EXPLORATION OF POTENTIAL DEMAND FOR AN ENHANCED STORNOWAY- ABERDEEN AIR SERVICE

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EXECUTIVE SUMMARY

Study Scope

The study assessed the potential impacts of increased frequency and revised timings on the Stornoway-Aberdeen air service. This was based on increasing the number of return flights from one to two per day, Monday-Friday. That would allow day trips to be made in both directions. It would also offer better timings for business travel and to those connecting with offshore flights at Aberdeen.

Existing Position

Table E.1: Estimated total travel market between Stornoway and the Aberdeen area

Purpose	Stornoway-Aberdeen Air	Stornoway-Inverness air and surface travel	Ferry and surface travel	Total market size
Business - Offshore	1,410	2,449	548	4,407
Business - Other	2,047	1,146	1,130	4,323
Leisure	1,993	1,615	4,316	7,924
Total	**5,450**	**5,211**	**5,995**	**16,656**

Note: Some columns do not sum to the total shown due to rounding

A significant proportion of the demand shown above is trips by Outer Hebrides residents who work outside the islands. As well as offshore workers, they include people employed onshore in the oil and gas sector in the Aberdeen area and those in shipping and other sectors. In general the wages paid to these workers are much higher than those available in the Outer Hebrides.

At present, there appear to be very limited business-to-business and public sector links between the two ends of the route. This partly reflects the different scale and composition of their economies: particularly the highly significant role of the oil and gas sector in the Aberdeen area. There are some common specialisms-notably fisheries. However, their impacts are limited by the small scale of the islands' economy.

Linkages between the two areas are more evident in the:

- Number of Outer Hebrides residents working in the Aberdeen area-or travelling through it to work elsewhere (especially offshore).
- Social and family links.
- To a lesser extent, Outer Hebrides school leavers studying at FE/HE institutions in Aberdeen.

Impacts of Enhanced Stornoway-Aberdeen Service

Table E.2 shows passenger forecasts for a double daily Stornoway-Aberdeen service under two different fares scenarios.

Table E.2: Stornoway-Aberdeen double daily air service: passenger traffic forecasts

Fare Levels	Low Sensitivity	Central Estimate	High Sensitivity
Existing	12,601	13,635	15,213
20% higher than existing	9,405	10,419	11,443

This increase in demand-compared to the present 5,450 passengers-would lead to only limited diversion of traffic from other routes. For example, under the central estimate with existing fare levels, the extent of diversion would be around:

- 8% of total Stornoway-Inverness air service passengers; and
- 1% of total Ullapool-Stornoway ferry carryings.

Passenger volumes in the first year of operation are likely to be lower than the annual forecasts shown above. This reflects that it may take time for some passengers to change their travel habits. However, it is expected that demand would generally quickly grow towards the forecast level.

Even with the forecast volumes Stornoway-Aberdeen would still be a thin route. As such, relatively small variations in absolute passenger numbers could have significant impacts on total demand. In effect, this increases the risk to the airline compared to thicker, larger volume routes.

Apart from passengers there is only quite limited potential for freight and newspapers to contribute additional revenues to the operator.

The Transport and Economic Efficiency (TEE) analysis shows that a double daily Stornoway-Aberdeen air service at existing fare levels would give an NPV (Net Present Value) of around £0.51 million (including carbon impacts). The NPV falls to around £0.33 million under the higher fares scenario.

Reduced passenger overnight stay costs (accommodation, subsistence, etc.) would be an additional benefit of an enhanced service; one that is not captured in the TEE results (as is standard practice).

For the other two sets of forecasts the NPVs would be:

- Low passenger forecasts: with current fares £0.39m; higher fares £0.25m.
- High passenger forecasts: with current fares £0.70m; higher fares £0.45m.

Limited stimulation of traffic means that inbound visitor impacts in the Outer Hebrides would be slight. Between 3 and 4 FTE jobs (direct, indirect and induced) would be generated by increased visitor spend.

The main social benefits of an enhanced Stornoway-Aberdeen service would be:

- The opportunity for some of those working in the Aberdeen area to move back to live in the Outer Hebrides, and commute to their existing job.
- Increased interaction between friends and relatives.
- Long distance commuters able to spend more time at home.

Potential For Future Increase in Passenger Carryings and Linkages

There is potential for additional demand to be generated on the Stornoway-Aberdeen route beyond the first years of an enhanced service. This could be through:

- A greater number of Outer Hebrides residents taking up work outside the islands.
- Potentially, attracting an inward investor through the improved connectivity, which would generate business passenger trips on the air service.

Both of these would produce economic benefits for the Outer Hebrides. However, the scale and likelihood of these potential opportunities is quite uncertain.

There are also other opportunities to increase linkages between the two ends of the route. These include:

- Exploration of opportunities for collaboration between Lews Castle College UHI and Aberdeen University and/or RGU.
- Development of relationships between media and other creative industries businesses.
- Opportunities for small scale businesses/self-employed to remotely supply services to oil and gas sector firms.

1. INTRODUCTION

This is the final report of an exploration of potential demand for an enhanced Stornoway-Aberdeen air service. The research was undertaken on behalf of Highlands & Islands Enterprise (HIE) between May and September 2014. It was carried out jointly by ekosgen, Reference Economic Consultants and RDC Aviation (RDCA).

1.1 OBJECTIVES

The objectives of the research were, first, to:

- Estimate total current demand for travel between Lewis/Harris and the Aberdeen area by all modes, broken down by travel purpose and routings.
- Profile Lewis/Harris residents travelling regularly to the Aberdeen area and onwards for work.
- Provide a broad, high level assessment of current linkages between Lewis/Harris and the Aberdeen area.

Second, to assess the impacts of enhanced frequency and timings on the Stornoway-Aberdeen service. This was in terms of:

- Passenger demand, and the scope for this to grow over the next five years through increased business links between Lewis-Harris and the Aberdeen area. This was to include an assessment of displacement of passenger traffic from other transport providers.
- Potential demand for carriage of freight/newspapers.
- Passengers' willingness to pay higher fares to use an enhanced service, and the consequent potential impacts on carryings and revenues.
- Economic impacts, by applying the *Team Scotland* methodology for appraising new air routes.
- The scope for increased linkages between Lewis/Harris and the Aberdeen area in the short to medium term.

It was *not* an objective of the research to assess the overall financial performance/viability of an enhanced Stornoway-Aberdeen service.

1.2 METHOD

The research comprised:

- Review of existing data on travel between Lewis/Harris and the Aberdeen area.
- Analysis of socio-economic statistics.
- Consultation with 24 organisations and individuals.
- An online survey of current and potential users of the Stornoway-Aberdeen service. Some 387 responses were received. Further details of the survey are given at **Appendix A**.

1.3 STRUCTURE OF THE REPORT

Chapter 2 Describes current transport links, travel demand, and social and economic linkages between Lewis/Harris and the Aberdeen area.
Chapter 3 Contains traffic forecasts for an enhanced Stornoway-Aberdeen service.
Chapter 4 Assesses the potential economic impacts of an enhanced service.
Chapter 5 Gives a summary of findings.

Appendix A contains the online survey findings. **Appendix B** provides a list of those consulted during the study. **Appendix C** gives some supporting information on air service price elasticity of demand.

2. THE EXISTING POSITION

2.1 INTRODUCTION

This Chapter describes the existing position for travel and connections between Lewis/Harris and the Aberdeen area. It reviews the:

- Stornoway-Aberdeen and Stornoway-Inverness air routes, in terms of service provision and passenger demand.
- Ullapool-Stornoway ferry service, also in terms of service provision and passenger demand.
- Existing economic and social linkages between the two areas.

Some of the analysis is based on 2013 CAA Passenger Survey data. Every four years the CAA conduct interviews with passengers at Aberdeen and Inverness airports among others. They provide a range of useful information on trip purpose, origins and destinations, use of connecting flights, etc.

We have used the 2013 CAA survey results to help analyse the travel market between Stornoway and the Aberdeen area. However, the data are based on a small number of interviews, as follows:

- 63 passengers on the Stornoway-Aberdeen service.
- 143 passengers on the Stornoway-Inverness service, 10 of whom had a trip end in the Aberdeen area.

Accordingly this analysis should be treated with some caution, not least because not all passengers provided an answer to every survey question. Therefore, we have also drawn on our online survey and consultation findings, which are introduced later in the Chapter.

Please note that in some Tables column or row data do not sum to the total shown. This is due to rounding.

2.2 STORNOWAY-ABERDEEN AIR SERVICE

2.2.1 Schedule

The Stornoway-Aberdeen service is operated by Eastern Airways.

Table 2.1: Stornoway-Aberdeen schedule

Days of Operation	Schedule			
	Dep Aberdeen	Arr Stornoway	Dep Stornoway	Arr Aberdeen
Monday-Friday	12:45	13:40	14:10	15:05

It is provided by an Aberdeen based aircraft, complementing the route(s) it serves at other times of the day. The service:

- Has a flight time of 55 minutes.
- Operates on weekdays only - no weekend flights are available.
- Offers a single flight in each direction, with no day returns possible.
- Operates in the middle of the day. The departure from Aberdeen is at 1245 and the plane arrives back just after 1500.

The schedule has changed very little since the service commenced in 2006. The departure and arrival times have moved by no more than +/- 30 minutes from the current schedule.

2.2.2 Fares

In common with most air services a range of fares is available. They vary according to the conditions attached to them (e.g. flexible tickets which allow refunds and/or switching to different flights are more expensive than non-flexible ones). Fares also differ according to how far in advance the booking is made.

The CAA Passenger Survey asks interviewees how much they paid for their air ticket. The following caveats should be noted:

- Stating an accurate fare can be problematic if the respondents have not themselves purchased the ticket, and the question may be interpreted differently by different people (e.g. are taxes included, excess baggage charge, etc.).
- Not all respondents are asked the fares question (e.g. interliners).
- Fares can be highly variable, and this variance can be greater on certain routes. Therefore, any averages should be treated with a degree of caution.

It is likely that some of the stated fares include discounts associated with the Air Discount Scheme (ADS). This scheme aims to tackle the problem of high air fares for the remotest communities in the Highlands & Islands by providing a discount of 40% on the core air fare on eligible routes. Essentially, any individuals whose residence is in Colonsay, Orkney, Shetland, the Western Isles, Islay, Jura, Caithness and North West Sutherland can apply for membership.

If the ADS discount is applied at the time of booking and if people report (to the interviewers) the price they paid, then their stated fare should be net of ADS.

The average (mean) reported single fare is £115, although the median is slightly lower (i.e. between £76-£100)

Table 2.2: Stornoway-Aberdeen: average one-way fare paid

One-way fare (£)	Share of Passengers
50-75	14%
76-100	41%
101-125	4%
126-150	31%
151+	10%
Total	**100%**
Average (mean)	***£115***

Source: 2013 CAA Passenger Survey

The results also illustrate the range of fares that passengers reported/are available for the route.

2.2.3 Carryings

Annual

In 2013 the Stornoway-Aberdeen service carried around 5,500 passengers.

Table 2.3: Stornoway-Aberdeen annual passenger carryings

	2006	2007	2008	2009	2010	2011	2012	2013
Carryings	5,371	6,750	7,113	6,350	6,338	5,957	5,555	5,476

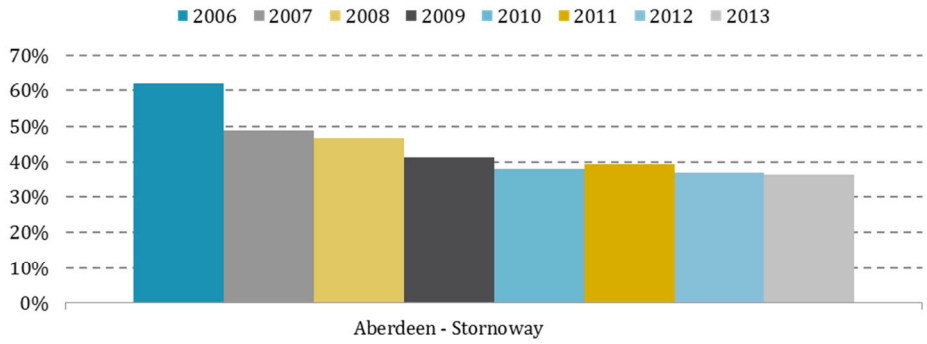
Since 2006, volumes have grown at an underlying compound aggregate growth rate of 0.3%. They have not varied greatly in absolute terms. However, they peaked at over 7,000 passengers in 2008 after which they have declined in successive years.

Notwithstanding this, carryings increased in the first half of 2014. CAA data show that passenger numbers were 16% (408) higher than in the corresponding months of 2013.

Load Factors

Throughout the period, load factors have seen more variance than carryings.

Figure 2.1: Stornoway-Aberdeen load factors



(Source: CAA, Capstats.com)

The route was originally operated with an 18-seat Jetstream 32 aircraft. In 2007-08 this was replaced by the larger 29-seat Jetstream 41. This led to the load factor dropping from 61% in 2006 to just 36% in 2013.

Seasonality

Traffic levels do not vary significantly across the year. However, in 2013 the service's demand peaked in July, with lower carryings evident between October and December.

2.2.4 Connecting Flights At Aberdeen

Connecting Traffic

CAA data show one third (c1,800) of the passengers using a connecting flight at Aberdeen. Most of these were scheduled services rather than offshore helicopter flights.

The most commonly reported scheduled connections were with:

- Stavanger: 464 passengers.
- London Heathrow: 258.
- Paris (Charles De Gaulle): 210.
- Copenhagen: 201.
- Bergen: 105.

There was also a smaller number of connecting passengers to UK airports like Leeds-Bradford and Manchester. Thus, most connections are to/from Europe outside the UK.

The use of connecting flights is also evident from the online survey. Over one third (35%) of individual respondents reported that some trips involve a connecting flight at Aberdeen airport. Most of them (two thirds) referred to offshore helicopter flights, with the rest relating to fixed wing connections. Also, some 44% of business/organisational respondents indicated that at least some of these trips involve a connecting flight at Aberdeen.

Analysis of Available Connections

We analysed the range of connections available through the current Stornoway-Aberdeen schedule. These were taken as the flights available within a three hour time window of arrival at Aberdeen.

This was to allow for a minimum one hour connecting time flights (recognising that many connections will be "do it yourself" rather than through ticketed); and up to two hours allowed thereafter to enable a connection that would not require any overly long stopover at Aberdeen - especially for business passengers.

The connections were identified through reviewing the latest *OAG Flight Guide* for travel on a Wednesday (which was taken as the specimen day).

Table 2.4: Stornoway-Aberdeen: connections at Aberdeen within time window

Departing Aberdeen after arriving from Stornoway	Arriving at Aberdeen to connect on to Stornoway
Cardiff	Birmingham
Durham Tees Valley*	Durham Tees Valley*
Kirkwall	Humberside*
London City	Kirkwall
London Heathrow	Leeds Bradford*
Newcastle*	London City
Wick*	London Heathrow
	Manchester
Amsterdam	Newcastle*
Frankfurt*	Norwich*
Oslo*	Southampton
Paris	Wick*
Riga*	
Sumburgh	Amsterdam
Stavanger*	Frankfurt*
	Oslo*
	Paris
	Stavanger*

*Services either not available from another Scottish airport or from only one of Edinburgh, Glasgow, Inverness or Prestwick

A range of connections is available to/from UK airports and a number of overseas ones.

Some 14 onward connections are available within the time window for those flying into Aberdeen from Stornoway. These are equally divided between UK and other European destinations. Half of the airports served either do not have a flight available from another Scottish airport (e.g. Durham Tees Valley) or have one available from only one other Scottish airport (e.g. Frankfurt).

Slightly more (17) connecting flights are available within the time window for onward travel from Aberdeen to Stornoway. Most (12) are to other UK airports. A further five are to elsewhere in Europe. Less than half (eight) connections are to airports that are served by no more than one other Scottish airport (e.g. Norwich).

2.2.5 Passenger Profile

CAA Survey data (shown at Table 2.5) suggest that approaching two thirds (64%) of passengers using the Stornoway/Aberdeen route live in the Outer Hebrides. Most of the rest (24% of all passengers) are from either Aberdeen City or Aberdeenshire. Some of the others come from outside Scotland, including overseas.

Most (63%) passengers reported their trip purpose as business, with the remaining 37% making leisure trips.

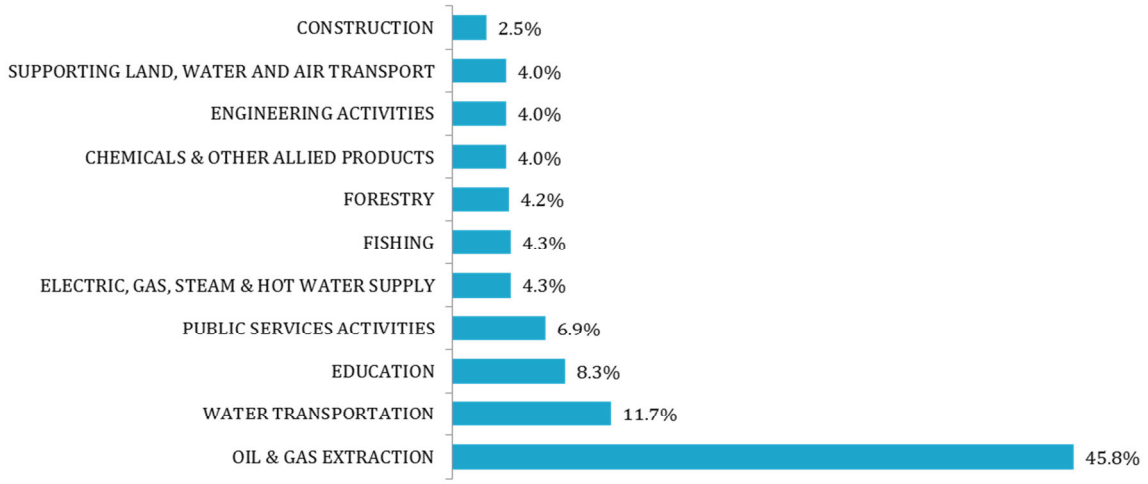
Table 2.5: Stornoway-Aberdeen: passenger place of residence

Home District	Number of Passengers	Share
Outer Hebrides	3,464	64%
Aberdeen City/Aberdeenshire	1,302	24%
Other Scotland	122	2%
England	201	4%
Overseas	363	7%
Total	***5,452***	***100%***

Note: Total differs very slightly from that shown at Table 2.3 due to use of different data sources

It should be noted that the CAA definition of a "business" trip includes those who are commuting to/from their place of work and those who work on a contract basis and are travelling home for a period of leave. These are in addition to the more usual business purposes like meetings, attending conferences, etc.

