Stornoway to Ullapool Ferry Study

Final Report

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Prepared for:

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1 Introduction

The Stornoway to Ullapool ferry service was introduced in 1973, providing the first Ro-Ro service to the Western Isles. The service is provided by CalMac and currently operates six days per week using two vessels, the freight Ro-Ro Muirneag and the RoPax[1] Isle of Lewis.

Comhairle nan Eileen Siar have commissioned Fisher Associates to undertake an initial study on this route, identifying options and bringing forward proposals for the future operation of vessel(s). It focuses on short / medium term issues such as appropriate vessel types and specification, and timing changes, but does not examine longer term options such as alternative sailing routes with new ports.

It is important to note that this is not a full Scottish Transport Appraisal Guidance (STAG) study. The objective is to identify the future options for vessel deployment in an objective manner. It provides a focus for informed debate, and the basis for a subsequent full STAG appraisal.

This study makes significant use of the Western Isles Ferry Fares Mechanism Study (June 2006), referred to here as the "Ferry Fares Study".

This report is structured with the conclusions, key findings and recommendations presented with the summary at the beginning of the report. The structure is as follows:

- Section 2 presents the summary and conclusions, which contains an overview of the key points, options sifting and key findings, and the recommendations.
- The scope of work is detailed in Section 3.
- Section 4 details the services that operate on the route.
- An analysis of problems and needs is presented in Section 5.
- Constraints and uncertainties are identified in Section 6.
- Section 7 develops objectives for the study.
- The opportunities and options are crystallised in Section 8.
- Section 9 presents the quantitative appraisal of the options with the results.

[1] Pax refers to passengers.

2 Summary and Conclusions

2.1 Overview

2.1.1 Scope of Work

With respect to the Stornoway to Ullapool ferry route, the objective of this report is to:

- Assess the key issues affecting stakeholders on the route.
- Identify constraints and uncertainties.
- Identify planning objectives and measures that might be taken on the route to support these.
- Make an initial appraisal of deploying different types of vessels, assuming that the current ports are retained.

2.1.2 Key Issues

Hauliers showed strong dissatisfaction with the level of cancelled sailings and late arrivals by the Muirneag, but have a preference for a dedicated freight ferry. Trade to the Island is unbalanced, resulting in the need to ship empty trailers. These attract a full lane metre charge, and hauliers consider this to be inequitable.

Residents wish for higher frequency and a shorter crossing time. They have indicated dissatisfaction with the general level of comfort and facilities on the Isle of Lewis, especially for disabled people. Some would like to see later sailings out of Ullapool.

Businesses believe that the service must improve simply to ensure that they can “stand still”. They contend that poor connectivity affects their ability to recruit people onto the Island, and they believe that high freight costs contribute to a significant uplift in construction costs on the Island.

The Western Isles visitors market is medium to long stay. The short break and weekend market is higher yield, and most destinations are therefore targeting this sector. It is widely held that peak demand is suppressed by the number of sailing days, lack of frequency, and insufficient peak capacity. The daytrip market is very limited and may have significant potential.

The perception that there is insufficient accommodation on the Island to increase visitor numbers in summer may be misguided. Hotels and guesthouses achieve about 70% to 80% summer occupancy, and these tend to be booked around transport schedules, creating bottlenecks on some days, and lulls on others. Occupancy is much lower in the hinterland than at points of entry.

The sea conditions in The Minch are a major constraint. Data shows that both the Isle of Lewis and the Muirneag have been subject to significant disruption in winter over the last two years. The Muirneag is most affected, however, the ship carries heavy vehicles on a large deck, and sails in the dark, therefore this might be expected. All vessels will be affected by sea conditions to some extent.

The economy of the Western Isles is a source of uncertainty. It is unbalanced and is dominated by the public sector. Traditional industries face an uncertain outlook, and new industries such as renewables have yet to realise their potential. Tourism is possibly the most robust source of future growth.

2.1.3 Options and Methodology

Six options were developed:

1. Do Nothing: Service continues as is.
2. Do Nothing +: Isle of Lewis operates alone.
3. Consolidation: Replace both vessels with a larger faster RoPax vessel.
4. Two RoPax vessel: Replace both vessels with two medium sized faster RoPax vessels.
5. Innovation: Replace both vessels with a larger faster RoPax vessel plus seasonal fast ferry.
6. Innovation based on Isle of Lewis: Replace the Muirneag with a seasonal fast ferry, such that the Isle of Lewis offers the sole winter service, and a freight service in summer.

These options were appraised against the following measures identified to support the objectives of economic development and sustainable population:

- Increasing the frequency of crossings when this is needed.
- Making the crossing faster.
- Improving reliability.
- Providing greater capacity in the summer.

A quantitative appraisal was also made of the options to assess likely trade-offs between additional financial costs and induced economic benefits.

The appraisal parameters included an assessment of all the costs of operating services, including charter fees, which effectively cover the capital cost of the vessels.

Fundamental to the options appraisal is the principle that improving the service by attaining the above measures will stimulate more travel, and that this will stimulate economic benefits.

The appraisal uses the methodology of the Ferry Fares Study to identify some of the economic benefits and costs that would result indirectly from increased patronage brought about by a better ferry service. These include:

- Impact of additional expenditure by marginal visitors.
- Impact of savings from EXISTING expenditure by residents & business travellers.
- Impact of NEW expenditure by marginal resident & business travellers.
- Employment generated by these impacts.
- Increased taxation from this employment.

It does not consider any changes in business output because the Ferry Fares Study derives this from a reduction in freight rates, and this is not under consideration in this study.

Two scenarios were developed – a Base Case and a 7 Day Case. This enabled us to consider for each option the marginal (or incremental) financial costs and indirect economic benefits of operating 7 days per week for the six summer and shoulder months, instead of the current 6 days per week.

2.2 Options Sifting

2.2.1 Appraisal Against Objectives

A summary of how the various options were appraised against the measures is presented in Figure 1.1. The notations mean:

- –: no impact
- ✖: negative impact
- ✓ to ✓✓✓✓✓: meets objective

The principles for ranking against the measures are:

- Allocation for weekly frequency is based on quantitative outputs from the options modelling.
- A faster crossing significantly below 2 hours scores ✓✓✓. A moderate reduction in time scores ✓.
- It is assumed that both the Isle of Lewis and the two vessel solution would offer better winter reliability for the overnight freight sailing than the Muirneag, but that the best reliability would be with the larger RoPax vessel.
- There are currently an average of 2.3 sailings per day in summer. Increasing to 3 full sailings per peak day scores ✓. Increasing to 4 sailings per day scores ✓✓✓.

Figure 1.1: Appraisal of options against objectives

Option		Achieving Objectives	Conclusions
1	**Do Nothing:** Service continues as is	Higher weekly frequency – Faster crossing – Better winter reliability – Summer peak day capacity –	This option achieves none of the measures, except that weekly frequency is increased if the IoL is operated 7 days per week.
	Do Nothing (7): As above but with passenger services operated 7 days per week in summer	Higher weekly frequency ✓ Faster crossing – Better winter reliability – Summer peak day capacity –	
2	**Do Nothing +:** Isle of Lewis operates alone 3 services per day all year, of which one is an overnight freight service, 6 days per week	Higher weekly frequency ✖ Faster crossing – Better winter reliability ✓ Summer peak day capacity ✖	This option will reduce weekly frequency and peak capacity, resulting in negative impacts. It is assumed that the IoL would provide a more reliable overnight winter freight service.
	Do Nothing + (7): As above but with passenger services operated 7 days per week in summer	Higher weekly frequency – Faster crossing – Better winter reliability ✓ Summer peak day capacity ✖	

Option		Achieving Objectives	Conclusions
3	**Consolidation:** Both vessels replaced by one larger, faster RoPax vessel operating: Winter: 2 full speed pax services / day + 1 slow overnight freight service Summer: 3 full speed pax services per day (Wed + Fri) + 1 slow overnight freight service	Higher weekly frequency – Faster crossing ✓ Better winter reliability ✓✓ Summer peak day capacity –	This option results in a quicker crossing due to deploying a faster ship. It is assumed that a larger ship would offer the best reliability on the overnight winter freight service. Operating 7 days per week gives a higher weekly frequency.
	Consolidation (7): As above but with summer passenger services operated 7 days per week	Higher weekly frequency ✓ Faster crossing ✓ Better winter reliability ✓✓ Summer peak day capacity –	
4	**Two vessel:** Both vessels replaced by two medium sized, faster RoPax vessels operating: Winter: 2 full speed pax services / day + 1 slow overnight freight service Summer: 4 full speed pax services per day + 1 slow overnight freight service + additional daily slow freight service for 4 of 6 months	Higher weekly frequency ✓✓✓ Faster crossing ✓ Better winter reliability ✓ Summer peak day capacity ✓✓✓	This option gives significant gains in terms of higher weekly frequency and peak day capacity. It is assumed that the overnight winter freight service is more reliable. This option results in a quicker crossing due to deploying a faster ship.
	Two vessel (7): As above but with summer passenger services operated 7 days per week	Higher weekly frequency ✓✓✓✓✓ Faster crossing ✓ Better winter reliability ✓ Summer peak day capacity ✓✓✓	

Option		Achieving Objectives	Conclusions
5a	**Innovation a:** Both vessels replaced by: Winter: one larger, faster RoPax vessel operating the same schedule as Do Nothing (Isle of Lewis and Muirneag combined) Summer: the Winter vessel operating 2 slow freight services per day of which one is overnight + seasonal fast ferry providing **3** services per day	Higher weekly frequency ✓ Faster crossing ✓✓✓ Better winter reliability ✓✓ Summer peak day capacity ✓	Deploying fast ferries results in a significant reduction in crossing time. Both weekly frequency and peak day capacity improve, the extent of this depending on whether 3 or 4 sailings per day are provided, and on whether the service is operated 6 or 7 days per week. It is assumed that a larger ship would offer the best reliability on the overnight winter freight service.
	Innovation a (7): As above but fast ferry operating 7 days per week in summer	Higher weekly frequency ✓✓ Faster crossing ✓✓✓ Better winter reliability ✓✓ Summer peak day capacity ✓	
5b	**Innovation b:** As Option 5a but with seasonal fast ferry providing **4** services per day	Higher weekly frequency ✓✓✓ Faster crossing ✓✓✓ Better winter reliability ✓✓ Summer peak day capacity ✓✓✓	
	Innovation b (7): As above but fast ferry operating 7 days per week in summer	Higher weekly frequency ✓✓✓✓✓ Faster crossing ✓✓✓ Better winter reliability ✓✓ Summer peak day capacity ✓✓✓	

Option		Achieving Objectives	Conclusions
6a	**Innovation a (IoL):** Muirneag ceases operations Winter: Isle of Lewis operating the same schedule as Do Nothing (Isle of Lewis and Muirneag combined) Summer: Isle of Lewis operating 2 freight services per day of which one is overnight + seasonal fast ferry providing **3** services per day	Higher weekly frequency ✓ Faster crossing ✓✓✓ Better winter reliability ✓ Summer peak day capacity ✓	Deploying fast ferries results in a significant reduction in crossing time. Both weekly frequency and peak day capacity improve, the extent of this depending on whether 3 or 4 sailings per day are provided, and on whether the service is operated 6 or 7 days per week. It is assumed that the IoL would provide a more reliable overnight winter freight service.
	Innovation a (IoL) (7): As above but fast ferry operating 7 days per week in summer	Higher weekly frequency ✓✓ Faster crossing ✓✓✓ Better winter reliability ✓ Summer peak day capacity ✓	
6b	**Innovation b (IoL):** As Option 6a but with seasonal fast ferry providing **4** services per day	Higher weekly frequency ✓✓✓ Faster crossing ✓✓✓ Better winter reliability ✓ Summer peak day capacity ✓✓✓	
	Innovation b (IoL) (7): As above but fast ferry operating 7 days per week in summer	Higher weekly frequency ✓✓✓✓✓ Faster crossing ✓✓✓ Better winter reliability ✓ Summer peak day capacity ✓✓✓	

The appraisal concludes that the three best options would be based on a 7 day per week service over the summer and shoulders, and these are:

- **Option 4**: Two medium sized RoPax vessels, where both the Isle of Lewis and the Muirneag would be replaced by faster RoPax vessels operating:
  - Winter: 2 full speed pax services / day + 1 slower overnight freight service.
  - Summer: 4 full speed pax services per day + 1 slower overnight freight service + additional daily slower freight service for 4 of the 6 months.
- **Option 5b**: A large RoPax vessel plus a seasonal fast ferry replacing the Isle of Lewis and the Muirneag, operating:
  - Winter: the RoPax vessel operating a similar schedule to the current schedule (Isle of Lewis and Muirneag combined).
  - Summer: the RoPax vessel operating 2 slow steam freight services per day of which one is overnight + a seasonal fast ferry providing 4 services per day.
- **Option 6b**: Isle of Lewis plus seasonal fast ferry and no Muirneag operating:
  - Winter: the Isle of Lewis operating a similar schedule to the current schedule (Isle of Lewis and Muirneag combined).
  - Summer: Isle of Lewis operating 2 freight services per day of which one is overnight + seasonal fast ferry providing 4 services per day.

2.2.2 Indicative Costs and Benefits

It is anticipated that new vessels might have to be purpose built in the case of the large and the two medium sized RoPax vessels. These might cost in the region of £30 million or £20 million x 2. The government would need capital to fund these, but would then recover its investment via charter fees. Set against this cost would be the value of the Isle of Lewis, which is perhaps £8 million.

It is anticipated that fast ferries would be chartered if they were to be deployed. Therefore Option 6 does not need capital for vessels.

