--	-	0	+	++	+++		---	--	-	0	+	++	+++
	TPO Target 1:								TPO Target 6:							
	TPO Target 2:								TPO Target 7:							
	TPO Target 3:								TPO Target 8:							
	TPO Target 4:								TPO Target 9:							
	TPO Target 5:								TPO Target 10:							

Contribution toward the Government Purpose:
 This option would contribute to the Government’s transport purpose by providing a more reliable transport service through the provision of new infrastructure to replace existing ageing vessels and terminals. The provision of a Fetlar breakwater and in turn the ability to berth the ferry overnight on Fetlar would enable an additional commuter sailing, thus providing improved integration opportunities between the transport networks of the North Isles and Shetland Mainland, and improving accessibility for residents seeking to travel off the island for work purposes. The Fetlar breakwater could also support wider socio-economic opportunities, including for tourism, if supported by small boat berthing facilities.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
Safety	Replacement vessels would comply with maritime legislation (SOLAS). Option may lead to slight increase in maritime incidents.	Technical	This option is considered to be technically feasible.
Economy	Enhanced service reliability through new infrastructure would have economic benefits, whilst provision of breakwater would open up commuting opportunities through provision of an additional morning sailing. Breakwater could support wider socio-economic opportunities if supported by small boat berthing facilities.	Operational	This option is considered to be operationally feasible. Development of a Fetlar breakwater would enable the vessel to berth overnight throughout the year including during periods of adverse weather.
Integration	Fetlar breakwater would allow the ferry to berth overnight on the island, which would offer islanders the opportunity of an additional commuter sailing. Provision of a more reliable and accessible service would increase integration opportunities between the transport networks of Unst, Fetlar, Yell, and Shetland Mainland.	Financial	Replacement vessels and construction of improved terminals, including breakwater at Fetlar would incur significant capital costs, and therefore external funding support. However, high operating costs associated with the maintenance of ageing vessels and terminals would be alleviated through the replacement of existing infrastructure.
Accessibility & Social Inclusion	Breakwater would improve accessibility to/from Fetlar e.g. this could increase the potential to introduce commuter sailings from the island in the morning, allowing residents to access jobs off the island.	Public Acceptability	Consultation revealed support for vessel and terminal replacement. Unanimous support among local residents (and no objections among residents of Unst and Yell).
Environment	<i>This section identifies key impacts and tensions across the sub-criteria</i>		
	The development of new terminals has the potential to have adverse impacts on biodiversity in the short term, though in the long term effects would be considered to be neutral. New terminals could have an adverse impact on landscape character, due to new construction activity. The Gutcher SSSI, designated for its geology, could be impacted should the redeveloped terminal be located to the south of the existing facility. Significant adverse effects on landscape character and visual amenity are predicted during construction of the Fetlar breakwater, though these would be short term.		
Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
TPO 1:	Provide a transport link which is economically efficient.	TPO 6:	Provide a transport link which is considered to be affordable to users.
TPO 2:	Provide a transport link which is operationally reliable on a day to day basis.	TPO 7:	Provide a transport link which is considered to be affordable for funders and operators.
TPO 3:	Provide a transport link which is operationally sustainable in the long term.	TPO 8:	Provide a transport link which provides sufficient capacity for passengers and vehicles.
TPO 4:	Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland.	TPO 9:	Provide a transport link which provides island – focussed accessibility opportunities for Unst, Fetlar and Yell.
TPO 5:	Provide a transport link which has a regular and easily understandable pattern of transport opportunities.	TPO 10:	Provide a transport link which promotes wider socio-economic opportunities for North Isles communities.

Option Summary Table *Study Title: Bluemull STAG* Option title: Option 8 – Unst-Yell Tunnel + 2 Fetlar Crews

<p>Option description: Option involves the development of a fixed link tunnel between Unst and Yell, in addition to the operation of dedicated Fetlar ferry service, operated by two crews running from Fetlar to an upgraded terminal at Belmont. This option also assumes the development of a breakwater at Fetlar.</p>	<p><i>Capital Costs/Grant (2002 Prices - undiscounted)</i> £136.7m</p> <p><i>Annual Revenue Support (2002 Prices - undiscounted)</i> £1.2m pa</p> <p><i>Present Value (PV) of Cost to Government</i> £99.5m</p>
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<p>Summary of impact on the five STAG criteria</p>	<p>Impacts (Monetary and Non-Monetary)</p>							<p>Monetary only (£m)</p>	<p>Monetary impact ratio (if relevant)</p>		
	<p>--- -- - 0 + ++ +++</p>										
	Environment										
	Safety										
	Economy										
	Integration										
Accessibility and Social Inclusion											
<p>Including Wider Economic Benefits</p>								<p>NPV: -£9,810,716</p>	<p>BCR: 0.59</p>		
<p><i>*Nb the left box refers to the impacts of the Unst-Yell tunnel proposals / the right hand side box refers to the impacts of the Fetlar ferry service.</i></p>								<p>NPV(WEB): -</p>	<p>BCR(WEB): -</p>		