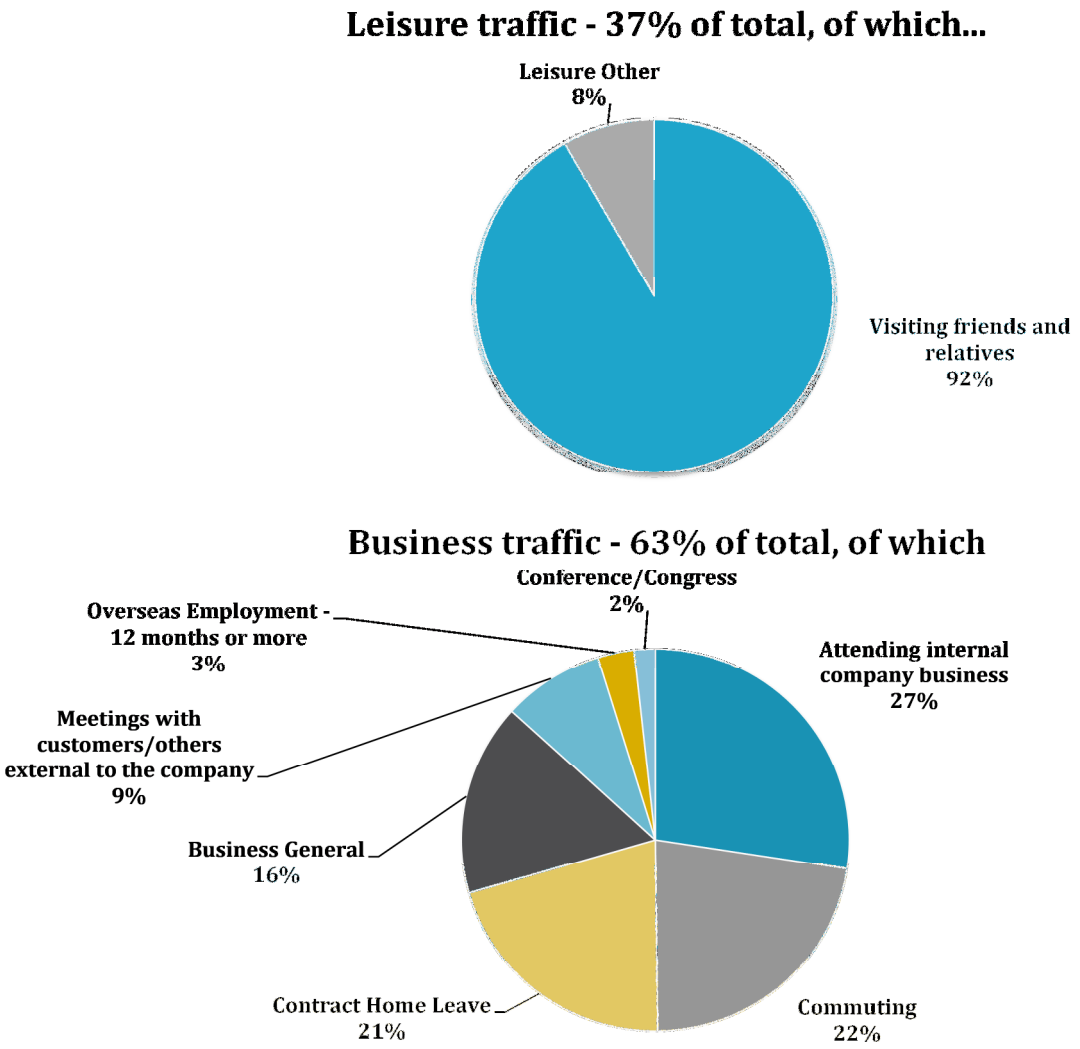
Figure 2.2: Stornoway-Aberdeen business passengers: main business activity



The main business activity of business passengers is Oil & Gas Extraction. This accounts for over 40% of the passengers. There is a wide distribution across other business activities, although Water Transportation (which will include various types of shipping) accounts for more than 10%.

Most (27%) of those travelling for business purposes were on Internal Company Business.

Figure 2.3: Stornoway-Aberdeen: detailed trip purpose



However, most is notable is the high total share of passengers travelling to/from their place of employment. These account for some 46% of all business passengers, distributed between each of commuting, contract home leave and overseas employment.

Almost all **leisure** passengers reported that they were travelling to visit friends or relatives. This points to the limited use of the route for holiday/short-breaks.

Based on the CAA data, business passengers using the service have relatively high salaries. Some 22% reported an income at or above £115,000. Altogether, almost all (90%) earn more than £28,750 (i.e. at a level above the average Scottish earnings[1] of £25,960).

This fits with the online survey results. As shown at Appendix A, relatively high wages are earned by those whose place of residence is the Outer Hebrides but who work elsewhere.

[1] The Scottish Parliament, Earnings in Scotland 2012, December 2012

2.3 STORNOWAY-INVERNESS AIR SERVICE

2.3.1 Schedule

The Stornoway-Inverness service is operated by Loganair as a flybe franchisee. It provides another means of travel between Stornoway and Aberdeen. This is through flying to/from Inverness and then surface travel between Inverness and Aberdeen. The flight time is 40 minutes.

Three returns operate on weekdays. They provide a first departure from Stornoway at 0840 and a first arrival at Inverness at 0920. In the other direction, the last departure from Inverness is at either 1755 or 1825 - with an earlier one also available at either 1405 or 1455.

There is a single return flight on both Saturday and Sunday.

Table 2.6: Stornoway-Inverness schedule

Days of Operation	Schedule			
	Dep Inverness	Arr Stornoway	Dep Stornoway	Arr Inverness
Mon/Fri	07:30	08:10	08:40	09:20
	14:55	15:35	16:05	16:45
	17:55	17:15	18:25	19:05
Tue/Wed/Thu	07:55	08:35	08:40	09:20
	14:05	14:45	10:55	11:35
	18:25	19:05	17:05	17:45
Sat	11:25	12:05	10:15	10:55
Sun	13:50	14:30	15:00	15:40

Compared to the current Stornoway-Aberdeen schedule the Inverness service offers:

- A much higher frequency - 17 rather than five return flights per week.
- A seven, rather than five, day operation.
- Day trip opportunities for some trip ends.
- Weekday arrivals in Inverness and Stornoway before 0900 and post-1700 departures from both airports.

2.3.2 Fares

As on the Aberdeen service a range of air fares is available.

Table 2.7: Stornoway-Inverness: average one-way fare paid

One-way fare (£)	Share of Passengers
50-75	46%
76-100	35%
101-125	14%
126-150	2%
151+	2%
Total	**100%**
Average (mean)	***£81***

Source: 2013 CAA Passenger Survey

The average (mean) single fare on Stornoway-Inverness is £81: that is, some £34 below that for Stornoway-Aberdeen. Compared to Stornoway-Aberdeen very few passengers (4%) pay a single fare of more than £125.

2.3.3 Carryings

Annual

In 2013 around 32,800 passengers used the Stornoway-Inverness service.

Table 2.8: Stornoway-Inverness annual passenger carryings

	2006	2007	2008	2009	2010	2011	2012	2013
Carryings	32,190	36,403	35,636	33,110	29,777	36,114	36,249	32,850

Since 2006, volumes have grown at an underlying compound aggregate growth rate of 0.3%. They have fluctuated since 2006: peaking at 36,400 in 2007 after which they fell to below 30,000 passengers in 2010.

Traffic then grew strongly in 2011, back to over 36,000 passengers. However, there was then a sharp fall (of over 9%) in 2013.

Seasonality

The service displays relatively consistent year-round demand; although there is a drop off in passenger numbers between October and December.

2.3.4 Demand For Travel to/from the Aberdeen Area

CAA Survey Data

The CAA Survey data in 2013 shows some 7% of Stornoway-Inverness passengers had a trip end in Aberdeen City/Aberdeenshire (equivalent to around 2,400 trips).

Table 2.9: Stornoway-Inverness: mainland trip end

Mainland Trip End	Number of Passengers	Share
Highland	25,562	75%
Aberdeen City/Aberdeenshire	2,375	7%
Moray	1,636	5%
Perth and Kinross	486	1%
Connecting at Inverness	4,015	12%
Total	**34,074**	**100%**

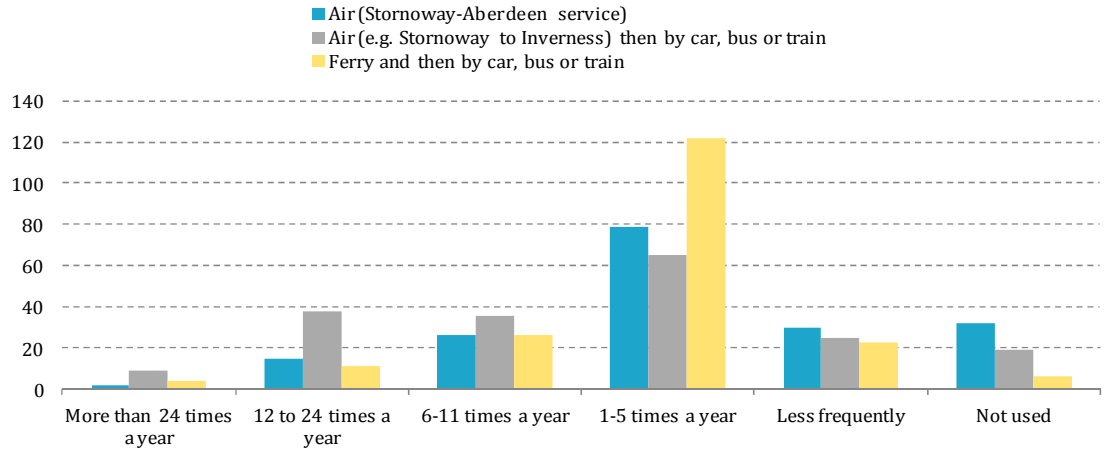
Source: CAA Passenger Survey. It should be noted the total shown is greater than that at Table 2.8. This discrepancy appears to arise from a coding issue within the 2013 CAA Passenger Survey data for Scotland.

A similar volume (2,600 passengers) was recorded by the 2009 CAA Passenger Survey.

Online Survey

However, based on stated level of usage of the Stornoway-Inverness service in the online survey, it appears that the CAA survey underestimates the number of passengers with a trip end in the Aberdeen area. This is especially the case for those using Stornoway-Inverness frequently (i.e. more than 6 times per annum).

Figure 2.4: Stated usage of air and ferry services for accessing the Aberdeen area



Source: Online survey

By weighting the stated number of trips per annum by frequency of trip for each of the two air services, respondents' travel on the Stornoway-Inverness route is almost 1½ times higher than their use of Stornoway-Aberdeen.

As shown below, when this ratio is applied to actual 2013 carryings on Stornoway-Aberdeen, a much higher volume of traffic is estimated.

Table 2.10: Stornoway-Inverness: online survey-based estimate of passengers with a trip end in the Aberdeen area

Weighting	Frequency of use	Stornoway-Inverness	Stornoway-Aberdeen
0	Not used	19	32
0.5	Less frequently	23	31
3	1-5 times a year	59	82
8.5	6-11 times a year	33	26
18	12 to 24 times a year	35	16
24	More than 24 times a year	9	5
	Weighted trips	**1,315**	**891**
	Inverness/Aberdeen Ratio	*1.48*	
Actual Stornoway-Aberdeen Passengers (2013)			*5,450*
Survey response-based Stornoway-Inverness passengers (2013)			*8,048*

There is a significant disparity with the CAA survey-based estimate of 2,375 passengers. However, the figures at Table 2.10 are based on 159 respondents who stated they use the Stornoway-Inverness service (compared to the CAA Survey's 10 respondents).

As a reconciliation of these differences, a mean of the two estimates has been taken as the actual number of Stornoway-Inverness passengers with a trip end in the Aberdeen area.

This will account for potential *under* representation in the CAA survey data and potential *over* representation of trip demand in the online survey responses. Therefore, trip demand between Stornoway and Aberdeen travelling via the Inverness air service is estimated at 5,211 passengers.

2.3.5 Passenger Profile

Trip Purpose

CAA Survey data show 54% of passengers travelling for business (34%, in total, for offshore purposes). The remainder were travelling for leisure.

Table 2.11: Stornoway-Inverness: journey purpose of passengers with a trip end in the Aberdeen area

Purpose	CAA Survey	Online Survey	Average
Business-offshore	34%	60%	47%
Business-other	20%	25%	22%
Leisure	47%	15%	31%

When weighting the number of responses received from the online survey by number of trips per annum, the online survey reveals a higher percentage of people using the Stornoway–Inverness air service for off-shore purposes – 60% of total trips. Taking the mean of the two datasets, we estimate that 47% of trips made on the Stornoway-Inverness air service are for offshore purposes

Surface Transport Mode

Passengers' surface travel was mostly by private car. The rest were travelling by rail and then to Inverness Airport by minicab, taxi or bus.

Table 2.12: Stornoway-Inverness: surface travel by passengers with an Aberdeen City/Aberdeenshire trip end

Main Mode	Second Mode	Share of Passengers
Private car	-	57%
Rail	Minicab	19%
Rail	Taxi	15%
Rail	Local bus companies	10%
Total		**2,375**

Source: CAA survey data

A number of consultees noted that some offshore workers keep a car in the vicinity of Inverness airport which they use to travel to/from Aberdeen. They may share this car journey with other offshore workers. Others, however, wish to avoid the cost of keeping a car for infrequent use and travel by train between Inverness and Aberdeen.

Table 2.13: Stornoway-Inverness: journey time and costs for surface travel to Aberdeen

Mode	Time	Cost (£)
Drive (via A96) - 97 miles	2 hours 7 minutes	£23.59
Rail and Bus	2 hours 44 minutes	£23.40

Source: CAA survey data

Both surface journeys take more than 2 hours and have costs of around £23 each way[2]. These costs are in addition to the air fare between Inverness and Stornoway.

[2] Rail and Bus: Assumes a 02:09 rail journey from Aberdeen to Inverness, a 15 minute wait at Inverness for a bus and a 20 minute bus journey to the airport. Drive: Assumes the shortest journey via A96 and average group size of 1.65 people. Costs: standard off-peak return train with PlusBus bus ticket, driving costs based on petrol and running costs for an average petrol car. Sources: Google Maps, www.thetrainline.com, www.stagecoachbus.com and http://www.theaa.com/motoring_advice/running_costs/

2.4 ULLAPOOL-STORNOWAY FERRY SERVICE

2.4.1 Schedule

The third means of travelling between Stornoway and Aberdeen is to use the Ullapool-Stornoway ferry and surface travel between Ullapool and Aberdeen.

Table 2.14: Ullapool-Stornoway ferry: 2014 summer schedule

Days of Operation	Schedule			
	Dep Stornoway	Arr Ullapool	Dep Ullapool	Arr Stornoway
Monday-Friday	0700	0945	1025	1310
	1350	1635	1735	2020
Saturday	0700	0945	1025	1310
	1430	1715	1815	2100
Sunday	1430	1715	1815	2100

There are two return sailings per day Monday-Saturday and one on Sunday. Monday-Saturday the first arrival on the mainland is at 0945, with the last departure from Ullapool at 1735 on weekdays and 1815 on Saturday. The crossing time is 2 hours and 45 minutes.

Thus, compared to the Stornoway-Aberdeen air service, the ferry offers:

- A much higher frequency - 13 rather than five return services.
- A seven, rather than five, day operation.
- Day trip opportunities for some trip ends.
- Pre-1000 arrival on the mainland Monday-Saturdays, and post-1700 departures from Ullapool.

Frequency is increased slightly during the peak summer months. From late June to early September three rather than two return sailings operate on Wednesday and Friday.

2.4.2 Fares

The current (summer 2014) single fares are:

- Passenger: £9.15.
- Car: £48.00.

2.4.3 Carryings

Table 2.15: Ullapool-Stornoway annual passenger carryings

	2006	2007	2008	2009	2010	2011	2012	2013
Carryings	181,160	185,522	182,833	219,907	227,676	230,949	224,165	222,950

The ferry volumes have grown over the period from around 181,000 to 223,000 in the most recent year. This increase occurred largely in 2009 when an additional 37,000 passengers were carried. That coincided with the introduction of reduced (RET) fares on the route, which stimulated trips by visitors in particular.

After 2009, traffic continued to grow until it peaked at around 231,000 in 2011. It has since declined although demand in 2013 remained above that seen in 2009.

Only annual carryings data are publicly available. However, it is known that there is a significant seasonal increase on the route in the summer because of increased visitor activity in the Outer Hebrides. It should be appreciated that, as shown later, only a small proportion of total demand on the ferry service has a trip end in the Aberdeen area.

2.4.4 Estimate of Use of Ullapool-Stornoway Ferry For Trips To/From Aberdeen Area

For the ferry users there is no comparable equivalent to the CAA Passenger Survey. Therefore, the online survey results have been used to estimate the number of ferry passengers with a trip end in the Aberdeen area.

The online survey asked respondents if they use the ferry for travelling between Stornoway and Aberdeen and if so, how often they do so. A similar question was also asked about use of the Stornoway-Aberdeen air service. Through weighting the frequency of trip responses of both ferry and air service users, it is possible to estimate the relative number of ferry and air trips. Thus, because the number of Stornoway-Aberdeen air passengers is known, the number of ferry passengers can be estimated.

The online survey responses show that for each trip made by air, there are 1.1 trips by ferry. This gives an estimate of around 6,000 ferry passengers who are travelling between Stornoway and the Aberdeen area.

Table 2.16: Online survey-based estimates of Ullapool-Stornoway ferry passengers with a trip end in the Aberdeen area

Weighting	Frequency of use	Ullapool-Stornoway ferry	Stornoway-Aberdeen
0	Not used	6	32
0.5	Less frequently	23	31
3	1-5 times a year	124	82
8.5	6-11 times a year	26	26
18	12 to 24 times a year	14	16
24	More than 24 times a year	5	5
	Weighted trips	**977**	**891**
	Inverness/Aberdeen Ratio	***1.10***	
Actual Stornoway-Aberdeen Passengers (2013)			*5,450*
Survey response-based Ullapool-Stornoway passengers (2013)			*5,995*

Further, a cross check was made using data from household surveys undertaken by Scottish Government as part of the National Ferries Review. The number of interviews was not large, while they were only undertaken with Outer Hebrides residents rather than the travel market as a whole.

However, based on the available survey information the estimate of ferry passengers shown at Table 2.16 does not appear unreasonable, thus increasing our confidence in the figures shown.

2.4.5 Passenger Profile

Trip Purpose

Table 2.17: Ullapool-Stornoway ferry passengers journey purpose

Purpose	Share of total
Business - offshore	9.1%
Business - other	18.9%
Leisure	72.0%

Source: online survey

Based on the online survey results a clear majority (72%) of the ferry passengers are assumed to be travelling for leisure purposes (very largely VFR). The remainder are travelling on business.

Surface Transport Mode

The ferry and drive combination from Stornoway to Aberdeen would cost approximately £67.50 per person (based on an average group size of 1.65 people) and take around 6 hours in total[3].