Fast ferries would probably need investment in infrastructure at both ports. In general fast ferries do not carry heavy freight vehicles, thus port equipment can be designed only for cars and light commercial vehicles, and should be relatively cost effective. Additional investment would also be required in Ullapool to enable a vessel significantly longer than the current vessels to berth safely.

It should be noted that the combined ship dues and volume related charges at Stornoway and Ullapool Ports amount to about £2.3 million pa (example based Option 5b). This is a considerable income against which the ports, both independent Trust Ports, might anticipate appropriate investment in upgraded infrastructure when it is needed.

In comparison to the Do Nothing situation, the NPV over 10 years of the marginal (or incremental) cost of funding the increased operating deficit for the three best options would be:

- Option 4: about £26 million (perhaps £18 million if IoL were to be sold).
- Option 5b: about £33 million (perhaps £25 million if IoL were to be sold).
- Option 6b: about £10 million.

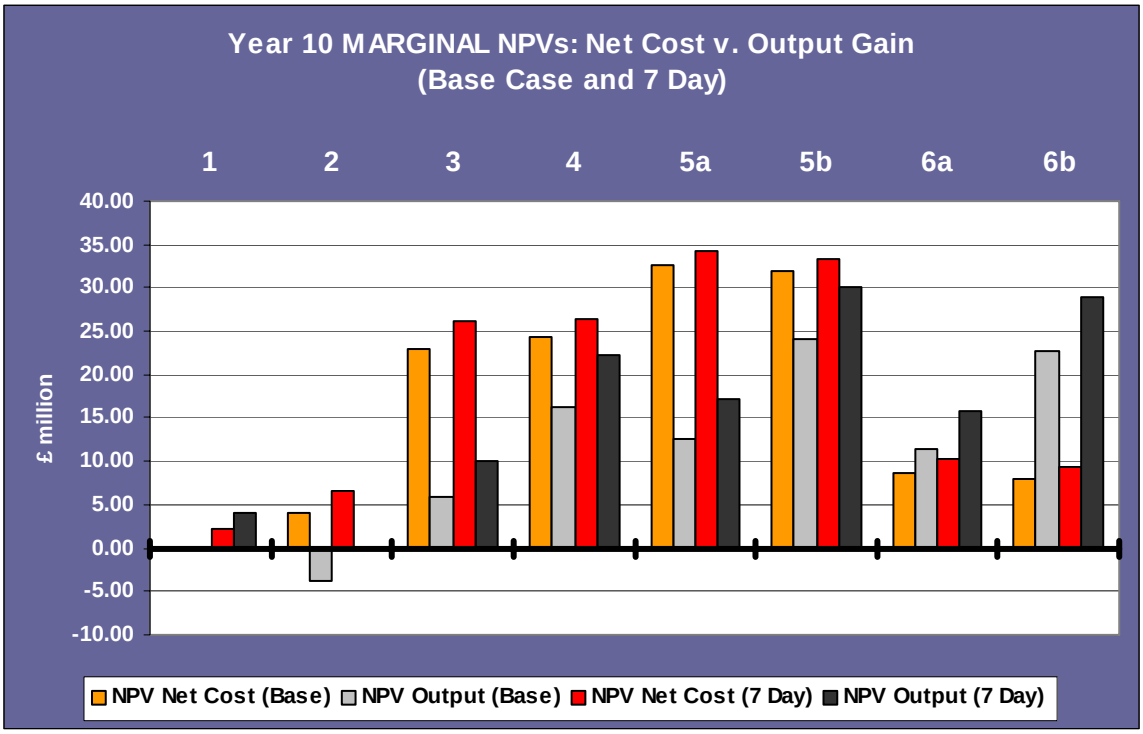
This is made up of the differences between the increase in operating deficit for each option, which is partially offset by the increase in tax revenue generated by new employment, compared to what would have happened with Do Nothing.

The analysis indicates that alternative options to the Do Nothing option would contribute to significant economic benefits. The gains in economic output resulting indirectly from the three best options have an NPV of between £22 million and £30 million over 10 years.

These gains in output depend on the elasticities used in the appraisal giving a true reflection of the increased travel that would be generated by improvements in the ferry service. The gains should be construed as indicative only.

A summary of the quantitative appraisal is shown in Figure 1.2.

Figure 1.2: Summary of key results



2.3 Key Findings

Option 1 (Do Nothing) is not recommended because it does not attain any of the measures, and therefore does not support the objectives.

Option 2 (Do Nothing +) is not recommended because it will increase cost, contribute to a reduction in output and employment, and has insufficient peak capacity.

It may seem counter intuitive that operating the Isle of Lewis on its own is more expensive than operating both the Isle of Lewis and the Muirneag together. There are good reasons for this:

- The Muirneag is crewed by the ship's managers.
- It is relatively fuel efficient.
- Operation of the Isle of Lewis with two crews can only be achieved by these living primarily ashore due to accommodation issues on the Isle of Lewis.

Option 3 (one large faster RoPax) brings benefits in terms of a faster crossing, the potential for 4 crossings per day (of which one would be for overnight freight), and probably the best weather reliability.

However it offers relatively poor value in terms of the difference between the additional cost of providing the option, and the additional economic output it creates. This may also seem counter intuitive because one might expect economies of scale. Again there are good reasons for this:

- A big ship is expensive to propel quickly.
- Many of the costs scale up with the ship, including charter fees (which are linked to higher capital cost), crewing and ship dues.
- It can make only up to four round trips per day, of which one would be an overnight freight service. It therefore offers less frequency than a two-ship solution or a fast ferry, which both better stimulate demand.

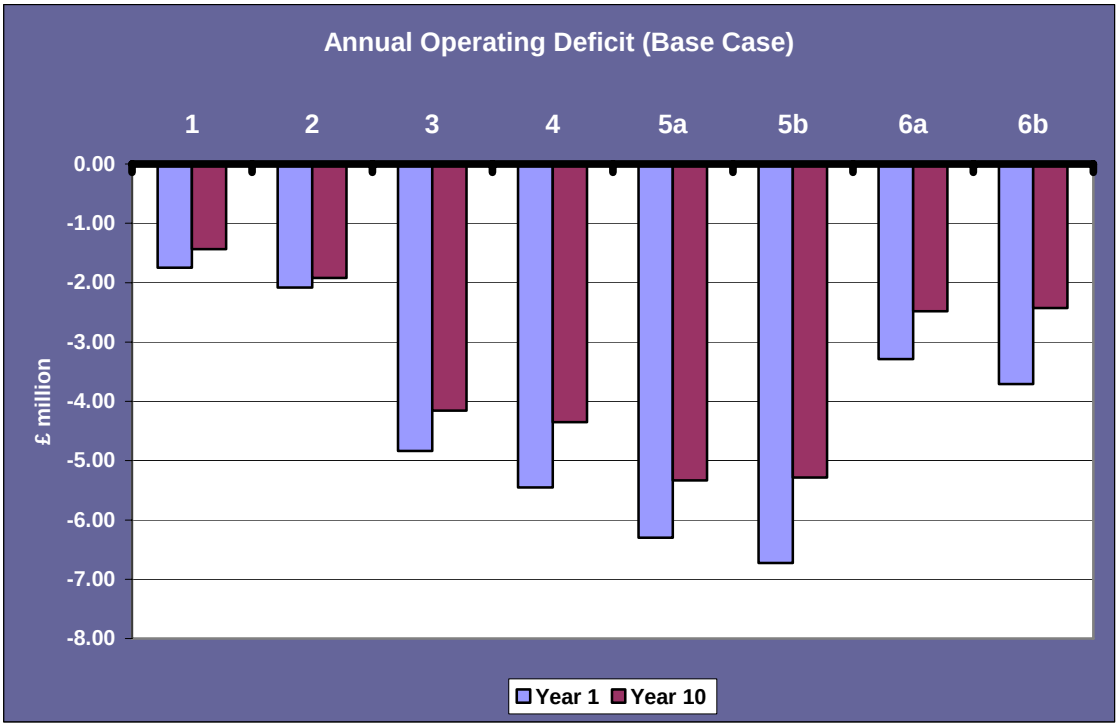
Option 4 (2 medium sized faster RoPax vessels), and **Option 5b** (large RoPax plus fast ferry operating 4 times per day), and **Option 6b** (Isle of Lewis plus fast ferry operating 4 times per day), offer potential for significant gains in economic output, particularly when operated 7 days per week in summer. These options offer the potential to support significant employment gains. The key differences between these options are:

- Option 4 would be a very flexible solution, but would require careful design and sizing to ensure that the overnight freight sailing is adequate. It could be designed to work with existing port equipment.
- On the other hand, the larger vessel in option 5b may be superior in terms of weather reliability in the winter months, but would require investment in Ullapool. A fast ferry deployment would probably require investment in both ports.

- Option 6b offers the best solution in terms of the trade off between additional financial cost and economic benefit gained. On the other hand, the design of the Isle of Lewis means that a maximum of only 5 dropped trailers, and up to 12 trailers in total could be carried. It is possible that this would provide a capacity constraint on the overnight freight sailing.

The **deficit reduction** over the 10 year period should be noted (see Figure 1.3). It reduces by some £1.3 to £1.6 million pa over this period in Options 4, 5 and 6. Extended appraisal should identify further reductions in the annual deficit, but not of the same scale.

Figure 1.3: Annual deficit (Base Case)

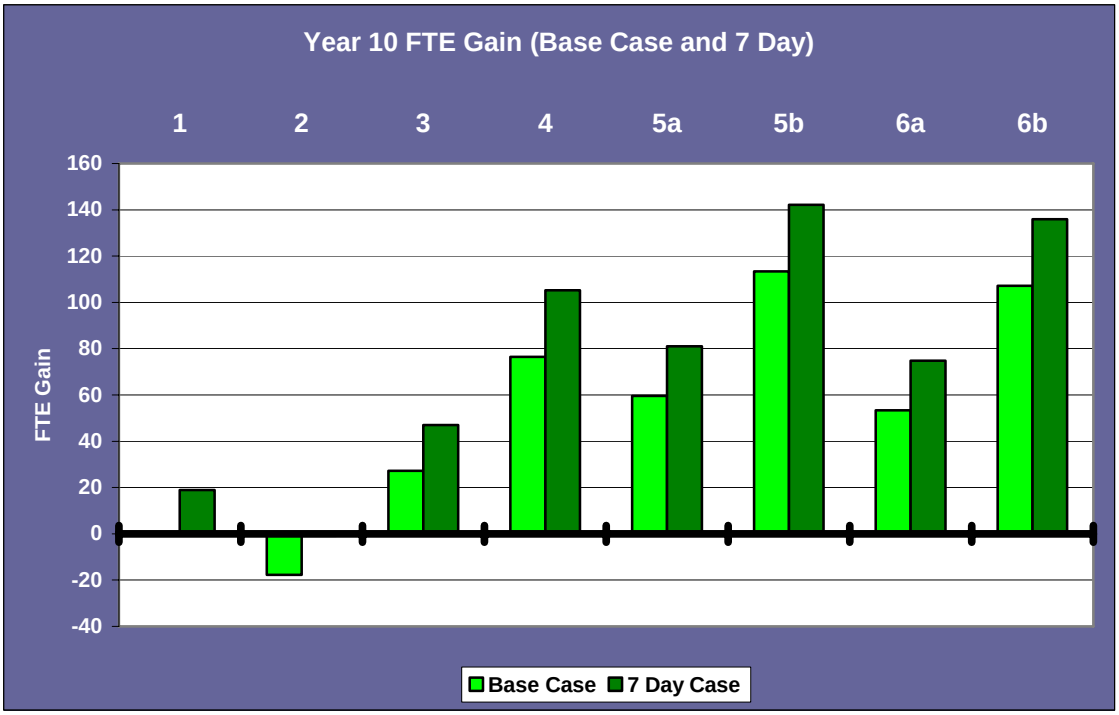


The indicative scale of the **gain in output and FTE employment** must be seen in context:

- The NPV over 10 years of the potential gain in output for several options could exceed 10% of the current annual Gross Regional Value Added for the Western Isles.
- FTE employment gain (see Figure 1.4) at the end of 10 years might be equivalent to about 1.4% of current employment levels.

These are serious gains which given the fragility of the economy offer a good policy response.

Figure 1.4: FTE employment gain



The **relative risks** related to the comparison of the options concern whether the increase in frequency and speed will produce the modelled impact on demand. Until an ex ante appraisal such as this is followed by an investment decision, and then appraised ex post, there will be no definitive resolution of whether the elasticities used give a true reflection of what will happen. The argument that the population and the tourism capacity on the Island cannot support increased demand in response to better ferry services is not robust (see sections 5.2.4 and 9.2).

It is noted however that provision of improved ferry services in advance of visitor demand places the risk of funding investment and increased operating deficit onto the Government.

2.4 Recommendations

1) Alternatives to Do Nothing indicate indirect economic benefits that are significant relative to the marginal cost of implementing them. We recommend that a full STAG appraisal be undertaken to assess the options in more detail. This should give full consideration to the advantages of solutions that allow ramping up of services proportionate to increased demand in summer. This would support growth in tourism, which is one of the most robust prospects for economic growth. The full STAG would include in its scope wider consideration of other services to the Western Isles, additional variants or options such as application of the Austal Trimaran hull form, and alternative landfalls.

2) There are either actual or perceived shortfalls in the level of comfort and provision of passenger facilities on the Isle of Lewis. We recommend that the findings of this report be noted, and the potential for addressing these issues should be kept under review.

3) The Isle of Lewis has potential to provide an enhanced service. We recommend that detailed consideration should be given to service enhancements, both by the operator and by the community, and a plan drawn up to implement those changes that are both wanted and affordable. The following could be considered:

- Increasing the number of days on which three sailings per day are offered in the summer.
- Increasing the window over which three sailings per day are offered to include the shoulder periods.
- Increasing the number of sailing days in the summer and shoulder periods.
- Delaying the second departure from Ullapool, at least on a Saturday.