<p>Assessment against Transport Planning Objectives</p>	<p>--- -- - 0 + ++ +++ --- -- - 0 + ++ +++</p>														
	TPO Target 1:														
	TPO Target 2:														
	TPO Target 3:														
	TPO Target 4:														
	TPO Target 5:														
	TPO Target 6:														
TPO Target 7:															
TPO Target 8:															
TPO Target 9:															
TPO Target 10:															
<p><i>*Nb the left box refers to the impacts of the Unst-Yell tunnel proposals / the right hand side box refers to the impacts of the Fetlar ferry service.</i></p>															

Contribution toward the Government Purpose:
 Provision of a tunnel between Unst and Yell would improve reliability and journey times and generally increase integration of the North Isles transport networks and the rest of Shetland. Accessibility would be improved for residents of the North Isles through the provision of a fixed link between Unst and Yell, with increased opportunities opened up for accessing employment, shops and other services elsewhere in the North Isles and on Shetland Mainland. This option also has the potential to increase tourism in the North Isles.

Provision of a dedicated Fetlar service and the development of a Fetlar breakwater would increase the reliability of the service. Access problems to/from Fetlar would broadly remain equivalent to current situation, but would be assisted by the construction of the breakwater.

STAG Criteria		Implementability Appraisal	
Criterion:	Supporting Information	Criterion:	Supporting Information
Safety	Whilst the removal of a ferry link removes one set of safety considerations (maritime legislative requirements), this option requires the introduction of rigorous tunnel operational procedures. Also, while maritime incidents would be reduced due to operation of two island ferry service, option is associated with an increase in traffic volume, as well as increase in distance travelled, which increases the opportunity for road accidents.	Technical	In the UK, there is no experience of tunnels constructed for low-volume island links. While technically feasible to construct a Unst-Yell tunnel, further work would be required to refine design options, costs, and manage technical risk. Provision of a dedicated Fetlar ferry considered to be technically feasible.
Economy	Tunnel between Unst and Yell could encourage wider socio-economic benefits by improving the potential for inward investment and encouraging population retention, in turn supporting local economic growth. Option could deliver economic benefits related to increased business efficiency associated with reduced journey times. Tourist numbers could also be expected to increase. Wider impacts on Fetlar would be more limited.	Operational	The operation of a tunnel between Unst and Yell would be operationally feasible. This would be subject to the introduction of rigorous tunnel management procedures. The provision of a dedicated Fetlar ferry is also considered to be operationally feasible although there could be a risk related to sustaining sufficient crew on Fetlar.
Integration	Option would remove the Bluemull Sound ferry interchange and improve integration between Unst and Yell, thus promoting a seamless journey between the two islands for the movement of people and freight. Provision of dedicated Fetlar service would also provide a more easily understandable service.	Financial	A tunnel would require significant funding resources though, despite high capital costs, operating costs would be lower compared to ongoing operation of ferry services. A two crew Fetlar ferry service represents a balance between single crew operation and higher levels of resource provision.
Accessibility & Social Inclusion	Accessibility would be significantly increased for North Isles residents through the provision of a tunnel affording 24 hour access between Unst and Yell. Two crew Fetlar ferry service could potentially have negative accessibility impacts for residents living on the island, as this would be a reduction in service levels compared with existing levels, though it is expected that service could be tailored to meet the needs of the local community.	Public Acceptability	Strong support for Unst-Yell tunnel, although some concerns related to loss of island status and potential subsequent rationalisation of services between Unst and Yell. Fetlar residents support the development of a tunnel as this would provide the opportunity for the island to have a dedicated ferry service with the ferry based on the island. Fetlar residents expressed concerns that provision of an Unst-Yell tunnel could lead to a 'watered-down' ferry service.
<i>This section identifies key impacts and tensions across the sub-criteria</i>			
Environment	<p>Tunnel construction activities could have moderate to major adverse impacts on biodiversity, though these would decrease over time. Tunnel construction would have temporary major adverse impacts on landscape character due to construction compounds and activity (e.g. temporary buildings, plant and excavated materials, high volume of HGV movements etc.). Longer-term, there would be an impact on landscape character associated with introducing man-made features in previously undeveloped land. A tunnel could also potentially have adverse impacts on cultural heritage sites, while the potential exists for excavated spoil and pollutants to affect water quality.</p> <p>Upgrades to existing terminals could have a temporary adverse biodiversity impact. Construction activities could also result in temporary adverse impacts on visual amenity and landscape character. Significant adverse effects on landscape character and visual amenity are predicted during construction of the Fetlar breakwater, though these would be short term.</p>		