Table 2.18: Ullapool-Stornoway ferry: journey time and car costs for travel to Aberdeen

Journey Component	Cost	Time
Ullapool-Stornoway fare	£48.00 (car)+£9.15 (per passenger)	2 hours 45 minutes
Ullapool-Aberdeen (car)	£63.41	3 hours 16 minutes
Average party size	1.65	
Cost per person (including one adult ticket)	**£76.67**	
Total journey time		**6 hours 1 minutes**

Public transport is potentially an option for travel between Ullapool and Aberdeen. However, it is assumed that the large level of inconvenience this would involve (there is no direct bus service) means that there is very little use made of this option.

2.5 LINKAGES BETWEEN LEWIS/HARRIS AND THE ABERDEEN AREA

2.5.1 Nature of the Two Economies

Population and Employment

The economies at each end of the route are quite different. First, in terms of size. Based on the 2011 Census the combined population of Aberdeen City and Aberdeenshire is around 476,000 people. That is 22 times greater than the population of Lewis/Harris (c 21,600).

This is reflected in employment levels in the two areas. The 2012 *Business Register and Employment Survey* (BRES) provides data on the total number of jobs, albeit that it excludes most of the self-employed and also employment in businesses whose turnover is below the VAT threshold.

BRES shows the number of jobs in Aberdeen City and Aberdeenshire at around 280,000. This compares to about 8,200 in Lewis/Harris, again pointing to the small scale of its economy.

Employment Structure

The Aberdeen City/Aberdeenshire economy is quite different to that of both Scotland and Lewis/Harris.

The green shading in Table 2.19 (overleaf) indicates that *Wholesale and retail*, and *Human health*, etc., activities account for relatively large shares of employment in each of the three economies.

Table 2.19 also shows the distinctive nature of the Aberdeen City/Aberdeenshire economy. This reflects the high proportion of employment in both *Mining and quarrying* and *Professional, scientific and technical* activities.

[3] Ferry and drive: return price for car on ferry and drive to Aberdeen via A835 and A96 (158 miles). Standard drive costs applied to journey and split between 1.65 people on average (the standard group size of people travelling between Stornoway and Aberdeen). Sources: www.calmac.co.uk, Google Maps, http://www.theaa.com/motoring_advice/running_costs/ and RDCA Analysis.

Table 2.19: Employment structure 2012

	Share of Total Employment		
Industry	**Aberdeen City/Aberdeenshire**	**Lewis/Harris**	**Scotland**
Agriculture, forestry and fishing	1%	3%	3%
Mining and quarrying	10%	1%	1%
Manufacturing	9%	6%	8%
Electricity, gas, steam and air conditioning supply	0%	0%	1%
Water supply, sewerage, waste management and remediation activities	0%	0%	1%
Construction	5%	7%	5%
Wholesale and retail trade; repair of motor vehicles and motor cycles	12%	12%	15%
Transport and storage	4%	5%	4%
Accommodation and food service activities	6%	6%	7%
Information and communication	1%	3%	2%
Financial and insurance activities	1%	1%	4%
Real estate activities	1%	2%	1%
Professional, scientific and technical activities	13%	3%	7%
Administrative and support service activities	9%	3%	8%
Public administration and defence; compulsory social security	4%	13%	6%
Education	6%	9%	7%
Human health and social work activities	13%	22%	16%
Arts, entertainment and recreation	2%	1%	3%
Other service activities	2%	1%	2%
Total Number of Jobs	**279,794**	**8,202**	**2,425,942**

Source: BRES

This is due to the very strong presence of oil and gas-related activity in the area. In contrast, one of the main sectors in Lewis/Harris is *Public administration, etc*.

The BRES data were analysed further to see how far the two areas' share specialisms in the same type of industries, which could form the basis of existing or potential economic linkages. This was done by identifying specific industries in Aberdeen City/Aberdeenshire and Lewis/Harris that have a larger share of total employment than is the case for Scotland as a whole.

The results (at Table 2.20, overleaf) show a range of common specialisms in the two economies. They include primary, manufacturing, construction and service sectors. However, they are unlikely to be intensive users of air services, which tend to be in higher value manufacturing and professional services.

Table 2.20: Main common industries of specialism in the Aberdeen City/Aberdeenshire and Lewis/Harris economies

Industry (in order of degree of specialism)
Fishing and aquaculture (notably fishing)
Other mining and quarrying
Civil engineering
Freight transport by road and removal services
Rental and leasing activities
Manufacture of food products (notably prepared animal feeds)

Source: Based on BRES data

Further, while they do represent specialisms in the Lewis/Harris economy the size of the industries in the islands are small in absolute terms. For example, *Freight transport by road and removal services* accounts for 116 jobs, while rental and leasing has around 70 jobs, in Lewis/Harris. This will limit the extent of actual or potential linkages with similar industries in the Aberdeen area.

Consultation Findings

Consultees tended to highlight generally **very limited business and sectoral links** compared to those with Glasgow, in particular, and Edinburgh. As an indicator, there appears to be much less road freight between Lewis/Harris and Aberdeen than with Glasgow, Edinburgh or Inverness. What there is appears mainly related to fisheries and individual company requirements (e.g. for the Bristow Search and Rescue facility at Stornoway).

There do not appear to be many, if any, significant business-to-business links between major island employers and companies in and around Aberdeen. One consultee stated that this was also the case for Lewis/Harris and Inverness.

Consultees also mentioned the **limited extent of public sector links** between the two areas. While there is some travel to/from Aberdeen this was usually to meetings of regional or national groupings that are periodically held there, rather than being directly related to links with Aberdeen based organisations.

A number of public sector consultees referred to downward pressure on the budget they have available for travel. Within this, there is an increasing emphasis on reducing travel through use of videoconferencing and similar communication methods.

2.5.2 Residents Working Outside the Outer Hebrides

The research clearly points to the importance of Outer Hebrides residents who work elsewhere. As covered elsewhere in this report this is, first, in terms of a significant share of the Stornoway-Aberdeen area travel market. Appendix A shows that these long distance commuters are not only offshore workers. They include people employed onshore in the oil and gas sector in the Aberdeen area and those whose work is in shipping or other sectors.

Thus, access to employment opportunities outside the islands is important in providing a living to those whose place of residence is in the Outer Hebrides. As the online survey results show off-island employment is generally well paid. The median annual gross salary of island residents working elsewhere is above £60,000. That is more than twice that for full-time employee jobs in the Outer Hebrides (£26,738: source ASHE 2013.)

This level of wages and the number of individuals involved show that off-island employment will have a discernible impact on the average wage level for Outer Hebrides residents as a whole.

2.5.3 Social and Family Links

Consultees referred to a notable number of Lewis/Harris residents who have friends and relations living in the Aberdeen area. It was mentioned that the long history of attendance at Higher Education (HE) or Further Education (FE) institutions in Aberdeen and oil and gas-related employment opportunities have created an Outer Hebrides diaspora in the area.

2.5.4 Individuals Studying Outside the Outer Hebrides

A relatively low number of pupils leave school in the Outer Hebrides and go on to either HE or FE in Aberdeen.

Table 2.21: Outer Hebrides initial school leaver destinations: number of HE/FE students in Aberdeen

Left School in Year (August-July)	HE		FE
	Aberdeen University	RGU	Aberdeen College
2008-2009	4	4	0
2009-2010	<5	<5	<5
2010-2011	<5	<5	<5
2011-2012	10	<5	<5
2012-2013	8	5	<5

Source: Skills Development Scotland. Numbers include Uist and Barra school leavers as well as those from Lewis and Harris

The numbers leaving to attend Aberdeen College are particularly low: no more than four individuals in any of the years shown.

Numbers are highest at Aberdeen University, with 18 school leavers in the last two years, albeit that some may be from the Southern Isles rather than Lewis/Harris. The numbers are lower for RGU - no more than five school leavers in any of the years covered by the data.

Consultees recognised that Aberdeen is not the main location for these school leavers. However, their understanding appears to be that the numbers involved are higher than is actually the case. This may be because Aberdeen is a longstanding FE/HE destination for some of the islands' school leavers.

2.5.5 HE/FE Links

Lews Castle College UHI noted that they do not currently have many connections with HE institutions in Aberdeen, although they do have collaborative projects with universities elsewhere.

They were unsure how far this reflects current transport services between the two areas. The amount of time spent off the island to travel to/from Aberdeen was seen as a disincentive to developing stronger connections.

The College does, however, receive visits from Aberdeen-based oil and gas companies who promote employment opportunities to students. For a number of years this has successfully led to students gaining offers of employment outside the Outer Hebrides.

2.6 FEATURES OF THE TRAVEL MARKET

2.6.1 Introduction

The online survey and consultations support and provide context for the analysis shown in the first parts of this Chapter. These are discussed below.

2.6.2 Significance of Offshore Worker Traffic

The traffic analysis in this Chapter has shown the significance of the trips by offshore workers. These are very largely people working in the more northern parts of the UK Continental Shelf (UKCS). Their significance within the passenger flows reflects their consistent travel throughout the year. Most are on either a 2 weeks on/2 weeks off or 3 weeks on/3 weeks off rotation. Between times they also undertake occasional trips to Aberdeen for medicals, training, etc.

Offshore workers travelling between Stornoway and Aberdeen largely appear to be from Lewis/Harris. There are occasional trips by those based in Uist. However, we understand that almost all Uist and Barra offshore staff fly to Glasgow from where they travel to Aberdeen.

As reflected in the earlier market analysis, consultees believe that most offshore workers travel via Stornoway-Inverness rather than using the Stornoway-Aberdeen flight. This largely reflects the timings of the two air services. The latter's middle of the day timings means that it is unsuitable for same day connections with many of the offshore helicopter flights. The use of Stornoway-Inverness allows an earlier arrival into, and later departures from, Aberdeen, and can thus connect with a greater number of offshore flights.

Hence, many respondents to the online surveyed *strongly disagreed* with the statement: "the (Stornoway-Aberdeen) air service provides good connections for offshore flights (via helicopter)".

Further, the timings of medicals and training in Aberdeen require only a day trip but this is not possible under the existing transport options. Arrival times in Aberdeen are too late, and departure times are too early. Thus, overnight stays are incurred.

For some, however, the lower fares on the Inverness flight is also a reason for using it rather than the Eastern service. The online survey shows that of those travelling for business, commuting or working offshore, by far the majority are responsible for arranging and paying for their own travel. However, it is notable that:

- A slight majority of offshore workers using Stornoway-Aberdeen have their fare paid by their company; while
- Only one third of offshore workers who use Stornoway-Inverness are in that position.

There are also **other long distance commuters** from Lewis/Harris. Some of them require ongoing connections at Aberdeen - e.g. those working on fisheries protection vessels. They tend to use Stornoway-Inverness to fit with the times of their vessel's arrival and departure at Aberdeen, although relative air fares also seem to play a part in route choice.

In addition, there are commuters who work onshore in the Aberdeen area. They have to fit their working week around the transport links to Stornoway. This can mean arriving at work after the start of business on Monday and leaving before close of business on Friday - although some employers do not permit this.

2.6.3 Comparison To Other Outer Hebrides Air Routes

Both online survey respondents and consultees contrasted the transport links between Stornoway and Aberdeen with those to other Scottish cities. The main *general* points related to the:

- Very limited NHS/health-related and public sector traffic compared to the Glasgow and Inverness flights.
- Lack of viable day trip opportunities in either direction.

Points specific to the Stornoway-Aberdeen service were:

- Inability to fly outside office hours - which is important to some business travellers.
- An imbalance of flows meaning that some flights between Stornoway and Aberdeen can be much quieter than others.
- A low profile. This was attributed to its limited frequency and its arrival and departure at Stornoway at a time when the airport is relatively quiet.

2.6.4 Fare Levels on Stornoway-Aberdeen

As shown earlier, average fares on the Stornoway-Aberdeen route are higher than those on the Stornoway-Inverness route. Our research suggests some people's decision to use the Inverness flight is based simply on the relative air fares rather than fully taking into account the additional surface travel costs to/from Aberdeen.

However, a number stated that Stornoway-Aberdeen fares are also higher than on other routes out of Stornoway. This leads to a perception that the fares are high *per se*. This is even after allowing for ADS discounts. (The online survey shows that ADS is used extensively by those who are eligible to use it).

Cost rather than simply travel time is important to some business travellers. Further, as noted earlier a number of "business" travellers between Stornoway and Aberdeen are, in fact, commuters - many of whom are paying for their own travel, while also travelling in their own time. This could lead to them using criteria to choose between the available routings which are different to those used by people travelling on company business.

There were also references to Eastern tickets being less flexible than those on the flybe services. This is in terms of allowing switching to different flights without incurring a related charge. This was particularly mentioned by offshore workers whose "Vantage" card allows them to do so. Overall, therefore, some view tickets on flybe services out of Stornoway as offering better value than those available on the Eastern service.

2.6.5 Use of the Various Routing Options

The online survey shows a **considerable number of people using more than one routing** across all the trips they make between Stornoway and Aberdeen. A number of individuals (and businesses) travel on each of the two air routes *and* the ferry service within a 12 month period.

This is likely to vary by trip purpose. That was confirmed by some consultees who would use one air service for business travel but the other when visiting friends and relatives.

The survey also showed that **importance is attached to a number of factors that influence choice of routing.** These are: total travel times, total travel costs, avoiding overnight stays, and departure and arrival times at Aberdeen. These are *all* important in the decision on which routing to use on a particular trip.

The *most* important factors in choice were reported as, for those using:

- *Stornoway-Aberdeen*: total travel time, and then arrival and departure times at Aberdeen.
- *Stornoway-Inverness*: arrival and departure times at Aberdeen, and then total travel time.
- *Ullapool-Stornoway ferry*: total travel cost, and then total travel time and arrival and departure times at Aberdeen

2.6.6 Inbound Leisure Traffic

Inbound leisure traffic to the Outer Hebrides is seen as being dominated by VFR. Some wondered how far Stornoway-Aberdeen was being marketed to other visitors, including those beyond the Aberdeen area. Current fare levels and structure were seen as a deterrent to this market. This was especially the case for those looking to connect at Aberdeen as through ticketing would not be available on most flights.

2.6 Lack of Weekend Flights on Stornoway-Aberdeen

The lack of weekend flights was referred to by online survey respondents. A number mentioned it as an important factor in deciding which routing to take to travel between Stornoway and Aberdeen.

Significantly, it was the most commonly stated feature of the Stornoway-Aberdeen air service that prevents respondents from using it as much as they would like to. Thus, it was more significant than current fare levels or departure/arrival times at Aberdeen.

2.7 ESTIMATE OF TOTAL TRAVEL MARKET

Across the various routings used to travel between Stornoway and Aberdeen, total market demand is estimated at 16,656 passengers.

Table 2.22: Estimated total travel market between Stornoway and the Aberdeen area

Purpose	Stornoway-Aberdeen	Stornoway-Inverness and surface travel	Ferry and surface travel	Total market size
Business - Offshore	1,410	2,449	548	4,407
Business - Other	2,047	1,146	1,130	4,323
Leisure	1,993	1,615	4,316	7,924
Total	**5,450**	**5,211**	**5,995**	**16,656**

The traffic break down shows that:

- The ferry has the largest share of the three routings (36%). However, the shares of the other two are quite similar - both with over 30% of the total market.
- There is a broadly even split between leisure and business trips.
- Business accounts for most trips on the two air services, while leisure accounts for over 70% of the ferry trips.

It should be appreciated that these are “best estimates” based on the available information. There could be some under or overestimation of the individual elements that make up total demand. For example, offshore traffic could be understated to an extent while other business trips are overstated.

3 ENHANCED STORNOWAY-ABERDEEN SERVICE: TRAFFIC FORECASTS

3.1 INTRODUCTION

This Chapter presents our traffic forecasts for an enhanced Stornoway-Aberdeen air service. First, it covers demand for an enhanced service at current fare levels. Second, it assesses passengers' willingness to pay higher fares to use an enhanced service, and the potential impacts on carryings and revenues.

The Chapter also discusses:

- Potential freight demand.
- Possible impacts on connecting traffic.

3.2 ENHANCED STORNOWAY-ABERDEEN SCHEDULE

The following schedule was identified as one that could be attractive to both existing and potential users of the Stornoway-Aberdeen service. It was included within the online survey and consultations for this study.

Table 3.1: Stornoway-Aberdeen: possible enhanced schedule

Days of Operation	**Schedule**			
	Dep Aberdeen	Arr Stornoway	Dep Stornoway	Arr Aberdeen
Monday-Friday	0630	0725	0755	0850
	1600	1655	1730	1825

It should be appreciated that this timetable is a potential one - the actual times could be varied. In particular, there could be a later second departure from Aberdeen.

Compared to the current schedule the enhanced one would offer:

- Two rather than one flight per day.
- Day return opportunities in both directions. Some 11 hours would be available at the Stornoway end and around seven hours at Aberdeen.
- Most flights outside office hours, thus benefiting business travellers.
- A pre-0900 arrival at Aberdeen, rather than around 1500. There would also be earlier and later departures from Aberdeen - at 0630 or 1600 compared to the current 1245.

The service would remain a weekdays operation, with no weekend flights.

Compared to Stornoway-Inverness and travel via the ferry service, the enhanced Stornoway-Aberdeen schedule would offer:

- Fewer weekly frequencies.
- A five rather than seven day service.
- Earlier arrival times on the mainland - and directly into Aberdeen.
- Realistic day return opportunities in both directions.

3.3 APPROACH TO TRAFFIC FORECASTING

3.3.1 Basis

Survey respondents were asked about their potential usage of the double daily service at, first:

- The approximate current fare levels (£210 return for non-flexible and £300-£400 return for flexible tickets); and second
- Higher fare levels - 20% above current fares.

Their responses were compared to, first, their current frequency of trips on Stornoway- Aberdeen and, second, to their current use of:

- Stornoway-Inverness air service + surface travel to/from the Aberdeen area.
- Ullapool-Stornoway ferry + road/public transport travel to/from the Aberdeen area.

The increase in trip demand on the double daily service (compared to current usage) was then determined.

The analysis was broken down between:

- Business-offshore.
- Business-other.
- Leisure.

3.3.2 Assumptions

1) Due to the small number of responses from businesses/organisations in the online survey, these have been combined with individuals' responses to determine growth rates/increased trip demand from a double daily service.

2) Growth rates from a double daily service have been determined from analysis of survey respondents' answers to current and potential trip demand.

3) To account for hypothetical bias (i.e. bias introduced in survey respondents' answers to a hypothetical situation versus actual choice), stated growth in trips per person have been reduced by two thirds. That is based on findings reported by HM Treasury[4] that people overstate their valuation of a good in stated preference surveys.

The HMT research was conducted into cost-benefit analysis and while targeted towards the impacts of social policy decisions, it covers the differences between *stated* preference (i.e. what an individual states they would do in response to a certain situation) and *revealed* preference (i.e. what an individual actually does in response to a situation). The report summarises other research which states:

"The hypothetical nature of the good in question and the payment mechanism can lead to inflated values in surveys. It is widely believed that individuals overstate their valuation of a good by a factor of two to three when comparing hypothetical versus actual payments for goods (Murphy et al., 2005)."