4) Consideration should be given to implementing a differential tariff between loaded and empty freight vehicles, and to structural changes in the tariff to encourage more visitors either side of the peak summer months.

5) Consideration should be given to investment in the Port of Ullapool to enable berthing of longer vessels. This would improve flexibility. Consideration should also be given in both the Ports of Ullapool and Stornoway to the provision of cost effective and flexible facilities to handle fast ferries such as the Incat 74m and 82m classes of vessels. Given the wide availability of craft for charter, these offer opportunities for significant service enhancements.

6) We recommend the formation of a corridor partnership. This is not because integration is currently poor. Its purpose would be to improve responsiveness as a whole to possible changes and improvements in the passenger transport chain, for example, changing bus schedules to integrate with later ferry departures from Ullapool. The partnership would bring together CalMac, both ports, and the primary bus companies, and provide the basis for a coordinated approach on what can be done to improve the service and how.

3 Scope of Report

The terms of reference are detailed below:

1. Identify shortcomings in the existing service provision following a range of meetings with ferry users and local groups.
2. Examine the existing service provided and identify the limitations placed on any potential service improvements by the existing vessels and / or other infrastructure or local restrictions.
3. Develop options to address the shortcoming identified in initial phase of this study, which would improve the service provided.
4. Discuss proposals with ferry users and local groups to ensure wide-ranging support for any alternative schemes.
5. Bring forward detailed proposals including potential capital and revenue costs for each option showing all potential benefits, or otherwise, which will be available from each alternative, for consideration by the Steering Group.
6. Take forward the option recommended by the Steering Group including any discussion with presentations to the Comhairle and the Scottish Executive.

This terms of reference has been discharged in the context of the STAG process. This can be summarised as:

- Pre-appraisal: Develop clear planning objectives based upon a proper understanding of the problems and opportunities on the service, and identify and sift options in the context of applicable constraints and uncertainties.
- Part 1 Appraisal: Assess the options' likely impacts against the planning objectives; make an initial check of the proposal's fit with other relevant policies; investigate options' feasibility, affordability and likely public acceptability (its "implementability"); make an initial view of the impacts of the proposal against the Government's five objectives.
- Part 2 Appraisal: Detailed scrutiny of the options against the Government's five objectives; revisiting Part 1; appraising risks and identifying cost to Government.

This report primarily covers the Pre-appraisal stage.

4 Service

4.1 Vessels

The main particulars for the Isle of Lewis and the Muirneag are given in Table 4.1.

Table 4.1: Vessel particulars

	Isle of Lewis	Muirneag
Notes	Mezzanine deck Twin engines Twin bow thrusters	Twin bow thrusters Special rudder
Built	1995	1979
LOA	101 m	105 m
Beam	18.5 m	18.8 m
Draft	4.2 m	5 m
GRT	6,753	5,801
Speed	18 kt	13 kt
Crew	30	N/A
Passenger capacity	680[2]	12
Car capacity	92	N/A
Trailers	12 (truck + trailer)	43 (trailer)
Lane metres	240	776

[2] Passenger capacity can be increased up to about 1,000 by deploying additional crew on the vessel.

4.2 Services

The service offered by the Isle of Lewis is summarised in Table 4.2. There are two services six days per week throughout the year, and these are supplemented by two additional services per week during the summer.

Table 4.2 Isle of Lewis service

Base Timetable				
	Stornoway	**Ullapool**	**Ullapool**	**Stornoway**
Monday to Saturday	0715	1000	1030	1315
	1345	1630	1715	2000
Sunday	No services			
Summer variation (25 June to 1 September 2007)				
	Stornoway	**Ullapool**	**Ullapool**	**Stornoway**
Wednesday & Friday	0615	0900	0930	1215
	1240	1525	1550	1835
	1900	2145	2200	0045

The Muirneag offers the services detailed in Table 4.3. There is one overnight sailing six days per week.

Table 4.3 Muirneag service

Base Timetable				
	Stornoway	**Ullapool**	**Ullapool**	**Stornoway**
Monday to Saturday	2330	0300	0400	0800
Sunday	No services			

4.3 Fares

The fares charged for travel on the Isle of Lewis for 22 October 2006 to 29 March 2007 (top schedule) and 30 March to 20 October 2007 (bottom schedule) are reproduced below from the CalMac timetable. Residents pay the winter fare all year round.

FARES: ULLAPOOL – STORNOWAY

All tickets must be purchased before boarding vessel		SINGLE	SAVER 5 DAY RETURN	6 JOURNEY*
Driver/Passenger (each)		£12.20	£20.90	£63.00
Car or 4x4 (each)		£58.00	£98.00	£261.00
Motorhome	up to 5m	£58.00	£98.00	£261.00
	up to 8m	£87.00	£147.00	£392.00
	up to 10m	£116.00	£196.00	£522.00
Caravan, Boat/Baggage Trailer	up to 2.5m	£29.00	£49.00	N/A
	up to 5m	£58.00	£98.00	N/A
	up to 8m	£87.00	£147.00	N/A
Bicycle (single) £2.00	Motorcycle	£29.00	£49.00	£131.00
Light Vans exceeding 5m in length or 3.5 T, or 3m height, or 2.3m in width are charged at the commercial vehicle rate.				
*6 Journey tickets are valid for **one** passenger or **one** nominated motorised vehicle – **not valid for caravans or trailers.**				
Pier Dues (included in fares shown) Ullapool: Passenger 50p, Car 60p, Stornoway: Passenger 25p, Car 81p.				

FARES: STORNOWAY – ULLAPOOL

All tickets must be purchased before boarding vessel		SINGLE	SAVER 5 DAY RETURN	6 JOURNEY*
Driver/Passenger (each)		£15.00	£26.00	£65.00
Car or 4x4 (each)		£73.00	£125.00	£266.00
Motorhome	up to 5m	£73.00	£125.00	£266.00
	up to 8m	£110.00	£188.00	£399.00
	up to 10m	£146.00	£250.00	£532.00
Caravan, Boat/Baggage Trailer	up to 2.5m	£36.50	£63.00	N/A
	up to 5m	£73.00	£125.00	N/A
	up to 8m	£110.00	£188.00	N/A
Bicycle (single) £2.20	Motorcycle	£36.50	£63.00	£133.00
Light Vans exceeding 5m in length or 3.5 T, or 3m height, or 2.3m in width are charged at the commercial vehicle rate.				
*6 Journey tickets are valid for **one** passenger or **one** nominated motorised vehicle – **not valid for caravans or trailers.**				
Pier dues (included in fares shown) Ullapool: Passenger 51p, Car 61p; Stornoway Passenger 26p, Car 83p.				

5 Analysis of Problems and Needs

This section sets out the key findings based upon discussions with a range of stakeholders.

5.1 Problems

5.1.1 Perceptions of Service

There is a perception that it cannot be cost effective to operate two vessels on the service. This is addressed in the options analysis.

Local perception is that the Muirneag is not fit for purpose. This is an emotional view, but this attitude is causing a pervasive leeching of confidence in the Muirneag's service, and it may have affected operations policy.

Perception of the Isle of Lewis remains reasonable.

5.1.2 Fares and Rates

All ferry users would like lower fares and rates. This is not unusual. The Ferry Fares Study looked at rates in detail, and concluded that in comparison with other subsidised routes passenger fares are higher, car rates are significantly higher, and freight rates are three times higher. Based on this evidence, it is true that fares and rates are high.

The service operates at a trading deficit, which is funded by the Scottish Executive. Fares and rates would be significantly higher without this funding.

5.1.3 Sailing Times

The Isle of Lewis leaves Stornoway at 0715. This is generally felt to be an appropriate time.

The last sailing from Ullapool is at 1715. There is a strong feeling amongst some people that this should be later, particularly on a Saturday. This would enable residents to extend their time on the mainland before having to leave, with the alternative being to stay two nights because there is no sailing on Sunday.

Hauliers are generally supportive of the Muirneag's current schedule.

It is notable that some hauliers rely on the freight capacity of the Isle of Lewis as well, and it is estimated that this vessel carries some 30% of freight on the route. This provides flexibility, and permits more efficient driver and equipment operations.

5.1.4 Sailing Days

Consideration should be given to providing services 7 days per week in summer. There are strong cultural reasons why this is not currently the case, but on the basis of our consultations it is clear that many residents support and would benefit from this.

Tourism would receive a boost because the lack of a 7 day service has two specific effects:

- It suppresses the Island's ability to penetrate the short break market because some people wish to return home on Sunday for work on Monday.
- It causes bunching of demand in hotels in Stornoway, with the knock on effect of losing bookings to the Island as a whole, and suppressing occupancy levels outside Stornoway.

This issue is discussed further in Section 5.2.4, and indicative costs and economic impacts are quantified in the options appraisal.

5.1.5 Voyage Times

The Isle of Lewis completes the voyage in 2 hours 45 minutes. It is widely held that the target for the crossing should be under 2 hours. Such a voyage time, it is argued, would encourage significantly more people to travel by sea, making residents time more productive, and encouraging visitors.

It is certainly true that the Isle of Lewis is relatively slow by modern commercial ferry standards.

5.1.6 Winter Schedule / Frequency

Frequency could best be described as limited but not bad.

There is some variation in the summer and winter schedule. The base schedule is one overnight sailing by the Muirneag, and two daily sailings by the Isle of Lewis. In July and August the Isle of Lewis starts an hour earlier (at 0615) on Wednesday and Friday and completes a third late sailing.

The Isle of Lewis could regularly undertake three voyages per day, but this would raise various issues that are discussed in section 6.1.1.

5.2 Key Issues and Needs

5.2.1 Hauliers

The following summarises the main comments from hauliers:

- There is very strong dissatisfaction with the level of cancelled sailings by the Muirneag. In addition, hauliers complain the Muirneag is frequently late. These events have regular impact on the bottom line because it generates overtime, can cause issues with drivers' hours, and results in equipment being in the wrong place.
- There is wide scepticism that there is not a better alternative than the Muirneag available.
- Hauliers contend that they sometimes experience damage to vehicles and cargo both on loading and on passage.
- Hauliers have a strong preference for a dedicated freight ferry offering an overnight sailing. If the Muirneag suffered fewer cancellations, the service would be regarded as good.
- They perceive that relying on a service provided by a RoPax will inevitably result in a conflict between freight and passengers, and that freight will lose out in terms of service specification.
- Hauliers expect to be able to drop trailers (have them shipped without the truck attached) and to piggyback empty trailers on other trailers to reduce lane metre costs. CalMac policy is that trailers cannot be dropped on the Isle of Lewis because there is insufficient turnaround time, and furthermore up to five trailers only could be dropped due to the ship's deck layout. This means that the truck must be transported with the trailer on the Isle of Lewis, causing additional lane metre charges. Hauliers do not like this.
- The lane metre charge is the same for both full and empty trailers. This highlights the expense of repositioning trailers off the Island once goods inwards have been delivered. Hauliers believe that a lower rate for empty trailers is justified. The tariff on Northern Isles routes differentiates between full and loaded commercial vehicles.

It is noted that two key discount schemes apply. A "Traders Rebate Scheme" permits volume based discounts of up to 15%. A further 10% discount applies to the Muirneag.

5.2.2 Residents

Residents have raised a number of issues in connection with the Isle of Lewis' service:

- Frequency should be at least three sailings per day.
- The crossing is too long – many people prefer to use the service to Tarbert because it is about an hour shorter.

- The services to the Northern Isles are seen as superior.
- The Island's ferry services are equivalent to the mainland's highways, and therefore the Island should benefit from equivalent levels of funding.
- The Isle of Lewis is regarded as an uncomfortable ship. The seats are seen as uncomfortable, and some do not recline. The vessel suffers from vibration and seems "less steady in the water than other classes of CalMac ship".
- Disabled facilities are felt to be very poor, both in terms of access to different parts of the ship, and the main area that wheelchair users use.
- The access to the vessel via the linkspan in Stornoway is thought to be too steep.
- Price differences between summer and winter discourage visitors from travelling.
- The pricing bands for motor homes are seen as unfair, because a vehicle just over 5m is charged the 8m tariff.

5.2.3 Businesses

The following comments were made by businesses.

- The key question is how can the service be *improved*. It is widely considered that standards and expectations are continually rising, and that improvements are needed "just to stand still" in terms of economic and population sustainability.
- Greater flexibility in scheduling would be beneficial. The existing schedule is perceived as very rigid. When demand is low, the Isle of Lewis could make only one sailing, whereas when it is high it should be making 3 sailings.
- Businesses have the perception that sailings are increasingly being cancelled, and are curious as to the reasons for this. There is suspicion that CalMac is cancelling sailings more readily to reduce costs. People realise however that they do not fully understand all the issues.
- It is difficult to recruit professional staff onto the Island. Poor connectivity, particularly on Sunday, is seen as a constraint to this because people moving onto the Island for work may bring families. For them, travel by car is the most practical mode, and should be the most cost effective.
- The principle of a ferry discount scheme should be considered to support development of businesses on the Island. The private sector needs as much stimulation as possible to grow, and take a greater share of the economy.
- Construction costs on the Island are subject to an average uplift in the range of 20% to 30% in comparison with the mainland. Freight costs are seen as a key cause of this.

- It is hoped that the renewables base developed on the Island will be a success in time. This could generate more freight traffic. The general outlook for industries that generate goods outwards, such as seafood and agriculture, is perceived to be very uncertain.
- Businesses have noted that they are not in a protected position. On-island businesses are competing for example with internet based companies in the retail market.
- Population is tending to concentrate increasingly on Stornoway to be nearer businesses and amenities.