Transport Planning Objectives			
Objective:	Description of Objective	Objective:	Description of Objective
TPO 1:	Provide a transport link which is economically efficient.	TPO 6:	Provide a transport link which is considered to be affordable to users.
TPO 2:	Provide a transport link which is operationally reliable on a day to day basis.	TPO 7:	Provide a transport link which is considered to be affordable for funders and operators.
TPO 3:	Provide a transport link which is operationally sustainable in the long term.	TPO 8:	Provide a transport link which provides sufficient capacity for passengers and vehicles.
TPO 4:	Provide a transport link which is integrated with the transport network on Unst, Fetlar and Yell, and Shetland Mainland.	TPO 9:	Provide a transport link which provides island – focussed accessibility opportunities for Unst, Fetlar and Yell.
TPO 5:	Provide a transport link which has a regular and easily understandable pattern of transport opportunities.	TPO 10:	Provide a transport link which promotes wider socio-economic opportunities for North Isles communities.

17.6 Recommendations and Work Going Forward

17.6.1

Study Recommendations

The STAG appraisal study has examined the cost, benefits and risks associated with each of the option packages. Through careful appraisal as part of the STAG Part 2 appraisal framework, the following conclusions emerge:

1. At present, there is a significant risk of severe and costly disruption on the route should either the terminals or the ferries fail to be able to operate for legislative reasons or deterioration in condition. This would have particularly detrimental consequences for the communities of Unst and Fetlar.
2. Taking into account the outcomes of the appraisal, and issues such as risk and deliverability, Option 2 (replacement of Gutcher and Belmont terminals and *MV Bigga* and *MV Geira* and development of Fetlar breakwater) has emerged as the most favourable of the options considered within the appraisal.
3. In combination with proposals for a small berth facility, the provision of a breakwater at Fetlar provides an opportunity to deliver a more reliable, and more island centred service to this island, as well as to Unst, with associated socio-economic benefits. In particular, this could secure significant additional accessibility benefits to both islands, subject to issues of crewing / operational sustainability being addressed.

17.6.2

Work Going Forward

Whilst Option 2 emerges as the preferred recommendation based on the results of the STAG appraisal, it is recognised that this option does not entirely meet the expectations of the community which, as confirmed by the consultation findings, largely support the development of a fixed link. Given this, and the strong political will for the development of fixed links in Shetland, at the sensitivity testing stage of this study, consideration was given to the feasibility of developing a single bore, single lane tunnel option (controlled by traffic lights). If technically and operationally feasible, the appraisal results suggested that this option would out perform all other options due to significantly lower capital costs than the single bore two lane tunnel option.

Given the potentially clear economic advantages of the single bore tunnel option relative to the recommended option (and all other options), it is recommended that prior to finally confirming which option should be taken forward and implemented on Bluemull Sound, additional work assessing the operational risks associated with developing a single bore tunnel option is undertaken. Discussions with community representatives should also be undertaken.

Since it is not operationally imperative that the planning and design of terminals and ferries on Bluemull Sound starts immediately, it is considered that there is an opportunity to explore a single bore, single lane tunnel further and report back to the Council as to whether or not this is a viable alternative to the ferry.

This work should not however delay the commencement of work on the Fetlar breakwater development, and also the provision of a replacement terminal at Belmont, which will both be required irrespective of the development of a tunnel.

Once the feasibility work into the potential for a single bore tunnel has been completed, the final recommendations will require to be considered within the context of the emerging findings from the recent STAG studies for Whalsay and Bressay. The recommendations from each of these studies will be included in an Implementation Plan, containing all the information required to prioritise these projects against other projects in the Council's Capital Programme and make the case for investment and infrastructure implementation going forward.