In this report, the value of the good is the benefits of having a double daily Stornoway-Aberdeen service compared to a single daily service.

[4] July 2011, HMT Valuation Techniques for Social Cost-Benefit Analysis: Stated Preference, Revealed Preference and Subjective Well-Being Approaches

In the central traffic forecasts, the upper end of the hypothetical bias has been used. This assumes that the online survey responses overstate the uplift in demand by a factor of three–i.e. respondents' stated demand in the survey is reduced by two-thirds). In the high traffic forecast sensitivity, a reduction of only one half is used.

4) Estimates of stimulation and diversion from other modes have been based on trip type and penetration levels from analysis of competing air services. First, it is assumed that all growth in travel for accessing offshore destinations is diverted from other modes (i.e. the introduction of a double daily service would not mean more people are travelling overall for this journey purpose).

Second, for other traffic types (i.e. other business and leisure), levels of diversion/penetration are based on RDC analysis of other Scottish air services and the level of capture additional frequencies have on traffic using alternate air services. For the proposed service frequency increase of 5x weekly rotations, a penetration (diversion) level of 62% has been used across all modes of transport and for other journey purposes.

Third, stimulated demand is the difference between the overall growth minus the estimated level of diversion.

3.4 CENTRAL ESTIMATE TRAFFIC FORECASTS: EXISTING FARE LEVELS

Taking into account the estimate for hypothetical bias noted earlier, the expansion of the Stornoway-Aberdeen service to double daily would result in carryings of 13,635 passengers. This compares to 5,476 passengers on the current single daily service.

Table 3.2: Stornoway-Aberdeen forecast demand for double daily service-at current fare levels

Purpose	Current Service	Stimulation	Diverted	Total
Business - Offshore	1,410	0	1,656	3,066
Business - Other	2,047	1,188	1,100	4,335
Leisure	1,993	1,429	2,812	6,234
Total	**5,450**	**2,617**	**5,568**	**13,635**

These would include 2,617 additional (stimulated) passengers. Thus, the overall travel market between the two areas is forecast to grow to around 19,300 passengers. Within this, the double daily Stornoway-Aberdeen service is forecast to capture about 70% of the total market (up from the current service's 33% share).

A further 5,568 passengers would be diverted from either the Stornoway-Inverness air service or Ullapool-Stornoway ferry. That is, around half of the Stornoway-Aberdeen area passengers that these two services presently carry. The diverted trips would comprise:

- 2,823 that are currently made on the Ullapool-Stornoway ferry-around 1% of its total carryings.
- 2,745 that are currently made on the Stornoway-Inverness air service-around 8% of the total passengers on that service.

There would be a pick up in offshore traffic on the route. We would expect this to be wholly diverted traffic attracted by the much larger number of offshore helicopter connections that would be available. The online survey showed that the current departure time from Aberdeen to Stornoway is the main constraint on offshore workers' use of the current service.

However, some offshore travellers would continue to fly Stornoway-Inverness. This would reflect:

- Some individuals' specific timing requirements.
- The relative fares on the two air services. The online survey shows that for those who use *only* the Stornoway-Inverness route, fares are as big a constraint on use of the Aberdeen service as its timings.
- The value that many appear to place in the greater flexibility to change Stornoway-Inverness flights.

Additional trips by other types of business users would also be stimulated. This reflects:

- Day trip opportunities, which the survey identified as a key constraint on current use of the service among this group.
- The relatively high values they place on total journey time.
- An ability to make travel budgets stretch so that the total number of trips can increase. This would be through less need to pay for overnight accommodation and subsistence costs.

For long distance commuters who are not going offshore, the new timetable would address the main constraint they face in using the current air service - i.e. times of arrival and departure at Aberdeen.

Leisure traffic would also be stimulated. However, it would be constrained to some extent by the limited attractiveness of a 0630 departure from Aberdeen. Further, the revised timetable would not address the main constraint on use of the service by the VFR market - i.e. no weekend flights.

3.5 CENTRAL ESTIMATE TRAFFIC FORECASTS: HIGHER FARE LEVELS

3.5.1 Traffic Forecasts

Overall, a double daily Stornoway-Aberdeen service with 20% higher fares is forecast to carry 10,420 passengers per annum. This compares to 13,635 passengers for a double daily at existing fares.

Table 3.3: Stornoway-Aberdeen forecast demand for double daily service-at 20% higher fares

Purpose	Current Service	Stimulation	Diverted	Total
Business - Offshore	1,410	0	1,051	2,461
Business - Other	1,801	1,129	671	3,601
Leisure	1,435	1,257	1,665	4,357
Total	**4,646**	**2,386**	**3,387**	**10,419**

As would be expected if the double daily service was approximately 20% more expensive, then the increase in demand reported by survey respondents was lower. Responses in the online survey support this.

Changes in service timing would make the service much more attractive to use but higher fares would deter people; with some stating they would stay with existing modes of transport.

In particular, this would result in fewer passengers being diverted from the other two routings. The diverted trips would be:

- 1,782 that are currently made on the Stornoway-Inverness air service - around 5% of the total passengers on that service.
- 1,605 that are currently made on the Ullapool-Stornoway ferry - less than 1% of its total carryings.

In addition, higher fares are likely to lead to the loss of some of the existing trips made on the Stornoway-Aberdeen service. Hence the total carryings for "Current Service" at Table 3.3 are lower than those shown at Table 3.2.

Stimulation levels are also lower than at current levels. However, while higher fares will inevitably hinder trip stimulation, the additional frequency should generate more trips from increased convenience and time savings.

3.5.2 Price Elasticity of Demand

General economic theory on the responsiveness of people's actions and choices with regards to price states that as a product becomes more expensive, fewer people choose to purchase it. Price Elasticity of Demand is the factor which represents this change in demand according to price. For example, if demand for a product drops by 1.5% when the price of that product increases by 1%, the Price Elasticity is equivalent to -1.5.

There are many influences on peoples' responsiveness to price change-purpose of travel, income, brand/product loyalty, etc. However, business passengers tend to be less price elastic as their needs for travel tend to be more fixed and have a higher value of time (and therefore cost) than leisure passengers. The elasticity value of business passengers would therefore be closer to 0 than those for leisure passengers (i.e. the change in demand from business passengers is lower than the change in demand from leisure passengers if both groups are subject to the same price increase).

Based on the information gained from the online survey, a 20% increase in fares could lead to 24% fewer passengers flying, giving an overall implied elasticity of -1.12.

Offshore workers and other business-related travellers are less sensitive to price changes. Their elasticities lie between -0.80 an -0.1. As noted at Chapter 2, the online survey shows a degree of price sensitivity in these two markets. There is a tendency for some travellers to compare the Inverness and Aberdeen flight fares directly rather than accounting for total journey costs including surface travel.

As would be expected, leisure demand is much more sensitive to fare increases. It has an implied elasticity of -1.51. Further, in the online survey a significant proportion of VFR travellers identified *existing* fare levels as constraining their use of the service.

These results are within the bounds of price elasticities from various research studies. Appendix C summarises four key studies which look at air fare elasticities in detail. Each one combines a literature review with econometric analysis of trends in income, fares and passenger numbers. Thus, they provide a comprehensive overview of the issue. Gillen and Intervistas provide international empirical evidence; the CAA and DfT's work focuses on the UK aviation market.

The studies show a range of price elasticities according to journey purpose. DfT values, while the most appropriate, seem significantly lower than other studies and, indeed, against the CAA values of -0.5 and -1.3 for business and leisure, respectively.

The CAA figures match much more closely with those from the Gillen et al study for short-haul services (-0.7 and -1.5 median values, for business and leisure, respectively). The Intervistas study shows a short-haul, intra-European route/market elasticity of -1.96.

Thus, the elasticities implied by the responses to our online survey are within the bounds identified by previous research studies.

3.5.3 Direction of Traffic Flows

In both sets of forecasts, it is estimated that 68% of additional passenger traffic (both diverted and stimulated) would be outbound from Stornoway (i.e. Outer Hebrides residents), compared to the current profile of 65% outbound.

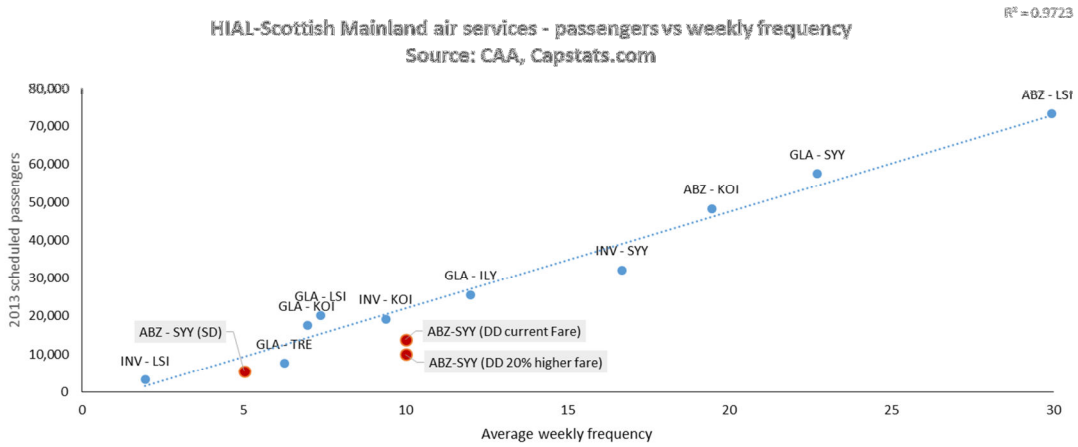
This profile is likely to result in the first morning sector (departing Aberdeen) having a lower load factor than the second morning sector (departing Stornoway to return to Aberdeen). This is because the bulk of passenger trips originate from the Outer Hebrides.

This return sector (arriving into Aberdeen at 0850) would be a key driver for increased demand on the service. Not only would it connect with a greater number of offshore helicopter flights, but day return business trips could also be made.

3.6 COMPARISON OF CURRENT DEMAND AND FORECASTS TO OTHER SCOTTISH ISLAND-MAINLAND AIR SERVICES

In order to assess the reasonableness of the traffic forecasts, other comparable Scottish island-mainland services were reviewed. This was to examine the relationship between demand and frequency.

Figure 3.1: Stornoway-Aberdeen forecasts and comparator routes



There is a very good correlation between annual passenger numbers and average weekly frequency (R^2 of 0.97): that is, more frequencies are directly and linearly related to higher passenger carryings.

The current single daily Stornoway-Aberdeen service (*ABZ-SYY (SD)* at Figure 3.1) sits below the trend line. This reflects its low load factor of 36% compared to an average of 65% on the comparator services. The forecast increase in demand to double daily (at current fares) would see the service follow the general trend seen on the comparator services (although it still sits below performance).

At higher fare levels with a 10x weekly frequency, the route would be well below the trend line: both compared to the other route and in general, given its low load factor (around 33%).

Passenger volumes in the first year of operation are likely to be lower than the annual forecasts shown above. This reflects that some time will be required for full customer awareness of the service enhancements to be developed. Also, some of the passengers who are expected to divert to the double daily service will have made forward bookings on other modes of transport.

However, it is expected that demand would generally quickly grow towards the forecast level. This is because:

- As an existing air route there is already awareness of Stornoway-Aberdeen-particularly among Outer Hebrides residents. Any awareness generation will be around the increased frequency.
- It is expected that the airline and airport operator would advertise the enhancements for a period before they are introduced.
- With a relatively small community of users expected for the service (notably offshore workers) it is likely that news of the double daily service would spread quickly.

Thus, while airline revenues could be lower in year one of the enhanced service, we would expect them to ramp up fairly quickly.

However, even with the forecast volumes Stornoway-Aberdeen would still be a thin route. As such, relatively small variations in absolute passenger numbers can have significant impacts on total demand. For example, with just under 5,500 passengers using the current service if just 5 passenger trips a week were not made (i.e. 1 fewer return passengers each weekday), this would mean a c9% decline in annual carryings, with a consequent impact on revenues.

This point also holds for the higher volumes forecast for the double daily operation. In effect, it increases the risk to the airline compared to thicker, larger volume routes.

This is in a context where traffic forecasting on a thin route is, arguably, more difficult than on larger ones, especially where the number of CAA passenger interviews is quite limited. What have been produced here are forecasts of *potential* demand-as per the brief-rather than a guarantee that the traffic will materialise.

3.7 SENSITIVITY TESTS ON TRAFFIC FORECASTS

There are a number of areas where the information used in the central estimate traffic forecasts are less certain than others. These are the:

- Number of passengers on the Stornoway-Inverness air service with a trip end in the Aberdeen area.
- Proportion of the above passengers who are travelling to/from offshore.
- The value used to account for hypothetical bias.

We have therefore undertaken sensitivity analysis on the central forecasts that were shown earlier. These provide boundaries of where the forecasts could sit, thus acknowledging that some data sources (particularly the CAA Survey) are less robust than others.

The specific sensitivities are set out below.

Table 3.4: Sensitivities used in low and high traffic forecasts

Factor	Low Sensitivity	Central Estimate	High Sensitivity
Number of Stornoway-Inverness air passengers with a trip end in the Aberdeen area	2,375	5,211	8,048
Proportion of Stornoway-Inverness air passengers travelling to/from offshore	34%	47%	60%
Hypothetical bias adjustment	-66.7%	-66.7%	-50%

For the first two factors the low sensitivity figures are taken from the CAA Survey data, while the high sensitivity ones are taken from the online survey. Only in the high case is a sensitivity applied to the hypothetical bias factor.

The impact of the sensitivities on the traffic forecasts are shown below.

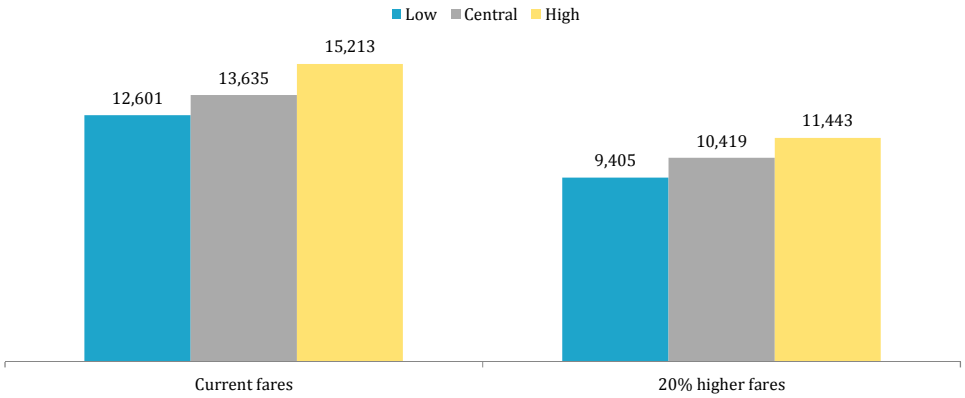
Table 3.5: Sensitivities: passenger traffic forecasts

Fare Levels	Low Sensitivity	Central Estimate	High Sensitivity
Current	12,601	13,635	15,213
20% higher	9,405	10,419	11,443

Thus, at current fares the overall forecasts lie in a band of around 12,600 and 15,200 passengers. At 20% higher fare levels, the range is from about 9,400 to 11,400 passengers.

The largest absolute impact is from the high sensitivity under current fares. That sees an increase of around 1,600 passengers compared to the central estimate.

Figure 3.2: Sensitivities: passenger traffic forecasts



3.8 AIRLINE PASSENGER REVENUES

The central estimate forecast with *20% higher* fares would generate around 8% lower revenues the central estimate forecast at *current* fare levels. This reflects the price elasticities set out earlier.

Table 3.6: Gross annual airline passenger revenues (indexed–Central Estimate at current fare levels = 100)

Fare Levels	Low Sensitivity	Central Estimate	High Sensitivity
Current	88.8	100.0	112.0
20% higher	82.5	91.6	100.0

Table 3.6 shows that revenue is forecast to range between 82% (higher fares, low traffic forecast) and 112% (current fare levels, high traffic forecast) of the central estimate with current fares.

3.9 POTENTIAL FREIGHT DEMAND

3.9.1 Newspapers To Lewis/Harris

Previous Practice

The Scottish Newspaper Society (SNS) largely organise the transportation of newspapers and magazines on behalf of the publishers. Until April 2013 the publications arrived in Lewis/Harris by air, with around 14 titles produced by eight publishers.

The newspapers were flown from Aberdeen in the morning using a freighter aircraft operated by Loganair. It had a capacity of around 3.5 tonnes: c1.5 tonnes of this was taken up by the newspapers. The freighter carried no other cargo apart from the newspapers - either into Stornoway or on the return leg.

Loganair sought to increase the charge to SNS for carrying the newspapers. This was in a context where Loganair had been unable to attract any other freight. SNS elected not to pay these higher charges. Instead, the vast majority of the publications are now moved wholly by surface transport.

Current Practice

Almost all the publications are now moved by road from the central belt to connect with ferry sailings. This is at a much lower cost: about 25% of the previous charge for air freight via Aberdeen.

The newspapers do not now arrive into almost all of the Outer Hebrides until the afternoon. As well as inconveniencing readers, this, it was reported to us, has reduced sales in some shops. That is because some customers prefer to shop in the morning and will not make a second trip to purchase a paper in the afternoon - or may not now visit the shop at all.

A number of possible solutions have been proposed. These include:

- Rescheduling the Ullapool-Stornoway freight ferry service so that newspapers could once again arrive into the islands in the morning. However, the revised timings would have negative impacts on hauliers' operations.
- Greater use of scheduled air passenger services to deliver the newspapers. This option has not been taken up.
- Moving the papers onto existing Royal Mail flights. However, we understand from our consultations that Royal Mail have stated that there is insufficient capacity to do this.
- A current proposal to print newspapers in Lewis itself using digital technology. We understand that the publishers have yet to make a decision on this.

The one exception to the above is the publications of the **Press and Journal** (P&J). These are currently flown to Stornoway on the first passenger flights from Inverness (either 0730 or 0755 on weekdays). The newspapers are transported by road from Dundee - where they are printed - to Inverness airport. The distance is 144 miles.

Potential For Use of Enhanced Stornoway-Aberdeen Service

As a guide, the Jetstream 41 aircraft could have a hold capacity of around 150kg. This is based on the aircraft's maximum take off weight (MTOW) and assumes that 29 passengers are carried. Some of the 150kg capacity would be taken up by bags on each flight. However, this could be offset to an extent if less than 29 passengers were on board.

However, 150kg capacity would only take a small percentage of the total volume (c1.5 tonnes) of papers being moved on any one day. The alternative would be to use some of the cabin space to accommodate newspapers, thus reducing the number of seats and the number of passengers that could be carried.

Discussions with SNS highlighted the following issues:

- The likely high level of charge by the airline compared to existing road/ferry delivery.
- The limited capacity of the aircraft compared to the volumes for which SNS are responsible.
- SNS' reluctance to split deliveries between air and road/ferry. This would reduce economies of purchasing power and increase the overall complexity of managing the deliveries.
- Lack of weekend flights - an alternative routing would be required on two days of the week.
- A 0630 departure from Aberdeen could be challenging for some publications that are printed further south in the UK. This is because all the newspapers would need to be at Aberdeen airport by around 0530 to be cleared to go on the flight. A later departure, say 0730, might address this issue for titles printed farthest away.