5.2.4 Visitors

The seasonality of the visitor market must be fully appreciated. Nearly one third of total passengers carried by the Isle of Lewis are handled in July and August. It is widely held that there is further constrained demand for travel to the Island, but that there is no data on this because there is no record of business that is turned away due to poor frequency, no service on the days that people wish to travel, and so on.

The Island's visitor market is primarily medium to long stay. This is due to the cost of getting to the Island and its accessibility at weekends. The weekend and short break market is a growing sector offering relatively high yields because people tend to spend their available budget in a shorter time, but the economy gets a higher turnover of visitors. It is for this reason that most destinations target this market.

There is a perception that there is insufficient accommodation on the Island to handle expansion of the tourism industry. This may be misguided. It is true that occupancy of self-catering accommodation is over 90% in the summer. Most hotels and guesthouses however are operating at 70% to 80% summer occupancy, whereas B&Bs are operating at 50% summer occupancy.

The Western Isles Tourism Facts and Figures Update concluded that shortage of accommodation is more perceived than real because accommodation tends to be booked according to transport schedules, resulting in bottlenecks on some days of the week and lulls on others. It also concluded that occupancy is significantly lower in the hinterland than at points of entry and exit.

It concluded that there is evidence of supply constraint only on a few peak days of the summer. St such times, like the Celtic Festival, occasional B&B providers offer extra capacity.

Accommodation is not as responsive to increasing demand as transport capacity can be. The most pressing needs for additional accommodation seem to be for self catering, family friendly affordable hotels, and higher quality 4* accommodation. Providers are reluctant to invest until they see evidence of demand. If transport providers will not provide services because there is perceived to be insufficient accommodation, this creates a vicious circle. The chicken and egg conundrum could be broken by better ferry services.

Outside the summer season, there is considerable spare capacity on sailings in the shoulders and over the winter. There could be much lower fares, priced in effect at marginal cost. This would encourage more visitors. CalMac do occasional campaigns, but several consultees thought there should be structurally lower fares to encourage this.

The daytrip market is very limited at the moment, and could be substantially increased if there were more frequent and faster services. The Island offers outdoors activities, wildlife, heritage, and there are various sights, offers and visitors centres outside of Stornoway. Some coach tours have developed on days when three sailings are offered. These are sold by CalMac in Inverness and Ullapool.

The overriding message from consultation was that the visitors market would benefit substantially from shorter journey times. The target is 1.5 hours, and the maximum is 2 hours.

5.2.5 Conflicts Between Users

This is not a big issue on this route because there are separate freight and RoPax services. There is clear concern that conflict could arise in the event that a consolidated service was reinstated.

5.2.6 Integration with Other Transport

It is clear that timetabling of bus services both on the mainland and on the Island is generally integrated with the ferry services. There are reports of people not being able to access certain parts of the Island by bus when they arrive later in the day.

This integration may be having the unwanted effect of constraining innovation in scheduling and services, the problem being that “we cannot change the service of one part because it links in with the others”.

We recommend the formation of a corridor partnership including the main bus operators (see Section 2.3). This would provide the links needed to further improve integration and overcome any inertia.

6 Constraints and Uncertainties

6.1 Constraints

6.1.1 Vessel Limitations

The Muirneag is a relatively slow but cost effective vessel. It is time chartered, which means that the crew is not employed by CalMac. It offers very good manoeuvrability in port, thanks to two bow thrusters and a special rudder. It has substantial capacity – it has had up to 22 trailers on board, which takes up about 50% of capacity (assuming no trucks). (In contrast, the maximum capacity of the Isle of Lewis is about 12 articulated units.)

It was originally built to work in Danish waters, but has spent most of its life on the Irish Sea. It is reported to be a stable ship with a high GM, which means that a relatively strong righting moment is generated when the ship is heeled. This can produce a relatively lively action in seas. It is due for a special survey for classification purposes in November 2008. This is the equivalent of a major 5 yearly overhaul.

Although opinions differ markedly on the vessel's suitability for the route, in most technical senses it is a very useful vessel, and difficult to replace like with like. CalMac have looked on two occasions recently. The market for pure freight Ro-Ros is fairly limited, and it has not been possible to find an alternative that is both sufficiently manoeuvrable and able to work within current port facilities.

The Isle of Lewis was built specifically for the route. It is a little longer, but significantly beamier and deeper drafted than other CalMac vessels. It suffers from a number of inherent design features that make it less optimal than it could have been:

- The cargo deck layout does not allow efficient use of the internal load space by freight.
- Limitations caused by the design of the vessel constrain the scope to improve access to all decks for wheelchair users.
- The full forward profile means that the vessel is prone to slamming and vibration, requiring a reduction in speed in moderate to rough conditions.
- It was built as a "day boat" – without the quality of accommodation required to house a crew for 24 hour operation.
- It is relatively slow by modern RoPax standards.
- It has a closed deck, and requires derogations for the transport of certain hazardous cargoes. This is not an issue while the Muirneag serves the route.
- It is prone to vibration, and this affects the ability of the crew to obtain quality rest at sea should this be required.

- This means that a two crew operation, which would regularly permit three sailings per day, requires the crew to be housed in shore accommodation when not on duty. This is expensive.

The vessel is fit for purpose, but in a technical sense could have been better.

It should be noted that CalMac do not consider it practical to operate the Isle of Lewis with a crew that is not “resident” on the vessel. The reasons for this include:

- The core crew terms and conditions for large ferries provide for the crew to work 14 days on the vessel and then have 14 days off. On the Isle of Lewis these are supplemented by crew on daywork terms to provide additional manpower to cover three sailings per day, two days per week, in summer.
- If a crew member did not return to the vessel after staying ashore overnight, for example due to sickness, the vessel may be unable to sail due to being in default of minimum crew requirements.
- The vessel must be manned overnight so that it has a crew available in the event of an emergency, or the need to move the vessel.

6.1.2 Weather Dependency

The service is subject to impact of weather and sea conditions on The Minch, the stretch of water between the Western Isles and the mainland. This can experience strong SW and NE winds, with 6 to 10 m seas.

A ship’s Master is responsible for the crew, the ship, and the cargo, and for deciding whether to sail or not. Prevailing weather and sea conditions on The Minch can often be on the beam, causing vessels to roll, and this sometimes results in the decision to sail a dog-leg instead of a direct course. This causes delays in the schedule.

If conditions are such that they would compromise safety, it is the Master’s duty not to sail. Masters use their experience and local knowledge to interpret current and forecast conditions when deciding whether to sail. A key factor in this is whether the vessel can safely enter port once it has left.

The poor perception of the Muirneag’s weather capability is based partly on emotion (because of the impact that missed sailings can have), but is also supported by the facts. Data on cancellations is presented in Table 6.1.

A customer who has kept detailed records of the Muirneag’s sailings contends that there were in fact 44 days missed in 2006, and that excludes any possible cancellations that may have occurred on a Saturday.

Table 6.1: Cancelled services

	2003	2004	2005	2006
Isle of Lewis				
Cancellations (weather)	16	7	23	22
Cancellations (other)	3 Technical problems	0	5 Technical problems	2 Crew Virus
Muirneag				
Cancellations (weather)	18	12	31	38

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It is clear that both the Isle of Lewis and the Muirneag have been subject to significant disruption in the last two years. The Muirneag is more affected than the Isle of Lewis, and one must also consider that the Isle of Lewis makes two voyages per day to the Muirneag's one. On the other hand, the Muirneag has a large deck with heavy vehicles, it sails in the dark when the sea cannot be seen, and it is logical that the Master would be making decisions not to sail more often than the Master of the Isle of Lewis.

Vessels do differ in their sea-keeping abilities, but no vessel will be able to sail all of the time. Weather being what it is, it is quite likely that there will be a few bad winters when cancellations are more frequent. Respect for the Master's responsibility must remain paramount, and it is arguably bad luck if a run of poor weather causes a high number of cancellations. It remains possible however that another vessel might experience fewer cancellations at the margins. Every ship is different.

Notwithstanding this, the impact of cancellations can have significant consequences. Distribution practices in the Western Isles are likely to have changed significantly over the last 20 years. The two main supermarkets are working on the just in time supply models that are employed on the mainland. People on the Island consume more fresh produce, and this has a relatively short shelf life. Rumours that there are likely to be cancelled sailings can affect spending patterns, with people stocking up just in case.

Figure 6.1 overleaf shows extracts of data provided by CalMac highlighting the occasions in 2006 on which sailings were cancelled or delayed on consecutive days.

Figure 6.1: Consecutive cancelled sailings in 2006

Three or more consecutive day cancelled sailings ex Stornoway 2006

DATE	DAY	VESSEL	SCHEDULED	ACTUAL	WIND	SEA STATE
09/01/2006	Monday	ISLE OF LEWIS	07:15	CANCELLED	FORCE 7-9	ROUGH-HIGH
09/01/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	STORMBOUND IN ULLAPOOL	
10/01/2006	Tuesday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 8-9	ROUGH-HIGH
10/01/2006	Tues/Wed	MUIRNEAG	23:30	CANCELLED	FORCE 8-9	ROUGH-HIGH
11/01/2006	Wed/Thur	MUIRNEAG	23:30	CANCELLED	FORCE 9	ROUGH-HIGH
12/01/2006	Thursday	ISLE OF LEWIS	07:15	CANCELLED	FORCE 8	ROUGH-HIGH
12/01/2006	Thursday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 8	ROUGH-HIGH
12/01/2006	Thur/Frid	MUIRNEAG	23:30	CANCELLED	FORCE 8	ROUGH-HIGH
13/01/2006		ISLE OF LEWIS	13:45	16:25	DELAYED ARRIVAL - FORCE 8	
27/02/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	FORCE 8 N'ly	VERY ROUGH
28/02/2006	Tuesday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 10	HIGH
28/02/2006	Tues/Wed	MUIRNEAG	23:30	CANCELLED	FORCE 10	HIGH
24/10/2006		MUIRNEAG	23:30	00:10	delayed due to hours of work regulations	
25/10/2006	Wed/Thur	MUIRNEAG	23:30	CANCELLED	FORCE 7-8	ROUGH
26/10/2006	Thursday	ISLE OF LEWIS	07:15	CANCELLED	FORCE 7-8 NE	ROUGH-V ROUGH
26/10/2006	Thursday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 7-8	ROUGH - V ROUGH
26/10/2006	Thur/Frid	MUIRNEAG	23:30	CANCELLED	FORCE 7-8	ROUGH - V ROUGH
30/10/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	FORCE 9-10	V ROUGH - HIGH
31/10/2006	Tuesday	ISLE OF LEWIS	07:15	CANCELLED	FORCE 7-9	HIGH
31/10/2006	Tuesday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 7-9	HIGH
31/10/2006	Tues/Wed	MUIRNEAG	23:30	CANCELLED	FORCE 7-9	HIGH
08/11/2006	Wed/Thur	MUIRNEAG	23:30	CANCELLED	FORCE 7-8	ROUGH - V ROUGH
09/11/2006		MUIRNEAG	23:30	18:00 (09/11/06)	FORCE 6-8	ROUGH
10/11/2006		ISLE OF LEWIS	07:15	13:00	FORCE 7-9 S	ROUGH
10/11/2006	Friday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 7-9 W	HIGH
10/11/2006	Frid/Sat	MUIRNEAG	23:30	CANCELLED	vessel was stormbound in Ullapool (09/11/06)	
20/11/2006	Monday	MUIRNEAG	00:00	CANCELLED	FORCE 9-11	V ROUGH - HIGH
20/11/2006	Monday	ISLE OF LEWIS	07:15	CANCELLED	FORCE 9-11	V ROUGH - HIGH
20/11/2006	Monday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 9-11	V ROUGH - HIGH
20/11/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	FORCE 9-11	V ROUGH - HIGH
21/11/2006	Tuesday	ISLE OF LEWIS	13:45	CANCELLED	FORCE 8-9 NW	V ROUGH - HIGH
27/11/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	S 7-8	ROUGH-HIGH
28/11/2006	Tuesday	ISLE OF LEWIS	07:15	CANCELLED	vessel stormbound in Ullapool (27/11/06)	
29/11/2006	Wed/Thur	MUIRNEAG	23:30	CANCELLED	7 - GALE 8	ROUGH-V ROUGH
30/11/2006	Thursday	ISLE OF LEWIS	07:15	CANCELLED		
30/11/2006	Thursday	ISLE OF LEWIS	13:45	CANCELLED	vessel stormbound in Ullapool (29/11/06)	
01/12/2006	Frid/Sat	MUIRNEAG	23:30	CANCELLED	SE 7 - 9	V ROUGH - HIGH
11/12/2006	Monday	MUIRNEAG	00:30	CANCELLED	SW 7 -9	V ROUGH - HIGH
11/12/2006	Monday	ISLE OF LEWIS	13:45	CANCELLED	SW 7 -9	V ROUGH - HIGH
11/12/2006	Mon/Tues	MUIRNEAG	23:30	CANCELLED	SW 7 -9	V ROUGH - HIGH
12/12/2006	Tuesday	ISLE OF LEWIS	13:45	CANCELLED	SW 8	HEAVY SWELL
13/12/2006	Wednesday	ISLE OF LEWIS	13:45	CANCELLED	W8	ROUGH - V ROUGH
13/12/2006	Wed/Thur	MUIRNEAG	23:30	CANCELLED	W8	ROUGH - V ROUGH

Stakeholders have stressed the impact of this issue. Consecutive losses of this nature affect all people on the Island, including retailers of goods with limited shelf lives, wholesalers, construction and other industries, and of course households. Businesses can go for 4 or 5 days without replenishing supplies.

In general, the significant excess capacity of the Muirneag means that a backlog of freight can be cleared quickly when sea conditions improve.