There is potential for the air service to accommodate a small number of titles rather than looking to move a large proportion of those currently organised by SNS. This could include the P&J being switched from Inverness to fly out of Aberdeen. That would save around 70 road miles compared to transportation from Dundee to Inverness airport. One consultee stated that if this did occur then another publisher may take up the freight capacity that would become available on the Inverness flight.

This would require detailed discussions with publishers on their requirements and the level of charges that they would be willing to pay.

We conclude that there is some potential for newspaper traffic. However, this would require detailed discussions with SNS and, possibly, individual publishers.

3.9.2 Other Freight

Very little freight is moved on the current service. In part this will reflect the limited amount of high value goods in the local economy that are either perishable and/or urgent. Some of the islands' main exports - e.g. Harris Tweed, black pudding - do not generally have these requirements. This is an issue that faced Loganair in their efforts to attract additional business on their former freight service out of Aberdeen.

One exception is live seafood. However, there have been a number of initiatives in the last decade to move seafood from Lewis/Harris by air rather than by surface transport. These have not been successful, in part, because of reluctance of some producers to work together to provide sufficient loads. It is also because for some main markets (e.g. parts of continental Europe) it is challenging for air to be cost effective against road transport.

One consultee told us that there is currently no interest in a further initiative to increase air freighting of live seafood. In addition, its movement on scheduled services can be problematic and time-consuming to deal with if they are only small and occasional consignments.

It is also unclear as to the specific advantages of routing air freight via Aberdeen rather than another main Scottish airport. The major passenger hubs served from Aberdeen are similar to the ones available from Edinburgh and Glasgow.

One possible movement we identified was samples that CnES send to public analysts at laboratories elsewhere in Scotland. These need to be delivered to the laboratory within a certain timeframe. Glasgow is currently used but one consultee felt that Aberdeen could be equally suitable if a double daily service is available. However, there would not be a significant number of consignments.

We conclude that the potential for increased freight movements appears very limited.

3.10 CONNECTING FLIGHTS AT ABERDEEN

Another impact of the enhanced schedule could be greater opportunities for scheduled connections at Aberdeen. This was assessed on the same basis as the analysis for the existing schedule (as set out at Chapter 2). The results are shown at Table 3.7 (overleaf).

Within the time window, 18 onward connections are available for those flying into Aberdeen from Stornoway**.** These are mostly (13) to other UK airports. Half of the airports served either do not have a flight available from another Scottish airport (e.g. Durham Tees Valley) or one that is available from only a single other Scottish airport (e.g. Oslo, which has a flight from Edinburgh).

Considerably fewer (four) connecting flights are available within the time window for onward travel from Aberdeen to Stornoway. Most are to other UK airports.

Compared to the current position the enhanced Stornoway-Aberdeen schedule would offer more connections for those **departing Aberdeen after arriving from Stornoway**. There would be 18, compared to the existing 14, connections. More would be to airports not served by, or only served by one other Scottish airports. However, the total number of international connections would fall from seven to five.

There would be a significant fall in the number of connections for those **arriving at Aberdeen to connect on to Stornoway**. They would decrease from 18 to only four connections. This reflects that the first flight from Aberdeen to Stornoway is at 0630. That makes it redundant for same day connections. Second, there is a limited number of arrivals into Aberdeen within the time window for connecting onto the 1600 flight to Stornoway.

Table 3.7: Stornoway-Aberdeen enhanced schedule: connections at Aberdeen within time window

Departing Aberdeen after arriving from Stornoway	Arriving at Aberdeen to connect on to Stornoway
Belfast	London Heathrow
Birmingham	Newcastle*
Bristol	Sumburgh
Durham Tees Valley*	
Humberside*	Stavanger*
Leeds Bradford*	
London Gatwick	
London Heathrow	
Manchester	
Newcastle*	
Norwich*	
Sumburgh	
Wick*	
Amsterdam	
Kristiansund*	
Oslo*	
Paris	
Stavanger*	

*Services either not available from another Scottish airport or from only one of Edinburgh, Glasgow, Inverness or Prestwick

However, it should be appreciated that the Stornoway-Aberdeen specimen timetable is only a potential one. The actual flights times could be changed. In particular, there could be a later second departure from Aberdeen.

Perhaps the main point is the need to consider connecting traffic if changes are to be made to the Stornoway-Aberdeen timetable. As discussed at Chapter 2 there appears to be a reasonable amount of connecting traffic using the service at present.

3.11 POTENTIAL FOR INCREASED DEMAND IN THE MEDIUM TO LONGER TERM

There is potential for increased demand beyond the first years of an enhanced service. However, the scale and likelihood of this is quite uncertain. An improved schedule could lead to a greater number of residents working outside the Outer Hebrides.

These would be, first, offshore workers. However, the pay levels for this work suggest that many of those who are attracted will already be working offshore despite the current transport links.

Second, there would be potential for more residents to work onshore in the Aberdeen area. A number of consultees saw this as a potentially greater growth area than offshore working.

The second form of impact could be through the attraction of an inward investor on the back of an enhanced service. For example, the dispersal of some oil and gas back-office functions from Aberdeen to Stornoway. This would generate trips on the service by both island staff and management based in Aberdeen.

Bristow's operation of the Search and Rescue facility at Stornoway since 2013 appears to have such an effect. Trips are made on the Stornoway-Aberdeen air service by:

- Some of the crew who work at Stornoway. They are on a 2 weeks on/2 weeks off rotation but live elsewhere (England).
- Those delivering training to Stornoway based staff.
- Management and other HQ staff who work in Aberdeen.

The second of these impacts is largely temporary. The training requirement will decrease by early February 2015. The other two types of trip will continue at current levels. In fact there could be an increase in the number of crew travelling via Aberdeen. That would be if the double daily service gives improved connections to the north west and south west of England.

Bristow's trips will show up in existing Stornoway-Aberdeen carryings. They will have contributed to the 16% annual increase in traffic on the route in the first half of 2014. However, the number of Bristow-related trips will not increase from their present level; and will in fact decline in early 2015.

This example illustrates the effects that a single business decision can have on carryings on a thin route like Stornoway-Aberdeen. However, such inward investments are, by their nature, difficult to predict far in advance.

4 ENHANCED STORNOWAY-ABERDEEN SERVICE: ECONOMIC IMPACT ASSESSMENT

4.1 TRANSPORT AND ECONOMIC EFFICIENCY (TEE) APPRAISAL

The Transport and Economic Efficiency (TEE) appraisal of an enhanced service has been based on the approach set out in "Appraising the Economic Benefits of New Air Routes: Technical Report" (produced for Scottish Enterprise, 2012).

The approach reflects standard transport cost-benefit analysis principles (in line with those used by the DfT and Transport Scotland). However, it adapts them for specific information available for assessing air services, as well as incorporating some specific air-travel only indicators. The TEE covers impacts on passengers' journeys-notably travel time to/from the airport and air journey times; air fares; and carbon emissions.

Unless otherwise stated the figures shown in this section of the Chapter have been appraised over a five year period. They are a series of Net Present Values (NPVs) using a 3.5% discount as recommended by Scottish Transport Appraisal Guidance (STAG). The financial values are expressed in 2014 prices.

For diverted passengers (i.e. those travelling via alternative transport services who switch to the double daily Stornoway-Aberdeen service), the full value of any time and fare savings has been applied. For stimulated passenger trips, the convention of the "rule of half" has been applied. Thus, a rate of 50% to the full value of stimulated trips.

4.2 TEE: CENTRAL ESTIMATE TRAFFIC FORECASTS

4.2.1 Journey Times

For business travel, there is a cost associated (to the employer) for their employees travelling as opposed to working (assuming that time spent travelling is non-productive). As a result, any increase in the time spent working versus travelling has the potential to increase productivity and therefore produce economic benefits.

For leisure travel, the issue of value of time is more related to how much people are willing to pay for their travel time (given that there is implicitly a preference for choosing slower, but cheaper, modes of transport when travelling for leisure purposes). The willingness to pay for slower/faster modes of transport is dependent on many factors (e.g. income levels). However, average values can be used to assess the benefits of reducing a person's travel time for leisure purposes.

Time benefits will accrue from people transferring from longer journeys (either via the Stornoway-Inverness air service or the Ullapool-Stornoway ferry) to the double daily service.

Values of time are higher for business travellers (£30.17 per hour) than leisure passengers (£6.74 per hour) and commuters (£7.59 per hour)[5].

Table 4.1: Time saving benefits-5 year NPV discounted to 2014 prices

Fare Level	Business	All Passengers
Current	£719,492	£1,367,249
20% Higher	£466,145	£889,662

[5] WebTag TAG data book, May 2014, DfT, A1.3.2

Based on the forecast split of passengers by journey purpose, a double daily service at current fares would result in £1.38m in savings over five years, falling to £0.90m at higher fare levels.

4.2.2 Journey Costs

Financial Travel Costs

As shown at Chapter 2, fares on the existing service are higher than those on both the Stornoway-Inverness air service and the Ullapool-Stornoway ferry. Even when taking into account the additional surface travel to/from the Aberdeen area, these routings are still cheaper. Therefore, while the introduction of a double daily service will attract (and stimulate) travel demand, people are expected to be paying a higher overall price for travel than for the alternative routings.

Table 4.2: Fare and surface journey costs-5 year NPV discounted to 2014 prices

Fare Level	Business	All Passengers
Current	(£320,510)	(£860,041)
20% Higher	(£210,125)	(£552,168)

Overall, passengers would incur an additional £0.86m in travel costs on a double daily service at current fare levels, decreasing to £0.55m due to lower demand at higher fares. This takes into account changes in all travel costs-air, ferry and other surface transport (car and rail).

Other Savings (Not Accounted for in TEE)

The double daily service will result in another financial saving for some passengers: that is, through removing the need to have an overnight stay (with associated hotel and subsistence costs) due to the enhanced timetable. Some 57% of online survey respondents strongly agreed or agreed with the following statement:*" I/my company/organisation incur additional expenditure (e.g. hotel accommodation) in using this (Stornoway-Aberdeen) service".*

It is not possible to quantify these benefits. That is because it was not possible for the survey to go into detail as to how many trips would be affected and the average spend incurred per overnight stay.

Therefore, we simply note reduced overnight costs as an additional benefit of an enhanced service, and one that is not captured in the TEE results (as is standard practice).

4.2.3 Flight Carbon Emissions

Carbon dioxide (CO_2) is always generated during the combustion of fossil fuels (coal, gas, oil). The amount of carbon dioxide emitted is a direct function of fuel consumption: 3.157 kg of CO_2 are produced per kilogram of fuel burned.

In order to calculate the fuel burn from any particular flight, a range of sources are used to determine fuel burn from the landing and take-off cycle and during the actual flight. These sources are typically from aircraft and engine manufacturers and RDCA make adjustments to these based on aircraft age (older aircraft/engines typically being less fuel efficient) and aircraft capacity (greater capacity leading to greater on-board weight and therefore greater fuel burn). The sector great circle distance is then calculated and applied to the cruise fuel burn. Adding the LTO fuel burn gives a per sector fuel burn which is then converted to CO_2 emissions.

The Department of Energy and Climate Change[6] gives a central value of £16.70 per one tonne of CO_2 emitted, this value being guided by forecast EU Emissions Trading Scheme (EU-ETS) prices.

[6] DECC (2011) *A brief guide to the carbon valuation methodology for UK policy appraisal*

CO_2 emissions from one sector on a Jetstream 41 (the aircraft used on the route) between Stornoway and Aberdeen are approximately 1.39t.

Table 4.3: Flight carbon costs-5 year NPV discounted to 2014 prices

Fare Level	All Scotland
Current	(£70,121)
20% Higher	(£70,121)

With aircraft movements doubling under both fares scenarios, the cost of carbon emitted over a 5-year period is identical-£70,000.

4.2.4 Surface Journey Carbon Emissions

Some of this increase in carbon emissions will be offset by reduced surface journeys from people who are no longer driving from either Inverness Airport or Ullapool to Aberdeen.

Table 4.4: Surface journey carbon benefits-5 year NPV discounted to 2014 prices

Fare Level	All Scotland
Current	£19,715
20% Higher	£12,927

The average group size travelling between Stornoway and Aberdeen is 1.65 people. Thus, emissions from one car will be spread across more than one person.

The value of carbon savings is estimated as around £19,700 for a double daily service at current fare levels and c£12,900 with higher fares.

4.2.5 APD, Fuel Duty and VAT

At the UK level, the change in travel habits will have an associated impact on Governmental income as:

- Less fuel is used from fewer surface journeys; but
- There is an increase in Air Passenger Duty (APD) from people flying.

Flights departing Highlands & Islands airports are exempt from APD (so departing passengers from Stornoway do not contribute). However, passengers departing from Aberdeen are subject to APD.

Table 4.5: Taxation benefits-5 year NPV discounted to 2014 prices

Taxation	Current Fares	Fares 20% Higher
APD	£267,992	£189,012
Fuel Duty	(£190,334)	(£124,803)
Fuel VAT	(£21,188)	(£13,613)
Total	£56,470	£50,595

Overall, for double daily services at current fare levels, a net additional £56,000 in tax would be generated. This figure falls to slightly over £50,000 under the higher fares scenario.

4.2.6 Overall TEE Results

Figure 4.1 NPV for Stornoway-Aberdeen double daily-current fare levels and fares 20% higher

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Current Fares

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£719,492	£0	£1,367,249	£0
Surface journey and fare costs	(£320,510)	£0	(£860,041)	£0
Total passenger benefits	**£398,982**		**£507,208**	

	UK	Total
APD impact	£267,992	£267,992
Road fuel duty and VAT impact	(£211,522)	(£211,522)
Total government impacts	**£56,470**	**£56,470**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£19,715	£19,715

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£563,678	£563,678
Including carbon impacts	£513,271	£513,271

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Fares 20% higher

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£466,145	£0	£889,662	£0
Surface journey and fare costs	(£210,125)	£0	(£552,168)	£0
Total passenger benefits	**£256,020**		**£337,493**	

	UK	Total
APD impact	£189,012	£189,012
Road fuel duty and VAT impact	(£138,417)	(£138,417)
Total government impacts	**£50,595**	**£50,595**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£12,927	£12,927

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£388,089	£388,089
Including carbon impacts	£330,894	£330,894

The overall net economic benefit of increasing the service to double daily is positive for both fares scenarios. The overall outturn ranges from £0.33m to £0.56m, depending on the fares scenario and inclusion/exclusion of carbon emission costs, over a 5-year period. The most significant influences on the results are the time savings and overall travel costs.

4.3 TEE: LOW AND HIGH TRAFFIC FORECASTS

4.3.1 Introduction

The same method and calculations were used to produce TEE appraisals for the low and high forecasts. The results are summarised below.

4.3.2 Overall TEE Results: Low Traffic Forecasts

Figure 4.2 NPV for Stornoway-Aberdeen double daily: low traffic forecasts-current fare levels and fares 20% higher

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Current Fares (low case sensitivity)

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£657,266	£0	£1,205,400	£0
Surface journey and fare costs	(£276,307)	£0	(£800,903)	£0
Total passenger benefits	**£380,959**		**£404,498**	

	UK	Total
APD impact	£216,486	£216,486
Road fuel duty and VAT impact	(£179,972)	(£179,972)
Total government impacts	**£36,514**	**£36,514**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£16,626	£16,626

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£441,012	£441,012
Including carbon impacts	£387,517	£387,517

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Fares 20% higher (low case sensitivity)

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£437,794	£0	£795,655	£0
Surface journey and fare costs	(£185,587)	£0	(£521,789)	£0
Total passenger benefits	**£252,208**		**£273,866**	

	UK	Total
APD impact	£155,602	£155,602
Road fuel duty and VAT impact	(£118,787)	(£118,787)
Total government impacts	**£36,816**	**£36,816**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£11,003	£11,003

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£310,682	£310,682
Including carbon impacts	£251,563	£251,563

The overall net economic benefit of increasing the service to double daily in the low case sensitivity is positive for both fares scenarios. The overall outturn ranges from £0.25m to £0.44m, depending on scenario and inclusion/exclusion of carbon emission costs, over a 5-year period.

Overall TEE Results: High Traffic Forecasts

Figure 4.3 NPV for Stornoway-Aberdeen double daily: high traffic forecasts-current fare levels and fares 20% higher

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Current Fares (high case sensitivity)

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£832,485	£0	£1,606,302	£0
Surface journey and fare costs	(£408,489)	£0	(£940,655)	£0
Total passenger benefits	**£423,996**		**£665,646**	

	UK	Total
APD impact	£319,563	£319,563
Road fuel duty and VAT impact	(£243,078)	(£243,078)
Total government impacts	**£76,485**	**£76,485**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£23,067	£23,067

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£742,131	£742,131
Including carbon impacts	£695,077	£695,077

Transport Economic Efficiency Results (5-year NPV, discounted to 2014 prices) - Fares 20% higher (high case sensitivity)

	Business passengers only		All passengers (inc commuters)	
	Scottish	*Non Scottish*	*Scottish*	*Non Scottish*
Time saving costs	£532,149	£0	£1,048,958	£0
Surface journey and fare costs	(£265,014)	£0	(£603,803)	£0
Total passenger benefits	**£267,135**		**£445,154**	

	UK	Total
APD impact	£222,478	£222,478
Road fuel duty and VAT impact	(£158,865)	(£158,865)
Total government impacts	**£63,613**	**£63,613**

	UK	Total
Flight carbon	(£70,121)	
Surface access carbon	£15,097	£15,097

Overall NPV	**UK**	**Total**
Excluding carbon impacts	£508,767	£508,767
Including carbon impacts	£453,742	£453,742

The overall outturn ranges from £0.45m to £0.74m, depending on scenario and inclusion/exclusion of carbon emission costs, over a 5-year period.

4.4 INBOUND VISITOR IMPACTS

4.4.1 Central Estimate Traffic Forecasts

One of the impacts of the double daily service would be the generation of visitor trips to the Outer Hebrides that would not otherwise be made.

It is estimated that at current fare levels, an additional 2,458 inbound passengers would use the double daily service. Of these, it is estimated that 928 passengers would be stimulated (i.e. new to the Outer Hebrides). At higher fare levels, these estimates fall to 1,746 and 836, respectively.

In 2013[7], the average spend per visitor in the Outer Hebrides was assessed as being £279 per holiday visitor, £285 per business visitor and £148 per visitor travelling to the islands to visit friends or relatives. Based on the journey purposes of stimulated trips to the Outer Hebrides, this results in a weighted average of £263 spend per visitor trip. Thus, the direct spend from the stimulated trips would be around £122,000 for a double daily service at current fare levels.

Table 4.6: Visitor impacts in the Outer Hebrides-central estimate traffic forecasts

Measure	Current Fares	Fares 20% Higher
Direct Visitor Spend	£122,032	£109,934
GVA (Direct, Indirect and Induced)	£100,066	£90,146
FTE Employment (Direct, Indirect and Induced)	3.5	3.2

Adopting the approach set out in "Appraising the Economic Benefits of New Air Routes: Technical Report" this direct spend generates £100,000 in GVA and 3.5 FTE (Full Time Equivalent) jobs. (Both figures include direct, indirect and induced impacts). At higher fares, a double daily service is still forecast to yield more than £100,000 in additional visitor spend.

The opportunity to increase visitor spend relates in particular to leisure trips over the weekend.

4.4.2 Low and High Traffic Forecasts

Using the same approach as for the central estimates, we have calculated inbound visitor impacts for each of the two sensitivities.

Table 4.7: Visitor impacts in the Outer Hebrides-low traffic forecasts

Measure	Current Fares	Fares 20% Higher
Direct Visitor Spend	£118,087	£107,436
GVA (Direct, Indirect and Induced)	£96,831	£88,097
FTE Employment (Direct, Indirect and Induced)	3.4	3.1

Table 4.8: Visitor impacts in the Outer Hebrides-high traffic forecasts

Measure	Current Fares	Fares 20% Higher
Direct Visitor Spend	£122,164	£110,066
GVA (Direct, Indirect and Induced)	£100,174	£90,254
FTE Employment (Direct, Indirect and Induced)	3.5	3.2

The differences between the two sets of results. and compared to the central estimates, are minimal. This is because there is very little difference in terms of passenger stimulation between each of the three forecasts.

4.5 POTENTIAL WIDER ECONOMIC AND SOCIAL IMPACTS OF ENHANCED SERVICE

4.5.1 Economic

For Passengers Using the Service

- Increased business productivity from removal of unnecessary overnight stays, with savings in business time and accommodation/subsistence costs.
- An increase in the number of residents able to take up well paid off-island employment.

[7] Outer Hebrides Visitor Survey 2012/13 Research Results-Final Report (February 2014)

Potential Increases In Linkages Between Two Areas (Short To Medium Term)

The research suggests that the following business linkages could be established or further developed:

- Greater possibility of the Outer Hebrides attracting inward investment through capturing overspill activity from Aberdeen. This would be particularly in the energy sector but also, potentially, financial & business services.
- Exploration of opportunities for collaboration between Lews Castle College UHI and Aberdeen University and/or RGU.
- Development of relationships between media and other creative industries businesses in the two areas.
- Opportunities for small scale businesses/self-employed to remotely supply services to oil and gas sector firms.

4.5.2 Social

- The opportunity for some of those working in the Aberdeen area to move back to live in the Outer Hebrides, and commute to their existing job.
- Increased interaction between friends and relatives.
- Long distance commuters able to spend more time at home.
- Improved ability for families to visit those in HMP Peterhead (c 4-6 individuals at present). Increased contact is seen as both benefiting the family and likely to reduce reoffending.

5 SUMMARY OF FINDINGS

5.1 CURRENT POSITION

The Stornoway-Aberdeen air service operates on weekdays. It provides a single return flight in the early afternoon. In 2013 some 5,476 passengers travelled on the service. Some use is made of the service to connect with flights at Aberdeen. These include offshore helicopter movements and scheduled services within the UK and elsewhere in Europe.

Most of the passenger traffic originates in the Outer Hebrides. Included within business passengers are long distance commuters who work offshore or onshore in the Aberdeen area and elsewhere. Leisure traffic is largely VFR.

There are two other ways of travelling between Lewis/Harris and the Aberdeen area:

- Stornoway-Inverness air service and surface travel between Inverness airport and Aberdeen.
- Ullapool-Stornoway ferry and surface travel to/from Aberdeen.

These two routings permit earlier arrival times and later departure times at Aberdeen. However, like the Stornoway-Aberdeen flights they are not really feasible for a day trip.

The two other routings' travel costs include those for surface travel between Aberdeen and Inverness airport or Ullapool. However, the air fare on Stornoway-Inverness and the ferry fare on Ullapool-Stornoway are less than the Stornoway-Aberdeen fare. There also appears to be more flexibility to change flights on the Stornoway-Inverness route than on the Aberdeen service.

Lewis/Harris-Aberdeen traffic accounts for a small proportion of overall traffic on these other two routings, around:

- 16% of total Stornoway-Inverness air carryings.
- 3% of all traffic on the ferry service.

There appear to be very limited business-to-business and public sector links between the two ends of the route. This partly reflects the different scale and composition of their economies: particularly in terms of the highly significant role of the oil and gas sector in and around Aberdeen.

There are some common specialisms-notably fisheries. However, the impacts of such apparent commonalities are limited by the small scale of the islands' economy. Further, many of the common specialisms are not particularly "air intensive".

Linkages between the two areas are more evident in the:

- Number of Outer Hebrides residents working in the area-or travelling through it to work elsewhere (especially offshore).
- Social and family links.
- To a lesser extent, Outer Hebrides school leavers studying at FE or HE institutions in Aberdeen.

Offshore worker traffic is a significant element of travel between the two areas. However, the Stornoway-Aberdeen service does not provide good or many connections with offshore flights. This leads to the workers either incurring additional overnight stays or having extended journey times by using Stornoway-Inverness or the ferry in order to better fit with offshore connections. Nor do the current transport links allow offshore workers to make day trips to Aberdeen for staff medicals or training.

Similar issues are faced by other long distance commuters. This includes onshore workers where the Stornoway-Aberdeen timings do not fit with working office hours.

Stornoway-Aberdeen differs from other air routes out of Stornoway. In particular:

- Very limited NHS/health-related and public sector traffic.
- Inability to fly outside office hours.
- Lack of day trip opportunities.
- Lack of weekend flights.

The service's fares are also relatively expensive. This is in a context where many long distance commuters are paying for their own travel. Air fare costs are an important consideration for many travellers between the two areas-including not only commuters but also some business passengers.

The size of the total annual travel market between Lewis/Harris and the Aberdeen area is estimated at around 16,650 passengers. They are split broadly evenly between:

- Stornoway-Aberdeen air service.
- Stornoway-Inverness air service and onward surface travel.
- Ullapool-Stornoway ferry and onward surface travel.

5.2 PROFILE OF OUTER HEBRIDES RESIDENTS WORKING ELSEWHERE

Appendix A uses the online survey results to provide a detailed profile of Outer Hebrides residents who work outside the islands. Their key characteristics are:

- Almost all are men.
- More than half are aged between 25 and 44 years.
- A median annual gross salary of over £60,000. That is more than twice the median salary for full time jobs in the Outer Hebrides.

5.3 DOUBLE DAILY SERVICE: IMPACT ON DEMAND

5.3.1 Central Estimate

The impacts of a double daily service on Stornoway-Aberdeen were assessed. The proposed timetable would allow connections with most offshore flights and good day trip opportunities in both directions. The service would continue to operate on weekdays only.

At *current fare levels* it is forecast that the double daily would see annual carryings grow from around 5,500 to 13,600 passengers. Most of this increase would be diverted trips from the other two routings rather than stimulated (i.e. new) trips between the two areas. The diverted traffic would be split broadly evenly between existing ferry passengers and existing Stornoway-Inverness passengers.

With a *20% increase in current fare levels* annual carryings are forecast to be around 10,400 passengers: that is, some 3,200 passengers less than if current fares were retained. This largely reflects lower levels of diverted traffic than would occur with a double daily service at current fares.

Irrespective of the fare levels to be charged any change to the schedule should take cognisance of its impacts on connections with scheduled flights at Aberdeen.

5.3.2 Sensitivity Analysis

Sensitivity analysis was conducted to produce low and high traffic forecasts in addition to the central estimates.

The sensitivities involved varying the:

- Number of existing Stornoway-Inverness air passengers with a trip end in the Aberdeen area.
- Proportion of Stornoway-Inverness air passengers travelling to/from offshore.
- Adjustment factor applied to survey respondents' stated demand for a double daily service.

The sensitivities produced the following passenger forecasts for a double daily Stornoway-Aberdeen service:

- At current fare levels: 12,601 (low) and 15,213 (high).
- With a 20% increase in current fare levels: 9,405 (low) and 11,443 (high).

Passenger volumes in the first year of operation are likely to be lower than the annual forecasts shown above. This reflects that it may take time for some passengers to change their travel habits. However, it is expected that demand would generally quickly grow towards the forecast level.

Even with the forecast volumes Stornoway-Aberdeen would still be a thin route. As such, relatively small variations in absolute passenger numbers could have significant impacts on total demand. In effect, this increases the risk to the airline compared to thicker, larger volume routes.

5.3.3 Potential Freight Demand

There is quite limited potential for freight and newspapers to contribute additional revenues. This reflects, first, the limited capacity of the passenger aircraft to accommodate newspapers, plus an apparent lack of appetite to switch from current delivery methods to Lewis/Harris (almost all by surface transport). There may, however, be potential to generate some limited revenue by attracting a single/small number of titles to the Stornoway-Aberdeen service.

Second, the nature of the Lewis/Harris economy means that it does not generate much in the way of high value goods that are time sensitive and/or perishable. The exception is some seafood. However, previous efforts to attract it to air rather than ferry transport have been largely unsuccessful. More widely, there do not appear to be compelling reasons why, if goods did leave the island by air, this would best be to Aberdeen rather than another airport.

The likelihood of medium to long term increase in demand on an enhanced service is uncertain and not amenable to quantification. Potentially the new schedule could attract more residents to work outside the islands. If it helped to attract an inward investor with a base in Aberdeen that would also help generate additional traffic on the route. However, such investments are difficult to anticipate far in advance.

5.4 TEE ANALYSIS

5.4.1 Central Estimate

A double daily service at existing fare levels gives an NPV of around £0.51 million (including carbon impacts). This largely reflects time savings to business passengers.

The NPV falls to around £0.33 million under the higher fares scenario, reflecting its lower carryings. Again, benefits largely accrue from time savings to business passengers.

Reduced passenger overnight stay costs (accommodation, subsistence, etc.) would be an additional benefit of an enhanced service; one that is not captured in the TEE results (as is standard practice).

5.4.2 Sensitivity Analysis

Including carbon impacts, the NPVs would be:

- Low passenger forecasts: current fares £0.39m; higher fares £0.25m.
- High passenger forecasts: current fares £0.70m; higher fares £0.45m.

5.5 POTENTIAL WIDER ECONOMIC AND SOCIAL IMPACTS OF ENHANCED SERVICE

The limited stimulation of traffic means that visitor impacts in the Outer Hebrides would be slight. Employment impacts are estimated at between 3 and 4 FTE jobs (direct, indirect and induced) under both fare scenarios in each of the three traffic forecasts (central, low and high). The opportunity to increase visitor spend relates in particular to leisure trips over the weekend.

Limited stimulation means that the wider economic and social benefits would-at least initially-flow largely to existing travellers between Lewis/Harris and the Aberdeen area.

Within this, existing business travellers would enjoy increased productivity. That is, from removing the time and financial costs associated with unnecessary overnight stays. Over time, the improved schedule could allow a greater number of Outer Hebrides residents to work in well-paid employment outside the islands.

The enhancement should also increase the possibility of attracting inward investment from companies based in Aberdeen. There are also other opportunities to increase linkages-although their impacts on passenger numbers may be quite small. These include:

- Exploration of opportunities for collaboration between Lews Castle College UHI and Aberdeen University and/or RGU.
- Development of relationships between media and other creative industries businesses.
- Opportunities for small scale businesses/self-employed to remotely supply services to oil and gas sector firms.

Social benefits would include:

- More time at home in the Outer Hebrides for long distance commuters.
- Greater social interaction through increased VFR trips.
- The opportunity for some of those working in the Aberdeen area to move back to live in the islands.

However, even with the uplift in traffic levels from a double daily service, overall volumes would remain slight. This suggests that many-though not all-of the potential impacts outlined above would be of limited scale.

5.6 FURTHER CONSIDERATIONS

In taking forward consideration of its Stornoway-Aberdeen service Eastern Airways may wish to reflect on the:

- Apparent demand for a weekend flight, assumed to be a Sunday rotation.
- Value that passengers attach to the flexibility to change flights without incurring significant penalties.
- General demand for a later ex Aberdeen flight than is currently operated.

Appendix A: ONLINE SURVEY FINDINGS

A.1 INTRODUCTION

The online survey ran between June 2nd and 23rd. It collected views and information from people who travel between Lewis/Harris and the Aberdeen area, and those who have an interest in possibly doing so. The survey was promoted through a range of avenues. These included:

- Media releases to broadcasters, print newspapers and online news providers.
- Publicity on the website of public sector organisations, including Comhairle nan Eilean Siar, HIE, HIAL and HITRANS.
- Business organisations publicising the survey to their members. They included Aberdeen and Grampian Chamber of Commerce and the Federation of Small Businesses.

There were 387 responses to the survey. The vast majority (94%) responded as an individual. The other 6% (22 respondents) did so on behalf of a business/organisation.

A.2 RESPONDENT PROFILE

A.2.1 All Respondents

Usual Place of Residence

Most (73%) respondents indicated that they are a resident of the Outer Hebrides. The vast majority (97%) of them live in Lewis - very largely outside Stornoway. The rest were split between Harris and the Southern Isles.

The other respondents were largely (79%) from either Aberdeen City or Aberdeenshire (mostly the former). The remainder were mostly from Scotland outside the Highlands & Islands (largely Glasgow or Edinburgh).

Characteristics

More men (61%) than women (39%) responded to the survey.

Table A.1: Respondent Age Profile

Age Band	Percentage
16-24	7%
25-34	23%
35-44	29%
45-54	26%
55-64	11%
65 years+	3%
Total	**100%**

More than three quarters of respondents (78%) were aged between 25 and 54 years. There were relatively few of the youngest respondents (i.e. those aged under 25) and those who are 65 years and above.

The vast majority (95%) of those providing information on their employment status are currently working. Not all of those in employment/self employment stated where they work. Among those who did the break down was:

- Outer Hebrides: 35%.
- Offshore-oil/gas sector: 34%.
- Scotland-outside Outer Hebrides: 28%.
- Outside Scotland: 3%.

This indicates the extent to which Outer Hebrides respondents work outside the islands while still retaining their home there.

A.2.2 Businesses and Organisations

Some 18 of the 22 businesses/organisations gave details of their location. Most (12) were based in the Outer Hebrides, almost wholly (11) in Lewis. As with the individual respondents, most of the Lewis businesses/organisations were based outside Stornoway. Of the six mainland respondents, almost all (five) were in Aberdeen.

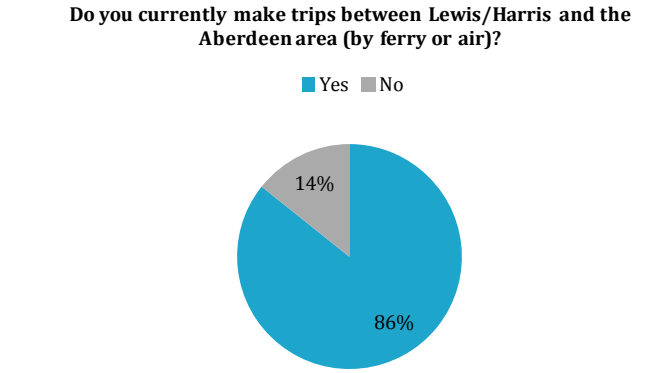
More than half (63%) of respondents were from the private sector. They encompass a wide range of business activities. The most common grouping was services to the offshore sector. This was reported by four companies, each involved in one or more of software, consultancy and engineering.

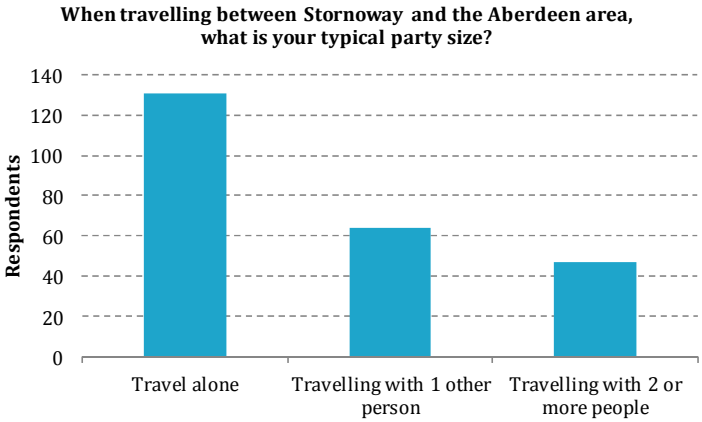
A further two are involved in non-offshore related consultancy. The rest are in: public relations, electronics, food and drink or publishing.

Employment levels varied considerably. One third employed up to four staff. However, half of the respondents were organisations with more than 10 employees, including some with more than 50 staff. (Note: these employment levels refer to the business unit where the respondent works, not the total employment in their business/organisation).

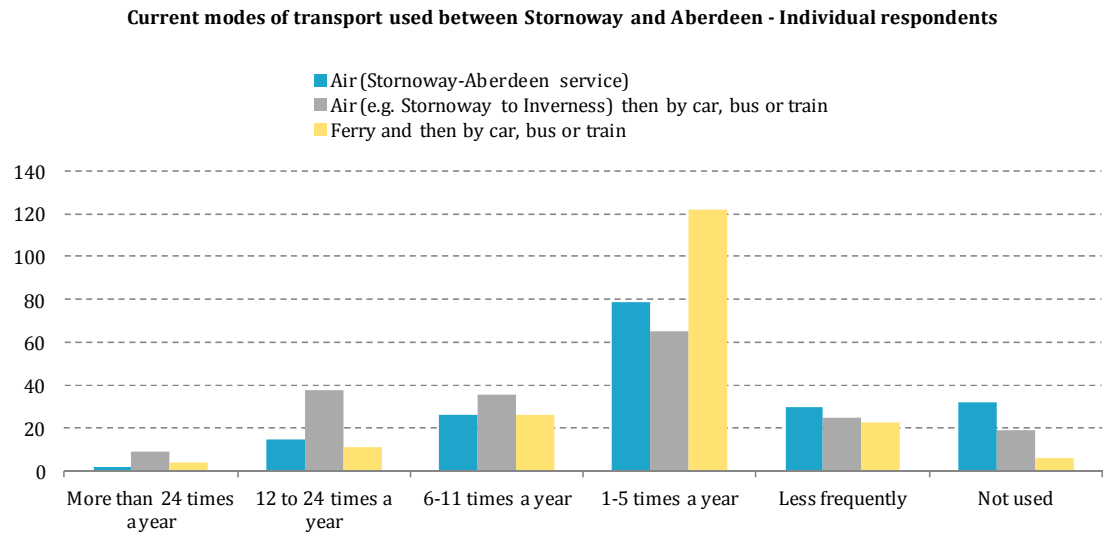
A.3 TRAVEL CHARACTERISTICS: INDIVIDUAL RESPONDENTS

86% of respondents currently make trips between Lewis/Harris and the Aberdeen area (by ferry or air). When doing so they are most likely to be travelling alone.