Businesses contend that consecutive lost services result in actual losses of value, and not just deferral of activity. For example, in the case of shellfish, product may have to be frozen with subsequent loss of value. Salmon is killed on a daily basis, and must be shipped out the same day. Hauliers are affected through equipment being out of position, and by knock on effects of delays due to drivers' hours regulations. Medical and pharmaceutical supplies can be affected.

The options considered in Section 8 include the possibility of deploying fast ferries. This section therefore considers limitations with respect to these.

There is no barrier to the operation of fast ferries on The Minch on a **seasonal** basis. It is possible that novel hull forms such as the Austal Trimaran could operate well outside the summer period.

The following is the conclusion of a report prepared for CalMac[3]:

> " The fast ferry industry has experienced considerable development in recent years and many new designs offer improved operational characteristics, some of which offer solutions to [problems which are identified].
>
> A fast car / passenger ferry could technically operate on all routes currently serviced by Caledonian MacBrayne. The type and size of the vessel will depend on the route and must be assessed on such a basis. It is noted that many of the vessels available for sale or charter have a track record of operating in exposed sea areas such as the Irish Sea and the English Channel. Such vessels are considered suitable for operation in the worst expected sea conditions experienced on the Caledonian MacBrayne ferry network."

[3] Fast Ferry Review, Seatec Engineering Ltd, May 2005

6.1.3 Port Infrastructure Limitations

Ports present limitations in terms of draft, length of ship and dimensions of the linkspans. Key dimensions are summarised in Table 6.2.

Table 6.2: Port limitations

	Stornoway No.1	Stornoway No. 3	Ullapool
Depth (CD)[4] m	4.5	6.5	6
Length m	140	128	100

Linkspans impose various limitations in terms of the distance between the centre of the linkspan and the jetty wall, and the width of the end of the linkspan's ramp. Individual vessels on the charter market would have to be assessed on a case-by-case basis.

For new vessels, these could largely be designed to accommodate the limitations of linkspans. The Isle of Lewis has an offset ramp for this reason.

It is likely that most fast ferries of a wave piercing catamaran design would require modification to linkspans or new linkspans because they are beamy.

Depth at Stornoway No3 berth and Ullapool are unlikely to cause constraints. Depth at Stornoway No.1 berth is likely to be adequate, but this would depend on the design of the vessel, and the load factor. The Muirneag uses No.1 berth, and it has a fully loaded draft of 5m.

The Port of Stornoway is considering replacement of its older (No.1) linkspan. This may have strategic benefits, for example in the two vessel option it would be possible to have two vessels working simultaneously, and this would support differentiated freight and passenger services which might load at the same time but be operated at different speeds. If one linkspan failed there would be an alternative, although other ports on the Island could also be used in extremis.

This is an opportune time for Port of Stornoway to be considering this given the context of new or replacement vessels. If fast ferries were to be deployed, it might make sense to design a replacement ramp for No.1 berth in Stornoway for such craft. This would not have to handle heavy commercial vehicles and would be relatively cost-effective to provide.

[4] Height of tide must be added to this.

At Ullapool, construction of a new dolphin would be required to provide an additional mooring point for say a 115m + vessel, should a RoPax vessel larger than the Isle of Lewis be introduced.

The Port of Ullapool has significant plans for the Eastern Harbour Development including a new marina and cruise berth. It is conceivable that additional requirements brought about by a proposal to employ craft such as fast ferries on the Ullapool to Stornoway route could be incorporated into these proposals, or indeed elsewhere.

Discussions with both ports, which are independent Trust Ports, indicate their readiness to look at new ideas and work together with other parts of the transport chain to achieve the best outcome for the route.

One consultee commented that port infrastructure should be developed to be more flexible, so that replacement vessels are easier to deploy in response to market conditions, or to cover periods of maintenance. There is a specific example of this. CalMac identified a possible alternative to the Muirneag in 2005. It lacked sufficient bow thruster power, but was also 117m, which meant that it would have been too long for Ullapool.

6.1.4 Wash

It seems unlikely that this would cause a serious constraint on deployment of new vessels. The wash from the Isle of Lewis is already significant, and any alternatives would have to be assessed on a case-by-case basis to determine whether there were any greater impacts, for example in Loch Broom. Any new deployment would require an environmental assessment on a case-by-case basis.

6.1.5 Capacity of Service

This issue is typically dealt with by calculating annual capacity and comparing this with annual volumes. This is not a suitable methodology for demand that is highly seasonal.

The important issue is whether there is sufficient **peak** capacity, and this is the key yardstick used in the appraisal. There is no specific data on peak utilisation, but we have three fairly robust frames of reference:

- The Isle of Lewis had insufficient capacity to handle both demand for cars and freight in the summer in 2001, and this was evidenced by the introduction of the Taygran.
- The Isle of Lewis is now full on a few peak Saturdays in the summer.
- The maximum utilisation of the Muirneag is some 50% to 60%.

This information has been used to calibrate the analysis.

6.1.6 Cost of Service

The service is funded because it is a lifeline service, and this recognises the inherent requirement for secure services to support the Island's economy and population. According to CalMac's annual report 2005 – 2006, the operating deficit on the Stornoway to Ullapool route was £4.5 million in 2006 up from £2.7 million the previous year. The general reasons for this increase were stated as fuel costs, traffic and berthing dues and pension costs.

CalMac has been made increasingly accountable to the Scottish Executive for maintaining operating costs within budget, and it is possible that pressure will grow on restraining deficit funding.

Considering again the potential for fast ferries, some comment is warranted on the popular perception that they are prohibitively expensive to operate because of their fuel cost. This is true only to a limited extent for the Stornoway to Ullapool route, as illustrated by the following examples:

- A typical fast ferry with capacity for c. 450 / 500 passengers and about 85 cars will cover the 42 miles in 1.5 hours.
- The Isle of Lewis with capacity for 680 passengers and 92 cars covers the 42 miles in 2.75 hours.
- The fast ferry will use 9% more fuel than the Isle of Lewis on this journey.

Also consider that:

- The fast ferry would require a crew of 19[5], compared to the crew of 30 on the Isle of Lewis.
- Fast ferries are readily available for purchase on the used market for values that are very modest relative to that of the Isle of Lewis.[6]

The key issues in deployment of fast ferries, and the reasons why they are not operating on all routes all of the time, are:

- Most can only operate seasonally in UK waters because their operation is regulated according to wave heights.
- Only large fast ferries can carry freight, and these are significantly more expensive to operate.[7]

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[5] Assuming 3 services per day were provided.

[6] A 1992 example of the SeaCat class, such as operates to the Isle of Man, was recently sold for in the region £1.6 million, and there are similar vessels available.

[7] Fast ferries are mostly restricted in the type of cargo they can carry. For example, the 74 m Incat class (e.g. SeaCat) can carry cars and light vans only. In comparison, the larger 81 / 82 m Incat vessels are capable of taking light commercial vehicles and buses. Some large fast ferries, such as the Stena HSS, can carry all traffic including heavy commercial vehicles.

6.1.7 Supply of Alternative Vessels

Maintaining a separate freight service allows significant flexibility in terms of finding alternative vessels.

It is necessary to carry certain goods to and from the Island in accordance with the requirements of the International Maritime Dangerous Goods (IMDG) code. The code classifies dangerous goods according to type and stowage requirements. Restrictions are placed on the categories and mix of goods that may be carried by passenger ships and the numbers of passengers who may be accommodated at the same time.

It is an international regulatory requirement that some of these goods be carried on an open deck rather than in an enclosed car deck. The dedicated freight service means that conventional closed deck passenger vessels can be used.

Thus the Stornoway-Ullapool route offers the maximum flexibility out of all CalMac's routes in terms of the potential for alternative vessel deployment.

In the market place in general, ferries tend to be built against specific routes. A fleet owner will normally take the decision to order a new vessel because an existing vessel has reached the end of its working life or is going to prove too costly to upgrade to satisfy new safety legislation. It is normally expected that when a vessel is ordered for a route she will see out her working life on that route. There is no ready supply of new tonnage or tonnage under construction which is uncommitted.

The used market is also limited. Legislation governing the levels of safety required by Ro-Ro ferries at sea has been tightened in recent years as a result of the sinking of first "Herald of Free Enterprise" and then "Estonia". Vessels that were trading at the time the legislation was introduced were allowed time to comply.

Some passenger Ro-Ros were physically unable to comply with the regulations as a result of their design and others were simply not economic to upgrade. This has resulted in the phasing out of older non-compliant tonnage. These older vessels have had to either be scrapped or sold into markets where the regulations are not in force.

This in turn means that there is a restricted supply of suitable second hand vessels, however, it is only possible to know what is available by actually going to the market.

As noted earlier, however, there is a ready supply of fast ferries on the market.

6.1.8 Market Peaking

Figure 6.2 below shows snapshots of the seasonality of traffic. Two thirds of coaches are handled in the summer period. For passengers and cars, the four summer months (May to Aug) account for nearly half of volumes. The four winter months (Nov to Feb) account for only one fifth. In contrast, the distribution of commercial vehicles is more constant, with similar volumes handled during each period. The picture has changed little over the last ten years.

Figure 6.2: Seasonality of traffic on the Stornoway to Ullapool route

Analysis of Seasonality of Demand 2006, 2001, 1996

2006

Period	Passengers	Cars	Coaches	CV Meterage
Winter (Nov to Feb)	19%	22%	6%	31%
Shoulders (Mar/Apr/Sep/Oct)	32%	33%	33%	34%
Summer (May to Aug)	49%	46%	62%	35%

2001

Period	Passengers	Cars	Coaches	CV Meterage
Winter (Nov to Feb)	19%	22%	6%	31%
Shoulders (Mar/Apr/Sep/Oct)	33%	33%	28%	36%
Summer (May to Aug)	48%	46%	67%	33%

1996

Period	Passengers	Cars	Coaches	CV Meterage
Winter (Nov to Feb)	18%	19%	6%	33%
Shoulders (Mar/Apr/Sep/Oct)	31%	31%	29%	32%
Summer (May to Aug)	51%	50%	65%	36%

This type of demand profile applies to many ferry routes. It is a constraint in the sense that capacity provided to meet summer peak season demand would be underutilised during the winter.

The big difference between the Stornoway to Ullapool route (and other CalMac routes), and commercially operated routes elsewhere, is the supply response:

- Capacity is likely to double or triple on commercial routes, with increases in service quality provided as well (speed and frequency).
- In contrast, capacity stays relatively constant on the Stornoway to Ullapool route. This is a systemic pattern in all of the services provided by CalMac.

On the Stornoway to Ullapool route this results in the gross over-supply of capacity in the winter, and very poor response to demand opportunities in the summer. In winter there could be more crew than passengers on the ship. In summer services are not ramped up proportionate to the increase in demand.

A key objective for the route in our view should be to address this situation.

6.2 Uncertainties

6.2.1 Economy

The economy of the Western Isles seems to have stabilised, but it has an uncertain outlook.

The economy is unbalanced and lacks diversity. It relies heavily on the public sector, which provides about 50% of jobs in the Western Isles, and employment is vulnerable to possible efficiency programmes.

The agriculture sector is changing its raison d'être from producing goods for eating to producing environmental goods in response to CAP reforms. Sheep production is reducing. This will have a knock on effect on transport e.g. reduced feed requirements.

There are significant risks to the future of aquaculture on the Island. The trend has been for the closure of processing plants, although the outlook for production looks reasonable at least in the short to medium term.

The fisheries sector continues to perform well, with 200 vessels in the Western Isles engaged mainly in shellfish catching.

Renewables are seen to offer strong potential for the economy, with targets for generation of 40% of the Island's electricity from renewable sources by 2020. It is hoped that the industry will result in a community legacy, but is winning both friends and enemies. Two attempts to develop manufacturing in a subsidised facility have failed so far. The signs are good but the path uncertain.

The construction sector has been a key driver of activity, but public sector projects (e.g. arts centre, sports hall, roads) have made a big contribution to this. Public sector spending will diminish in time with consequential reduction in output.

On the other hand, the number of private planning applications is very high at the moment, and a lot of new houses are being constructed. This suggests confidence and spending power in the community.

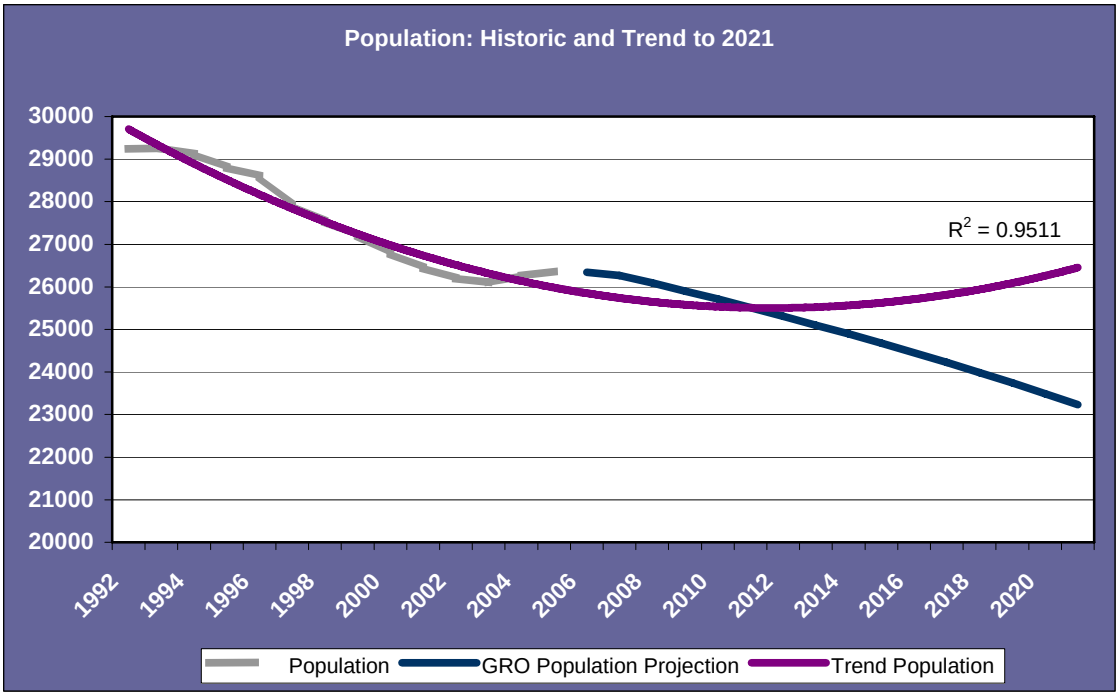
Tourism is growing at about 4% to 5% pa. There are some 160,000 to 180,000 visitors pa to the Western Isles, but this is only about 20% of the number visiting Skye. The potential for tourism was noted earlier.