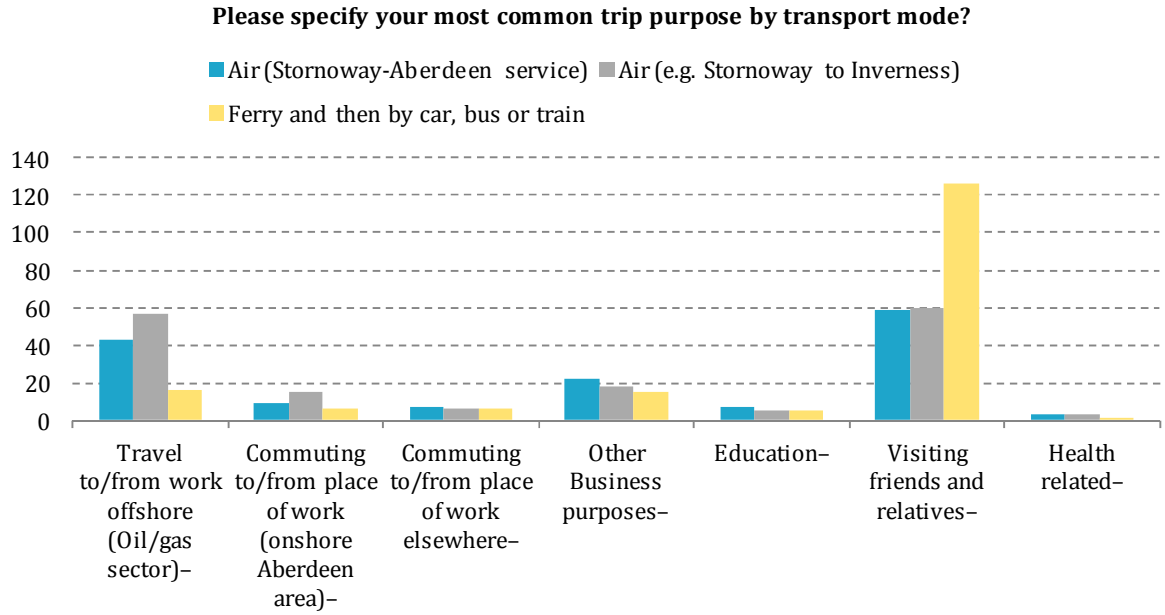




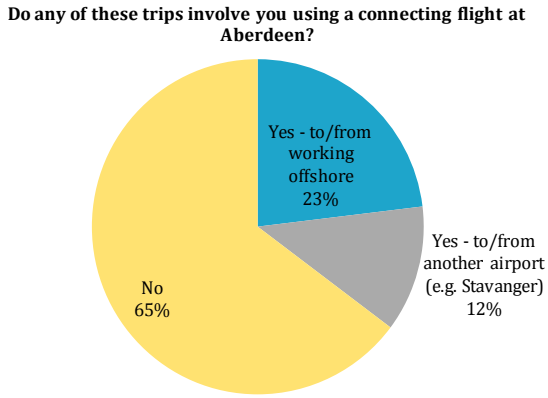
The more frequent travellers-i.e. those making 6 or more return trips per year-are most likely use the Inverness flight. In contrast, for those respondents travelling 1-5 times a year the ferry is by far the most popular choice, followed by the Stornoway-Aberdeen service.



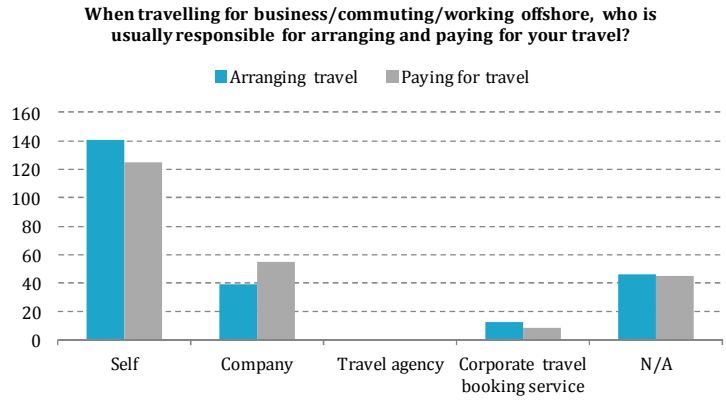
It is clear that the ferry is the most popular choice for VFR, whereas air services are preferred by those travelling to work offshore. For all other trip purposes the three different transport modes are used in broadly equal measure.



65% of respondents stated that trips to Aberdeen do *not* involve a connecting flight at Aberdeen airport. Thus, some 35% make at least some use of connections. This is mostly to offshore helicopter flights (23% of the whole sample) rather than to access other airports (12%).



A clear majority of those travelling for business, commuting or working offshore are responsible for arranging and paying for their travel.



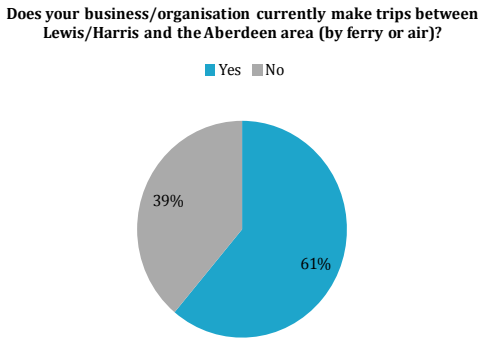
Most of those who currently fly as part of their trips between Stornoway and the Aberdeen area stated that they are eligible to use the Air Discount Scheme (ADS).

This was stated by 56% of all respondents in relation to commuting trips and by 69% regarding leisure trips.

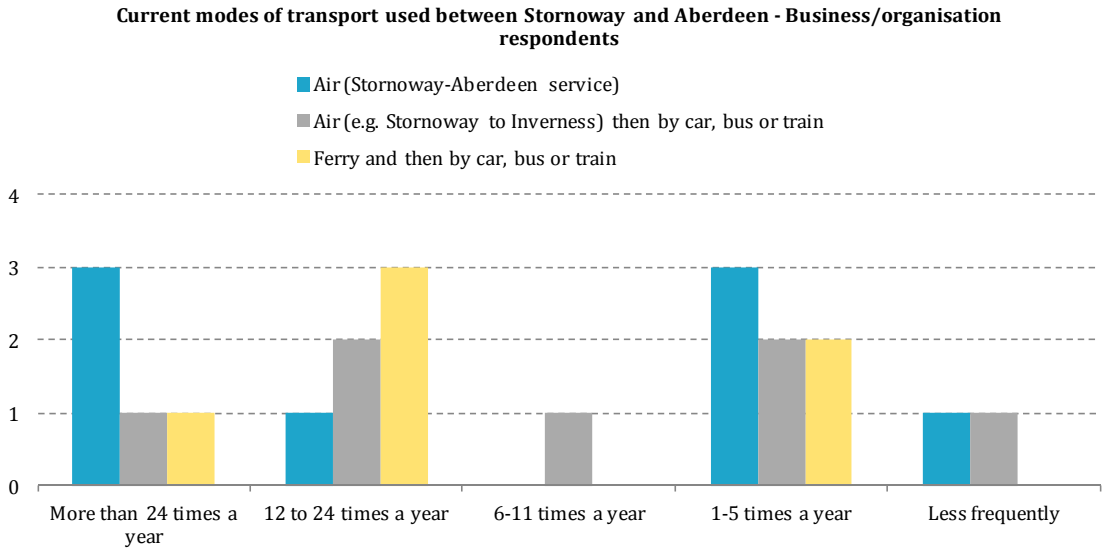
There is extensive use of ADS by those who are eligible to use it. Over 80% of them use ADS on the vast majority (i.e. 75%-100%) of flights they make to travel between Stornoway and the Aberdeen area.

A.4 TRAVEL CHARACTERISTICS: BUSINESSES AND ORGANISATIONS

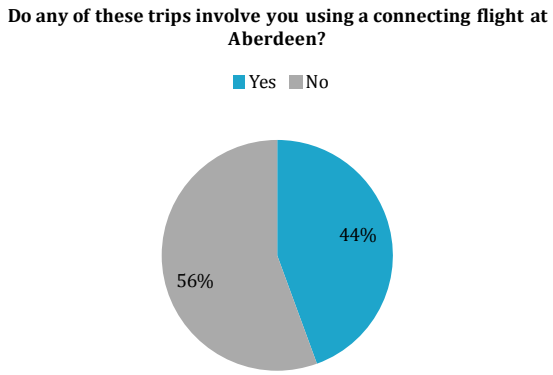
61% of the staff of businesses\organisations currently make trips between Lewis/Harris and the Aberdeen area (by ferry or air). In doing so they are most likely to be travelling alone.



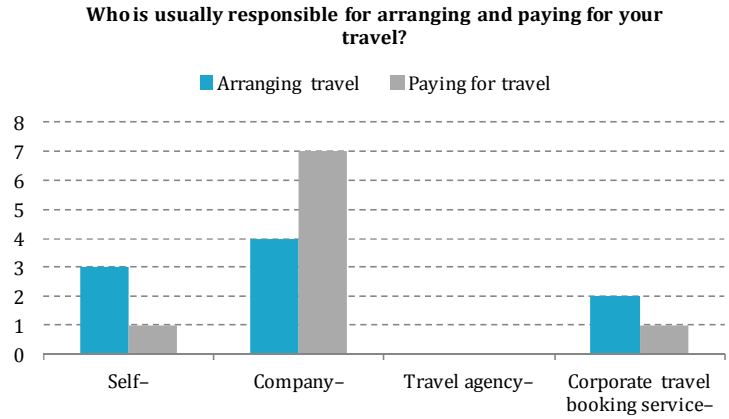
The Stornoway-Aberdeen air service is the preferred choice where more than 24 return trips per year are being made. For those travelling 12-24 times a year the ferry is used as much as the two air services combined.



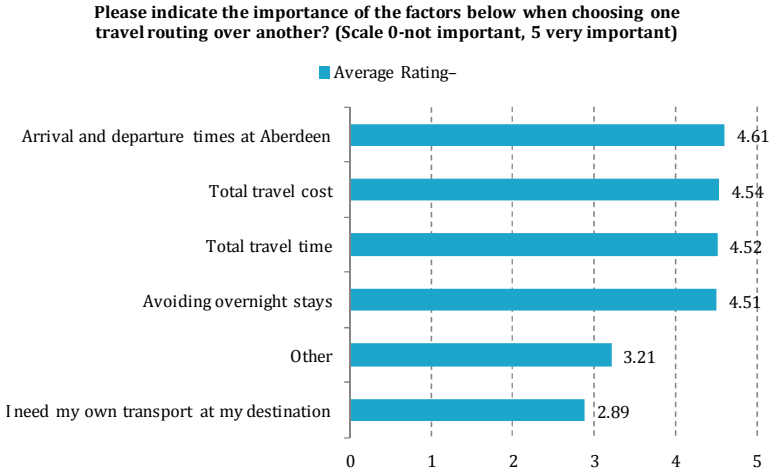
Some 44% of respondents indicated that at least some of these trips involve using a connecting flight at Aberdeen airport.



The company is the most common means of both arranging and paying for travel.

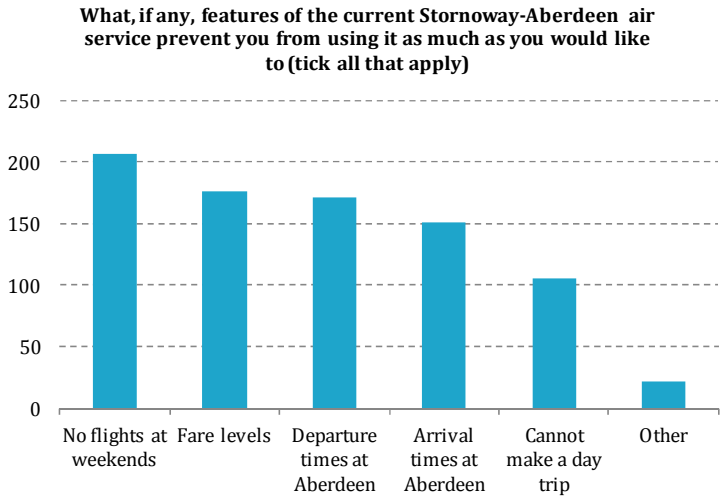


A.5 FACTORS AFFECTING ROUTING AND TRAVEL FREQUENCY



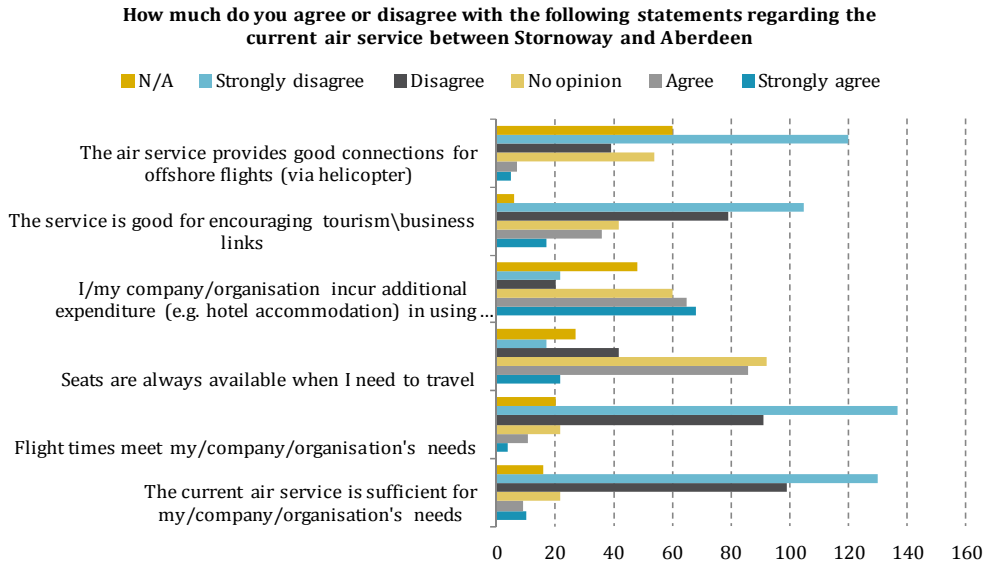
The most important factor is 'Arrival and departure times at Aberdeen' followed by 'Total travel cost', 'Total travel time' and then 'Avoiding overnight stays'. 'Other' factors were less important. The main ones include availability of weekend flights and connecting with other flights (both offshore and other).

The survey asked what, if any, features of the current Stornoway-Aberdeen service prevents the respondent from using it as much as they would like to.



The most common feature is the lack of weekend flights. The next highest reason was current fare levels, followed by departure and arrival times at Aberdeen, and the inability to make a day trip. Interestingly, the number of respondents stating 'no flights at weekends' was twice that who mentioned 'cannot make a day trip'. Among the relatively small number of 'other' responses the most common themes were difficulty in connecting with other flights and departure/arrival times at Stornoway.

Respondents were then presented with a series of statements about which they were asked to comment.



The statement obtaining the most positive response was 'Seats are always available when I need to travel'. However, it is clear that respondents largely *strongly disagree* with the following statements:

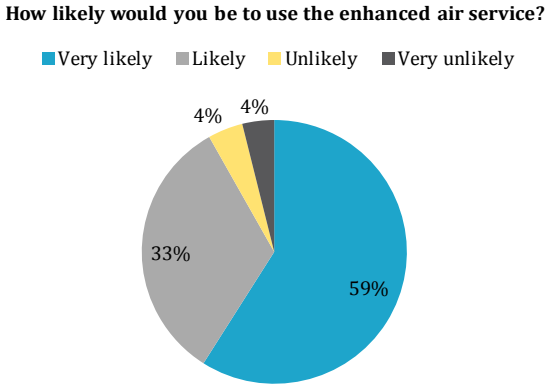
- *The air service provides good connections for offshore flights (via helicopter*).
- *The service is good for encouraging tourism/business links*.
- *Flight times meet my/company/organisation's needs*.
- *The current air service is sufficient for my/company/organisation's needs*.

Whilst less standout than the above statements, it is apparent that respondents tend to agree with the following statement:

I/my company/organisation incur additional expenditure (e.g. hotel accommodation in using this service

A.6 REACTION TO DOUBLE DAILY STORNOWAY-ABERDEEN SERVICE

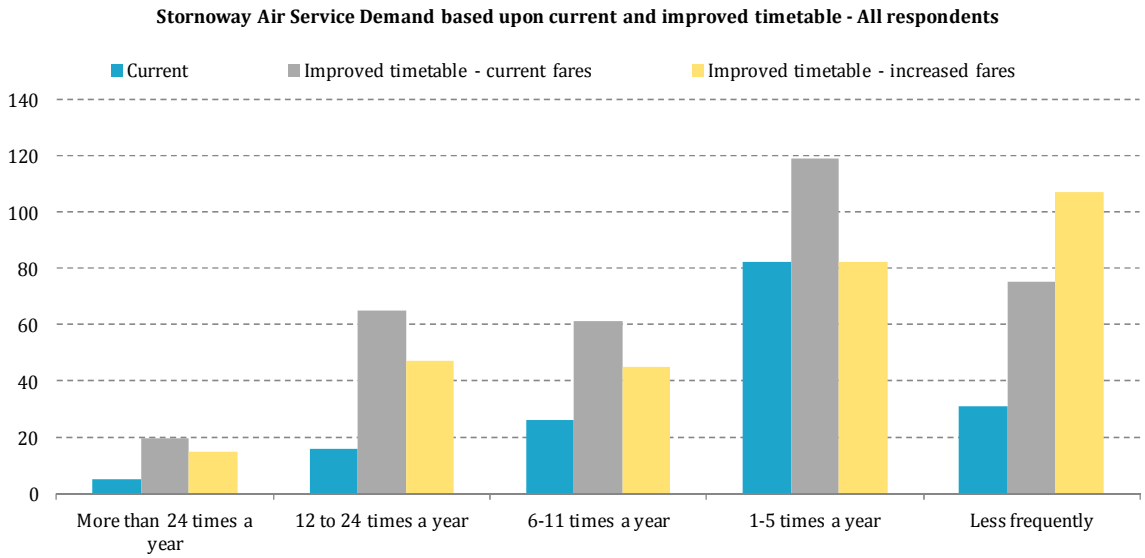
Respondents were asked how likely they would be to use a double daily Stornoway-Aberdeen service, operating on weekdays.



92% indicated they would be 'very likely' or 'likely' to use the enhanced air service. Within this more than half (59% of all respondents) would be 'very likely' to do so, and 33% likely'.

The chart below shows the implied number of trips on the Stornoway-Aberdeen air service at present compared to those with a:

- Double daily service-current fares.
- Double daily service-increased fare levels (c. 20% above current).



The survey suggests that a double daily service would increase demand. However, should fares increase by around 20% then demand would be less than that of a double daily service at current fare levels.

Respondents were asked to provide some supporting information about their stated levels of trip-making.

Some 174 respondents provided some additional information regarding the **enhanced service at current fares**.

A minority referred to factors that had positively influenced their stated level of trip-making. After grouping the various comments the most common references were to:

- Timetable is much more attractive: 14 respondents.
- Removes time and costs associated with overnight stays: 12.

To illustrate the above:

The main issue with the current flight times is the fact that half the day is gone by the time you get there, and vice versa on return. This schedule would solve that

This service would also be great for myself and others to travel to Aberdeen and then on to offshore rather than having to leave home the previous day and stay in hotels prior to the later morning check-ins. The new times proposed would be great for courses, medicals, hospital and day trips/ holidays to and from Aberdeen.

Times are more important than flight costs to get to meetings on time. E.g. next week's meeting is from 13.30-16.00 so I'd require two overnights. I will be using vc instead which isn't reliable depending on the level of expertise at the other end and prevents networking

The negative comments largely related to the current fare levels, as follows:

- High fares-general comment: 37 respondents.
- High fares for flexi ticket 24.
- Specific references to cheaper air fares and overall journey costs if routing via Stornoway-Inverness: 13.
- High fares-inflexible ticket 8.
- High fares-would go by ferry instead: 5.

To illustrate the above:

- *I think £210 for a return flight to Stornoway is excessive*
- *Flexible ticket is too expensive*
- *It is still too expensive, I'd rather take the extra time and travel by road and sea*
- *£210 is too high for non flexible*
- *Too expensive for a short break*

The main other comment was made by 10 respondents. They would want the fare conditions on Stornoway-Aberdeen to allow one free change of flight-especially given the possibility of weather and other factors delaying offshore travel.

Some 138 respondents provided some additional information regarding the **enhanced service at higher fares**.

The general themes were very similar to those for the existing fare levels. The main positive comments were:

- Removes overnight stays-time and costs: 9 respondents.
- Willing to pay higher fares: 6.

Specific comments included:

- *All I want to do is get to Aberdeen and back home to Stornoway as quickly as possible, sick of travelling all day just to get to work*
- *Cost is not my main constraint on business flights*
- *Still alleviates need for hotel stop-over*

A further seven respondents stated that fares not a consideration. That is because their employer pays for travel costs.

Again, the negative comments very largely related to the higher fare levels, as follows:

- High fares-general comment: respondents 56.
- Specific references to cheaper air fares and overall journey costs if routing Stornoway-Inverness: 14.
- High fares for flexi ticket: 11.
- High fares-inflexible ticket 9.
- High fares-would go by ferry instead: 7.

Some illustrative quotes:

- *Couldn't justify the increased cost compared to the flybe service to Inverness*
- *Very expensive, would only use that service in an emergency*
- *Far too expensive, not practical for people who work outwith oil*
- *£360-£480 is a ridiculous amount to pay for a 50 minute flight*

A.7 FINAL COMMENTS

A.7.1 Benefits of an Enhanced Service

Respondents were asked:

'How, if at all, might this enhanced Stornoway-Aberdeen air service benefit you or your family, including decisions you make about where you work or live? Or if you are answering on behalf of a business/organisation how, if at all, would this benefit you?'

A total of 164 respondents provided comments. The most common positive ones from **those responding as individuals** can be grouped as follows:

- More time at home/at home with family rather than travelling (commuters): 46 respondents.
- Easier to visit friends and relatives (mostly visiting those in Aberdeen rather than Outer Hebrides): 30.
- Reduce overall travel time for trips: 15.
- Direct, single leg route for travel between Stornoway and Aberdeen: 9.
- Would consider, or easier for, commuting from the Outer Hebrides: 7.

The following quotes illustrate some of these responses:

- *With a reasonable flight time I could spend more time In the Western Isles, with my family and in the community, spend less time away, contribute more to the community and local businesses and economy*
- *It would cut two days off of my travelling time, travelling to and from my offshore job. Would make my travelling a lot easier and my time off much more enjoyable and longer*
- *It would make a huge difference as it would be easier to visit relatives for weekends. Fly away on a Friday and fly back Monday morning*
- *It would allow us to visit relatives more frequently*
- *Would consider moving to Lewis to live and commute to Aberdeen weekly*

The most common positive comments from **businesses/organisations** were around:

- Ability to make a day trip: 4 respondents.
- Less wasted business time: 2.

One commented that it:

Would allow public sector bodies to attend the many consultation, etc, events which are held for the "north of Scotland" in Aberdeen

Those who stated that there would be **limited or no benefits** referred in particular to:

- Fare levels would prohibit using the flights: 21 respondents.
- Lack of weekend flights: 5.
- Timings not suitable/worse than at present e.g. still not late enough ex Aberdeen: 5.

A.7.2 Other Comments

Finally, respondents were asked to provide any further comments on air services between Stornoway and Aberdeen. Some 76 took the opportunity to do so.

Many repeated or re-emphasised points they had made in response to earlier questions. The main points made that were *not* covered earlier related to:

- Some travellers require a departure from Aberdeen at around 1800.
- Better marketing of the service to Aberdeen residents to attract tourists to the Outer Hebrides.
- Fare discounts for students.
- The greater flexibility of a double daily service to meet the needs of offshore workers who work on an ad hoc basis and get short notice requests to travel offshore at. It would also offer day trip opportunities for their attending training courses in Aberdeen.
- Suitable frequency and timings will maximise off-island commuting opportunities for Outer Hebrides residents.
- The service's general lack of through ticketing to airports beyond Aberdeen.

A.8 OUTER HEBRIDES RESIDENTS WORKING ELSEWHERE

A.8.1 Personal Characteristics

Some 98 respondents identified themselves as residents of the Outer Hebrides who work outside the islands. A very clear majority are offshore, as follows:

- Offshore oil/gas sector: 79% (77 individuals).
- Scotland outside Outer Hebrides: 13% (13).
- Outside Scotland: 8% (8).

Almost all (95%) are men.

Table A.2: Outer Hebrides Residents Working Elsewhere: Age Profile

Age Band	Percentage
16-24	8%
25-34	32%
35-44	29%
45-54	23%
55-64	8%
Total	**100%**

The workers are very largely between 25 and 54 years old. In total more than half (61%) are aged between 25 and 44 years. The largest single age band is 25-34 years. It accounts for around a third of all the workers.

Table A.3: Outer Hebrides Residents Working Elsewhere: Annual Gross Salary

Annual Salary	Percentage
Less than £20,000	3%
£20,000-£30,000	5%
£30,001-£40,000	10%
£40,001-£50,000	14%
£50,001-£60,000	17%
£60,001-£70,000	18%
£70,001-£80,000	12%
£80,001-£90,000	3%
£90,001-£100,000	3%
More than £100,000	15%
Total	**100%**

Very few (8%) of the workers earn £30,000 or less. Most (almost half) lie in a range between £40,000 and £70,000.

One in three earns more than £70,000, with 15% of all workers getting more than £100,000 per year.

A.8.2 Offshore Oil/Gas Offshore Workers

When asked about the **main activity of the business/organisation you work for** the offshore workers most commonly referred to:

- Drilling.
- Anchor handling/supply boats.
- Hydrographic surveying.
- Offshore construction.

The following were each mentioned by a single offshore worker:

- Crane operations.
- Craft inspectorate
- Drilling contractor.
- Marine services.
- Service contractor.
- Survival.
- Well intervention.

The most common **occupations** cited by the offshore workers were Mechanic (4 respondents) and Technician (3 respondents). Each of the following was mentioned by two respondents: Marine Engineer; Mechanical Technician; Production Technician; Rig mechanic; Roustabout.

The following were each mentioned by a single individual respondent:

2nd officer	Lead mechanical engineer	Painter blaster
2nd officer dpo	Lead mechanical tech	Painting supervisor
Able seaman	Lifting technician	Plater
Ballast control operator	Logistics supervisor	Production operator
Barge master	M.s.o.	Production technician
Client site representative	Maintenance coordinator	Project leader
Construction manager		

Crane operator Deck crew Deck crew/welder Deck operator Dimensional control surveyor Drilling fluids supervisor Electrical technician Engineer Engineering Engineering team leader General foreman Handyman Health & safety advisor Heli-admin Hydraulic engineer Instrument technician Lead deck hand	Maintenance electrician Maintenance operator Marine contractor Marine control room operator Marine operator Maritime professional Master mariner Materials controller Marine engineer N2 supervisor Offshore chef Offshore maintenance supervisor Offshore operations coordinator Offshore surveyor Oil rig crew	Qc engineer Rigger ROV pilot ROV pilot tech Ssl Subsea engineer Surveyor Survival craft inspectorate Welder

Table A.4: Offshore Workers Annual Gross Salary

Annual Salary	Percentage
Less than £20,000	0%
£20,000-£30,000	5%
£30,001-£40,000	11%
£40,001-£50,000	11%
£50,001-£60,000	19%
£60,001-£70,000	22%
£70,001-£80,000	12%
£80,001-£90,000	3%
£90,001-£100,000	4%
More than £100,000	14%
Total	**100%**

None of the offshore workers is paid less than £20,000 per annum, with more than half (53%) receiving between £50,000 and £70,000. Around one in seven has a salary of more than £100,000.

A.8.3 Working In Scotland Outside the Outer Hebrides

Of the 13 Outer Hebrides residents working elsewhere in Scotland more than half (seven) work in **onshore oil and gas activities**. Their occupations are:

- Drilling superintendent.
- Engineer.
- Graduate maintenance engineer.
- Head of estimating.
- Lorry driver.
- Senior engineer.
- Shutdown team lead.

Their posts are generally well paid. Three respondents have a salary of more than £90,000, with a further two on between £70,000 and £90,000.

The other six individuals work in: education, fisheries, church ministry, shipping or the merchant navy. The three who work in sea transport are either crew or a ship agent.

A.8.4 Working Outside Scotland

Eight of the Outer Hebrides residents work outside Scotland. Three are in the offshore sector as: Marine Engineer; QA Engineer; or Senior Drilling Engineer. Two of them have an annual salary of between £50,000 and £70,000. The other is on over £100,000 per year.

The five remaining individuals work in:

- Media/publishing (Editor).
- IT (Consultant).
- Financial services (Customer Service Officer).
- Higher Education (Postgraduate Researcher).
- Merchant navy (Chief Officer).

Appendix B: LIST OF CONSULTEES

- Aberdeen Airport.
- Bristow Helicopters.
- Comhairle nan Eilean Siar-Technical Services, Economic Development and Business Support, and a number of other individuals regarding staff travel.
- Eastern Airways.
- Federation of Small Businesses.
- Highlands and Islands Airports Limited.
- HIE-Innse Gall office; Regional Infrastructure; Oil and Gas.
- HITRANS.
- Lews Castle College UHI.
- Loganair.
- Outer Hebrides Tourism Industry Association.
- Scottish Newspaper Society.
- Woody's Express Parcels.
- Three companies involved in oil and gas production or related support sectors.
- A number of current commuters from Lewis/Harris to the Aberdeen area.

Appendix C: PRICE ELASTICITY RESEARCH

Gillen et al – 2003 (Gillen, D.W., W.G. Morrison and C. Stewart for Department of Finance, Government of Canada: Air travel demand elasticities - concepts, issues and management; 2003)

The comprehensive review of existing studies undertaken by Gillen et al for the Canadian Department of Finance in 2003 provides a comparative evaluation of the elasticity of air travel available from the academic literature. They collected 254 own-price elasticity estimates from 21 empirical studies and 132 income elasticity estimates from 14 studies. From this data they identified six distinct markets that studies of the demand for air travel should distinguish between:

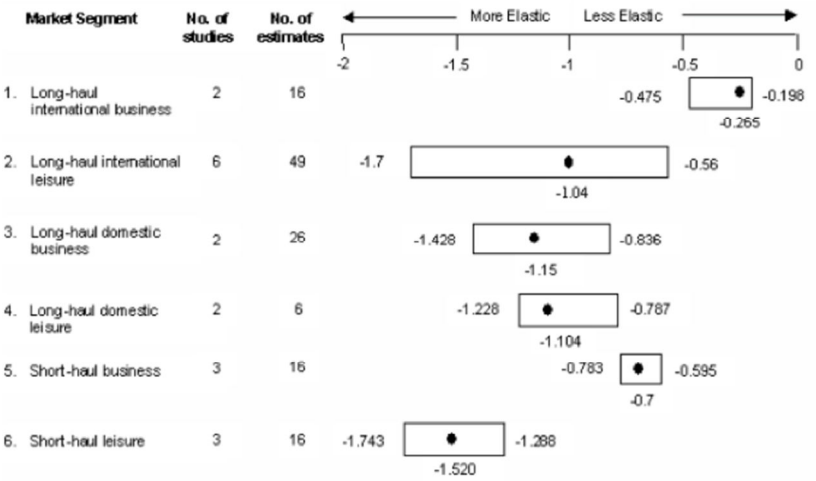
- Business and leisure travel.
- Long-haul and short-haul travel.
- International and North American long-haul travel.

Accordingly, to examine the sensitivity of the demand for air travel to its price, separate estimates of the own-price elasticity of demand were gathered for each of these six markets.

Gillen et al then went on to postulate that since the availability of alternative modes of transportation that are reasonably close substitutes for air transport diminishes with distance travelled, it can be expected that the demand for air transport will be less elastic for longer flights than for shorter flights. Further, the report hypothesises that international travel tends to be spread over more time than domestic travel, so that the airfare is a smaller proportion of overall trip costs, which makes international travel less sensitive to changes in ticket prices. And finally, they anticipate that leisure travellers are more likely to postpone trips to specific locations in response to higher fares, or to shop around for those locations offering more affordable fares. Consequently, they expect that the demand for air transport for leisure reasons will be more elastic than business travel.

Gillen et al produced a summary of their meta-review of various cost elasticities according to sector type and journey purpose (summarised overleaf). It is clear there is no single elasticity value that is representative of air travel demand; rather there are several distinct markets and consequently several different elasticities should be used when exploring the impact on the overall market from changes to the aviation environment.

Furthermore, even within a single market segment the study suggests there is a range around this elasticity value that should be considered in forecasting the impact of fare changes. The aggregate elasticities for the market segment reflect the combined effect of demand relationships in each component market. Each market will typically exhibit different elasticities than that considered at the aggregate market level. All markets demonstrate some unique idiosyncrasies at the granular, route-by-route level.



Intervistas Study 2007 (Intervistas for IATA: Air Travel Demand Elasticities: Dec 2007)

This important report was commissioned by IATA and published in 2007. It is widely regarded, both internationally and by different sections of the industry, as a core source document on fare elasticities in the passenger aviation market. The study undertook an extensive meta-review of previous research on airfare elasticities (23 papers over the preceding 25 years – including Gillen et al's 2003 work), and combined this with econometric analysis.

The aim of the research was to provide elasticity estimates to enable policy issues relating to liberalisation, airport charges, taxation and emissions schemes to be examined from a more robust and evidence-based perspective. The literature review and econometric analysis demonstrated that airfare elasticities vary depending on a number of factors such as geography, distance and level of aggregation.

There is a significant demand response to changes in air fares, with increased air fares leading to lower passenger demand. The uniformity and consistency of this result indicates strongly that any policy action that results in higher fares (e.g. taxes, increased landing fees) will result in a decline in demand. But the scale of this decline in demand will depend on a number of factors:

- Business/leisure mix - business travellers are less sensitive to fare changes (less elastic) than leisure travellers because they generally have less flexibility to postpone or cancel their travel than leisure travellers.

- Short-haul vs. long-haul route structure - fare elasticities on short-haul routes are generally higher than on long-haul routes, reflecting the opportunity for inter-modal substitution on short-haul routes (e.g. travellers can switch to rail or car in response to air fare increases).

Some studies also reviewed by Intervistas supported the idea that the demand elasticity faced by individual air carriers is higher than that faced by the whole market. For example, Oum, Zhang and Zhang (1993) estimated airline network elasticities in the U.S. and found values ranging from -1.24 to -2.34, while studies estimating market or route elasticities ranged from -0.6 to -1.8.

In contrast, Alperovich and Machnes (1994) and Njegovan (2006) used national-level measures of air travel in Israel and the UK respectively and produced even lower elasticity values (-0.27 and -0.7, respectively).

A summary of the potential range of elasticities identified in the Intervistas study is provided in the table below. Short-haul intra-European services on a route/market level were identified as having an elasticity of -1.96:

	Route/Market Level		National Level		Pan-National Level	
	Short-haul	Long-haul	Short-haul	Long-haul	Short-haul	Long-haul
Intra North America	-1.54	-1.40	-0.88	-0.80	-0.66	-0.60
Intra Europe	-1.96*	-1.96	-1.23	-1.12	-0.92	-0.84
Intra Asia	-1.46	-1.33	-0.84	-0.76	-0.63	-0.57
Intra Sub-Sahara Africa	-0.92	-0.84	-0.53	-0.48	-0.40	-0.36
Intra South America	-1.93	-1.75	-1.10	-1.00	-0.83	-0.75
Trans Atlantic (North America – Europe)	-1.85	-1.68	-1.06	-0.96	-0.79	-0.72
Trans Pacific (North America – Asia)	-0.92	-0.84	-0.53	-0.48	-0.40	-0.36
Europe-Asia	-1.39	-1.26	-0.79	-0.72	-0.59	-0.54

*The short-haul adjustor has not been applied to the Intra Europe short-haul elasticity in order to maintain elasticities below 2.0

CAA Elasticities Study 2005

The CAA found the literature on UK aviation demand elasticities relatively sparse; certainly more so that Gillen at al had found in North America. In the forecasting work underpinning the last Air Transport White Paper, DfT found that leisure traffic was price elastic (elasticity value of around -1.3), but business traffic was price inelastic (elasticity value of around -0.5).

The CAA also highlighted two other academic studies of demand for air travel in the UK:

- Graham (2000), who estimated the income elasticity for UK leisure travel to be about +2, but found no significant relationship between demand and air fares.
- Dargay and Hanly (2001), who used pooled time-series/cross-section data that covered the years 1989 to 1998. They estimated a price elasticity of about -0.6. They also found exchange rate (local currency per pound) and relative prices (RPIUK/RPIFOREIGN) to be more influential than air fares with elasticity estimates of +1 and -0.8, respectively.

Elasticities in DfT 2011 Air Passenger Forecasts

The Table overleaf provides a summary of the estimated long run elasticities (for both income and price) of air passenger demand that were used by the DfT in 2011.

Again, differing elasticities have been utilised for different traffic types, highlighting the fact that different journey purposes and destinations have a different traffic profile.

		Elasticity of demand with respect to	
Sector	Share of Passenger demand 2008	Income	Air Fares
UK Business	8%	1.2	-0.2
UK Leisure	45%	1.4	-0.7
Foreign Business	7%	1.0	-0.2
Foreign Leisure	14%	1.0	-0.6
International to International Interliners	10%	0.5	-0.7
Domestic	15%	1.7	-0.5
Overall	100%	1.3	-0.6

Notes:

Income variable depends on sector

Price and income elasticities are point estimates.

Results are elasticity of terminal passengers to income or fares

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