Call centre activity has been developing, with the DTI and TalkTalk opening up facilities. There are plans for expansion by Carphone Warehouse providing 120 new jobs. However this activity is very mobile, and cannot be relied upon to remain.

6.2.2 Population

Demand for freight transport, and resident transport, is driven by population and the economic activity that this generates. Figure 6.3 below illustrates recent population data for the Western Isles.

Figure 6.3: Population of the Western Isles



Population in the Western Isles declined steadily from 1993 to 2003, but has since rallied somewhat to 26,370 in 2005. The official forecast from the GRO places population at 23,200 in 2021, but this precedes the recent rises.

It is hoped that the University of the Highlands and Islands will help to encourage reinstatement of a "missing generation" – people in the 18 to 30s age group. Satellite colleges will be set up in the Western Isles, and it is thought that this will encourage retention of young people, as well as learning and upskilling.

The curved trend line shows an alternative view, and this seems to be a possible outcome given policy measures and recent growth. It would clearly be forward thinking to support such an outcome with transport services that at least "make the improvements required to stand still".

6.2.3 Impact of Air Transport

It is clear that the two modes compete for the same markets to some extent. Stornoway Airport and the Stornoway to Ullapool ferry handled some 300,000 passengers (150,000 individual travellers) in 2005. The estimated breakdown of this is shown in Table 6.3.

Table 6.3: Passenger market segmentation[8]

	Thousand Travellers 2005		
	Combined	By Air	Stornoway - Ullapool
Residents	54	18	36
Visitors	63	11	52
Business	33	29	4
Total	150	58	92

The general growth in air services, including more destinations and greater frequency, will encourage a gradual erosion of ferry market share in all markets. Greater price competition in air services, and the use of “low cost” pricing strategies will contribute to this.

The ferry had a 67% market share in resident transport in 2005. The Air Discount Scheme for residents commenced in mid 2006. This will be encouraging new demand from residents, but it will also result in the transfer of some passengers from sea to air. According to CalMac, passenger volumes have been affected, but we have no evidence of this yet.

6.2.4 Redeployment of Isle of Lewis

CalMac has looked at a couple of options for redeploying the Isle of Lewis in the event that new vessels were to be brought onto the route. This has not been addressed now, but would be included in a full STAG appraisal.

6.2.5 Supply of Alternative Vessels

It is not known what vessels will be available on the market at what price to buy or charter. It is noted however that deployment of vessels in the market at large holds clear potential (uniquely for this route in the CalMac network), particularly if modest improvements to port infrastructure are made.

[8] FA estimates based upon various data.

7 Objectives

STAG advises that objectives should indicate desired change and its direction at the pre-appraisal stage, and that they should be developed in accordance with the following key principles:

- Objectives should be established without any prejudice to a preconceived solution.
- Objectives will express the outcomes sought in the study area as opposed to any of the activities planned to achieve them.
- The formulation of objectives should take full account of a thorough investigation of the root causes underlying identified problems.
- The development process should be inclusive.
- Any existing resources in the form of previously established sets of objectives or data resulting from surveys or consultation exercises will be fully used in setting objectives.

National policy sets five core objectives. All of these are relevant to some degree, but in the context of this exercise some are more relevant that others as noted in Table 7.1.

From these national objectives we must distil the key objectives for this initial appraisal. We believe that there are two critical outcomes sought:

1. Support economic development: The quality of services provision on the route has a big impact on the Island's economy. Services must support business and industry, tourism and the service industries.
2. Support sustainable population and communities: A sustainable population is needed, in terms of non declining or growing numbers, and a balanced demographic profile. Services on the route should address the core of this issue, and help to tackle barriers to social inclusion.

What measures with respect to the Stornoway to Ullapool ferry services can be progressed to achieve these?

Sea transport is a core component of most economic activity on the Island. It acts as a barrier or a facilitator, depending on your perspective. *Better ferry services* equate to more economic activity, and more choice thus encouraging balanced population.

Table 7.1: National objectives

Objective	Meaning	Relevance
Environment	Maximising the quality of the built and natural environment for enjoyment by all.	Moderate: Improving the competitiveness of ships against aircraft will reduce average emissions per traveller. Using the same ports will not impact on road miles or car emissions.
Safety	Reducing the risk and incidence of accidents and improving the security of all transport users.	Important: Safety is not at issue here. However, if vessels that offer sea keeping better matched to the route were used this would improve security of supply by reducing cancellations.
Economy	Saving people's and businesses' time and money and facilitating desired economic development.	Vital: The fragility of the economy is apparent, and tourism is a rare sector with relatively robust potential. Sea transport is a vital component of this, and of supporting the economy and a sustainable population in general.
Integration	Fitting the transport network together and ensuring a rational relationship between transport and land use and wider policy.	Important: There are important links with port facilities, connecting bus services, and provision of tourism accommodation.
Accessibility	Providing everyone (not just users but also non-users) with the means to travel to opportunities of all kinds.	Vital: Sea transport should provide a baseline low cost service to residents. This will give them opportunities for travel and sustain the population on the Island. The quality of this service needs to constantly improve to stand still.

What does a *better ferry service* mean? Transport demand can respond positively to lower fares, higher frequency, lower journey times, better reliability, and greater capacity.

The first of these is a pricing decision that is independent of the vessels on the route. In addition to the general level of tariffs and tariff mechanisms, which was reviewed in detail by the Ferry Fares Study, it is possible that a Ferry Discount Scheme could be funded to a similar level as the air scheme. This would reimburse residents with 40% of their fares. The discount is provided at the point of sale and is funded direct to the operator. The level of fares is a separate policy issue not appraised by this report.

There are therefore four main measures that the study must appraise:

- Increasing the frequency of crossings when this is needed.
- Making the crossing faster.
- Improving reliability.
- Providing greater capacity in the summer.

8 Opportunities and Options

8.1 Approach

The four measures translate readily into principles for the development of options for the route.

- Increased frequency can be accomplished by:
  - More sailings from existing vessels.
  - Adding additional vessels to provide more sailings.
  - Replacing existing vessels with faster vessels that can do more voyages in the same time.
- A faster crossing could be achieved through reducing the length of the route by using alternative ports, or using faster vessels.
- Improving reliability might be achieved by deploying vessels with sea keeping characteristics that enabled reduced cancellation of services in winter, or which are more mechanically reliable.
- Greater summer capacity can be achieved by:
  - More sailings from existing vessels.
  - Adding additional vessels to provide more sailings.
  - Replacing existing vessels with faster vessels that can do more voyages in the same time.

It is clear that there is a commonality between these measures and what might be done in principle to achieve them. Options developed with this in mind must also be appraised against a Do Nothing scenario, which enables the marginal impact of the options to be assessed.

8.2 Options

The following options were identified in response to these measures and were taken forward for evaluation:

1. Do Nothing: Service continues as is.
2. Do Nothing +: Isle of Lewis operates alone.
3. Consolidation: Replace both vessels with a larger faster RoPax vessel.
4. Two vessel: Replace both vessels with two medium sized faster RoPax vessels.
5. Innovation: Replace both vessels with a larger faster RoPax vessel plus a seasonal fast ferry.
6. Innovation based on Isle of Lewis: Replace the Muirneag with a seasonal fast ferry, such that the Isle of Lewis offers the sole winter service, and a freight service in summer.

Early discussions with stakeholders during the crystallisation of these options indicated a diversity of opinions on their merits. Most people concentrated on aspirations (particularly shorter crossing and higher frequency) rather than the means to achieve this.

We developed representative timetables for these options as detailed in Figure 8.1. Some services operated for freight are designated as slow steam to conserve fuel. They would still be quicker than the Muirneag.

The timetable for Option 6 would be similar to 5, but with the Isle of Lewis operating in winter with its current timetable plus an overnight freight sailing.

The main parameters for the vessels used in the options analysis are shown in Figure 8.2. They have been based mainly on suggestions from CalMac as to average speeds over the whole passage, and no attempt has been made to optimise the capacities and speeds etc. This should be considered in the full STAG appraisal.

Figure 8.2: Vessel parameters

Crossing times	Pax	Lane m	Av speed	Crossing	h	m
Isle of Lewis	680	240	15.25	2.75	2	45
RoPax large	680	350	18.70	2.25	2	15
RoPax medium	550	200	18.00	2.33	2	20
Fast Ferry a	515	420	24.00	1.75	1	45
Fast Ferry b	515	420	28.00	1.50	1	30
Muirneag	12	776	11.20	3.75	3	45
Slow Steam			14.00	3.00	3	0

Figure 8.1: Representative timetables

Representative Timetables																
	Stornoway	Ullapool	Ullapool	Stornoway	Stornoway	Ullapool	Ullapool	Stornoway	Stornoway	Ullapool	Ullapool	Stornoway	Stornoway	Ullapool	Ullapool	Stornoway
	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr
1. Do Nothing:																
Isle of Lewis Winter	7.15	10.00	10.30	13.15	13.45	16.30	17.15	20.00								
Isle of Lewis Summer	6.15	9.00	9.30	12.15	12.40	15.25	15.50	18.35	19.00	21.45	22.00	0.45				
(Wednesday and Friday for 26 wks)																
Muirneag									23.30	3.15	4.15	8.00				
2. Do Nothing +:																
Isle of Lewis (Ave speed 15.25 knots)	7.30	10.15	10.45	13.30	14.00	16.45	17.30	20.15	0.30	3.15	4.15	7.00				
Max speed 18.00 knots																
3. Consolidation:																
WINTER Large Ro-Pax Vessel	7.45	10.00	10.30	12.45	15.15	17.30	18.00	20.15								
WINTER Large Ro-Pax SLOW STEAM									0.15	3.15	4.15	7.15				
SUMMER Large Ro-Pax Vessel	7.45	10.00	10.30	12.45	13.15	15.30	16.00	18.15	18.45	21.00	21.30	23.45	**(Wednesday and Friday for 26 wks)**			
Summer: Ro-Pax SLOW STEAM									0.15	3.15	4.15	7.15				
4. Medium Sized Ro-Pax Vessels:																
WINTER First Vessel					15.50	18.10	18.40	21.00								
WINTER Second Vessel	7.10	9.30	10.00	12.20												
WINTER Second Vessel SLOW STEAM									0.15	3.15	4.15	7.15				
SUMMER First Vessel	7.10	9.30	10.00	12.20	12.50	15.10	15.40	18.00	18.30	20.50	21.20	23.40				
SUMMER Second Vessel	10.10	12.30	13.00	15.20												
SUMMER Second Vessel SLOW STEAM		2nd service 4 months only --->			15.50	18.50	19.50	22.50	0.15	3.15	4.15	7.15				
5. Ro-Pax & Fast Ferry:																
WINTER Large Ro-Pax	7.45	10.00	10.30	12.45	15.15	17.30	18.00	20.15								
WINTER Large Ro-Pax SLOW STEAM									0.15	3.15	4.15	7.15				
Summer: Ro-Pax SLOW STEAM	7.45	10.45	11.15	14.15					0.15	3.15	4.15	7.15				
Fast Ferry a	6.00	7.45	8.15	10.00	10.30	12.15	12.45	14.30	15.00	16.45	17.15	19.00				
Fast Ferry b	6.00	7.30	8.00	9.30	10.00	11.30	12.00	13.30	14.00	15.30	16.00	17.30	18.00	19.30	20.00	21.30

9 Appraisal and Results

9.1 Overview

Our work has been undertaken in several stages as illustrated in Figure 9.1 overleaf. The methodology was to:

- Meet with stakeholder representatives to discuss problems and needs.
- Identify constraints and uncertainties through stakeholder engagement and observation on fieldwork.
- Identify the main options in principle in consultation with stakeholders.
- Engage with CalMac to obtain basic operations and cost parameters for the options.[9]
- Identify key objectives for improved services on the route, and measures that could be taken to support these.
- Construct possible schedules for the options, and then model operating costs and revenues for each of these.[10]
- Analyse historic demand for growth and seasonality, and identify a future demand profile for the Do Nothing option.
- On the basis of demand elasticities developed in the Ferry Fares Study, assess the additional traffic that would be generated by improved ferry services including faster passage, higher frequency, and more sailing days.
- On the basis of additional travel by residents and visitors, and using relevant parameters developed in the Ferry Fares Study, identify the net increase in economic output, FTE employment, and increase in tax revenue, that would result indirectly from these.
- Review outputs at a meeting with CalMac and identify any changes required to input assumptions.
- Develop results for options offering a better ferry service that illustrate the trade off between additional financial costs (over and above the Do Nothing option), against their benefits in terms of economic output and FTE employment.
- Identify which options best achieve the measures and support the objectives.

The rest of this section summarises key aspects of the appraisal.

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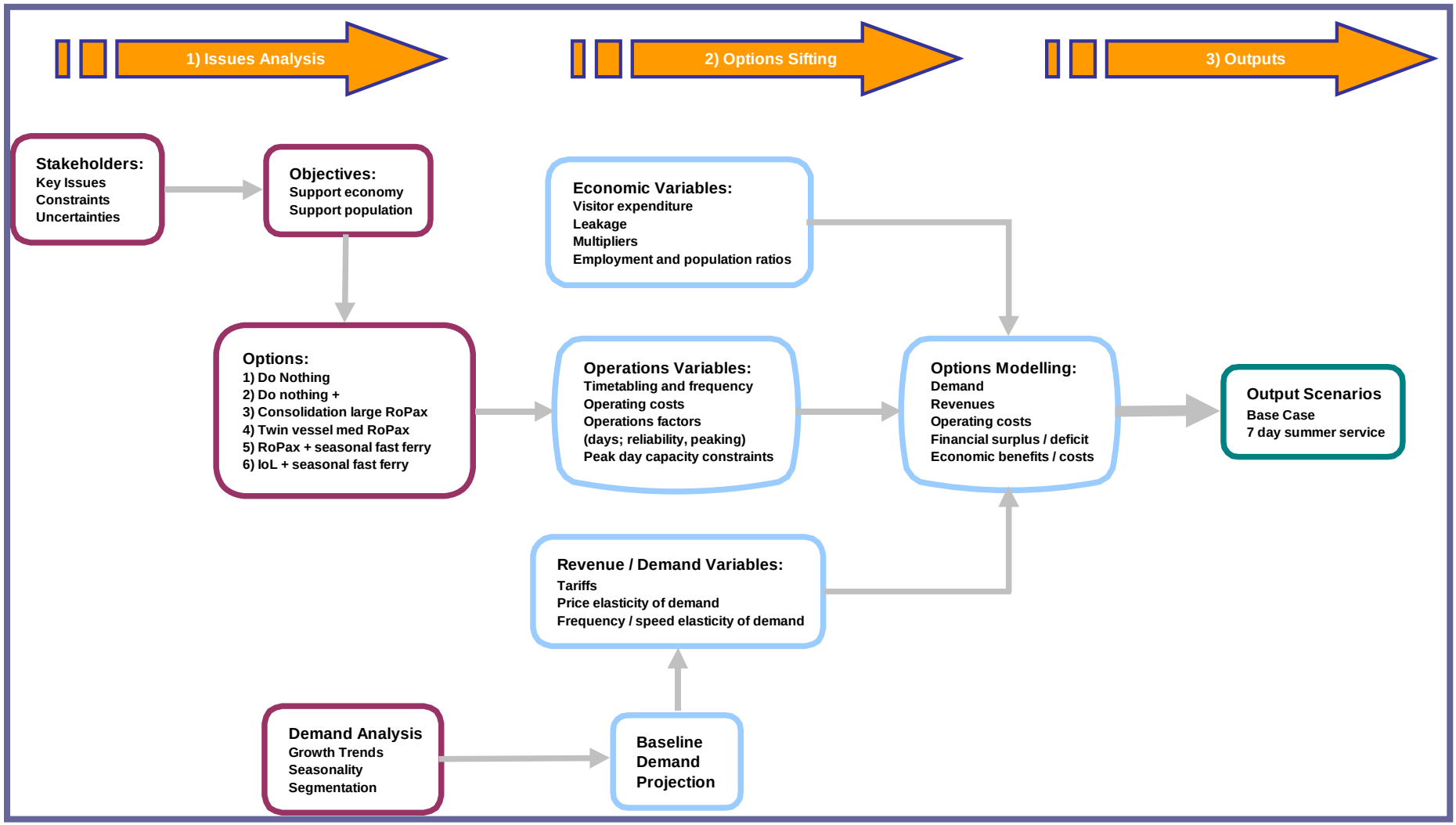
[9] It is assumed that CalMac Ferries will operate the service, and that Caledonian Maritime Assets (CMA) would charter current and new vessels to them.

[10] The model permits key variables to be changed, and was calibrated against the inputs provided by CalMac.

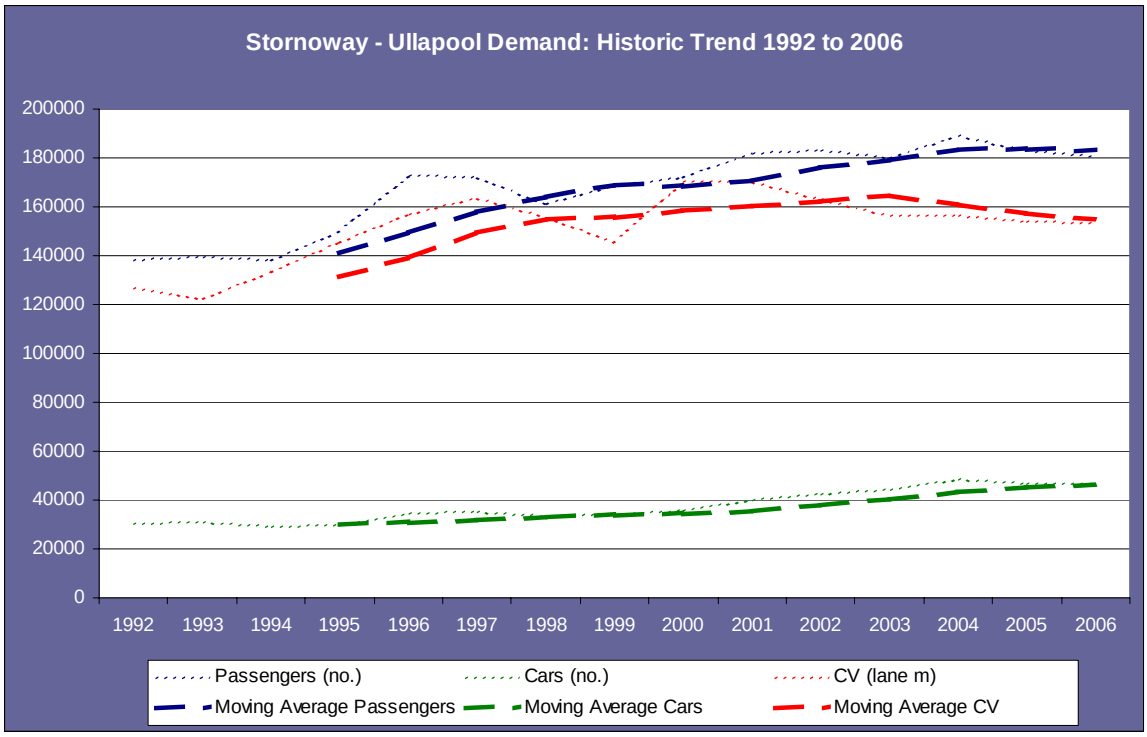
Figure 9.1: Appraisal methodology



9.2 Demand Analysis

The growth in traffic for the last 15 years, together with trend lines based upon moving averages, are shown in Figure 9.2.

Figure 9.2: Historic demand



Despite consistently falling population over the period, the rising trend for cars and passengers is clear. The trend for commercial vehicle lane meterage has been downward since 2002. It is likely that this can be explained primarily by the deployment of the Taygran, and then the Muirneag, which allowed dropped trailers to be shipped without the truck.

Figures 9.3 and 9.4 show trend projections for demand over the next 15 years.

Figure 9.3: Demand projections Passengers, Cars and Commercial Vehicles (CV)

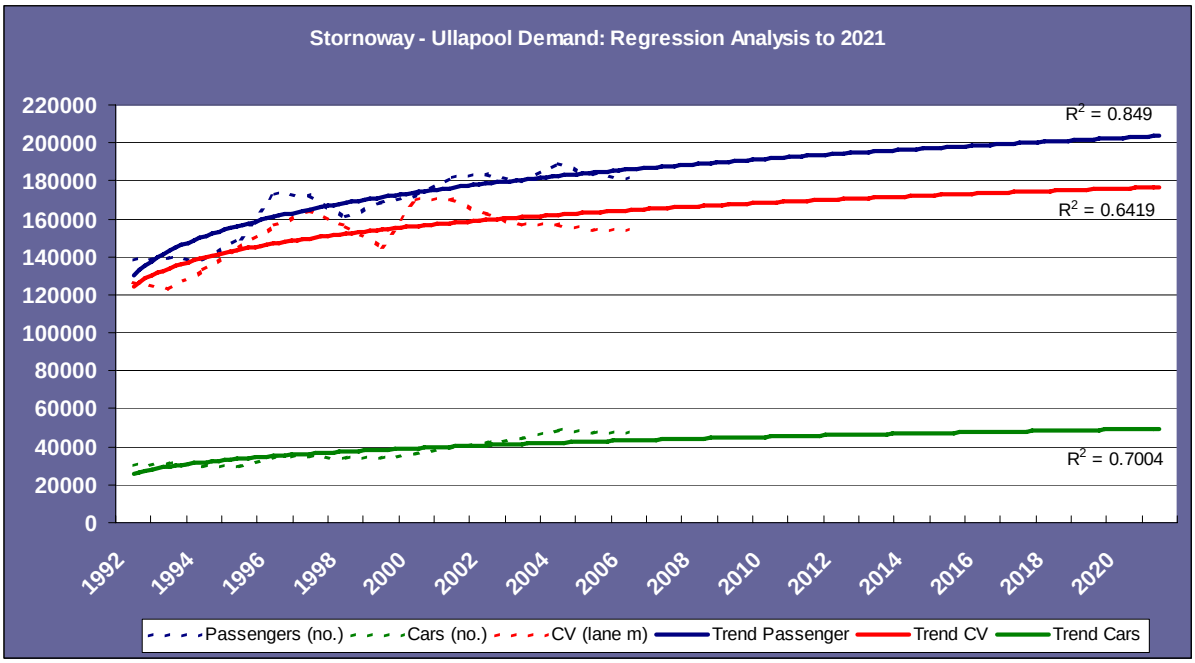
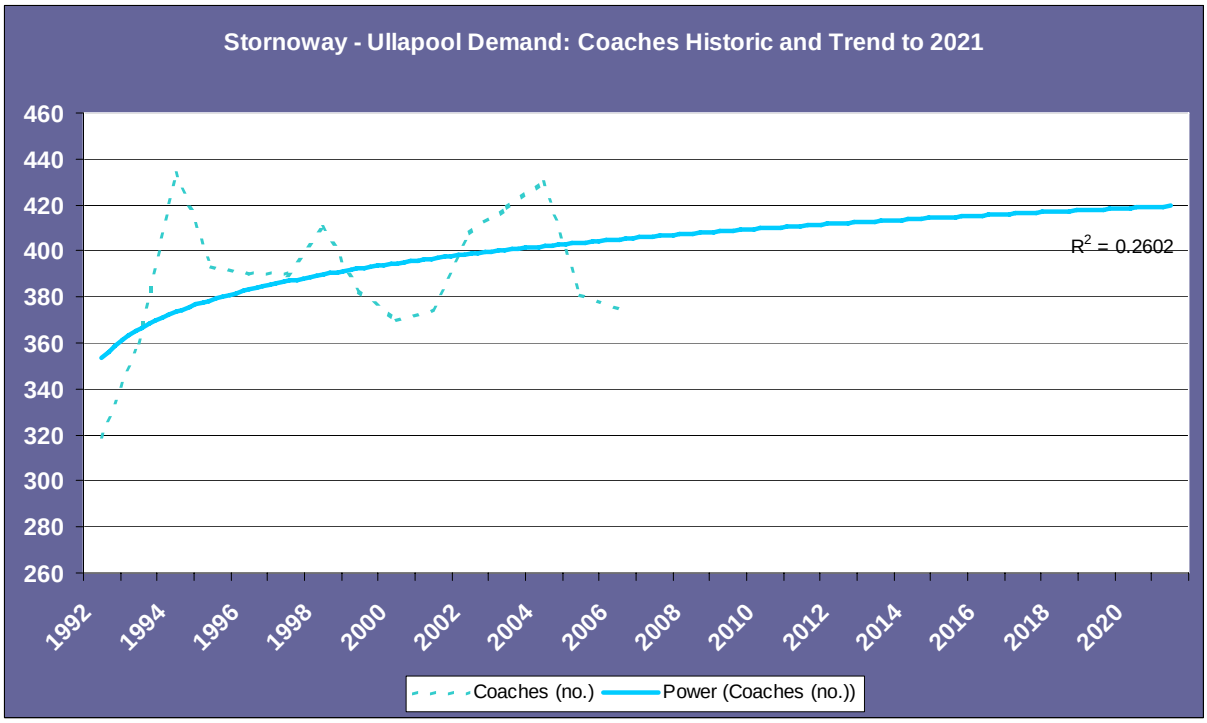


Figure 9.4: Demand projections Coaches



These baseline demand projections have been based upon Excel generated curves that fit reasonably well mathematically, and concur with common sense.

9.3 Options Modelling

In addition to the baseline demand projection, there are several core groups of variables.

Operations variables included charter rates[11], most operating costs, key operations factors such as reliability and peaking, and peak time capacity constraints. Some of these have benefited from inputs by CalMac, notably charter rates, fuel consumption, port costs, and other allowances.

We have included allowances for all operating costs that we could identify. Due to issues of confidentiality with CalMac, we have not had access to voyage accounts for the route. Where necessary we have made reasonable assumptions on costs. There are obvious limitations from this approach, however, the assumptions are applied equally to all options, and should therefore give a good picture of their relative cost performance.

Revenue and demand inputs were referenced to the baseline demand projections, and these were used to develop traffic scenarios for each option based on the response of demand to quality improvements. Revenues were then calculated on the basis of these and tariffs. The main assumptions are shown in Figure 9.5.

The elasticities used allow the model to estimate the impact of changing sailing days, frequency and speed of service on demand and thence revenues.

An improved ferry service would reduce generalised transport costs (including inconvenience costs due to poor frequency, long crossing time, and number of sailing days). These user benefits would stimulate economic activity and result in more employment.

This study uses the methodology from the Ferry Fares Study to estimate or proxy some of these benefits. The objective is to enable the potential economic benefits to be seen in the context of the potential additional financial costs.

Economic variables were based upon visitor spend, economic multipliers and so on. These allowed the estimation of changes in output, employment and tax. Parameters were taken from the Ferry Fares Study. The main assumptions are shown in Figure 9.6.

[11] The appraisal assumes that CalMac Ferries will operate the service, and that Caledonian Maritime Assets (CMA) would charter current and new vessels to them. It is assumed that CMA will set the charter rate at levels that cover the cost of capital. This means that although capital would be required to fund new vessels, CMA would fully recover its investment.

Figure 9.5: Revenue and demand variables

Revenue and Demand Variables				
Tariff	Residents	Visitors Winter	Visitors Summer	Price Elasticity
Px	10.5	10.5	13	-0.7
Car	49	49	62.5	-1.2
Coaches		712	864	
CV per lm	18.012	per m		
Other vehicles	100	100	115	
Freight Rate Calculation				
Base charge	10.76	per 1/2 lane m		
% Muirneag	70%			
% IoL	30%			
Muirnaeg discount	10%			
Vol discount applies	10%	Reduction on all traffic		
Frequency Elasticity				0.9

Figure 9.6: Key economic assumptions

Economic Variables						
Visitor Expenditure			203			
% savings spent by Residents and Business in the local economy			80%			
% Resident and Buisness Expenditure Remaining in local economy			48%			
% Visitor expenditure remaining in local economy			71%			
Multiplier Resident and Business spending			1.24			
Multiplier Visitor spending			1.49			
Employment			0.03	FTE jobs per £1,000 of Output		
Number of FTE jobs			9908	2003		
Income tax revenue per FTE			3989			
Tourism share of output			15.60%	2003		
Discount Rate	3.50%					

The marginal economic output of each option over and above Do Nothing has been assessed to include:[12]

- Impact of additional expenditure by marginal visitors.
- Impact of savings from EXISTING expenditure by residents & business.
- Impact of NEW expenditure by marginal resident & business travellers.
- Employment generated by these impacts.
- Increased taxation from this employment.

It does not consider any changes in business output because the Ferry Fares Study derives these primarily from reduced freight charges.

The figures presented for gains in economic output and FTE jobs in the results show a single figure, but should be construed to provide an indication in the region of +/- 50%. The extent that these economic benefits will be achieved would depend on the validity of the elasticities used.

For the purposes of this appraisal, we have projected demand for 15 years on the basis of 15 years of historic demand data. This is arguably a short term, however, we have taken the view that this is the limit of robustness for the assessment at this stage.

For modelling purposes we have based calculations on years 6 to 15 of the projection, on the basis that the first five years would be required for project development. In practice it may take longer than this to implement options requiring construction of new vessels, but less than this to implement Option 6.

For modelling purposes we assumed that the summer timetable operates for 6 months per year to provide increased services on the shoulders.

The level of robustness is not sufficient for making investment decisions. This would require a full STAG appraisal. It is robust enough to give a reasonable expectation of relative financial and economic outcomes of the projects, and indicates the merits of one option against the other in quantitative fashion. It gives a real sense of the financial and economic trade offs.

The assessment is in real terms using a 3.5% discount rate. This means that no account has been taken either for inflation in costs or escalation in prices.

[12] For a detailed explanation of these parameters refer to the Ferry Fares Study.

9.4 Results

9.4.1 Introduction

This section shows the results of the quantitative analysis. These are presented on the following pages in the form of 2 scenarios:

- Base Case: modelled on 6 days per week of operation.
- 7 Day Case: operating 7 days per week in summer.

The key findings for each of these are summarised in this section. These are estimates only, and serve to illustrate the trade offs between options.

9.4.2 Option 1

Changing current operations for the Isle of Lewis to 7 days per week in summer would stimulate passenger and car traffic by 4% and freight by 1%. It would cost an additional £2.2 million over 10 years after tax benefits, but would raise output by £4 million over 10 years, and contribute to 19 FTE jobs.

9.4.3 Option 2

Ceasing operation of the Muirneag, and relying solely on the Isle of Lewis, would reduce passenger and car traffic by 5% and freight by 1%. It would cost an additional £4.1 million over 10 years after tax losses, and reduce output by £3.7 million over 10 years. FTE employment would fall by 18. The Isle of Lewis would not, however, be able to meet peak demand, even if it operated 7 days pr week. This would result in further loss of revenue, output and FTE jobs that have not been estimated.

9.4.4 Option 3

Replacing the Muirneag and Isle of Lewis with one larger RoPax vessel would stimulate passenger and car traffic by 8% and freight by 1%. It would cost an additional £22.8 million over 10 years after tax benefits, but would raise output by £5.8 million over 10 years, and contribute to 27 FTE jobs.

If the larger RoPax vessel was to operate 7 days per week in summer, this would stimulate passenger and car traffic by 13% and freight by 2%. It would cost an additional £26.2 million over 10 years after tax benefits, but would raise output by £10 million over 10 years, and contribute to 47 FTE jobs.

9.4.5 Option 4

Replacing the Muirneag and Isle of Lewis with two medium sized RoPax vessels would stimulate passenger and car traffic by 20% and freight by 3%. It would cost an additional £24.3 million over 10 years after tax benefits, but would raise output by £16.2 million over 10 years, and contribute to 77 FTE jobs.

If the two medium sized RoPax vessels were to operate 7 days per week in summer, this would stimulate passenger and car traffic by 27% and freight by 4%. It would cost an additional £26.4 million over 10 years after tax benefits, but would raise output by £22.3 million over 10 years, and contribute to 105 FTE jobs.

9.4.6 Option 5

Replacing the Muirneag and Isle of Lewis with one larger RoPax vessel plus a seasonal fast ferry operating ***3*** *sailings per day*, would stimulate passenger and car traffic by 16% and freight by 2%. It would cost an additional £32.5 million over 10 years after tax benefits, but would raise output by £12.6 million over 10 years, and contribute to 60 FTE jobs.

If this were to operate 7 days per week in summer, it would stimulate passenger and car traffic by 21% and freight by 3%. It would cost an additional £34.2 million over 10 years after tax benefits, but would raise output by £17.2 million over 10 years, and contribute to 81 FTE jobs.

Replacing the Muirneag and Isle of Lewis with one larger RoPax vessel plus a seasonal fast ferry operating ***4*** *sailings per day*, would stimulate passenger and car traffic by 29% and freight by 4%. It would cost an additional £31.9 million over 10 years after tax benefits, but would raise output by £24.1 million over 10 years, and contribute to 113 FTE jobs.

If this were to operate 7 days per week in summer, it would stimulate passenger and car traffic by 36% and freight by 5%. It would cost an additional £33.4 million over 10 years after tax benefits, but would raise output by £30.2 million over 10 years, and contribute to 142 FTE jobs.

9.4.7 Option 6

Replacing the Muirneag with a seasonal fast ferry operating ***3*** *sailings per day* alongside the Isle of Lewis would stimulate passenger and car traffic by 13% and freight by 2%. It would cost an additional £8.5 million over 10 years after tax benefits, but would raise output by £11.3 million over 10 years, and contribute to 53 FTE jobs.

If this were to operate 7 days per week in summer, it would stimulate passenger and car traffic by 18% and freight by 2%. It would cost an additional £10.3 million over 10 years after tax benefits, but would raise output by £15.9 million over 10 years, and contribute to 75 FTE jobs.

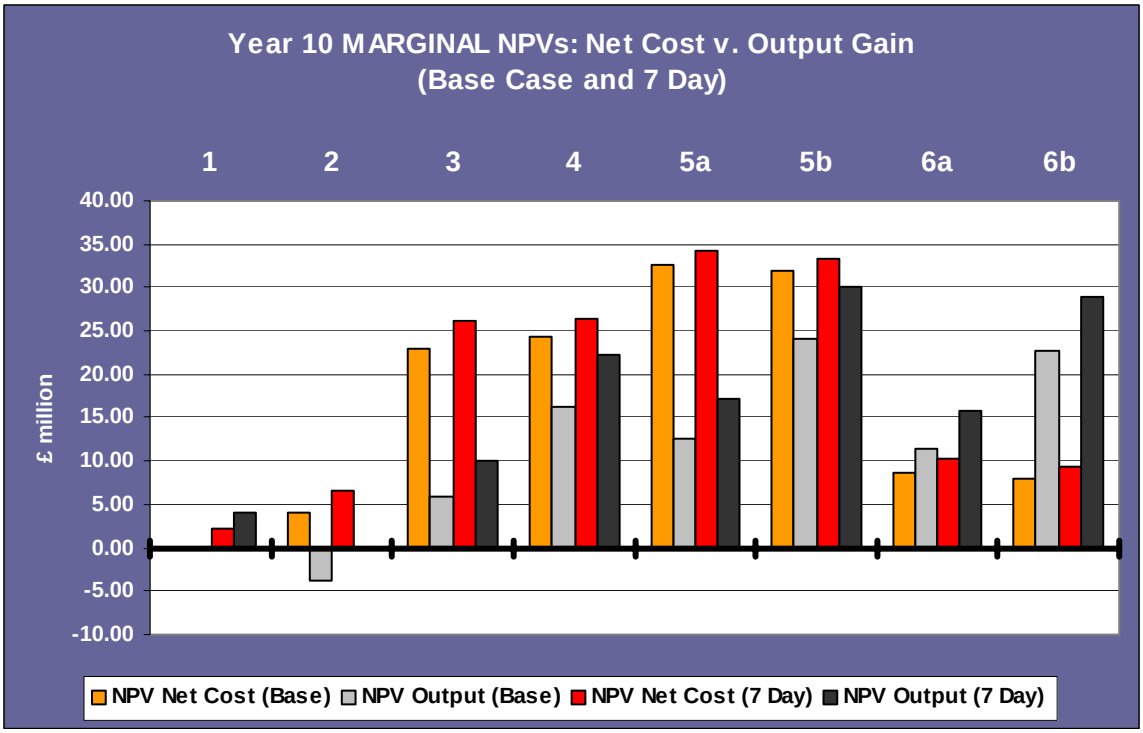
Replacing the Muirneag with a seasonal fast ferry operating ***4*** *sailings per day* alongside the Isle of Lewis would stimulate passenger and car traffic by 26% and freight by 3%. It would cost an additional £7.9 million over 10 years after tax benefits, but would raise output by £22.7 million over 10 years, and contribute to 107 FTE jobs.

If this were to operate 7 days per week in summer, it would stimulate passenger and car traffic by 34% and freight by 4%. It would cost an additional £9.4 million over 10 years after tax benefits, but would raise output by £28.8 million over 10 years, and contribute to 136 FTE jobs.

9.4.8 Summary Results

The trade off between additional cost and potential gains in output is illustrated in Figure 9.7.

Figure 9.7: Summary of key results



Key Results Table

Base Case

Days per wk: 6

Option		Service Surplus/Deficit (£m)		Volume Increase on Baseline 2021			Financial Trading NPV		Marginal Economic NPVs		FTE Gain
		2012	2021	Pax	Cars	CVs	Absolute	Marginal	Gross Output	Tax	2021
1	Do Nothing	-1.751	-1.433	100%	100%	100%	-13.3	0.0	0.0	0.0	0
2	Do Nothing +	-2.084	-1.920	95%	95%	99%	-17.0	-3.7	-3.7	-0.4	-18
3	Large RoPax	-4.835	-4.159	108%	108%	101%	-36.9	-23.5	5.8	0.7	27
4	Vls 1 + 2	-5.451	-4.353	120%	120%	103%	-39.5	-26.2	16.2	1.9	77
5	FF a (3/d)	-6.299	-5.334	116%	116%	102%	-47.4	-34.0	12.6	1.5	60
	FF b (4/d)	-6.725	-5.282	129%	129%	104%	-48.1	-34.8	24.1	2.9	113
6	FF a (3/d)	-3.285	-2.484	113%	113%	102%	-23.2	-9.9	11.3	1.4	53
	FF b (4/d)	-3.711	-2.432	126%	126%	103%	-24.0	-10.6	22.7	2.7	107

Key Results Table

7 Day Case

Days per wk: 7

Option		Service Surplus/Deficit (£m)		Volume Increase on Baseline 2021			Financial Trading NPV		Marginal Economic NPVs		FTE Gain
		2012	2021	Pax	Cars	CVs	Absolute	Marginal	Gross Output	Tax	2021
1	Do Nothing	-2.203	-1.708	104%	104%	101%	-16.0	-2.7	4.0	0.5	19
2	Do Nothing +	-2.540	-2.223	100%	100%	100%	-19.9	-6.6	-0.2	0.0	-1
3	Large RoPax	-5.419	-4.567	113%	113%	102%	-40.7	-27.4	10.0	1.2	47
4	Vls 1 + 2	-5.983	-4.631	127%	127%	104%	-42.5	-29.1	22.3	2.7	105
5	FF a (3/d)	-6.708	-5.551	121%	121%	103%	-49.6	-36.3	17.2	2.1	81
	FF b (4/d)	-7.173	-5.477	136%	136%	105%	-50.3	-37.0	30.2	3.6	142
6	FF a (3/d)	-3.694	-2.701	118%	118%	102%	-25.5	-12.2	15.9	1.9	75
	FF b (4/d)	-4.159	-2.626	134%	134%	104%	-26.2	-12.9	28.8	3.5	136